

Serap Kurbanoglu
Esther Grassian
Diane Mizrahi
Ralph Catts
Sonja Špiranec (Eds.)

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Worldwide Commonalities and Challenges in Information Literacy Research and Practice

European Conference on Information Literacy, ECIL 2013
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Revised Selected Papers

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Volume Editors

Serap Kurbanoglu
Hacettepe University, Ankara, Turkey
E-mail: serap@hacettepe.edu.tr

Esther Grassian
University of California, Los Angeles, CA, USA
E-mail: estherg@ucla.edu

Diane Mizrachi
University of California, Los Angeles, CA, USA
E-mail: mizrachi@library.ucla.edu

Ralph Catts
University of Stirling, UK
E-mail: ralphcatts@stir.ac.uk

Sonja Špiranec
University of Zagreb, Croatia
E-mail: sspiran@ffzg.hr

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Preface

The First European Conference on Information Literacy (ECIL) was co-organized by the Department of Information Management of Hacettepe University, Turkey, and the Department of Information and Communication Sciences of Zagreb University, Croatia. Information literacy (IL), media literacy, and lifelong learning being the main theme, ECIL aimed to bring together researchers, information professionals, media specialists, educators, policymakers and all related parties from around the world to exchange knowledge and experience and discuss current issues and recent developments. In all, 396 proposals—236 of which were in the paper category—were submitted to the conference. All submissions were subjected to a double-blind review process and 93 were accepted as full papers. This book consists of 88 contributions (2 keynotes, 9 invited papers, 73 papers, 4 doctoral papers). Contributions came from 59 different countries (Albania, Australia, Austria, Bangladesh, Belgium, Botswana, Brazil, Bulgaria, Canada, China, Colombia, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, India, Iran, Ireland, Italy, Jamaica, Japan, Lithuania, Malaysia, Malta, Mexico, The Netherlands, New Zealand, Nigeria, Norway, Pakistan, Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, Russia, Saudi Arabia, Serbia, Singapore, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Taiwan, Tunisia, Turkey, UK, Ukraine, United Arab Emirates, USA) and address a number of issues dealing with, among others, theoretical framework, policies and strategies, the digital divide, disadvantaged groups, IL for the workplace, and IL instruction.

Starting with our own organizations, Hacettepe University and the University of Zagreb, we are grateful to many organizations for their support. Our special thanks go to UNESCO and IFLA, two major organizations that have contributed tremendously to the development of IL, for generously providing their patronage.

We would like to take this opportunity to thank the conference keynote speakers Paul G. Zurkowski (who coined the term “information literacy”) and Christine Susan Bruce; the invited speakers (Carla Basili, Albert Boekhorst, John Crawford, Natalia Gendina, Bill Johnston, Evgeny Kuzmin, Jesus Lau, Annemaree Lloyd, Maria Carme Torras-Calve, Sirje Virkus, Li Wang, Sheila Webber); the panel conveners; the workshop presenters; the authors and presenters of papers, best practices, PechaKuchas, posters; and the session chairs. We would like to thank and acknowledge the hard work of the members of the Standing and Program Committees who invested their time generously to make this event happen.

Our editorial team should also be acknowledged here. Special thanks to Esther Grassian, Diane Mizrahi, and Ralph Catts for their hard work and valuable

editorial contributions. We also like to thank our proofreaders Yaşar Tonta and Umut Al.

Last but not least, we would like to thank the local Organizing Committee, our sponsors, and the organizing office, ARBER.

November 2014

Serap Kurbanoglu
Sonja Špiranec

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Information Literacy Is Dead... Long Live Information Literacy

Paul G. Zurkowski

Formerly Information Industry Association , Washington D.C., USA
zurkowskipaulg@gmail.com

Abstract. This is the keynote remarks of Zurkowski, plenary speaker of European Conference on Information Literacy held 22-25 October, 2013, in Istanbul, Turkey. The aim is to make an overall evaluation on evolution of the concept “information literacy” since it is first coined by Zurkowski himself almost four decades ago.

Keywords: Information literacy, lifelong learning, critical thinking, direct democracy, information industry.

1 Introduction

Ladies and Gentlemen!

I’m excited and thrilled to be here.

When I think of Information Literacy I think about what issues we will face over the next 40-50 years and the role information literacy can play in dealing with them.

It is difficult to predict what will happen around the globe with each country facing different opportunities and problems based on its unique history and circumstances. Yet there are some common threads of hope and inspiration that will help people take advantage of the opportunities the world will provide. What is exciting to think about is what innovations will come from which countries first and how people and governments will respond to future events.

For purposes of this conference I will suggest a new role for Information Literacy to play in this process.

I have a dream about what the future role of Information Literacy will be and I want all of you to think through the possibilities so that we can be that much better prepared to meet the future with enthusiasms and hope. For openers how do we respond to governments reducing their support of library for the public because “everything is on the internet?”

Does the history of libraries raise confidence that the functions of libraries can be remolded to play a key role in addressing the challenges now rearing their heads with consequences as huge worldwide as anything we have ever seen in the past?

Addressing significant questions like that is what makes conferences stand out in the history of human events. I want to address that question and hopefully together we can come away from this conference with the positive steps we each can take when we get home. By identifying where the world has gotten off track we in this field can work together around the globe actively to find out what exactly has brought the world to this point and to come up with a plan to move the world forward in what is shaping up as a critical moment happening on our watch here in early years of the 21st century.

Here we are five years into a great world-wide recession while the top one percent is enjoying a strong economy. Five years after the 1929 great depression started, it too had become clear we were facing a long term problem in digging out of it. Recent comparisons based on an assessment of the growing disparity in levels of wealth showed that in 1928 and in 1907 the disparity levels in income had twice reached the highest levels just a year prior to the financial disasters of '29 and '08.

The mortgage practices of big banks in 2007 and 2008 that any public interest investigation would have revealed the mortgage based investment vehicles to be fraudulent schemes which came close to bankrupting many countries including the United States.

The anti-terrorism efforts including stripping all of us of privacy protections in the name of national security raise big brother threats to almost everyone alive today.

As everyone knows this list could go on and on almost without end and it did on October 1st this year when a rogue group of representative for partisan purposes caused the U S government to close down.

These breaches of the mutual bonds of respect have not been adequately addressed by representative democracy for one simple fact. Special interest money supports cadres of lobbyists protecting the incumbents from the consequences of such activity. The U. S. Supreme Court, too, has enabled private money to flood election campaigns distorting the election process. Ways must be found to enable ordinary every day citizens produce and wield countervailing power to effectively restrain such forces from disrupting the economy.

To suggest that the library community can remodel itself to help correct these ongoing conditions may not on the face of it seem realistic. But history teaches us that librarians and their information knowledge, skills, understanding and wisdom have engaged challenges like this before

A combination of information literacy and a Direct Democracy movement, offer the library community such an opportunity to remodel itself while building, along with what I call The Direct Democracy Coalition for Citizen Rights and Responsibilities, the power to address these issues. We'll get to that as I talk with you about an expansion of the concept of information literacy in the area of Direct Democracy, a coalition for Citizen's Rights and Responsibilities, and a plan for implementing an approach to issues we as a civilization will face over the next approximately 40 years.

This may sound revolutionary but it is simply an extension of the role librarians have played over the years. It is relevant to take note that the premier performance of Stravinsky's Rite of Spring Ballet took place 100 years ago this year. Rather than applaud the performance the audience threw things at the stage and raged in protest. The dancers too didn't like its untraditional flatfooted dancing in flannel costumes.

The Direct Democracy idea may at first blush sound similarly disruptive of tradition, but remember, so does the whole information revolution and steps need to be taken to avoid corruption of popular movement toward democracy and citizens' rights and responsibilities.

We are gathered here today near the roots of civilization to proclaim to the world, the Launch of a New Age of Enlightenment in which everyone alive today can participate from elementary school age through lifelong learning. It needs doing as the evidence rolls in that representative democracy is hitting some glitches. Alarms should be going off all over the world over how the U. S. Congress is divided, letting a sub set of its members deny the government the authority to perform all of its functions.

If this Globe is ever going to live in peace citizens need to be involved in exploring remedies such as Direct Democracy to get the government working again. Introducing Information Literacy as a job opportunity to provide ordinary citizens with information (1) on how the process works or should be working and (2) how the underlying crises can be researched with step by step explanations of workable alternatives explained and confidently shared with interested citizens with access to countervailing power.

I will share the details of a program of Direct Democracy designed to create a universal world wide effort leading to a New Age of Enlightenment. It will call forth a coalition of organizations and forces, students and seniors, executives, day laborers and people reduced to homelessness by the recession we continue to experience, the employed, partially employed, underemployed and just out of work, but intelligent and smart, all concerned with Citizen Rights and Responsibilities. This is not a public relations gimmick. It will grow to be a serious program capable of enlisting many volunteers. That is my vision for Information Literacy. And I have a plan which I will share with you. Plant the seeds of the ideas in your communities. Seek local participation. See what appeals, what works. It's exciting. You won't be disappointed. How one such Committee of Citizens Rights and Responsibility (CCRR) would work is relatively simple. How a world-wide network of CCRR units will work together will take more time to work out. Your participation on the ground floor in your community will help move this world-wide organization forward. IFLA can share the ideas with its members and provide grassroots feedback. UNESCO can explore CCRR possibilities with its functioning units already in the field working on parallel ideas. The door to participation in this Direct Democracy effort is wide open.

Just as a lot has happened in the roughly 40 years since the words Information Literacy were coined in a communication to the U. S. Commission on Libraries and Information Services in 1973, a lot more is going to happen in the next forty that the people in this room have a special responsibility for. You know information, you are responsible for its use, preservation and ultimately for the enlightenment of the world through its use.

Before addressing my vision for this community let me explain to you what environment gave rise to the words information literacy, and what that environment taught me about vision, careful hard work and how the information age emerged from the first 20 years of the Information Industry Association.

2 Build It and They Will Come

Let me take you back to November 1968 before most you were born. The Information Industry Association (IIA) sprang to life November 6, 1968 at a meeting in Philadelphia of the 12 founders of this trade group which would engineer and perfect the foundations for the age of the Internet and the World Wide Web, test out its economics, participate in beta testing of technologies, products and services.

At the time I was a legislative assistant to my Wisconsin home Congressman Robert W. Kastenmeier who served as Chairman of the House Judiciary Committee's subcommittee on Copyright Revision. William Tyndale Knox a vice president at McGraw Hill, was elected the first Board Chairman. We had gotten to know each other as he called on me about the Copyright bill and computer usage of copyrighted works. I shared with him my vision for the future of the information business. I was hired in December 1968 and opened IIA's Washington office in January 1969. No one else was considered to head the IIA, which would become one of the four major trade associations all with a major stake in the business of this industry serving neighboring industries: book publishers, computer manufacturers and data processing services.

Over my 20 years as IIA President I led a team rising to over 30 staff members by 1989. We provided the industry five services or activities that stand out as worthy of note and of future value to the Direct Democracy Coalition of Citizen Rights and Responsibilities. They include the following:

1. **Membership.** We built a membership from the 12 founding companies to over 950 companies in 20 years time. We found the people engaged in the business and signed them up. I was called "The Johnny Appleseed of the information industry" for sowing the seeds of the business across the United States. The Direct Democracy Movement will need similar membership successes. I have a plan for doing it.
2. **Exciting Small Meetings.** We designed and implemented meeting plans based on Sociologist Margaret Mead's book, "The Small Meeting." It contains a progression of photos of a small meeting with text explaining the participants' thoughts and interactions. I took her body language instruction in the book to guide me in creating dynamic and interactive meetings unique to IIA. I started with a tiered U-shaped seating arrangement bringing everyone up close and personal with the speakers at the head table and with each other. People could look in the eye 70 to 80% of the attendees. The arrangement of the seating at the head table for speakers and IIA executives was the key to the immediate success of this approach. Meetings can be dull and uneventful unless someone questions a speaker on what sounds like a partially baked idea. We placed 3 or 4 of our key executives at the head table drawn into the open end of the big U of the seating for participants to get the session running like a board meeting. Gloves would come off with the first intervention by one of our executives. The audience quickly got involved followed that opening to press the speakers for answers. These high energy meetings brought companies into the membership not just for the fun of it but for the intelligence and insights to be gleaned at these meetings. Members knew we were competent from the success of these meetings. They knew they

couldn't afford to miss a meeting. The Direct Democracy movement will generate similar excitement from its meetings of citizens seeking answers on a lot of public governance questions currently going unanswered.

3. **Niche Markets.** We were working with the advanced scouts of the Information Revolution, the early geniuses who were pioneers in developing data bases and other services. Surprisingly most of these served niche markets. Most companies already owned a significant historical file of data of high interest mined from industry sources and in most cases were published in print as abstract journals and destined for a well-defined niche market they already served. This fact led to the realization that they could share their marketing and technology problems with other niche publishers because no one else was serving their particular niche. Therefore they were free to talk with other companies in the business without engaging in anti-competitive practices. The IIA discussions were intense and greatly escalated the speed of developments of individual companies, the technologies involved and the marketplace readiness for their new information services.
4. **The Information Industry Map.** Initially members were relative small companies often working in isolation. IIA developed a map of all the entities engaged in one way or another in the business – book and magazine publishers, libraries and information brokers, data base distributors, and ultimately the giant players, hardware companies, phone companies, computer companies, eager to learn the business from associating with niche market companies. See figure 1. All politics is local. The Direct Democracy movement will start locally, involving citizens in ones and twos to work on hot button issues troubling the general public. That will attract the doubting Thomases who at first will be skeptical that a meaningful coalition of citizens can be mustered to deal with the issues big and small facing society today. The numerically over-whelming middle class up to now was pretty much willing to “Let George do it” within representative democracy. We're seeing what that approach has done for us.

Start up information companies, members and non-members even in their relative isolation could see where they each fit on this map of most of the players information businesses. They then only had to identify their position on the IIA map to know that by playing their position as one of a limited number of entrants serving a particular niche market they would succeed.

For the Direct Democracy movement to function effectively, it will need something like the IIA map. I suggest the G-nome project and DNA mapping as a parallel approach to a map that shows everyone in the information literacy field how they relate to one another. Information literacy is different from media literacy is different from medical literacy or legal literacy, and so on and so on. Each with a mission and detailed approach to their subject area – niche markets all over again – but each different literacy being different from the others in their approach to and services of their niche. Each is an anti-environment for all the other literacies enabling participants to recognize their position, how it is different and where it is the same.

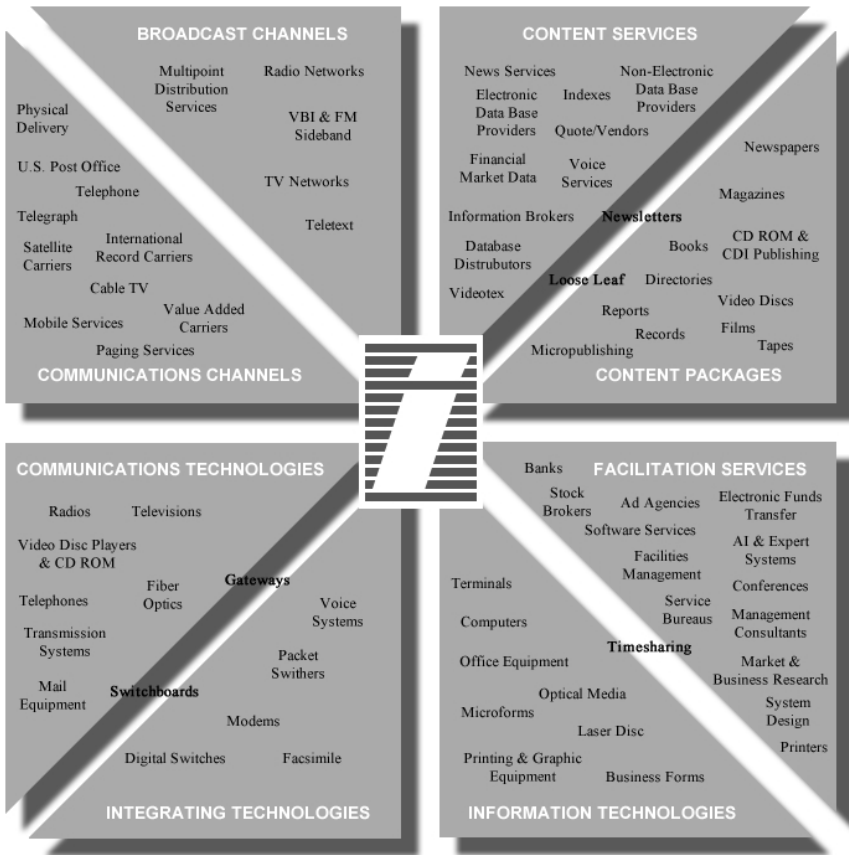


Fig. 1. The Information Industry Map (Source: Information Industry Association, p. 216 [1])

Each will gain confidence in their approach from seeing it work in neighboring niches all accelerating the intelligent, thought out growth of a Multitude of Literacies. The programming of this conference gives attendees many opportunities to apply these ideas and benefit from studying the multitudes being discussed in our program.

- 5. Information Policy Issues.** That leaves Information Policy itself as the last, but far from least on the list of IIA actions that have major implications for the approach information literacy can take in the Direct Democracy movement. There is no current watch dog monitoring effort on how policy comes into play with regard to information. The American Civil Liberties Union is well known for being a Civil Liberties watch dog and could serve as a role model for the Coalition on information policy issues. IIA found that it indeed took eternal vigilance to keep up with government information policies. Just as there is no Information Policy watchdog there also is no national effort designing, guiding and

encouraging citizens interested in participating in the process of participating actively in using critical thinking as a keystone for Direct Democracy. Librarians will find that a structured program of service in this area will be highly rewarding in building their supporting constituent base. Just as members of Congress create lifelong friends through constituent services of all kinds so too will librarians find the Direct Democracy will bring library users out of the wood-work to support the library services so critical to their success in influencing not only information policy issues but governance issues of all kinds. IIA undertook a year-long study to locate and analyze government information policies of all kinds for their impact on the free market place of ideas. Woody Horton who helped IIA on this project told me the other day that the supply of this Policy Book is down to a single copy. Tracking government information policy touches on privacy, the free market place of ideas, citizen ownership of the information everyone creates just by living, and the policing of wall street functions to name just a few.

Beyond these five action programs of the Information Industry Association its submission in 1974 wherein the term Information Literacy was coined, included about the only historical record of the emergence of the industry with the nature of the companies involved being identified and described. It was the library enthusiasms for Info Lit that has since led a parade of other literacies seeking recognition in their areas of activity many of which are likely participants in the Direct Democracy Coalition for Citizen Rights and Responsibilities.

Yes, there was an implicit business purpose to the presentation we made to the Commission. We were pointing out that there was an industry developing enhanced services to increase the quality of life, the profitability of businesses, the missions of charitable groups, etc. But most of the public knew nothing about these products and services and in fact, had a trained incapacity to use them across the board. Our submission suggested that by providing universal Information Literacy training the population, the business world and the gross domestic product reflecting increased efficiency and productively would result in increased per capita income. Such universal training would enlarge the free and open marketplace of ideas, a central guiding policy goal of the industry.

It must be noted that at the time the submission was made to the Commission there were no desk top computers, no internet, no worldwide web, no videos delivered as TV images on a cell phone or any of the more recent information implements.. Most computerized data base searching could only be done on remote mainframes. Such computerized research required a prized skill because of its complexity. Software to simplify searching would come later.

In 1973 we were talking about a very special information literacy field. Since then computerized searching has revolutionized what is thought of as Information Literacy. You will see in my Direct Democracy plan, some change in purpose, function and practice of Information Literacy is needed. Hence the title of my remarks is Information Literacy Is Dead, Long Live Information Literacy.

The Direct Democracy Movement focuses on marshalling more citizen involvement in Direct Democracy efforts, including such things as petitions for legislative action, recall movements, constitutional amendment petitions and similar actions which can be taken to highlight some glitch arising in the Representative form

of Democracy we are accustomed to relying on. Unfortunately, the representative form of Democracy has enabled citizens to take a “Let George Do It” position and their decision to decline to participate in whole or in part in governance issues. Many do not realize the personal power for good that they forfeit in that process. Information Literacy projects will reinforce regular citizen involvement programs with solidly researched reports on current issues. This too will enable more citizen involvement.

The action plan for this movement is contained in the supporting Phrase: The Coalition for Citizen Rights and Responsibilities (CCRR).

This suggests an urgent and immediate campaign to marshal citizens in an effort to clearly establish Citizen Rights and Responsibilities necessary to Direct Democracy. The struggle of the Arab spring, and other citizen-based efforts, such as Occupy Wall Street recently sought to bring direct democracy significantly into play.

3 A New and Large Role for Information Literacy Efforts

The library community has been the watchdog in the past over the use of library patron borrowing records and other issues. Now that the powers that be have decided their full commitment to the public for library services is no longer needed because “everything is right there on the Internet,” it may be necessary for the library community to transition itself to serve the same public with the library skills, training and respect for information in a new way. Information Literacy is a necessary element of such a new way.

I have been working to create a procedures manual to outline not only what can be done today to address this situation, but also how to create a Coalition for Citizen’s Rights and Responsibilities to lead, community by community, state by state, country by country, to the development of the rules of the information road that lies ahead. When the automobile was invented rules of the road had to be developed. A function of the Coalition is to monitor the rules developed for information. It’s beginning to happen in widely dispersed centers without any one actually verifying whether the proposed rules are good, bad or indifferent. We need better than that.

The manual also addresses the fact that there is no established process to engage citizens in issues like Information Policy or for that matter simply how to become a non-partisan, non-political force on any and all other issues arising today. Political assassinations like those of Jack and Bobbie Kennedy have put a limit on how many talented people are willing to risk their lives in public office. Where are they? Are they any less interested in how the country is governed? Can they become involved in and support coalition efforts outside of the political party system? This evolution could be supported by librarians and others who grasp the function of Information Literacy understand the details how the following a four-step process works:

Information becomes knowledge. Knowing how to find information on the internet seems to have been solved, but we know there is a great deal about the research process that is not yet grasped by the general public no matter how sophisticated their digital technology is.

*Knowledge leads to understanding and
Understanding becomes the individual and collective wisdom we will all need in
the coming next forty years.*

I find this four step process helpful in explaining to the general public what information literacy means in a generalized way.

4 A Tribute to Ben Franklin's Society for Useful Knowledge: The Direct Democracy Plan and How It Will Work

The organizing principals of my plan are based on a system created by Benjamin Franklin in about 1730 and a system he sustained throughout his life time. He called it the Society of Useful Knowledge. Mr. Franklin's driving force was based on the fact that the Colonies were populated principally by farmers and merchants and were purposefully limited by the crown in how much freedom they had. They needed useful knowledge just to get through the day. Within the Society for Useful Information, Franklin organized what he called the Leather Apron Committees, community groups of 12 people, later nicknamed the Junta, to explore what society's needs were and how to address those needs. Each one of the 12 were given the task by Franklin of writing a short description of a specific problem of their choosing needing to be addressed. Ben wrote several such statements to prime the pump. The Junta would once a month retire to a pub in the evening to discuss their approach to each issue. It may even have been one of those papers that suggested the study of lightening to Ben. It is known that they later dispatched a junta member to explain electricity and the need for lightening rods on buildings throughout the mid-Atlantic colonies.

Implementing such a plan today would meet require a body overseeing the work of the Juntas as a parent organization. In my plan it would be the Direct Democracy Coalition for Citizen's Right and Responsibilities. Induction into the CCRR would provide an academy of people committed to this process to develop competent and recognized policy statements designed to give participating citizens a clear understanding of the issues and a certainty as to the accuracy and value of CCRR publications

The fact that "All politics is local" means that under this plan, each local area, each library, each community organization, would be encouraged to create a Junta to work on community interests in their geographic area or intellectual area of interest.

In the process the Direct Democracy Coalition would provide a pathway for citizen involvement in the country's civic affairs. The most important part of this process is the need for information literacy skills, critical thinking, fact checking and where necessary text editing. Everyone needs an editor.

It is interesting to note that the Library of Congress supports House and Senate Members with its Congressional Research Service. Members of both houses can ask for help in understanding legislative proposals and response or for help in drafting and justifying new legislation. This is a confidential service. Only the member can divulge what he CRS came up with in response to a request. It is a service just like the support that Librarians and others could provide to a local Junta. Their studies

would be evaluated by members of the Coalition, individuals inducted into the Direct Democracy Coalition to assure the studies were fair, non-political, and factual all leading to public understanding of the issues involved. This would create a shared wisdom in the community needed to address the issue. See the book “The Society of Useful Knowledge” by Jonathon Lyons, Bloomberg Press, New York, 1913 for the complete story and the Colonial setting that fostered its growth and development.

The role of Libraries within the Citizen’s Right and Responsibilities program would be central and vital. A variety of other organizations would be welcome as well

I have met with Catherine Tease, Director of the Prince George’s County’s Memorial Library System, where I live just outside Washington, and she is willing to help beta test this program in the county Library system in all respects.

Some librarians are leaving libraries to create their own businesses. The Association of Independent Information Professionals [2], a global association of over 400 businesses with professional information searching skills and the understanding and wisdom earned in many years of library and information services. The Coalition for Citizens Rights and Responsibilities will work with AIIP member companies as participants in the Coalition. This will also draw in the information industry firms with information resources of vital interest to efforts of this type. The AIIP has negotiated discount data base search rates for its members with major information companies. The AIIP has been a big help to me in preparing for the “Marketing Aspects of Starting Your Own Information Company” workshop scheduled for Thursday from 1:30 to 3:00 pm. The workshop will provide the results of a Survey of the Membership of Associated Independent Professionals, detailing basic market facts about the Member’s businesses and will provide a an interactive discussion about factors to be taken into account before launching a business.

I cordially invite everyone at this conference to consider participating by creating local Coalitions for Citizen Rights and Responsibilities to encourage citizen participation in civic affairs. To stay connected on this future of Information Literacy and to receive detailed information on the Direct Democracy movement please use my email address to contact me.¹

In conclusion, it should be clear there is a world of opportunity to be conquered by skillful people in many roles, but the most important is the one regarding the care, feeding and the extension of Information Literacy. Long Live Information Literacy!

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¹ zurkowskipaulg@gmail.com

Information Literacy Research and Practice: An Experiential Perspective

Christine Susan Bruce

Information Systems School, Science and Engineering Faculty,
Queensland University of Technology, Brisbane, Australia
c.bruce@qut.edu.au

Abstract. In this paper I explore some experience-based perspectives on information literacy research and practice. Approaching information literacy from the point of view of those experiencing it, is very different from the standard interpretations of information literacy as involving largely text based information searching, interpretation, evaluation and use. It also involves particular understandings of the interrelation between information and learning experiences. In following this thread of the history of information literacy, I reflect on aspects of the past, present and future of information literacy research. In each of these areas I explore experiential, especially phenomenographic, approaches to information literacy and information literacy education, to reveal the unfolding understanding of people's experience of information literacy. The evolution and development of the phenomenographic approach to information literacy, and the associated growing attention to a dual focus on information and learning experiences are highlighted.

Keywords: Relational approach to information literacy, informed learning, information experience, information and learning, phenomenography.

1 Introduction

Experience is profound. Consider the words of a schoolgirl who said: "They can teach us all they like about justice and injustice; I don't think we will really understand until we experience it". Though deeply embedded in our 21st century learning systems, she recognized the difference between the cognitive and behavioural emphases of our conventional systems, and the complementary power of experience. Perhaps just as powerfully, we can consider information literacy experientially; not as a set of technical and cognitive skills but in terms of how people experience it; and so, in this paper I would like to begin to trace the past, present and future of experiential thought about information literacy.

There are of course many different 'takes' on experience, and the phenomenographically inspired work which is the primary focus of this paper is only one possible direction. It is my hope that the examples contained here may show something of the value of an experiential lens, and encourage more attention to information literacy from experiential perspectives. Phenomenography is a research approach that considers variation in people's experience of aspects of the world,

for example economic or scientific concepts, or phenomena such as political power, death or information literacy. Following the phenomenographic tradition [1-2]:

- learning about information literacy is about coming to experience it in new and different ways;
- experiencing information literacy involves attending to particular structural features of it, and associating it with particular meanings.

Making information literacy possible then requires discerning the different possible ways of experiencing it, and developing ways of making it possible for people to experience in all, or the desirable ways.

In phenomenography, considering experience means that: ‘... one should not... consider person and the world as separate... people live in a world which they experience... the world we deal with is the world as experienced by people.. neither individual constructions nor independent realities; the people... we deal with are people experiencing aspects of that world – neither bearers of mental structures nor behaviorist actors....by learning how people experience the world we may learn what the world looks like, and what the world could look like.’ (adapted from [1, p. 13])

In writing this paper I have come to realize that I am part of a scholarly community that appears, on the surface, to take the character of experience very much for granted, in the sense that experience is something that is rarely defined. It is rather described; perhaps following the best traditions of qualitative research! In essence, the research that I have undertaken, largely phenomenographic, is interested in people’s experience, borrowing from the phenomenological traditions of lived experience especially as articulated by educationally focused scholars like Max Van Manen [3] and Steinar Kvale [4]. These phenomenologists suggest a renewed turn towards people’s life-worlds, exploring their narratives about their lived experiences as data, and attempting to understand research participants’ experiences. This means that existing theoretical understandings of the phenomenon are put aside as far as possible. The descriptions yielded in the research process are then used to depict the character of experience as understood by the research tradition at hand.

So what might the experience of information literacy look like? How might the experience of information literacy be described? It is not about how much exposure people have had to particular environments or skills, or about what they do; but rather about what it is that they are experiencing, and how they are engaging in that experience. I provide tiny windows into three recent examples to briefly illustrate. These short descriptions provide a picture of varying ways of experiencing information literacy in particular contexts. In these I suggest that our typical interpretations of information literacy, in terms of skill sets and standards, are not visible. In both the health and faith studies people’s experienced meanings (the meanings they associate with information literacy) are associated with attending to information and learning in particular ways. We shall return to that point later.

- In a health focused study [5] information literacy was found to be experienced as striving for wellness, reaffirming wellness, knowing myself, protecting myself, screening knowledge and storing knowledge.

- In a faith focused study [6] information literacy was experienced as growing faith, developing relationships, managing the church, serving the community, outreaching beyond the community.
- In a discussion of the Native American experience [7] recognition is given to the ‘communal nature of shared information experience which informs the Native American learning system... learning which reflects the understanding that lives are truly and profoundly connected to other people and the physical world... with knowledge being transmitted through ritual, ceremony, art and appropriate technology for use in everyday life...’

For me, working in the information literacy arena has always been about looking at the world through a particular pair of glasses; those that provide both an information and a learning lens; and in my case the learning lens is sometimes dominant, and the glasses have a strong experiential tint. The position I have come to articulate is that information literacy is about the experience of using information to learn; it is about people’s different ways of experiencing using information to learn in particular contexts and settings, for particular purposes (from reading a bus timetable or choosing a school, to academic research). I see myself as an advocate for information literacy, which means that I promote, attend to, and attempt to bring about in collaboration with others, a realization of the capacity of information literacy to transform and empower. Coming to experience information literacy differently enables transformation and empowerment.

2 The Past

In 1974 Paul Zurkowski coined the term ‘information literacy’. The impact of this conceptual leap is beyond measure. Many of us here have direct experience of its influence. Information literacy is a construct we now recognize as changing lives, academically, economically, politically, socially, professionally and physically.

When the ALA Presidential Committee On Information Literacy released its *Final Report* [8] the importance of information literacy as a changer of lives, its transformational and empowerment elements were emphasized. This position has always been central to information literacy advocacy, and has informed interest in research and practice globally. These motivators, relevance to the world around us, transformation and empowerment, are still central to us today.

As the information literacy agenda gained momentum, policies, standards, and other guidelines for stakeholders around technology, information provision and learning gained prominence. Speaking the language of bureaucracies became important for advocacy, and a supporting research agenda began to evolve. Information literacy began to be largely associated with information and technology skills.

In moving forward, two alternative orientations evolved. The first of the following two directions aims to shape others, while the second aims to understand and enhance others’ experiences:

- educating or training people so that they conform to professional norms embedded in established systems and processes, or
- deepening our understanding of people, so that peoples' experiences of information literacy may be valued, celebrated and woven into the fabric of our society and its' systems.

The second direction is the key motivation for experientially grounded explorations and interpretations of information literacy that recognize the transformative and emancipatory potential of using information to learn. Such approaches are not focused on information or technology skills, but rather consider people's information and learning experiences; interpreting these from the perspective of ordinary people using information as part of their everyday lives.

2.1 Early Steps in Exploring Information Literacy Experiences

Our first steps in understanding people's experience of information literacy came from the explorations that came to be known as the *Seven Faces of Information Literacy* [9-11]. That project showed information literacy as being varyingly experienced as a) using technology to communicate and keep abreast of the field, b) sourcing information to meet a learning need, c) engaging in information processes to learn, d) making connections between information and learning needs, e) building a knowledge base in a new area of interest, f) extending knowledge, and g) making wise use of information for the benefit of others.

Each category involved different relationships between people and information in their work or everyday life. Across these experiences of information literacy people were experiencing information as objective, subjective or transformational (i.e. information as neutral, information as meaning making or information as life-changing). In the first two categories it is empowering to belong to part of a learning community, and in the last two categories using information opens up new possibilities for a community of others.

The most important lessons learned from that work were that:

- there was something very much in people's experiences that could be identified and described as information literacy;
- the meanings people associate with information literacy are richer than externally established processes, or skills, related to information need, seeking, access, evaluation and use. For example, the information processes people described were grounded in personal heuristics and did not look like conventionally advocated processes;
- each of the different ways of experiencing information literacy was focused on a specific feature, for example the first face focused on ICTs, the second on sources, the third on processes;
- information was experienced in varying ways (see above); and also
- the components of the ways of experiencing and how they were arranged or discerned in awareness was different for each one.

This early research was underpinned by interpretive phenomenology, and it is important to realize that the word ‘conception’ used to describe each of the seven faces was at the time the common phenomenographic label for representing a ‘way of experiencing’. The different ways of experiencing, when taken together, represented the whole phenomenon of information literacy – that is, the different ways in which it was experienced amongst the community of participants. As that participant base was very broad, representing different disciplines, professions, workplaces, life circumstances, and academic and professional interests, the emergent model has proved to be very adaptable to a range of contexts. Its communicability and adaptability have given it a lengthier life span than I anticipated.

2.2 The Value of Attending to Experience

Attending to experience involves a change in how we look at the world. It brings about different approaches to information literacy and information literacy programs, behaviour and skills, policy, technology and our thinking about our professional and scholarly interests more broadly.

Different Approaches to Information Literacy & Information Literacy Education. Considering experience leads to different approaches to information literacy and associated programs, particularly learning programs [12], [9], [13]. The relational approach did not, and does not provide a preordained set of strategies. Rather, it provides a particular way of thinking about our professional interest. The relational approach needs to be interpreted and contextualized in a way that is often foreign to prevailing competency and measurement oriented perspectives.

The relational model suggests new ways of thinking about and describing

- information literacy – that are faithful to people’s experiences, and that value their experience;
- information literacy education – in terms of enriching and expanding people’s experiences, providing new experiences as well as making them aware of aspects of their existing experience;
- information – in terms of what is informing to the user, and how their experience of information varies;
- information literacy policy and programs – grounding these in different experiences or the possibility of different experiences.

The relational model focuses attention on people’s experiences of information literacy, and especially variation in their experience. The seven faces, and other categories describing experiences of information literacy, represent forms of information use¹ that make learning possible. Introducing people to different ways of

¹ Information use, as the term is used in phenomenographic work associated with information literacy is not meant to refer to a specific portion of an information process, but rather to reflect orientation towards engagement with information in a broad and holistic sense.

experiencing information use, as well as making them explicitly aware of their own and alternative experiences, is what makes learning possible. In this model, information literacy education involves helping people to move into a more complete set of experiences, so they are empowered to identify which is most powerful for the context at hand.

Different Approaches to Skills and Behaviours. Considering experience from a phenomenographic perspective leads to different ways of thinking about skills and behaviours. Ference Marton has always held that powerful ways of seeing are associated with powerful ways of acting [2]. In other words, how people experience something, in our case information literacy, influences how they might go about something in particular circumstances. If I were to paraphrase, I would probably say ‘powerful ways of experiencing make possible powerful outcomes’.

This idea of powerful experiences is central to understanding the potential relationship between information literacy experiences and information skills. Borrowing a phrase from Patricia Breivik, I would say that skills of any kind, information skills, technology skills, or digital skills *are not enough*. My thoughts here are very much influenced by the thinking of Professor Jorgen Sandberg and Gloria Dall’Alba about competence [14-15]. Professor Sandberg describes people working on car engines, optimizing them, and distinguishes between those who follow the manual’s requirements and those who orient themselves to how the driver might experience the engine, as they work on it. In each case the same skills are involved, but the people involved have totally different experiences and the quality of their work reflects this. We can think about information literacy in the same way; we can focus on the manual and the skills we think that people need, encouraging technically competent application of skills, or we can orient ourselves to the experiences of the people we serve, and recognize skills as serving those experiences.

This example shows us something of how experiences influence skills or behaviours. Experiences are deeper and more powerful; they contextualize skills. In exploring learning to search the internet, Edwards [16] found that students who scored strongly on tests for skills did not necessarily experience searching in powerful ways. The same set of skills may be applicable to different experiences, or completely different skills may apply in different contexts. It is the different ways of experiencing that capture the meaning of information literacy and it is these information literacy experiences that we would wish to advance and bring into awareness. Given wide variation, technical and conceptual skills may or may not be important to engagement in the experience. In some contexts, as with the engine optimizer, skill may be prerequisite, but it is only the baseline of what is required; in health information literacy, for example, being able to experience the body as a source of information about personal health is important, and in faith information literacy coming to experience art, music and narratives as forms of information vital to supporting spiritual growth is fundamental to information literacy.

Different Approaches to Standards and Policy. Considering experience leads to different ways of thinking about standards and policy. These insights from the seven faces have had some influence, for example, on the Australia New Zealand Institute

for Information Literacy standards which endorse a) the importance of reflection on experience, and b) the idea that the standards are not intended to reflect a linear model, but rather represent a range of facets which support lifelong learning [17].

Policy principles derived from experiential awareness direct attention towards considering the experience of information literacy, recognizing that such experience differs across contexts and communities. [18, pp. 540, 541-543]. Policy needs to encourage valuing, celebrating and integrating the experiences we discern into the fabric of systems and social learning.

Different Approaches to Technology. Considering experience gives technology a different place in research and practice. While the term information literacy originally stemmed from interest in people's ability to function in ICT (information and communication technology) rich environments, peoples' experiences of information literacy are not always technology centric². The seven faces of information literacy show that while technology is present in all the faces, to be expected in an academic workplace, it shifts from being an important focus to being of lesser interest across the categories.

Early (and ongoing research) into information literacy experience³ has revealed that emphasizing technology at the outset makes an assumption about peoples' experience that may not be appropriate. Not directly referencing technology provides insights into its importance in people's experience, may reveal whether they do or do not attend to it, and reveals what kinds of technologies are attended to. This suggests that starting with the digital may not be the best way to understand people's information literacy experience. In people's experience, digital technologies may be present, but may not always be central in their awareness; technology may also take non-digital forms. On the other hand, if our focus is information literacy experience within the context of particular technologies, then starting with the technology context is clearly appropriate.

3 The Present

The territory of information literacy research and practice has expanded considerably. Little more than a decade ago information literacy research and conversation was largely confined to the formal education settings [19]. In the years since then, we have seen a blossoming of attention to workplaces, national cultures and many communities.⁴

² Only one of the seven faces is technology centric.

³ Similar conclusions are drawn from sociocultural research; see for example the work of Anne Lloyd.

⁴ Our QUT team has had a strong focus on experiential approaches to information literacy research and practice. A wide range of focal points are appearing including - evidence based practice, web designers, public librarians, serious leisure, disasters, tourism, early career academics, teenage content creators, ESL teachers (from China), inquiry learning, indigenous knowledge and religious information literacy.

The phenomenographic branch of information literacy has revealed previously unnoticed patterns and textures in the character of information literacy. From this branch we⁵ have developed a perspective on information literacy which is now called *informed learning* or using information to learn [13], [20], [18]. In addition to the seven faces of information literacy, the six frames for information literacy education and Mandy Lupton's identification of the different patterns of information use in learning are important to the architecture of informed learning.

3.1 The Six Frames for Information Literacy Education

The six frames for information literacy education [21] reflect the critically different ways educators approach information literacy education. They were developed to provide educators with a sense of the different approaches that may be adopted in designing and implementing information literacy education. While firstly reflecting alternative approaches to information literacy and information literacy education, they also point to experientially oriented information literacy program design, especially in the learning to learn, personal relevance, social justice and relational frames.

The frames draw attention to the need to understand when each frame may be appropriate, and place a spotlight on the different approaches which different parties involved in a project might bring to the table. They have been used extensively in professional development workshops for librarians, discipline-based academics, and other members of the teaching and learning community. Most recently the frames have been used by Drew Whitworth to analyse policy [22], and he is presently using them to analyse the information literacy trajectory as documented in scholarly literature.

3.2 Patterns of Information Use in Learning

Mandy Lupton's [23] research into the different ways of experiencing the relationship between information use and learning reveal three increasingly powerful patterns for learning. This work was conducted in academic contexts, however the insights are clearly transferable beyond those contexts. Working within two completely different disciplines, music and tax-law, Mandy identified the relationship between information use and learning as experienced in three ways: sequentially, where people identify useful information then learn from it; cyclically, where the process of identifying information and learning from it recurs; and simultaneously, where information use in all its aspects and learning are experienced as occurring together. The last experience seems to be particularly transformative. This is a similar finding to Louise Limberg's [24] when she identified particular approaches to information seeking that brought about more sophisticated learning outcomes than others.

⁵ Informed Learning is the outcome of substantial research and thinking within the Queensland University of Technology team, informed by much research beyond that team.

3.3 Information Literacy and Information Literacy Education as Informed Learning

Informed learning is about the focus on people's experience of using information to learn in different contexts, and what it takes to make that possible. It represents those forms of information literacy and information literacy education that embrace holistic thinking about information literacy and learning, and is specially derived from the experiential, phenomenographic strand.

Informed learning advances the relational approach to information literacy and information literacy education by integrating the various aspects of the program of research and development that arose around the world subsequent to the seven faces project. The publication of *Informed Learning* [13] led to renewed interest in experiential thinking in information literacy research and practice, and I elaborate on some of this work below. Of critical interest to many has been the explicit articulation of the relational aspect of information literacy, in the sense that information literacy is not independent of purpose or context. Information is always used for some purpose, in some context. From a relational perspective it is accepted that learning is always about something. Similarly, information literacy, involving both information use and learning, is also always about something – it is purposeful and contextual.

Informed learning points simultaneously towards information use and learning⁶. Consequently, there has been renewed and explicit interest in the combined elements of information experiences and learning experiences as people have begun to explore informed learning, in both formal and informal learning communities.

Community learning projects undertaken to date, that I will describe later, are showing that we can gain enhanced insight into the experience of informed learning from settings which admit ways of thinking about knowledge which differ from dominant scientific and socio-economic values, thus opening up windows into the experience of a greater diversity of communities. In revealing these new ways of seeing, being and experiencing, these studies make available to all of us an expanding repertoire from which to draw.

Such insights should allow us to nurture what are presently less recognised approaches to information use, as well as develop understandings that begin to take into account the diversity of experience that enriches our society.

3.4 Deepening Perspectives from Practice

To reflect on the adoption of the informed learning approach to information literacy and information literacy education in practice, I turn to the wide ranging work of Dr Mary Somerville and her colleagues at the Auraria Library, the Center for Colorado & the West and the Faculties of the University of Denver, Colorado. In 2008 Mary Somerville integrated informed learning (together with soft systems methodology, design thinking and evidence based practice) into the leadership and management

⁶ This is more easily understood if learning is seen to be a change in how we are aware of some aspect of the world; in this sense the terms information use and learning express broad interpretations of the underlying concepts.

philosophies and information practices of her library and has overseen its widening sphere of influence over the last several years [25-26]. In 2010, she was joined by Fulbright Scholar-in-Residence Dr. Hilary Hughes, who integrated informed learning into the Informed Learning staff development programs of the Auraria Library and into the classroom experiences of students at the University of Colorado Denver.

This program of professional development focused on developing understanding of informed learning's dual interest in information use experiences and (content) learning. Practical outcomes included 'frameworks for collaborative planning and implementation of curriculum based informed learning, a revised policy document and planning process in the form of an Informed Learning Blueprint, and the creation of new promotional and instructional materials' [27, p. 73]. Close partnerships between library and academic faculty was emphasised, as was the view of the library as a learning space, resource and service, as opposed to a collection of resources of services that learners needed skills to access. To ensure a sustainable platform for capturing local knowledge about using information to learn, the library created an informed learning space on the organizational intranet. Staff contribute content as they work with like-minded faculty and other colleagues to build a campus wide informed learning community-of-practice.

Denver: An Informed Learning Library Workplace. In August 2012 I was privileged to visit Denver to engage with Mary and her team on sustained reflection about what it means to imagine and create an informed learning workplace and library. The team established early that questions like 'What information literacy experiences do we want to facilitate or make possible?', and 'What information and learning experiences are vital to further our own professional work?' were critical points of departure. In other words, the aim was not to ask 'what skills or capabilities do we want to develop in others?'

From this point we explored the use of information to learn in the technical Web team. That team creatively developed a SCRUM (project management) process, taking critical digital information for workflow and problem solving and turning it into an informed learning experience that was visible, physical, tactile and mobile. Through this colourful and concrete experience staff were able to learn about what each other was doing and influence the daily work of the team. It was an interesting representation of the information process experience in the Seven Faces model. The learning outcomes of problem solving and decision making also became visible as pieces of paper were shifted and jabbed into place across a board!

In reflecting on this approach, team members acknowledged that they had come to value their own professional experiences, in contrast with other contexts where only measurable or quantifiable data was admissible as evidence. This collective recognition illustrates an important dimension of informed learning which recognises information as 'that which informs' in different contexts thus admitting personal experience as information. Extending this idea, another team revitalized their thinking about learning spaces through exploring these questions: 'How can we redesign our library as experiential learning spaces? ... perhaps even experiential learning spaces that enhance people's experiences of using information to learn!' Relatedly, for the science team, reflecting on the variability of experiences of using information to learn

evolved into dreaming about possibilities for creating information and learning futures that discover and transform campus constituencies' information and learning experiences.

Informed Learning in Classrooms. Working with Dr Carole Basile, an education professor, Hilary Hughes applied the informed learning approach to a First Year Experience course. They wove informed learning through the existing syllabus, adopting the narrative thread of an informed learning journey. Each week's class focused on a different topic relevant to first year students' needs, enabling them to develop knowledge of basic learning theory (content) whilst engaging with different types of information, to explore how they and other people learn with and through information (information use).

The students were socially and culturally diverse. Many were 'commuter' students who lived at home and were first in family to attend university. They were generally committed students; some were battling personal, financial and health issues. The course encouraged students to consider themselves as informed learners, on a journey of discovery about themselves and their learning environment; and to become aware of the different ways in which they and other people use information to learn. By building a community of fellow travellers, the unit supported collaborative and social learning. Assessment included the compilation of informed learning maps and treasure chests, which enabled the students to capture their information use and learning experiences, and establish a reflective approach [28].

Bringing Information Literacy Experiences to the Hispanic Community. At the Center for Colorado & the West, Mary and her team adopted informed learning principles to involve Hispanic peoples, displaced from the Auraria neighborhood, in building digital archives for their community [29]. Their work provides a striking example of systematically varying the information literacy experience and expanding the community's awareness of using information to learn. The team applied the Seven Faces model: raised *awareness* amongst the community that their experience was underrepresented in archival collections; identified that *available sources* provided little information and often misrepresented the community, and invited the community to engage in a process of *connecting with and* contributing resources of importance to them. The community built a *new understanding* of informed learning as they engaged with staff collaborating on the project; and *extended* the community's insight through producing a culturally authentic video 'Wild and Free' [30] promoting awareness of their digital heritage, and creating a script expressing informed learning through their cultural lens. Finally, the community created a video advising displaced Aurarian students about college scholarships to enable participation in higher education. These 'culturally informed learning experiences stimulated renewal of a Hispanic social action organization, dormant for 40 years, which ... advances civil rights, educational access and digital presence' (adapted from [18, pp. 533-534]).

These examples show the potential applicability of experiential thinking about using information to learn to a range of spaces, including academic and community contexts. They also reveal the transformational potential of expanding people's experiences of using information to learn.

3.5 Deepening Perspectives from Research

In this section I discuss recent projects highlighted earlier in this paper in a little more detail, and also an ongoing piece of work that explores using information to learn in the classroom. Each of the phenomenographic examples focus attention on the information and learning experiences that work together to comprise the information literacy experience. This is complemented by an outline of the experience of using information to learn in the Native American community.

Using Information to Learn about Health. In another branch of the health information literacy study mentioned earlier we show how the two intertwining elements of the experience of information and the experience of learning unfolds across the phenomenon. We found that information may be experienced as stable and meaningful across time; complex, an object in its own right and needing to be governed; sourced internally as well as externally; influential, helping with lifestyle decisions; powerful, changing the community, and relevant across a wide range of contexts. Learning, as the experienced meaning of health information literacy shifts from the individual to the collaborative, becomes increasingly ‘contextualised, controlled, personal, powerful and communal’ [7].

Using Information to Learn in the Church. In the faith study, Lyndelle Gunton [6] explored variation in the experience of using information to learn in church community. Within that broad research object, information itself was identified as being experienced in different ways: received; personalised; shared within relationships; corporate systematic; personalised and responsive within the community; personalised and applied beyond the community. The learning experience across the phenomenon is seen to vary from solitary and reflective, to communal, evidence based and kinesthetic, the latter involving learning through practice, including acts of service. She has found that relationships are vital to the experience of information use in church community.

Using Information to Learn in the Classroom. Clarence Maybee [31] has recently been engaged in looking at using information to learn in the classroom. He examined intended experiences of using information to learn (what the teacher planned), enacted experiences of using information to learn (what the researcher observed as happening in the classroom) and lived experiences of using information to learn (what participants experienced). The investigation required deep engagement with the content being learned as well as the information use processes being recommended and experienced. While the teacher intended the content to be as vital to the learning experience as the way she was recommending that information be handled, some students did not experience this connection. We hope that the research will lead us to ways for teachers to help students recognize that connection.

Using Information to Learn in Hispanic and Native American Communities. In reflecting on engagement with the Hispanic community in experiences of using

information to learn, Mary Somerville [7] notes the central need to appreciate traditionally devalued information formats, such as folk art, storytelling, community dance, cooking and cultural music, to appreciatively discover and explore the cultural communities' informed learning conception and everyday information practices. She cites Ybarro-Frausto's and Mesa-Bain's statement [32, p. 10] that the Hispanic people have 'collected a compendium of embodied knowledge – information that is passed on by the body through rituals, cooking, dancing, and oratory; it is an image bank of sources, concerns and aspirations.'

Exploring the Native American perspective reveals that learning for indigenous peoples is about perception and creative thought guided by ideas of spiritual ecology, with environmental, mythic, visionary and artistic foundations [33]. The information experience associated with learning is deeply communal and shared (adapted from [7]), and involves "relationships to other people and to the land...love and emotions and the feeling we get out here in nature". Information experiences, therefore, are rich – "the beautiful outdoors, the love of family, the sounds, the tastes, the smells of things" [34]. The learning environment is highly contextualized: e.g., in the "Native American environment, the child is sitting in the lap of the grandmother and she is teaching the child the native language that the child has not been exposed to before and so she teaches it word by word, phrase by phrase: the dog is there - 'chuka' - ... cat, igloo, and in the embrace of the child's grandmother. The child learns these words and these languages in a way that they are never forgotten." [34]

Reflections and Summary. We can see from the above that directing our information literacy research and practice towards informed learning encourages us to *identify both the* holistic nature of the information literacy experience (see the introduction to this paper), and the information and learning elements or aspects of the experience. Interestingly, the explicit consideration of the information and learning experiences has given me a fresh insight into the Seven Faces model. People have often commented on what they perceive as a difference between the first four, and last three categories in the Seven Faces; perhaps this is due to a higher degree of orientation towards information experience in the first categories, and towards the learning experience in the last three; although both aspects are simultaneously present in each.

4 Futures

What is required now to take forward the wider information literacy research and practice agenda? My suggestion is a philosophical re-turn towards our own experience and that of others; and deeper attention to working within and with communities. If we are to be serious about the empowering nature of information literacy, we need to continue to grow our understanding of people's experiences in their social contexts and cultures, further emphasize emancipatory and participatory approaches such as those found in action research, and further instantiate our insights within our research and professional practice. The future of information literacy research and practice may lie in:

- a) theorizing differently;
- b) contextualising and building praxis; and
- c) experimenting with new methods, new media – imaginatively.

4.1 Theorizing Differently

In theorizing we need to begin by *questioning assumptions*. Information literacy may be the pillar of being educated, it may be the pillar of democracy, it may be the pillar of economic progress and participative citizenry. It may be the pillar of all that is valued by contemporary Western society. Despite this we cannot assume that people in all contexts and societies operate from the same ideological base, or that they value the same constructs. To question our assumptions we may need to consider, for example, that information literacy may be used for purposes other than good; that, for some, technology might be meaningless; that, for others, ‘what is informing’ might be totally undocumented, and un-stored. In some contexts and cultures it may be that what is most informing is not meant to be documented (see papers on health and faith for specific examples of what constitutes information and how it forms part of the learning experience).

Clearly information literacy cannot be constrained by our professional views, it cannot be constrained by assumptions about ‘what is good’, it cannot be constrained by reductionist attempts to search for order and ways of standardizing its character. While we need to generalize about our understanding of information literacy to communicate about it at some level, we need evolving theories, and we need perspectives that can be contextualized, adapted and that encourage us to think about people and their information and learning experiences in their diverse circumstances.

We can perhaps see that some of the fundamental constructs/elements of information literacy *Learning – technology – information – literacy...* are vital to any information literacy experience and yet they may have totally different meanings in differing contexts and cultures. Our exploration of information literacy must help this unfold. I would also suggest that we need to theorise and investigate important constructs such as transformation and empowerment, which are foundational to the information literacy and practice agendas but remain relatively under considered.

As our research and practice continues to unfold people's information literacy experience, we can move to bring together different worldviews and methods in our field and our informing disciplines to understand their complementarities; as well as conceptually separating them to understand what each has to offer. While we need to deepen our understanding of experience as a frame for information literacy research, we also need to understand the complementarities of different branches of research both within the information literacy domain and beyond it. How does information literacy research from behavioural, experiential, socio-cultural, discursive and other perspectives interrelate? How do different approaches and methods complement each other? How might results of studies work together to build a larger picture? How can the approaches and results from other fields continue to inform our field? Understanding complementarities will make possible what Brenda Dervin [35] calls bridge building dialogue, helping us to find the language needed to communicate

across boundaries. Dervin [35, p. 1] refers to ‘disparate and disconnected discourse communities’. Is the information literacy community becoming one of these? Are we in danger of fragmenting from within? We urgently need to understand the complementarities of our methods and discourses, not just the differences between them.

4.2 Contextualizing and Building Praxis

Many people find experiential information literacy research difficult to relate to practice. Why is this? Perhaps it is because our organisations and our professional education largely gives us an orientation towards knowledge and skills. Formal educational systems want to be able to measure what skills and knowledge have been gained. Subscribing to an experiential orientation requires finding new ways to do things within the confines of systems dominated by a different paradigm. Nevertheless, the experiential paradigm has much to offer those interested in client and user-centred thinking, or learner-centred, professional practice and community-oriented education. It has a strong role to play in discipline-centred education when information experiences in particular disciplines are brought to the fore. Important intellectual partnerships need to be developed in pursuit of these directions.

Engaging with communities holding widely ranging beliefs and practices, is likely to yield new understandings, and understandings which are closer to the life worlds of those we work alongside and serve. Our information literacy research and practice must span ‘the rich and the poor, the digitally enabled and the digitally disabled, the psychologically empowered, and the psychologically disempowered’ [13, p. 187] and we must infuse the insights gained into our conventional spaces. Whether we see information literacy as independent of, or interdependent with the contexts and purposes for which it is used, we need to become aware of its character in a wide range of contexts.

In 2001 Dane Ward wrote that ‘the future of information literacy rests in our hands’; Dane asked then a question which we must pose for ourselves again today ‘Will we step out of our comfort zones...and meet the world where its problems really exist?’ [36, p. 922].

Dervin and Reinhard [37, p. 5, 55] raise the question of the increasing irrelevance of research to policy makers and general citizenry. We must ensure that this gap is closed in information literacy research – we need to ask what does it take to ensure relevance across the entire field? This ‘gap’ is perplexing, as many information literacy professionals are scholars, often researching their practice. Many information literacy researchers commenced their work from problems of practice, often as practitioners, and work closely with the communities they are interested in. Despite this, it is difficult to see on how research is influencing practice, and also how practice and problems of the real world are influencing research.

Pragmatically information literacy futures are still in building key partnerships/collaborations amongst interested parties in all spaces, at all levels, academic and practitioner, scholars, funding agencies, in both local and global situations. Information literacy, however we describe it, is important in every aspect

of life, in every context. Fundamentally, we need to recognize that information literacy is about transformation, its capacity to make real what is important to people, and find ways of working together to achieve this.

It is within a deep research-practice connection and in adopting experiential, transformative, participatory and emancipatory approaches to our work, that we may begin to understand how different discourses meet, and the practical relevance of different theories, approaches and the kinds of results they offer.

4.3 Experimenting with New Spaces: Embracing the Transformative and Emancipatory

In our world, how can information literacy help? Into what spaces should we be taking our interest in information literacy; into what new contexts, new paradigms, new methods, new contexts? How can information literacy research and practice help address hunger and poverty? What might we learn about technologically advanced environments; what is enhanced and what is lost? How can it help people confronted with tragedy, in both digital and non-digital spaces? We need to ask what are the issues of today and how does IL contribute? How can we bring the emancipatory transformational power of information literacy into people's awareness? In health literacy, for example, we see the enriching importance of learning communities, in religious information literacy we see the empowering nature of relationships.

To find deeper meanings for information literacy, to increase its relevance we need a return to the principles of advocacy, focusing attention on the transformational and empowering character of people's own information literacy experiences, sharing these experiences and making it possible for them to enrich the wider community. We need to move more strongly to critical paradigms, embracing, for example, action research⁷ and other emancipatory practices.

When, for example, was the last time that empowerment was considered as a potential key construct for information literacy in research? I am currently working with a doctoral candidate from Indonesia, Stevanus Wisnu Vijaya, who is in the midst of an ethnographic exploration of Indonesian migrant workers' experience of empowerment in online communities. He has explored research into empowerment in many contexts and is working to understand more deeply the empowerment experience of his social media connected countrymen. Such work has significant potential in the information literacy arena because of its intention to reveal how empowerment occurs for a substantial but seldom studied group of people using information. It has potential to shed light on inquiries into other less understood populations' emancipatory and transformative experiences.

In the formal education setting, Anne Whisken [38] is using an action research approach to help school teachers adopt an informed learning approach. She reflects that she has had to change her view of her role as bringing expertise about information literacy to the curriculum design table. She has had to come to see herself as facilitating ownership of the information literacy agenda amongst teachers, helping

⁷ Mark Hepworth and Drew Whitworth have been engaging in this direction.

them to consider questions like “How is information used in your subject area? What disciplinary information practices do you want your students to have? What experiences will you design so they can learn them?” She has come to learn to ask questions such as “What learning is taking place as students are using this information? What are they learning by using information from this source, in this format, for this purpose, at this level, in this language, for this audience? What are they learning about this subject, about information use in this subject, and about the use of information generally?” Through adopting an action research framework, Anne’s teachers are becoming empowered to revitalize their curriculum and their professional personas, as well as empowering their students to experience different ways of using information to learn in their subject areas.

So we may ask how does information literacy change lives, how do we help people change their lives, how does it empower, how does it transform? These are matters which experiential research is well equipped to handle. Limiting our focus to standards, indicators, and skills is unlikely to help us address these bigger/transformational questions. Will lifting our heads to address these things, in both research and practice, empower and transform us as researchers and practitioners?

5 Conclusion

Today I have pursued the development of experience-based information literacy research, attempting to reveal some past contributions and present directions. In doing so I have sought to highlight diversity and to suggest the need to celebrate this diversity and integrate it into our social and technical programs and systems. In looking at the future I have proposed not only a renewed orientation to experience in research and practice, but also the development of an integrated understanding of what it means to unify or harness together those agendas that are drifting apart, in the interests of the many and diverse communities we serve.

The position that I have come to, in adopting a phenomenographic experiential approach, and working with many colleagues aligned with at least aspects of that position, is that information literacy is about people’s varying lived experiences of using information to learn, within their cultural and social contexts.

We need to celebrate the diversity of these experiences, recognize and appreciate them, to ensure that the breadth and depth of people’s experiences are valued. We need to work hard to ensure that (social) systems, policies and technologies recognize how people learn and grow; and reflect and enhance peoples’ information and learning experiences, to enable personal empowerment and equitable social participation

For me there are critical ideas involved... ‘experiences, especially *information* experiences and *learning* experiences, diversity, valuing, reflecting and enhancing’. I am hoping there is a sense of ‘renewal’ that stems from the language of enhancement and empowerment.

To be most effective with our information literacy agenda, I suggest that we embrace the idea of experience and seek deep insights into peoples’ information literacy experiences. Why? To give us fresh understandings of the information

literacy experience and use these as forms of evidence to influence our practice (both as researchers and practitioners). Experience based research provides a picture of the kinds of information literacy experiences that are possible, and that we may want to encourage people to explore. We might say it provides a different and rich evidence base. This reinforces Pat Breivik's view when she wrote that information literacy is 'complex, messy and political....deeper, richer and more complex, than we had originally perceived', and exhorted the 'brave of heart' to recognize this in moving forward. [39, p. xii].

It is my belief that bringing together our interest in information use and learning, with deeper and more elaborated understandings of people's information and learning experience can be of service to information literacy research and practice. It is vital of course that our projects and programs benefit the communities that we serve and that inspire the projects and programs we pursue (adapted from [40, p.337]). Such insights might further enable us to appreciate the potential influence of adopting such lenses to both research and practice. In this paper, in tracing some research into people's experiences of information literacy, I hope to have illustrated one such direction.

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The Information Literate Brain

Paul Sturges¹ and Almuth Gastinger²

¹ University of Pretoria, Pretoria, South Africa
R.P.Sturges@lboro.ac.uk

² University of Science and Technology, Trondheim, Norway
almuth.gastinger@ub.ntnu.no

Abstract. The Information Literacy (IL) literature generally looks no further for a rationale than the evident value and obvious practical justification of IL programmes. There is emerging a wealth of published, broadcast and online scientific popularisation of modern neuroscience, which allows the general reader to grasp the implications of the research. From this we discover that neuroscience has a great deal to tell us about humans and information (seeking, discovering, understanding, remembering etc.). We argue that a neuroscience-based view of humans and information suggests new approaches in information science generally and the practice of IL teaching specifically. This would respect the importance of the personal modes of interaction with information that originate in the unconscious areas of the mind and which have been neglected in favour of an emphasis on the more formal searching structures that has been given precedence in librarianship.

Keywords: Human brain, neuroscience, information literacy.

1 Introduction

The case for the significance of Information Literacy (IL) might seem to have been made conclusively by 2013. International declarations, for instance Prague 2003, WSIS 2004, Alexandria 2005, Fez 2011, and Moscow 2012 [1], concern themselves partially or wholly with information literacy. There is also a large and growing literature in print and online that analyses, discusses and provides guidance on IL programmes. What we would suggest is that whilst this seems overwhelmingly convincing, it seldom actually engages with the deepest and most significant roots of the human need for information literacy. Furthermore, we would suggest that if we turn to what we can learn from modern neuroscience, those roots can be identified. A number of writers on IL and information behaviour generally have drawn lessons from cognitive psychology and in the process, some have made glancing references to neuroscience as such, but none of this amounts to a fully-fledged neuroscience-based argument. Here we will sketch some of what such an argument might address. In doing so we hope to make the case that by acquiring an understanding of the psychochemical workings of the brain we can find the most appropriate basis for a view of IL that is more than merely pragmatic.

2 Information Literacy

The literature of IL is of comparatively recent growth and quite explicitly built on the foundation of library practice. The term "information literacy" does not appear to predate its use by Paul Zurkowski in 1974, in a report written for the US National Commission on Libraries and Information Science [2]. If there are earlier uses, they sprang from a growing body of practice that we might identify as an emerging version of IL in the current sense. The 1974 report talks of the techniques and skills possessed by the information literate, 'for utilizing the wide range of information tools as well as primary sources in moulding information solutions to their problems'. The growth of interest in IL can be illustrated by the fact that in 1989 the US National Forum on Information Literacy was established, bringing together 90 plus organizations, including some with an international base. The later 1990s seem to have represented a key point in the history of IL. Christine Bruce's first influential work emerged at that time [3]. In 1998, the American Association of School Librarians, and the Association for Educational Communications and Technology jointly set out standards for information literacy education [4]. Whilst in the following year, the UK Society of College, National and University Libraries (SCONUL) [5], published its Seven Pillars of Information Literacy model to encourage the development of innovative programmes. All of this and an increasing body of literature witness the growth of a strong professional orientation and set of practices, but not, we would contend, one that undertook to dig deep into the essential rationale for IL. Broadly, IL was promoted because it made obvious sense in terms of the tried and tested values of librarianship.

At its most direct and ingenuous, the literature of IL acknowledges its roots in the practice and theory of librarianship. Take as example the second edition of the magisterial *Information Literacy Instruction: Theory and Practice* [6]. In Chapter Two the authors trace the history of IL instruction, rooting it firmly in the practice of library education, or bibliographic instruction as it is commonly known in the USA. Whilst it might be strictly true that librarians have a claim to ownership of IL, to go on to derive a view of IL from the often mechanical and unpopular efforts of librarians to instruct their users in the complexities of library organisation is unhelpful. In particular it effectively sidelines parallel literacies such as computer literacy, digital literacy, media literacy, civic literacy and critical literacy, at the risk of trivialising IL itself. Yet it does not seem that writers on IL find it easy to move beyond this. For example, Andretta [7, p. 5] says 'Information literacy has evolved from library education practices, and therefore the debate here is based on the examination of the literature generated by the library and information science disciplines'. Also, in a later publication [8] she draws attention to a number of comments in the literature which characterise IL as a set of skills.

To be fair, this unwillingness to set aside the more conventional aspects of past instruction and start from somewhere different is not the whole story. Grassian and Kaplowitz [6] give an excellent account of the psychology of learning and Andretta is well aware of the wider literacies. Yet what we fail to find in the literature generally is more than a passing sense that a different starting point for discussions of IL could lead to a different, more effective set of instructional practices. The most obvious resource against which to check this is the latest edition of Case's [9] massive survey

of the information behaviour literature. In particular, our reading of the book reveals no indication that neuroscience has been perceived as relevant to the disciplinary area. Fairly typical of recent work is Lloyd [10] which is concerned to articulate what distinguishes IL from older professional practice, but has nothing to say about the brain. Publications such as Martin and Rader [11], Jacobson and Mackey [12], Bruce [13], Lau [14], Kaplowitz [15], Gwyer et al [16], Godwin and Parker [17] and many others stress the importance of the user centred approach and the individuality of learning styles, but it is not in any way usual to trace this back to an account of the brain and its workings. Exceptions are few. Spink [18, p.78] calls for ‘a much stronger basis for our models of information behaviour that are based in solid psychological processes and validated by rigorous scientific and theoretical research’ and discusses brain volume in several places. Heinström [19] despite several passing references to the brain is more concerned with personality, although the way she works with this is susceptible to a neuroscience interpretation. Also in Kuhlthau, Maniotes and Caspari [20] there is passing mention of neuroscience. However, we believe that we can claim with a certain amount of confidence that the IL literature is largely a neuroscience-free zone.

The problem with the information science literature generally, and the IL literature in particular, is the tendency to talk about information seeking humanity as if it was always acting on the basis of rational, calculated, conscious engagement with the world that surrounds it. This is a legacy of the Shannon-Weaver model which deals, in the first place, with the problem in communication science of transferring signals over a ‘noisy’ channel [21]. It has been used in information science because it seems to offer a model in which the seeker can be linked with the right information through a logical process that overcomes the confusions associated with knowledge to which no one (such as a librarian) has imparted structures such as information retrieval systems and library instruction in the old, pre-IL, style. Heinström [19] identifies a ‘rational, problem-solving process’ which needs to yield to a flexible, dynamic view, dependent on context and individual personality. Modern neuroscience, by alerting us to the host of automatic functions which the brain performs beneath the level of consciousness, essentially subverts this ‘rational’ approach and the mind/computer analogy that often underlies it by offering ways into a dynamic, individualised approach. We share the view of Rose [22, p.103]: ‘Affect and cognition are inextricably engaged in all brain and mind processes, creating meaning out of information – just one more reason why brains aren’t computers.’ This is as good a starting point as any for a fresh rationale for IL.

3 Neuroscience

There was an early hint that information science might find something of value in neuroscience. A tantalising suggestion in the essay by Vannevar Bush that is often regarded as a foundation stone of the discipline refers to ‘the association of thoughts, in accordance with some intricate web of trails carried by the cells of the brain’ [23, p.106]. There seems to be no evidence that this inspired further investigation in information science. The line of reasoning that comes closest to connecting information science with neuroscience was set out in pioneering papers in psychology

such as those by Place [24], MacKay [25], and Smart [26], which wrestled with the relationship between the brain, consciousness and information. As Smart put it [26, p.141] 'It seems to me that science is increasingly giving us a viewpoint whereby organisms are able to be seen as psychochemical mechanisms: it seems that even the behaviour of man himself will one day be explicable in mechanistic terms.' His use of the words mechanism and mechanistic may have a jarring effect, but the sentiment is still powerful. The problem was that Smart and others were theorising at the end of an era in which there was only a limited range of approaches from which to derive an understanding of the brain. This has changed dramatically, and we will glance at the progress of neuroscience to illustrate this.

Dissection of the brains of dead subjects had established the basic shape and structure of the tissue in Hellenic times. The various parts of the brain were named and gradually some comparatively clear idea of functions they performed was gained. The problem is that what happens in the brain is much more complex than a mere division of functions. It seems that the brain does allocate its work between the left and right hemispheres, but the way it does this is not so simple as a mere division of responsibilities. Some insight into the complexity of brain function was developed in the nineteenth century, when a great deal was learned by inference from the experience of people who had suffered brain and other neurological injuries. By working on cases of brain injury neuroscientists could infer which functions were dependent on the damaged area. The healed brain was often found to have switched functions to previously uninvolved areas, where new capacity was developed [27]. This process is an aspect of what we call neuroplasticity: the capacity of the brain to mould and remould itself, through learning.

Similar lines of investigation have produced a clearer understanding of the relationship between the two hemispheres of the brain. In the past, the left hemisphere with its role in conscious thought tended to be valued over the right hemisphere, which was rather dismissed as an area where the necessary but 'lower' automatic, animal processes of the brain took place. However, studies of patients with right hemisphere damage showed that there could be a loss of significant areas of understanding, such as the interpretation of pictures and maps, the use of metaphors and jokes, and a grasp of the links between ideas and an ability to make sense of problems holistically. The left hemisphere of the brain produces answers slowly, working hard to search memory, test ideas and reason out solutions, but often seems to get tired and experience difficulty progressing. The right hemisphere takes the information input, experience and ideas available to it and seeks resolution through associative processes. The right hemisphere can then produce answers that seem to come 'out of nowhere'.

Today there is a wide array of technology available to the neuroscientist, opening up a rich body of investigation, theorising and speculation, which has built on and enhanced what could be learned from pre-technology neuroscience. Some, but far from all, of a host of recent books that make the neuroscience explosion accessible to the non-specialist reader are specifically referenced in what follows and others [28-31], [22], [32-34] were consulted for this paper. At the same time, radio and TV broadcasts, articles in magazines and quality newspapers (many of them in the form of book reviews), are simply too numerous to mention. If we look at this outpouring of information and comment to tell us why there has been a change, the answer is

solidly based in the technology available to the research scientist. It is the range of sophisticated scanning techniques that has made greater progress in research in neuroscience possible.

In the first half of the twentieth century, ways of measuring blood flow and electrical charge in the brain began to be developed. From the former, the technique known as Positron Emission Tomography (PET scanning) was developed to provide three-dimensional images of the brain at work. Since then, Magnetic Resonance Imaging (MRI) and functional MRI (fMRI) have been developed to provide images of even greater clarity. Now Magnetoencephalography (MEG) can read very small traces of magnetic activity during periods of thousandths of a second. Today, the activity of a single neuron can be monitored, as can many neurons working together. 'Using PET scans and fMRI, we can now find what parts of the brain are active or inactive when a patient performs a specific action or engages in a specific mental process' [35, p.85]. In particular the importance of the neural connections between parts of the brain has become clearer. The sum of all these connections is now often referred to as the connectome [36] and there is a kind of mantra: 'You are your connectome', or as LeDoux [37, p. ix] puts it 'You are your synapses'. Neuroscience, by directing our attention on the whole brain and its myriad neural connections, opens the way to a much stronger understanding of the information searching processes. As suggested earlier, the two aspects of neuroscience findings on which we will concentrate here are neuroplasticity and the distinction between the two hemispheres of the brain. Others, concerning memory and perception for instance, could usefully have been chosen, but the space available to us creates limitations.

4 The Brain, Learning and Information

If we return to the concept of neuroplasticity we can demonstrate its particular significance in learning, information searching and therefore IL. A clear formulation of neuroplasticity is offered by Carr [38, p.48]

The recent discoveries about neuroplasticity make the essence of the intellect more visible, its steps and boundaries easier to mark. They tell us that the tools man has used to support or extend his nervous system – all those technologies that through history have influenced how we find, store, and interpret information, how we direct our attention and engage our senses, how we remember and how we forget – have shaped the physical structure and workings of the human mind. Their use has strengthened some neural circuits while leaving others to fade away.

Carr turns our attention towards the development and functioning of the human brain and its dependence on access to what we might broadly call information. A flow of sensations into the brain that range from tastes and smells through to the visual and auditory reception of incredibly complex messages coded in language, number and other sets of symbols, does not merely inform, it develops and supports the ability to

think. The increase of brain activity in the areas associated with the various senses can be measured during the early months of human life and subsequently. The important thing is that this process of finding out, building understanding on what is identified, and then basing actions on that understanding, is not merely a learned response. The neural equipment of the human being from infancy onward has the basic capacity to cope with the information that reaches it. The brain requires sensory and coded information and deals with it both through its conscious (left hemisphere) and unconscious (right hemisphere) capacities to produce understanding and ideas.

The pedagogical theories associated with Jean Piaget and John Dewey suggest that children (and adults) engage actively with knowledge as individuals with their own different orientations. This places a requirement on education systems to respond to the needs of the learner, rather than to feed the learner with pre-structured information. As Maria Montessori [39], one of the other great pioneers of modern educational theory put it,

Education is not something which the teacher does, but it is a natural process which develops spontaneously in the human being. It is not acquired by listening to words, but in virtue of experiences in which the child acts on his environment.

More recently, this approach is the basis of hosts of experiments, both small and large scale, with child-centred learning in schools. It has also inspired a whole body of theory. For example, there is critical literacy which provides a strong theoretical basis for the idea of information literacy [40]. In this the teacher seeks to encourage learners to probe beneath the surface meaning of the information and ideas to which they are exposed, so as to draw out the causes, context and ideology of all types of communication. The significance of this for information science in general and IL in particular is obvious. It does not stop at the transition from childhood to adulthood. It is the pattern of lifelong learning in which the brain constantly develops and changes through both a conscious and an intuitive exposure to information. All of this urgently demands that the learner has information literacy, and it contains clues about the form information literacy programmes should take.

5 Implications for Information Literacy

At this point we leave the comparative security of our discussions of IL and of neuroscience and enter the arena of speculation. A user-centred approach to IL is already being delivered in new programme methodology and content, much of what fits comfortably with an interpretation of modern neuroscience. But if the neuroscience approach is to be considered a genuine enhancement of thinking about IL it ought also to be able to deliver something fresh. We can cite only one or two examples of substantial absorption of neuroscience concepts in IL programmes. Probably the biggest experiment has been one which concentrates on assessing students' learning styles rather than simply focusing on delivery. De Boer et al [41]

describe using a method known as the Hermann Brain Dominance Instrument in a University of Pretoria IL module delivered to a university-wide intake of more than 7000 undergraduate students. There is also a text on IL in schools ostensibly incorporating brain science concepts [42] which refers the reader to several web resources on the brain and education. However, beyond these explicit references to the brain as the starting point for IL there seems to be little else. In practice the programme described might just as easily been presented without this preamble. We still need to ask ourselves, if IL programmes were to be built on the basis of accessing unconscious feelings and emotions, where might that point us? Whilst the potential is extensive, we will confine ourselves to some words on three possible areas that offer possibilities: metaphor, intuition and empathy.

Regarding the significance of metaphor, we can draw attention to some experimentation by Cole and Leide [43]. They ask ‘Can metaphorical thinking supply a scaffolding structure from a known domain for a target unknown domain, providing a structuring vehicle until a more permanent one can be put into place?’ [43, p. 180]. Tentative their investigation and conclusions might be, but their line of thought is precisely the sort of thing one might expect to emerge from a brain-centred approach to information seeking. They suggest that their hypothesis might offer ‘information accessing environments that are closer to how people actually interact with, organise and store information in memory’ [43, p. 198]. This research genuinely seems to expand the scope of thinking on information retrieval and, by extension, of IL programme content.

On intuition in information science, it is more or less a truism that the World Wide Web and its hyperlinked resources are particularly conducive to intuitive searching. It is already becoming appreciated that Web 2.0 and the range of social media offer to further enhance this [17]. Today’s searcher can explore resources using natural associations rather than structures imposed by information professionals. Although this view seriously underestimates the intervention at search engine level, for the searcher it is possible to make decisions much more based on serendipity than systematic planning. A search involves following the implications of connections that are offered incidentally in the course of scanning and reading hyperlinked content. The brain can handle these connections, clues and pointers much faster and satisfyingly than it can engage with the formal indexes and catalogues of library practice. But while the intuitive character of web searching is an excellent fit for the human tendency to trust intuition, the web does provide us with a good deal of poor or deceptive information. Arguably the most valuable aspect of IL is a web-literacy that not only instructs in optimising searches but also provides the searcher with the critical tools to distinguish between what is reliable and what is not, what is helpful and what is deceptive.

Finally on empathy, there may be a problem for those of us who were taught that librarianship was about delivering facts and avoiding anything that looked too much like advice. Nevertheless empathy seems like a natural consequence of a willingness to incorporate an acceptance of the role of the unconscious mind in our interaction with information. If we allow ourselves to enter into the mind space of the searcher, or the learner on an IL programme, we can arguably achieve a great deal more than

merely by the unemotional delivery of facts. This is particularly true when the information that is sought is on subjects that touch the feelings of the searcher in an intimate way. Most obviously this can mean health information. Even casual observation tells us that someone who needs information relating to their health or that of those to whom they are close is much more able to grasp it when it is presented empathetically. Ina Fourie of the University of Pretoria has begun to explore this in various conference papers, articles and reviews of the literature such as Fourie [44]. Her work on information for cancer patients represents a call for empathetic delivery that fits naturally into a brain-centred approach to information work.

6 Concluding Remarks

So, to summarise, neuroscience suggests that the brains with which we process information are ‘plastic’ organs that change in response to information input. At the same time, the conscious (left hemisphere) mind alone cannot handle all the data and calculations that the exigencies of life require. Most of what we do (and think) is handled somewhere below the level of consciousness by the right hemisphere of the brain. Once we recognise this in relation to the educational, professional and leisure use of information, we can see that an IL activity that seeks to point towards a guaranteed direct line between the need to know (apprehended or implicit) and some form of resolution of the need is almost inconceivable. One line of enquiry, one document with one answer is just not the way we need to work and assuming that there is may even inhibit the power of our brains to work most productively. Therefore IL needs to tap the intuitive, associative, empathetic, metaphor-based thinking that is characteristic of right hemisphere brain activity. The implication is that we need to free IL from an unhelpful over-concern with structures designed to serve a view of the mind as resolutely logical and predictably organised. Instead we need to empower the whole of the individual brain, conscious and unconscious, left hemisphere and right hemisphere, to learn in a way that suits its own interests, capacity and learning style. Some of the implications of this version of IL are already being worked out in the development of the user-centred programmes that we hear of in conference presentations, at workshops and in the literature. What we offer is an outline of a rationale which, by exploring the fundamentals of human response through an understanding of neuroscience, could take IL programme development to new levels.

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Productive Partnerships to Promote Media and Information Literacy for Knowledge Societies: IFLA and UNESCO's Collaborative Work

Maria-Carme Torras i Calvo¹ and Evgeny Kuzmin²

¹ IFLA Governing Board / Bergen University College, Bergen, Norway
mctc@hib.no

² Intergovernmental Council, UNESCO Information for All Programme (IFAP) / Russian IFAP Committee / Interregional Library Cooperation Center, Moscow, Russian Federation
kuzmin@ifapcom.ru

Abstract. Building knowledge societies in the 21st century can only be achieved through targeted policies. Drafting such policies remains an international, regional and national challenge. In this paper, we make a case for productive partnerships as a necessary condition for the effective development and implementation of targeted policies which remove the barriers to open, inclusive, participatory, fair and sustainable societies. More specifically, we focus on IFLA and UNESCO's collaborative activities in one shared priority area, media and information literacy, in order to illustrate the necessity and value of partnerships beyond geographical borders, across sectors, institutions, organisations and professional groups.

Keywords: Media and information literacy, partnership, advocacy, IFLA, IFAP, UNESCO, knowledge societies.

1 Introduction

Building knowledge societies in the 21st century can only be achieved through targeted policies. Drafting such policies remains an international, regional and national challenge. In this paper, we make a case for productive partnerships as a necessary condition for the effective development and implementation of targeted policies which remove the barriers to open, inclusive, participatory, fair and sustainable societies. More specifically, we focus on IFLA (International Federation of Library Associations and Institutions) and UNESCO's collaborative activities in one shared priority area, media and information literacy (MIL), in order to illustrate the necessity and value of partnerships beyond geographical borders, across sectors, institutions, organisations and professional groups.

Knowledge societies [1] can be characterised as societies where the efficiency of their structural components correlates directly to the quantity and quality of information, authenticity of their resources and reliability of transmission channels which are required by and are sufficient for each of the components. In knowledge societies, citizens know which information should be used in each situation, in both

professional and private contexts. Citizens in knowledge societies know where to find this information, and how to assess and apply it critically, responsibly and ethically. Media and information literacy is the cornerstone of knowledge societies, and as such, one top priority area for IFLA and UNESCO, and especially for UNESCO's Intergovernmental Information for All Programme (IFAP). The agendas of IFLA and UNESCO share the goal of promoting MIL worldwide to empower citizens in accessing, using, creating, sharing and preserving information, regardless of the media, form or format in which it may be conveyed.

This paper is organised as follows. Firstly the information environment in which knowledge societies are being built is briefly sketched out. Understanding MIL as a composite concept is all important in order to face up to the challenges and seize the opportunities of the digital age, as well as bringing together all stakeholders to establish productive partnerships. Subsequently, the paper addresses the achievements of IFLA and UNESCO IFAP's joint action plan for media and information literacy. The conclusion outlines the way ahead for further collaborative work on MIL.

2 The Information Environment of the Digital Age: Empowering Citizens through MIL

The advent of the internet, social media and technological developments such as mobile platforms have brought about significant changes in the way we discover, access, read, produce and disseminate information. Citizens are no longer just information consumers but also information producers in a diversity of media and formats. There is a significant increase in the amount of created and circulated non-textual information (pictures, audio and video materials). Information flows across state borders and what one culture borrows from another culture may yield unexpected fruit in terms of preserving cultural identity as well as cultural and linguistic diversity.

The digital age has increased our chances of social participation, for instance through user generated content in the media, but it also presents more challenging sides. Information is digitally available regardless of relevance, currency and authority. In the case of academic libraries, the digital transition has led to *disintermediation* and *decoupling* of academic libraries from scholarly information communication and provision [2-4]. Libraries and other memory institutions are no longer information gatekeepers and main providers of quality information. In the overflow of digital information that surrounds citizens, Google and Google Books are examples of shortcuts to discover and access the information they need, thus bypassing the library. Citizens operate in an environment where information and misinformation coexist. In such a polluted information environment, MIL empowers citizens with key competencies related to areas such as critical thinking, ethics, security and privacy in the digital space. Empowering through MIL is also essential to bridge the gap between the information rich and the information poor, a gap that cuts across countries, social groups and generations.

In the early 2000's, the Prague Declaration: Towards an Information Literate Society (2003) [5] and the Alexandria Proclamation on Information Literacy and Lifelong Learning (2005) [6] capitalised on the significance of information literacy to

achieve sustainable human development and to build participatory and inclusive societies in the 21st century and beyond. Regarded as an integral part of the basic human right of lifelong learning, information literacy is described as crucial to achieving the United Nations' Millennium Development Goals and ensuring respect for the Universal Declaration of Human Rights.

In the increasingly complex and rapidly developing information and technological landscape where we are immersed, the need to treat MIL as a composite concept is brought up by several declarations over the last years. The Fez Declaration on Media and Information Literacy (2011) [7] calls our attention to increasing our understanding of the connections between media and information literacy: “[...] today’s digital age and convergence of communication technologies necessitate *the combination of media literacy and information literacy* [...]” (p.2). The Moscow Declaration on Media and Information Literacy (2012) [8] brings together media and information literacy perspectives both in its conceptualisation of the term and in the actions it proposes to promote media and information literacy for knowledge societies. MIL is looked upon as a prerequisite for the sustainable development of open, plural, inclusive and participatory knowledge societies, and the civic institutions, organizations, communities and individuals which comprise these societies. In the Moscow declaration,

MIL is defined as a combination of knowledge, attitudes, skills, and practices required to access, analyse, evaluate, use, produce, and communicate information and knowledge in creative, legal and ethical ways that respect human rights. Media and information literate individuals can use diverse media, information sources and channels in their private, professional and public lives. They know when and what information they need and what for, and where and how to obtain it. They understand who has created that information and why, as well as the roles, responsibilities and functions of media, information providers and memory institutions. They can analyze information, messages, beliefs and values conveyed through the media and any kind of content producers, and can validate information they have found and produced against a range of generic, personal and context-based criteria. MIL competencies thus extend beyond information and communication technologies to encompass learning, critical thinking and interpretive skills across and beyond professional, educational and societal boundaries. MIL addresses all types of media (oral, print, analogue and digital) and all forms and formats of resources.

UNESCO (forthcoming) [9] advocates for a human rights-based approach to formulating MIL policies and strategies. MIL is essential to basic human rights such as freedom of expression and access to information, as well as the right to education. Giving citizens access to information is essential, but it is just as essential to ensure that citizens have the necessary competencies to capitalise on the accessed information. This can only be achieved through citizens’ education, as emphasised more recently in the Doha Declaration on Supporting Media and Information Literacy Education in the Middle-East (2013) [10]. Actions are needed to work for MIL

education so that citizens become active builders of knowledge societies, tackling the challenges of the digital age but also benefiting fully from the opportunities it grants them.

The IFLA Trend Report [11] clearly suggests that the value of MIL will only increase in the future. The report points out five key trends that will change the information environment. New technologies will transform the global information environment, both expanding and limiting who has access to information. This will have serious implications for issues such as individuals' privacy and data protection. Online education will democratise and disrupt global learning. Hyper-connected societies will listen to and empower new voices and groups. In this evolving information environment, those who are not media and information literate will face barriers to participation in significant areas of life.

3 Productive Partnerships for MIL

Building human-oriented knowledge societies is a goal shared by many nations. Information and knowledge are an essential resource for development. The development of MIL “[...] is fundamental to nation building, economic development, the protection of human rights and for meeting the challenges of cultural and linguistic diversity” [9]. Enhancing the knowledge, attitudes, skills and practices that MIL encompasses is dependent on partnerships beyond geographical borders, across sectors, institutions and professional groups. Productive partnerships are a condition *sine qua non* to remove the barriers to open, plural, inclusive and participatory societies. Successful policy development for the implementation of MIL programmes is dependent on a common vision shared by stakeholders as well as specific actions which are underpinned by shared knowledge and resources. IFLA and UNESCO's collaborative work to promote MIL worldwide is a good example of productive partnership.

As the global voice of the library and information profession, IFLA advances the interests of library and information associations, libraries and information services, librarians and the communities they serve throughout the world [12]. The federation endorses the principles of freedom of access to information, ideas and works of imagination and freedom of expression embodied in Article 19 of the Universal Declaration of Human Rights. IFLA is committed to universal and equitable access to information, ideas and works of imagination for the social, educational, cultural, democratic and economic well-being of individuals and communities. Delivery of high quality library and information services helps guarantee that access. The IFLA Information Literacy Section¹ was established in 2002 with the aim of fostering international cooperation to advance the information literacy agenda.

UNESCO and IFLA have been long-term productive partners in their endeavours to support information professionals and other stakeholders in promoting MIL for all kinds of citizens, for all social sectors and in all geographical areas. IFLA and UNESCO have had a history of collaboration since IFLA initiated formal consultative

¹ <http://www.ifla.org/information-literacy>

relations with UNESCO in 1947. UNESCO has the global authority to influence governments and NGO's around the world, as well as the infrastructure to support important initiatives. A number of IFLA policies have been endorsed by UNESCO. These policies continue to have a great impact at a global level and contribute to the development of frameworks for high-quality library and information services.

UNESCO established the Information for All Programme (IFAP) in 2000 as a response to the challenges and opportunities of the information society. This intergovernmental programme pledges to harness the new opportunities of the information age to create equitable societies through better access to information. One of the five priority areas in IFAP is information literacy. IFAP has carried out regular consultations with IFLA on a wide range of problems, and engaged IFLA presidents and other members in preparing and holding IFAP international events. Common vision and goals led to the elaboration of an IFAP-IFLA joint action plan on information literacy. These joint actions have the ultimate goal of supporting governments and other stakeholders in developing general and sector-specific policies for building inclusive knowledge societies. Building knowledge societies calls for a focus on a people-centred approach to actions, rather than on a technology-centred paradigm. These actions must aim at fostering freedom of expression, right to information and equality, as well as ensuring citizens' privacy and security. The actions jointly carried out by IFAP and IFLA have targeted and involved a diversity of professional groups and government and civic society institutions. Some specific examples are provided in what follows.

IFAP and IFLA have engaged in the task of drawing up international recommendations on media and information literacy. The recommendations were prepared in consultation with UNESCO and IFAP experts, as well as media and information literacy experts from around the world. In April 2012, IFLA Media and Information Literacy Recommendations [13] were endorsed by the Intergovernmental Council for IFAP held in Paris. Further collaborative work on these international recommendations on media and information literacy is in progress. IFLA is currently exploring opportunities for UNESCO's endorsement of the recommendations. Endorsement is essential to raise the awareness of governmental and civil society institutions so that comprehensive MIL programmes are developed at all educational levels, research is commissioned and a wide range of MIL actions are collaboratively advocated and implemented worldwide.

The concept of media and information literacy calls for a deep understanding of the connections between media literacy, information literacy and other literacies. Such an understanding can only be gained by bringing together diverse expertise in order to identify challenges, recommend specific actions and urge stakeholders to commit to them. This was the aim of the International Conference on Media and Information Literacy for Knowledge Societies [14] held in Moscow, 24-28 June 2012. Co-chaired by UNESCO, IFAP and IFLA, the conference gathered over one hundred experts from forty countries in order to build a stronger foundation on which to lobby for and implement media and information literacy activities worldwide. The concept of media and information literacy, and of the ways it correlates with other literacies, was explored in depth. Key challenges were identified. Policies, professional strategies

and measures to improve international, regional and national responses to media and information literacy issues were discussed. The diversity of professional groups and government and civic society institutions at the conference raised a common awareness of the significance, scale and topicality of the tasks of media and information literacy advocacy among information, media and educational professionals, government executives, and the public at large. The conference resulted in the Moscow Declaration on Media and Information Literacy [8]. This is a valuable document as it provides a comprehensive working definition of MIL and makes a clear call to action for all stakeholders.

In addition to IFAP and IFLA's collaborative work, IFLA and UNESCO Communication and Information Sector have been working closely on several MIL actions. IFLA is actively engaged with UNESCO's initiative to establish a permanent *Global Alliance for Partnerships on MIL*, which includes other key stakeholders such as UNICEF and the United Nations Alliance of Civilizations (UNAOC). IFLA is also contributing to UNESCO's *MIL Policy and Strategy Guidelines* (UNESCO, forthcoming). Further, IFLA is currently assisting UNESCO in the development of an online community-based platform for Open Educational Resources in MIL in a large number of languages. This platform will contribute to community and capacity building through knowledge and resource sharing. The starting point for this project is the UNESCO publication *Overview of IL Resources Worldwide* [15].

4 The Way Ahead

UNESCO and IFLA's partnership builds upon the strong belief that MIL is essential for taking advantage of the democratic, social, educational, economic, cultural, health and sustainability opportunities provided by our quickly evolving information environment. Future collaboration must continue capitalising on understanding trends from a multi-stakeholder perspective and policy development and implementation which targets awareness raising, capacity building and other actions cutting across geographical borders, sectors and professional groups.

As new technologies emerge and converge, it is crucial to gain a more holistic understanding of their impact on the individual and on societies. Likewise it is important to better understand how MIL relates to information ethics, information preservation and information accessibility in an increasingly complex environment. These are also IFAP priorities and issues addressed by the *IFLA Trend Report*. Only by obtaining these insights can targeted policies be developed and implemented in order to build knowledge societies worldwide.

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Participatory Action Research and Information Literacy: Revising an Old New Hope for Research and Practice

Juan D. Machin-Mastromatteo¹, Jesús Lau², and Sirje Virkus¹

¹Tallinn University, Tallinn, Estonia
{machin, sirvir}@tlu.ee

²Universidad Veracruzana, Veracruz, Mexico
j1au@uv.mx

Abstract. This paper is a starting of a research which points toward constructing the basis for a research agenda integrating Participatory Action Research (PAR) into Information Literacy (IL) research and practice. In order to achieve this goal: a) we enumerate some pros and cons of using such methodology on IL with the pertinent literature and our own practice as IL researchers; b) we have developed a questionnaire to gather some insights from the research community in this matter; and c) we will start to seek an understanding of the possible contributions that a PAR-IL research agenda can bring to the field. The integration of PAR into IL research and practice is discussed from the three possible methodological stances: quantitative, qualitative, and a mixed methods perspective. Furthermore, we enumerate some of the pros, cons, hesitations and eagerness that researchers might have toward the idea of using PAR.

Keywords: Participatory action research, information literacy, methodology.

1 Introduction

This paper documents the starting point of a research study where we intend to offer some directions towards constructing the basis for a research agenda integrating Participatory Action Research (PAR) into Information Literacy (IL) research and practice. In order to achieve this goal: a) we enumerate some pros and cons of using such methodological tradition with IL, including some pertinent literature and our own practice as IL researchers; b) we have developed a questionnaire to gather some insights from the research community in this matter; and c) we will start to seek an understanding of the possible contributions that a more structured and stronger PAR-IL research agenda can bring to the IL field. As stated above, we are going to be discussing the integration of PAR into IL research and practice from the three possible methodological stances: quantitative, qualitative, and a mixed methods perspective. Furthermore, it is our intention to enumerate the pros, cons, hesitations and eagerness that researchers from each methodological tradition might have toward the idea of using PAR. PAR is an approach that has been left out and sometimes dismissed with some contempt by the education and research community [1-2],

among other stakeholders [3], especially when it is compared to positivist approaches [4]. Nevertheless, PAR deserves to be revisited and further analyze its possible applications into the area of IL. However, and regardless of the methodological and philosophical stance, we argue that its use is quite conceivable and there are good arguments for revisiting it and bringing it forward as one particularly useful voice for IL research and practice. Hence, an analysis of its possible applications into the area of IL research and practice is needed.

2 Participatory Action Research

Action research originated around the 1930s and 1940s, and actually, most authors tend to attribute the origin of this research tradition to the works of Kurt Lewin [5], [6], who developed a comprehensive action research theory in the 1940s [7]. In general, recurrent themes for action researchers are related to issues of power and/or discrimination against minority groups. Lewin's studies present some relevant notions, such as: knowledge generation from problem solving, group dynamics, intergroup relations, and the improvement of people's conditions for examining their realities. There have been many research traditions that have derived from action research and while they are all participatory methodologies, some researchers tend to understand them as synonyms, while others strongly advocate for the use of their preferred 'branch'. Some of such associated traditions are action research [8], action science [9], feminist PAR [10], PAR [11], practitioner research [12], self-study [13], teacher research [14], among others. Even though we have preferred to use PAR, we believe that if we limit our research to the uses of a specific branch, most of their differences sometimes will be subtle or overlooked, and thus we would be unfairly leaving out the other branches, which are also participatory traditions and that may have been used within the IL field. Furthermore, such exclusion, ironically, would be against the philosophy of participatory approaches. A good example to support this argument is the following definition, where the word participatory is highly stressed, but the concept is intended to correspond to action research: "action research is a participatory, democratic process concerned with developing practical knowing in the pursuit of worthwhile human purposes, grounded in a participatory worldview which we believe is emerging at this historical moment. It seeks to bring together action and reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern to people, and more generally the flourishing of individual persons and their communities" [15]. Freire's works are arguably among the classic examples of this approach [16] and also some kind of a starting point for bridging PAR with IL. However, his approach dealt more specifically with read-write literacies and emancipatory educational models, by emphasizing the active participation of students and collapsing the teacher-student dichotomy. Furthermore, PAR has been more relevant in countries such as in the UK, where some of the concerns are to develop strong ways to ensure validity and trustworthiness in PAR research [6].

2.1 PAR and IL: A Good Match?

PAR draws further attention, as opposed to 'plain action research', to the reactive effects of the researcher's presence within a participatory community. Furthermore, PAR actively aims to facilitate change and study, analyze and improve individual or groups' practices to achieve a state of betterment. Moreover, PAR stresses the commitment of all participants to the goal of a given study, as they embark on a collaborative endeavor, meaning that the researcher works with the participants from his or her own knowledge and then mediates common understandings by building upon the knowledge, practices and realities of each of the persons involved in the research. The direct implications or results of the research would be achieved, whenever participants improve upon their practices. Furthermore, PAR researchers may reflect on their own practices and thus they could achieve a state of betterment as well. PAR goals have been emancipatory and aimed towards the improvement of the practices and situations of the people involved. On the other hand, we have IL, which strives to develop more informed individuals, independent information users, and critical thinkers in order to achieve many different purposes, such as: problem solving, decision making, emancipation, for the exercise of active citizenship, overcoming oppression, bridging divides, achieving critical stances, and for lifelong learning. All these purposes have been largely studied since Zurkowski coined the concept in the 1970s. However, even when the 'good use' of information for the improvement of the human being is at the heart of IL and a participatory stance seems like a perfect match for IL and its various purposes, we believe that the bridging of IL with PAR has only started to be (re) discovered, and an analysis of this connection in the ways we intend may lead an improved research agenda for the IL area. So we ask ourselves, is it time to review some of these and bring them back to the forefront in order to see if an IL research and practice agenda, which integrates PAR, can translate to an enhancement of its results in the coming years? Conversely, how many of us IL researchers are using this approach? Is it an old hope or a new one? Is this IL-PAR connection obvious, or are practitioners too busy to realize that this is a good match? Participatory approaches are research strategies that have been used in IL research. Several researchers have used PAR, often driven by critical theory, for developing information literacy programs or activities in higher education [18-21], within schools [22], for the community [23], as a framework for evaluating IL instruction [24], among others. Moreover, in this age of social media (a.k.a. new or participatory media), participatory approaches are logical choices when dealing with the integration or mediation of these technologies for their appropriation [25].

2.2 Pros and Cons of PAR

As the humanities and social sciences have tried to evolve, these methodologies have also been vastly improved in the last 70 years. Moreover, these kinds of methodologies are very closely related to a human perspective [26], what is defined in the literature as 'research with people' instead of a positivist 'research on people' [27]. PAR deals with the rich subjectivity of the human being and it is arguably what it does best. However, some positivist or conductist traditionalists have sometimes dismissed PAR as purely subjective and not a serious research tradition [28-29]. They

highlight the arguments against PAR in similar ways to qualitative methodologies, such as stating that action researchers do not have mathematical and statistics skills, and that is why they take such an approach. Furthermore, there are the issues of validity, trustworthiness and the number of participants in a participatory study, which cannot be simply evaluated with the same lenses and values of quantitative research. Even so, it seems that an approach such as PAR would be favorable if it tries to bring some objectivity into that subjectivity and if we, the researchers, are able to control most of the variables in order to offer more trustworthy and reliable results. As with any other sound methodologies, if used correctly, PAR has the necessary elements: it is valid if it is systematic, establishes its parameters carefully, and follows its objective closely. Some solutions to address trustworthiness in PAR are that the researcher has to be even more transparent about the whole research process [6], [31], [32]. At the same time, its trustworthiness lies in the fact that it should also conform to long-standing traditional values, such as keeping in mind that it should be replicable and it should coincide with the literature as well. PAR, as any other good research, has to maintain logic regarding its overall structure and its train of thought and analysis throughout all its stages. Moreover, it should seek the ultimate goal of finding ‘the truth’ [33], balancing the objective/subjective dichotomy. Furthermore, the researcher has to detail the profile of the participants and demonstrate how a state of betterment was achieved considering participants’ practices or situations, which are among the main benefits of PAR [34]. These methodological approaches demand, apart from transparency, a deep ethical commitment from the researcher, because in the end, ethics is one of the most important issues regarding research trustworthiness, as numbers might be falsified as easily as qualitative data and its derived claims.

3 Methodology

For this research we obviously intend to use a qualitative and PAR approach, with which we invite all IL practitioners and academics to answer a questionnaire we have developed as our only data collection method. Our guiding research question is: in what ways can PAR contribute to the development of a research and practice IL agenda? Secondary research questions are: a) In what ways have IL practitioners profited from using participatory methodologies? b) What are the main contributions of PAR in IL research and practice?, and c) To which degree have IL practitioners used and accepted PAR for their activities?

To present this paper and thus this questionnaire at the European Conference on Information Literacy (ECIL) is a unique opportunity for seeking feedback from all interested stakeholders and to invite them answer this questionnaire. Furthermore, we will invite a larger amount of practitioners by sending the invitation through mailing lists and social media sites devoted to IL. The questions contained in the questionnaire are formulated to answer our research questions. They are as follows:

1. If you have dealt with participatory methodologies (such as Participatory Action Research - PAR, used henceforth) in your IL practice or research, please provide a short account of your experience and the lessons learned.

2. In what ways do you think PAR can contribute to advances in the research and practice agenda on IL?
3. Would you say that PAR represents an old-new-hope that is worthy to revise and retake or that it is out of touch with the times?
4. What are the important elements for advancing an IL-PAR agenda for research and practice?
5. In what ways do you think this perspective would be favorable?
6. How would it contribute to development? (e.g. individuals, policies, countries)
7. In what ways would it contribute to the library profession?

4 Conclusion

This short article is just one small step toward the revision of the use of PAR in IL research and practice. Some of the background to this research has been briefly developed and an invitation to provide feedback and answers to a questionnaire to further it was provided. We believe that all systematic research, which has been properly carried out and takes into account the perspective of research participants is valid and can advance our understanding and contribute to theory and practice, including PAR, phenomenography, and case study research, among others. The kind of approach we take is quite significant, because in our research group we use three possible methodological stances: quantitative, qualitative, and mixed methods. It is our interest to explore, seek to understand, and establish the possible contributions that a PAR-IL research agenda can bring to the LIS profession, taking as a base that any systematic study helps the advance of a discipline or field of study such as IL. Furthermore, any study to be conducted should triangulate results, indicators, and experiences. Hence, a basis for decision-making, knowledge development, theories, and concepts, can be offered from a research/empirical perspective.

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Analyzing the Intellectual Structure of World Information Literacy Literature through Citations and Co-citations

Zehra Taşkın, Güleda Doğan, and İpek Şencan

Hacettepe University, Department of Information Management,
06800, Beytepe, Ankara, Turkey
{ztaskin,gduzyol,ipeksencan}@hacettepe.edu.tr

Abstract. Information literacy is one of the emerging topics for many fields in recent years. This paper aims to evaluate the field of information literacy by using bibliometrics and scientific visualization techniques. To achieve this aim, a total of 1.218 papers related to information literacy on *Web of Science (Science Citation Index, Social Science Citation Index and Arts & Humanities Citation Index)* were identified. Searches were carried out using the term “information literacy” and all data were unified and standardized to be able to make reliable evaluations. Publication and citation counts, their distribution to journals, authors, document types etc. and co-citation networks were used for evaluations. Findings of this study are important to reveal the pioneers and interdisciplinarity of the field of information literacy.

Keywords: Information literacy, citation analysis, co-citation analysis, mapping, visualization.

1 Introduction

The term ‘Information literacy’ (IL), used for the first time by Paul Zurkowski in 1974, is defined as recognizing an information need and having the ability to locate, evaluate, and use it effectively [1]. After it was widely accepted, many countries worked on how to improve information literacy abilities and how to adapt this concept to education. Based on this, not only were models such as SCONUL [2], Big6 [3] and the Kuhlthau Model [4] developed, but also standards like the Information Literacy Competency Standards for Higher Education [5] and ANZIIL [6]. These developments show the incremental awareness about the information literacy over course of time.

Information literacy requires integration between numerous personal abilities such as, critical thinking, problem solving, analysis, synthesis, organizing the knowledge, etc., for using the needed information. Gaining these abilities helps personal development, self-confidence, lifelong learning, and social change as well.

On the other hand, information literacy engages with many different disciplines and topics. In recent years, the number of studies about various facets of information

literacy, e.g. models, standards, education, applications and training platforms and their importance to various disciplines have been increasing remarkably.

This study aims to evaluate the field of information literacy by using bibliometrics and scientific visualization techniques. Questions addressed as the aim of the study are:

- Who are the most prominent authors?
- Which papers are cited most often?
- How many publications are not cited?
- What are the most important journals for the field?
- Which types of papers are preferred by the authors of this field?
- What is the half-life for the field of information literacy?
- What are the most prominent terms used in this field?

2 Method

For evaluating the field of information literacy, a total of 1.218 papers from 1980 to 2013 related to information literacy in *Web of Science* (*Science Citation Index*, *Social Science Citation Index* and *Arts & Humanities Citation Index*) were identified. Searches were carried out on April 23, 2013 by using the term “information literacy”. All metadata about authors, journals, keywords etc. were unified and standardized to be able to make reliable evaluations. VosViewer visualization tool were used for co-citation analyses. Publication and citation counts and their distribution to document types, journals, authors; cited half-life and citation counts, author and term co-citation networks are identified.

Unfortunately, it is impossible to add all publications about information literacy to this study because of Web of Science’s content scope. Web of Science indexes only selected journals which restricts the evaluation process. In addition, since articles are the largest content component of Web of Science, the results and discussions here are primarily based on citations in articles.

3 Findings

1.218 papers were written by 2.235 authors. Table 1 shows most productive authors. As also seen in Table 1, the most productive author is *Julien, H.* with 21 papers. There are only five authors who published 10 or more papers. This means that there are no primary author(s) in the information literacy field, which makes creating a co-authorship map difficult.

Table 2 shows the list of journals where authors in the information literacy field publish. *Journal of Academic Librarianship*, with 124 papers, is the leading journal in the field followed by *Portal-Libraries and the Academy* and *College & Research Libraries*.

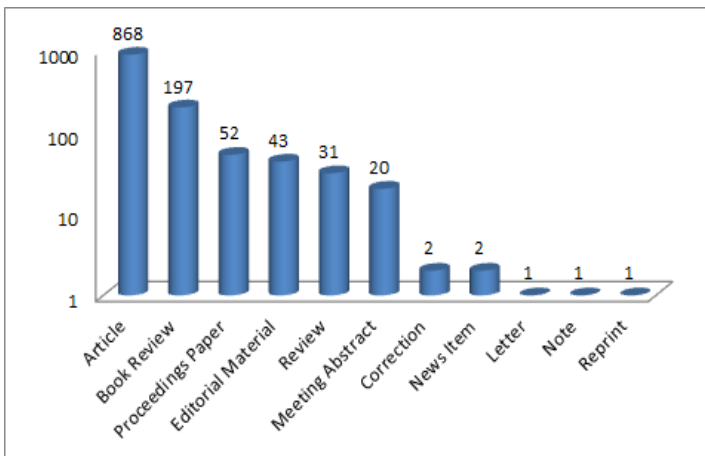
Table 1. Most productive authors for the information literacy field

Author	Publication number
Julien, H	21
Pinto, M	16
Bruce, C	15
Lloyd, A	13
Fourie, I	10

Table 2. Primary journals in the information literacy field

Journal	Publication number
Journal of Academic Librarianship	124
Portal-Libraries and the Academy	67
College & Research Libraries	64
Electronic Library	42
Reference & User Services Quarterly	42
Journal of Librarianship and Information Science	40
Library Trends	40
Libri	37
Information Research-an International Electronic Journal	35
Journal of Documentation	35

As was expected, articles are the most common document type indexed by *Web of Science* on the topic of information literacy. Other forms of publication are also important to this study. As seen in Figure 1, *book reviews* is the second most common document type found after *articles*. This can be interpreted in two different ways: the rising importance of books in the field, and the increasing number of published books. *Proceedings papers*, *editorial materials*, *reviews* and *meeting abstracts* are other document forms found in this index on IL.

**Fig. 1.** Published document types for the information literacy field

The 1,218 papers were cited 4,727 times, nearly half of which were self-citations (2,104). The citation count changed to 2,623 when self-citations were removed. The other important finding with the citations is that more than half of the papers (648) had been cited yet. Figure 2 shows publication counts with the number of non-cited papers by years. For the first 20 years (1983-2002) almost all published papers have an impact on the field. After 2002, the numbers of publications and non-cited papers rise dramatically. This can be interpreted as a result of the development policy of Web of Science. Although the number of publications in Web of Science rose with the content of regional development policy [8], these publications haven't been cited by other studies evenly.

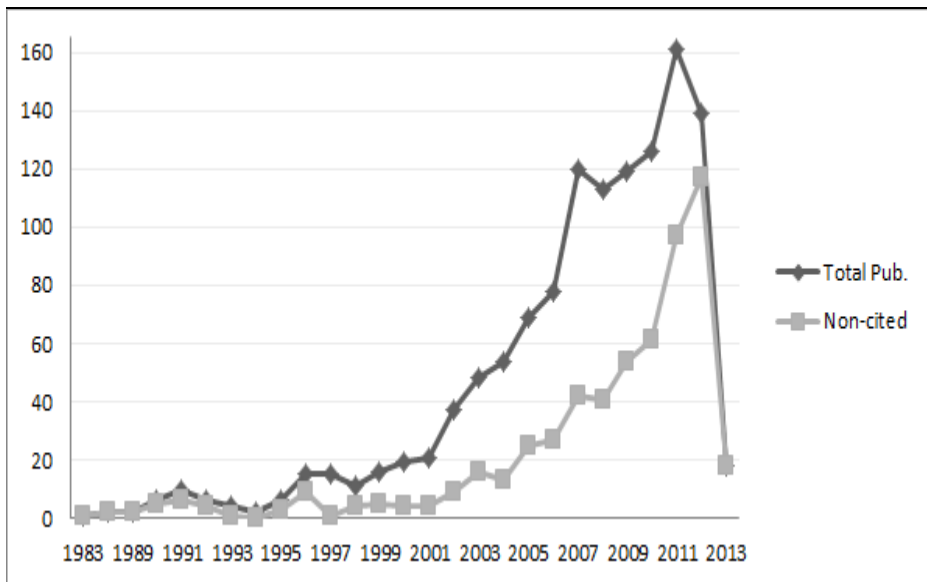


Fig. 2. Publication numbers and not-cited publications by years

Half-life of publications in the information literacy field is 11 years. In other words, the obsolescence rate for the field is 11 years and a source may be thought as not to be up-to-date after 11 years.

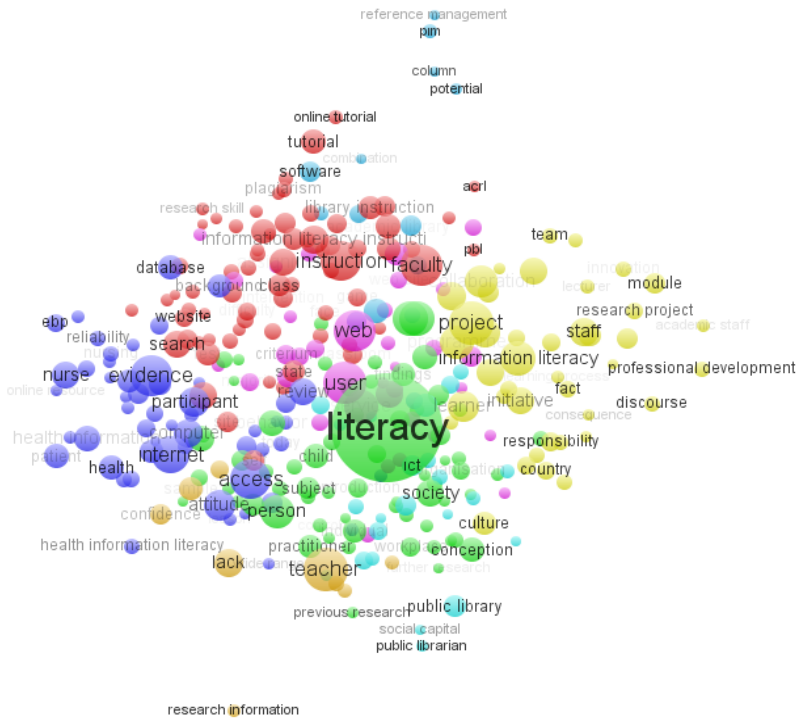
Table 3 shows the most cited publications in the information literacy field. The review entitled "Information and digital literacies: A review of concepts" by *David Bawden*, published in *Journal of Documentation*, appears to be the most cited work in the information literacy literature. The article entitled "Children's relevance criteria and information seeking on electronic resources," by *Sandra G. Hirsh* and published in *Journal of American Society for Information Science*, and the review entitled "The problem of information overload in business organizations: a review of the literature"

Table 3. Most cited first three publications, their authors and publication years

Publications	Authors	Publication years
Information and digital literacies: A review of concepts	Bawden, D	2001
Children's relevance criteria and information seeking on electronic resources	Hirsh, SG	1999
The problem of information overload in business organisations: a review of the literature	Edmunds, A; Morris, A	2000

by *Angela Edmunds* and *Anne Morris*, published in *International Journal of Information Management*, are the following most highly cited works in the information literacy literature.

Figure 3 shows the term co-citation network for the information literacy field created with VosViewer visualization tool. Unsurprisingly, the most prominent term for the field is *literacy*. The other prominent terms are *web*, *user*, *instruction*, *faculty*, *access*, *internet*, *evidence*, *participant*, *project*, *information* and *teacher*.

**Fig. 3.** Term co-citation network

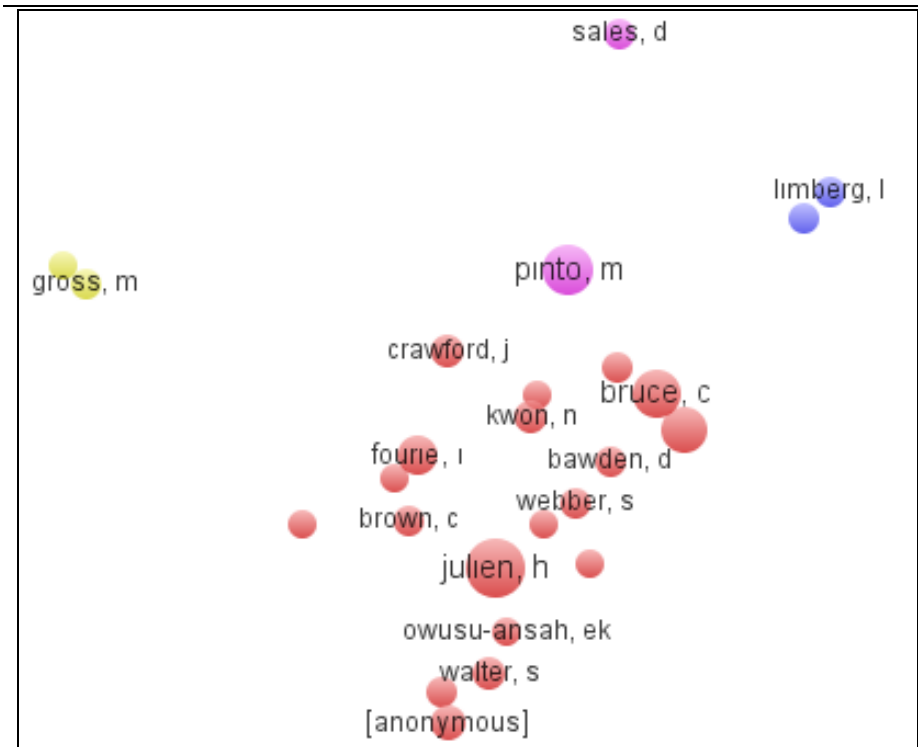


Fig. 4. Bibliographic coupling of authors

Figure 4 is a map for bibliographic coupling of authors. Red fields in this map indicate the most prominent authors for the information literacy field. They are Bruce, C. with published 21 papers, Pinto, M. with 16 papers and Julien, H. with 15 papers.

4 Conclusion

This study presents the general view of information literacy field based on the papers published in *Web of Science*. The findings of the study may be helpful for students and other starters in this area. These findings may be interpreted widely by the information literacy professionals.

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Information Literacy Policies from the Perspective of the European Commission

(Invited Paper)

Carla Basili

Ceris Institute, National Research Council,
via dei Taurini, 19 - Rome, Italy
c.basili@ceris.cnr.it

Abstract. Still notably absent in the European Information Literacy discourse is a targeted, definite and resolute political strategy, despite the fact that, from the outset, Information Literacy has been conceived of as an objective of national policy, thus requiring an intervention at the policy level. Based on this assumption, the paper begins by introducing some theoretical aspects that form the basis of a rationalisation of the various aspects of Information Literacy, suggesting separate plans of analysis from which different levels of intervention can then be developed. The paper then goes on, illustrating the point of view of the European Commission, through the examination of some recently issued official documents, and also by looking at financing initiatives for programs and research projects by the Commission itself. Purpose of the essay: to illustrate vision and strategic policies of the European Commission on Information Literacy, highlighting priorities, objectives and different types of agents.

Keywords: Policy dimensions of information literacy, European Commission policies and priorities, information policies.

1 Introduction

1.1 Information Literacy as a Multidimensional Issue

Information Literacy is a multifaceted issue, as it involves educational, cultural, social, political and ethical factors, as well as information policy measures.

This is observable from the specialised literature on Information Literacy (IL), but is also easily evident from the wide variety of topics covered by some recent (2013) Information Literacy related Conferences [1]. In fact, the exercise of analysing the call for papers of the Conferences that are announced on the National Forum on IL

website¹, reveals a large set of topics, ranging from “active learning” to “assessment of information literacy initiatives”, “critical thinking”, “curriculum development”, “teacher education”, “Bologna Process”, “information literacy in the workplace”, “standards”, “LIS education”, just to mention a few.

Looking into more detail at the specific topics addressed by these Conferences in their Call for Papers and announcements, a long list of topics emerges and, mainly, a quite disparate and polyhedric one.

A subset of these topics is listed in table 1 below.

Table 1. Subset of topics covered by some recent (2013) Information Literacy related Conferences

Active learning and creative pedagogical approaches	Collaboration across professions (P)	Effective means of developing information literacy skills in learners.	IL & education
Adding value to graduates' degrees through Information fluency	College and university libraries	Ethical use of information and plagiarism (D)	IL & emerging technologies (D)
Assessment of IF skills (C)	Computer literacy (D)	IL and employability (P)	IL & knowledge management
Bologna Process (D)	Digital empowerment (P)	IL & digital future	IL across disciplines (D)
Critical Thinking	Digital literacy	IL & democracy (P)	IL in different contexts (juristic, health, etc.) (P)
Changes of reading and writing in information literacy age	e-Learning (D)	IL & citizenship (P)	IL in the workplace
Civic literacy	E-literacy	IL & digital divide	Measurement and evaluation

¹ The Conferences analyzed within the list published by Sharon Weiner on the National Forum on IL website are: *Critically Examining Information Fluency Education*, March 13-14, 2013, Orlando, FL. - *Librarians' Information Literacy Annual Conference (LILAC)*, March 25-27, 2013, University of Manchester (UK) Library - *New trends in the areas of Information literacy, Education, Digital libraries, Information science and technologies*, April 17-19, 2013, Sibiu, Romania - Georgia International Conference on Information Literacy, September 20-21, 2013, Savannah, GA - *Information Literacy, Media Literacy and Lifelong Learning*, October 22-25, 2013, Istanbul, Turkey - University of Alberta (Canada), Augustana Information Literacy in Academic Libraries Workshop on the Theme “*Creativity and Student Engagement in Information Literacy*”, November 14-15, 2013

Faced with so a multifaceted phenomenon, is not easy to define a framework of policies that take into account both the large number of variables involved, and the predictable interdependencies existing among them. Adding further complexity, Information Literacy lies between the diverse contexts of Information and Education, as we already demonstrated elsewhere [2], and, more specifically, at the intersection between Information and Education policies.

1.2 Framing the Information Literacy Issue through Stratification

Given such a complexity, even in the very definition of Information Literacy and grounded on the conviction that coherent pragmatic decisions can derive from coherent theoretical premises, it has been suggested to differentiate among different discussion levels [3], [18], corresponding to three different perspectives of analysis:

- a) Disciplinary perspective: analysis of Information Literacy as a form of study of information (Culture of Information);
- b) Socio-political perspective: analysis of Information Literacy as an educational policy goal (Education to Information);
- c) Cognitive perspective : analysis of Information Literacy as a form of personal competence (Information Skills).

This sort of grid of analysis make it possible to identify - within the list of topics listed in Table 1 - issues of different nature, i.e. belonging to different perspectives of analysis, as indicated in the same table as (D) for disciplinary, (P) for socio-political and (C) for cognitive. This is just an exemplification, since the attribution of an issue to a class of problems is not unique and subject to interpretation.

What is important to show is that different IL issues should be analyzed from different perspectives, or, at least, with different criteria.

Our attention here is focused on the policy dimension of Information Literacy, which is natively a policy issue, since its very original conception in 1974, when Paul Zurkowsky was advocating that "... the top priority of the National Commission on Libraries and Information Science should be directed toward establishing a major national program to achieve universal information literacy by 1984." [4]

2 European Union and the Competencies for the Information Society

Literacy related issues have been in the sphere of interest of the European Commission at least since 1985, as can be seen from the Community legislation.

However, since 2000, as a result of the Lisbon strategy, there is a concentration of attention around the skills needed to live consciously in the context of the Information Society. It is important to remember that is the period of preparation of the "eEurope - An information society for all" [5], a political initiative to ensure that the European Union fully benefits from the changes which the widespread availability of the Internet is bringing.

The Lisbon European Council (March 2000), in fact, concluded that “a European framework should define the new basic skills to be provided through lifelong learning as a key measure in Europe's response to globalisation and the shift to knowledge-based economies, and emphasised that people are Europe's main asset.”

This general aim has been pursued, although with different emphases, by the Action plans emanating from the eEurope initiative: eEurope 2002 Action Plan [6] - focused on Internet connectivity in Europe and aimed at a cheaper, faster and secure Internet, investing in people and skills and stimulating the use of the Internet - whose successor will be the eEurope 2005 action plan for “an information society for everyone” [7], whose title is *per se* significant of its general aims.

2.1 The European Commission's Point of View on Information and Information Literacy

As to policies related more specifically to Information, in the period (1988-2005) the Commission launched a sequence of programmes, thus complying requirements and trends of the market of information, in all its forms (electronics, multimedia, digital): the IMPACT program (1989-1990) and his successors, IMPACT2 (1991-1995), INFO 2000 (1996-1999), up to eContent (2001-2005).

The IMPACT (Information Market Policy ACTions) programme of DG XIII/E aims at establishing an internal market for electronic information services and to improve the competitiveness of European firms by promoting the use of advanced information services.

The central strategic theme of IMPACT 2 - the second phase of the programme - is INFO EURO ACCESS “improving the accessibility of information at the European level for all interested parties”.

The third of the IMPACT programme's four action lines is aimed at “Increasing user-friendliness and improving *information literacy* (by stimulating the application of norms and standards, and carrying out awareness, user support and training activities).”

This being the only Commission's position explicitly related to the promotion of information literacy, the full text of the Communication COM(90) 570 is given below, in order to provide accurate information on the motivations and intentions of the Commission:

“3.3 To promote information literacy among professional people, the Commission will rely primarily on multipliers in the information services market and on certain groups of end-users. These multipliers include educational institutions, professional associations, national focal points, gateway operators and the specialised press.

Actions aimed at supporting the multipliers, experts and end users will comprise : development of appropriate tools, such as documentation, multimedia shows, videos, in all Community languages; organisation of conferences, seminars, workshops, information days, press conferences; participation in exhibitions; maintenance of existing directories and extension by new information products; publication of a regular newsletter giving information on Community initiatives; presence in information distribution networks of database inventories etc.; providing of a central help desk for users of information services, including a free phone enquiry service; operation of the multilingual host service ECHO (European Commission Host

Organisation) which will continue to especially support new users of electronic information services and will act as an instrument for transferring know-how to the market place in accordance with the guidelines for the improvement of the synergy between the public and the private sectors in the information market.

3.4 Training actions will address all kinds of information handlers within the information chain covering: database production, host service operation, multimedia dissemination of information and use of information. Support will be given to training intermediaries and professionals in the use of electronic information both on-line and off-line, with special attention being given to Less Favoured Regions. Actions will also include training of future trainers in different regions, economic sectors and companies.”

The IMPACT programme was followed by INFO2000 (1996-1999) (Development of a European multimedia content industry) the Multiannual Community programme to stimulate the development of a European multimedia content industry and to encourage the use of multimedia content in the emerging information society; and by eContent (2001-2004) (European digital content programme) the Multiannual Community programme to stimulate the development and use of European digital content on the global networks and to promote linguistic diversity in the Information Society.

From 2001 on, therefore, the attention of the EC turns decidedly toward the development of skills for the Information Society, with numerous policies falling within the wide scope of “an information society for everyone”.

A milestone can be considered the Recommendation on Key Competences for Lifelong Learning (2006) [8], however, it is possible to identify three basic lines of action - digital literacy, media literacy and e-inclusion - that will be shortly illustrated in the next sections.

2.2 The European Commission’s Point of View on Media Literacy

The European Commission’s conception of media literacy is explicitly given in the Communication on ‘A European approach to media literacy in the digital environment’, released in 2007 [9], as “the ability to access, understand, critically evaluate and create media content.”

And further refined in the 2009 Recommendation 2009/625/EC on “Media literacy in the digital environment” as related to “the ability to access the media, to understand and critically evaluate different aspects of the media and media content and to create communications in a variety of contexts.” The media considered are those “able to reach a wide public via different distribution channels. Media messages are informational and creative contents included in texts, sounds and images carried by different forms of communication, including television, cinema, video, websites, radio, video games and virtual communities.” [9]

The regulatory activity of the Commission for Media Literacy has been particularly intense since 2009², with a focus combining the interests of both

² A list of the main regulatory initiatives is given in the bibliography

European citizens “to better understand the world and participate in democratic and cultural life” and “a more competitive audiovisual and content industry”. [10]. This is the *leitmotiv* of the media literacy policy approach by the European Commission. From an EU educational policy perspective, is pivotal the opinion of the Committee of the Regions on media literacy and media education in EU educational policy” [11]; the Committee of the Regions, in fact, while supporting the introduction of media teaching at all levels of formal education, “highlights that a clear and substantive distinction must be made between the main components of media literacy, because the development of each component requires its own strategy, players and resources.”

2.3 The European Commission’s Point of View on e-Skills and Digital Literacy

The need to address ICT-related skills (e-skills) has been recognised as early as October 2002, at the European e-Skills Summit, and with the establishment by the Commission of the European e-Skills Forum in 2003, “to foster an open dialogue between all relevant stakeholders”. In 2004, an important outcome from the Forum was the report “e-Skills for Europe: Towards 2010 and Beyond” where e-skills are conceived as encompassing three categories [12]: ICT practitioner skills; ICT user skills and – what could not be expected within the scope of “e-skills” – “e-Business skills: the capabilities needed to exploit opportunities provided by ICT, notably the Internet, to ensure more efficient and effective performance of different types of organisations, to explore possibilities for new ways of conducting business and organisational processes, and to establish new businesses.”

A long term agenda for e-skills has been expressed by the Commission in 2007 with the Communication 496 on “E-skills for the 21st century: fostering competitiveness, growth and jobs” [13], a policy position planning, *inter alia*, the development of a European e-Competence Framework, in line with the proposal for a European Qualifications Framework.

A more recent (2010) strategic initiative by the European Union is the Digital Agenda for Europe [14], a set of planned actions for Europe, with a section devoted to enhancing e-skills and digital literacy, through a number of actions, including: Action 57: Make digital literacy and competences a priority for the European Social Fund Action regulation (2014-2020)

- Action 58: Develop tools to recognise and identify competences of ICT practitioners and users
- Action 59: Make digital literacy and skills a priority of the "New skills for new jobs" Flagship
- Action 61: Develop an online consumer education tool on new media technologies
- Action 62: Propose EU-wide indicators of digital competences and media literacy
- Action 66: Member States to promote long-term e-skills and digital literacy policies

2.4 The European Commission's Point of View on e-Inclusion

The issue of *e-inclusion* is another major concern of the European Commission and within the landscape of European policies, it is defined as follows:

“Being included means meeting the following pre-conditions:

- being online: e-accessibility is a key aspect;
- knowing how to use the equipment;
- feeling at home with technology: being trained, having e-skills that enable people to use all Mac, Windows, Linux, internet and mobile phone software, etc.;
- mastering the information needed for the critical assessment of all media support content, with a view to active citizenship.”

This concept is given in a position paper by the European Economic and Social Committee [15] on “Enhancing digital literacy, e-skills and e-inclusion”, that explicitly connects e-inclusion to digital literacy and e-skills.

The goals of digital literacy and e-inclusion are mutually supportive also in the European Parliament resolution of 5 May 2010 on a new Digital Agenda for Europe: 2015.eu where the European Parliament

“Proposes the launch of a ‘Digital literacy and inclusion action plan’ at EU and Member State levels, notably comprising:

- specific digital literacy training opportunities for unemployed people and groups at risk of exclusion;
- incentives for private-sector initiatives to provide digital skills training to all employees;
- a European-wide ‘Be smart online!’ initiative to make all students, including those engaged in life-long learning and professional training, familiar with the safe use of ICT and online services;
- and a common EU-level ICT certification scheme.” [16]

2.5 The Influence of the Europe 2020 Strategy and the Challenge of “Literacy Divide”

The above is a brief summary of the different lines of political intervention by the European Commission in the last twenty years, intervention oriented, as can be seen, to disseminate literacies different, albeit adjacent, to Information Literacy.

The discourse on specialised literacies [19], [20], however, is today urged by contrasting forces: on the one hand strategies for developing high-profile professional expertise, and on the other hand, the acknowledgment of an increasing illiteracy in the European population. A short account of both these conflicting trends is given below.

Among the 9 *flagship initiatives* included in the Europe 2020 economic strategy, of major interest for this essay are “*An agenda for new skills and jobs*” and the “*Digital Agenda for Europe*”. [17]

The first flagship initiative on skills and jobs is aimed at “empowering people through the acquisition of new skills to enable our current and future workforce to adapt to new conditions and potential career shifts, reduce unemployment and raise labour productivity”, while the aim of the Digital Agenda for Europe, on its side, is to “help Europe’s citizens and businesses to get the most out of digital technologies” [17].

Among the goals of Europe2020, the Commission “will work to ensure that the competences required to engage in further learning and the labour market are acquired and recognised throughout general, vocational, higher and adult education and to develop a common language and operational tool for education/training and work: a European Skills, Competences and Occupations framework (ESCO)”.

Against this optimistic future scenario, a recent (September 2012) report from the High-Level Group on Literacy illustrates the results of a public consultation. The report states that “One in five 15 year olds, as well as nearly 75 million adults, lack basic reading and writing skills, which makes it hard for them to get a job and increases their risk of poverty and social exclusion.”

3 Concluding Remarks

Policy is a problem-solving process that must respond to real-world situations and solve problems in concrete. This entails the need to adapt in time the indications of policy to the context of the moment. The European Commission has continuously confronted with the opportunities and the challenges of the reality of the moment, as emerges from the brief overview provided in this essay about policies and programs launched in the last 25 years by the European Commission.

As regards the policies related with the information and with the education to information, the European Commission has continuously reacted to economic and social requirements, launching a series of programmes complying with the evolution of the content industry. The Commission, in fact, has engaged the electronic information from the second half of the years '80 until 2005, during the period in which the market of electronic information, the multimedia and digital industry progressively emerged. From this period, in fact, are the IMPACT program (1989-1990) and his successors IMPACT2 (1991-1995), INFO 2000 (1996-1999), up to e-Content (2001-2005).

In parallel, the Internet diffusion at the end of the '90s and the multimedia technologies have led to policy measures aimed at developing the skills - digital literacy, media literacy and the e-skills - to live inclusively the Information Society.

In view of the above, a central question is: does it still make sense to maintain a distinction between Information Literacy and Media literacy? A positive answer to this question can be justified by considering Information Literacy as – natively – within the public sphere (even if the origin of the term in 1974 is due to Paul Zurkowsky, then President of the Information Industry Association).

Digital Literacy is in a sense a development parallel to the Information Literacy one, since it can be considered the successor of Computer Literacy. A discontinuity exists with respect to Media Literacy, indeed, a competence required to fully exploit the opportunities of the audiovisual business. It is this public-private dichotomy, indeed, that has an evident major impact on the process of policy making on the subject.

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Are National Information Literacy Policies Possible?

John Crawford

Glasgow, Scotland, UK

johncrawford705@yahoo.co.uk

Abstract. Policymaking for information literacy is still relatively underdeveloped with a limited number of documents being exclusively devoted to the subject. Some give insufficient attention to non-educational issues such as the workplace, health issues and skills development. Reviewing the work of some key commentators, the paper identifies the issues involved in developing national information literacy policies and suggests how they could be addressed at different levels of resource.

Keywords: Information literacy, information literacy policies, national information literacy policies lifelong learning, information society, informal learning.

1 Issues

As Stephen Town has pointed out, the road to information literacy activity takes place in three stages: a nation perceives a need for competitive reasons to be a player in the global knowledge economy. This, in turn, suggests a need for the upskilling of its population to work effectively in this sort of economy, resulting in a national 'learning agenda'. The 'learning agenda' also tends to become explicitly associated with the skills of citizens, the development of these skills within educational programmes and their subsequent application in the workplace. Thirdly the growth of digital media and communications results in widespread information overload, leading to the need for both individuals and corporations to have effective information and knowledge management [1, p. 86].

To understand information literacy today we have to include not only the evaluation and use of traditional 'library' sources but also social policy issues, relating to the relief of inequality and disadvantage, skills development for a post-industrial society, critical thinking and lifelong learning, an activity which information literacy informs and supports. There are also the issues of digital literacy, school and higher education curricula, early years learning, health issues, the dynamics of the workplace, learning and teaching skills and strategies with an increasing emphasis on teaching and learning in informal situations [2].

Concise definitions of what an information literacy policy actually is seem difficult to come by but it could involve three stages: gathering of information, identification of root causes and analysis of their connections and the making of policy decisions. There are also questions:

- Should information policy documents include those which are partly or largely concerned with ICT or educational issues or should they be strictly limited to information literacy?
- Should policies have a level of state recognition and, if so, at what level?
- Is endorsement by a professional body sufficient?
- Should they be simply prescriptive skills based documents or should they encourage independent critical thinking and problem solving skills? Who should be responsible for information literacy?

Clearly they must take account of the numerous policy documents and definitions which have appeared over the years and link objectives and outcomes to them. According to Basili [3], in most countries information literacy has not entered the policy agenda and it is still necessary to promote policy awareness about the information literacy issue. She identifies a total of 54 policy initiatives although most of them do not focus specifically on information literacy. Although she finds that most policy measures are initiated by Ministries of Education, the idea of information literacy appears mostly in ICT policy documents. Some of the policies are, in fact, higher education course materials. Whitworth [4] offers an analysis of the policy documents which are available in English and are in some sense, at least, national documents. Three of the states or parts of states are small: Finland, Hong Kong and Scotland (two other smaller states, Norway and Taiwan were not included) which raises the question of whether information literacy policies are easier to implement in small states. There are perhaps two factors which favour this view. In small countries educational policies are not just about education. They can help to define the values of the state and identify what factors differentiate it from other, larger countries nearby. It is easier to form networks of interested partners and meet and influence decision-makers, politicians, civil servants and staff of nongovernmental organizations (NGOs) who share some of the values of the information literacy activist.

Finland's policy is one of the few to have full state recognition. However the policy is only concerned with higher education, does not mention social impact, and information literacy is not seen as a holistic concept. The *Australian and New Zealand information literacy Framework* is the product of a professional body and the emphasis is on higher education. The Hong Kong policy is like the Finnish example, state sponsored. It is the most comprehensive of all the documents examined and the only one to pay real attention to the affective dimension, that is, the idea of pleasure being a motivator of information searching, a filter for information and a support for informational interaction. What is missing is the impact of information literacy on democracy and active citizenship. Most information literacy policy documents reflect the thinking of Western liberal democracies and this cannot be taken for granted. Both Whitworth and Basili examine the situation in some detail and offer evaluative criteria, but from the evidence available, five elementary criteria emerge which are not generally being met:

1. Information literacy policy documents should be about information literacy and not something else
2. They should have some form of government endorsement and support
3. They should be genuinely cross-sectoral, covering all education levels from early years to PhD level, the workplace, health, lifelong learning, employability and skills development, and citizenship and civil rights
4. They should be at least informed and preferably, led by the professional bodies of the countries concerned
5. They should be collaborative with input from all organisations in the countries concerned, such as skills development bodies, employers' organizations, trades unions, teaching and learning organizations, and relevant NGOs.

Some sort of standardized template for information literacy policies seems desirable. In the meantime some basic questions might be:

- What is an information literacy policy?
- What are information literacy policies for?
- What is the role of an information literacy policy within the wider world of information policy making?
- How can information literacy be defined to distinguish it from ICT infrastructural issues?
- Who should make information literacy policy?
- How can the information professional exert influence outside the information sector?
- What sort of agendas should information literacy policymaking identify/collaborate with, for example, educational and social policy, lifelong learning and health awareness?
- Is information literacy recognised in policy agendas worldwide?
- Can information literacy exploit digital inclusion agendas?
- What kind of state is receptive to information literacy policies?
- Have information literacy policies been systematically tested and evaluated?

2 Addressing the Issues

Policymaking for information literacy is best seen as an evolving, collaborative work in progress rather than an exercise in completeness. When Paul Zurkowski originated the concept in 1974, his aim was to achieve universal information literacy in the United States by 1984 [5]. This should act as a warning to us all. Policymaking is not about generating a product but a process. Evidence derived from the cited authorities and my work on the Scottish Information Literacy Project suggests that the following points are useful in what should be an ongoing process:

Advocacy and policymaking

- Advocacy strategies are essential to policymaking but this raises the issue of at what level case making should be made. Horton recommends aiming for the top, and the best example of this is probably Barack Obama's Presidential

proclamation of Information Literacy awareness month in the United States. Such coups are difficult to achieve and require a lot of planning and lobbying. In small states, access to decision makers is easier, but it is also important to tackle the issue at a practitioner level and encourage partners and supporters to make the case in their own organisations

- The process of advocacy, collaboration and networking is slow and time consuming, so plan for the long term. As Horton says [6, p. 272] it might take years or even decades
- Develop strategies and advocacy from existing national and international social and educational policies, or as Horton [6, p. 273] puts it: ‘Link information literacy to important and long-standing, intractable national or institutional or organizational goals and reforms’. These might, for example, include linking health education policies to information literacy
- Policymaking must address Intellectual Property Rights (IPR) issues and these must include ‘popular’ as well as more traditional issues deriving from the academic experience, such as downloading of music and videos and issues to do with the sale of illegal copies to the public
- Include Internet safety in the policy agenda. It is both an important issue in itself and is a matter of public concern

Working relationships

- Partnerships and networking are crucial using both personal and professional contacts
- Work cross-sectorally and not just with librarians and information specialists
- Develop a community of practice. This may be web based but could also involve face to face meetings. It should not be restricted to the library and information science profession
- Identify organisations to work with – Skills development agencies and other organizations involved in workplace training, organisations concerned with promoting digital inclusion, curriculum development bodies in education, teachers and university lecturers’ organisations, professional organisations which have an education and training role, job centres and career advisors, community learning and development organisations, telecommunications regulators such as Ofcom in the UK, chambers of commerce, employers’ organizations and trade union representative bodies. All these have an interest in information literacy outcomes.
- Offer support to practitioners. Support at policy levels informs the development of good practice at institutional levels which can be fed back to further policy development, thus creating a virtuous circle. This is particularly helpful to small organisations or solo operators like school librarians
- Have meetings and involve people. Encourage reporting on activities by activists. Thus gives activists an opportunity to present their ideas and receive comments and constructive criticism. Outcomes can then be fed into policymaking
- Develop a common vocabulary with which all stakeholders and partners can engage. Avoid ‘librarian’ speak.

Research and development

- Much of the information literacy agenda has a utilitarian content, education and specifically, education for employment, but there is a need to balance the utilitarian educational agenda against what has been called the affective dimension, personal social development and self fulfillment, outcomes which are difficult to measure, but for the people involved, are the most important of all.
- The development of learning material content should be an outcome of policy thinking but must be cross-sectoral and should not simply be higher education material 'bolted' on to another context such as workplace information literacy skills development. The role of project partners is essential in developing materials and exemplars of good practice
- Do your homework in the widest sense. Be aware of relevant research and engage in market oriented action research, preferably with other partners and including those out with the information sector. Exemplars of good practice and case studies can add value as local, in-house initiatives can inform wider practice.
- Funding: policymaking, especially if viewed as long term, is expensive and requires dedicated staff. Developing strategy strands which are likely to attract funding from governments and NGOs are worth pursuing.
- Encourage writing and reporting so that others both within the country and abroad can be aware of your work, learn from it and comment on it.
- Evaluate activity, preferably with partners.
- Link relevant information literacy skills levels to the school curriculum. The literacies curriculum outcomes are the most obvious but other areas are also relevant.
- Recognise and work with innovative learning and teaching agendas which recognise independent learning, as they are likely to be sympathetic to information literacy.

3 Strategies

While considerable progress has been made in moving information literacy from a 'library centric' model to one which is more society and community based, not enough has been done to integrate information literacy policymaking into public advocacy, and indeed, information literacy policymaking as a distinctive, systematic activity scarcely exists. ICT infrastructural and digital participation issues have achieved a much higher profile. It is difficult to see how much progress can be made without well funded, centrally led strategies which can co-ordinate and support the many disparate initiatives which take place. There has been much debate as to whether information literacy activity should be a top down activity or a bottom up one in which it is hoped that numerous, local and disparate activities will somehow coalesce into a coherent whole. However well intentioned the latter approach might be, it has not achieved high profile results, and Woody Horton, an expert in information literacy advocacy, champions the top down approach [6]. A national agency of some sort, in all countries, is needed to develop initiatives and support those who are already making them at a regional or local level. The American

National Forum on Information Literacy is a possible model for all, but expert national organisations need to be staffed and funded, although much can be achieved by a small number of people as the Welsh Information Literacy Project has shown. Such an agency might be led by the country's principal information organisation or at least have strong links with it. The primary motivation for setting up such an agency would almost certainly have to come from the country's principal information organisation as it is unlikely that any other body would have the expertise or will to do it. What would such an agency do?

Its first task would be to raise funding to support its activities and this must be an ongoing concern. Collaborative working with other bodies is essential and this applies to fundraising which should be sought in co-operation with universities and research bodies, charities, including those concerned with deprivation issues, educational organisations and curriculum development agencies, relevant professional bodies, employers and employee organisations, chambers of commerce, and skills and training agencies. It should have the support of the relevant government department which would probably be a ministry of education or lifelong learning. Collaborative working brings problems with it. Every organisation has its own distinctive aims and objectives and while these may overlap with information literacy they will not be the same, and it is important to respect other's aims and objectives and show how information literacy can inform and support them. Its first and principal task should be the development of an information literacy policy in co-operation with the above bodies. Policymaking must be realistic and should develop strands which will have appeal outside the information sector and are likely to attract funding. Particular attention should be paid to countries' social and educational policies, and policy and action should be mapped against them, with topics included which appeal to government and the public. Internet safety and IPR issues are obvious examples. Policymaking should recognise and work with innovative learning and teaching agendas which recognise independent learning and those who promote them, as they are likely to be sympathetic to information literacy. An information literacy policy is, however, a process, not an event and it needs to be modified and developed as new needs emerge. As an Irish study points out the information literacy landscape is constantly changing [7]. For this reason documentation should be web based and evolving, rather than a fixed printed document. Advocacy and lobbying, carried out in partnership with other agencies, should draw on and enhance existing policies [6, p. 273]. It is important to bring together all information sectors to achieve a process of cross-fertilisation so that the different sectors can learn from one another. Librarians working in higher education probably have the best developed skills in learning and teaching, thanks to links with academic departments and educational development units, and they are well placed to support other sectors. They could pass on their skills to other sectors. It is important that a national information literacy agency should support regional and local initiatives within the state by giving advice and guidance, acting as a link to relevant agencies, and behaving as a critical friend. It could well undertake evaluation work and one of its tasks might be to devise evaluation strategies. Cross-sectoral and collaborative working implies a community of practice. This might be web based, or consist of face to face meetings or, more probably, a combination of both. It should be a forum for the exchange of ideas and discussion of possible developments. Research projects, relevant to the agency's policies, should be

undertaken, preferably in conjunction with relevant partners, both within and beyond the information sector. These will build up the agency's expertise and provide a base of knowledge to further develop policy and activity. The Scottish Information Literacy Project, for example, was founded with the sole time limited aim of developing an information literacy framework linking secondary and tertiary education, but soon found, through a process of action research, that its remit needed to be widened to include the workplace, lifelong and informal learning.

Through collaboration with partners, exemplars of good practice and case studies should be collected and placed on the agency's website. These will both encourage and give status to those who have contributed them and will provide material which other partners can learn from and use and develop themselves. It can also provide data to inform policy development and future action points.

Communication is important and the agency should write up and publish by whatever means are appropriate the results of its work. These might include a blog and other forms of social media, reporting at conferences and publication in appropriate journals. It should also organise conferences itself where its staff and partners can present. Outside experts should also be invited to contribute.

It should also undertake evaluation activity and develop evaluative criteria. As these are currently underdeveloped, this is an important function.

If a national information literacy programme is impossible then activity by a professional body is another possibility and this is probably the most favoured option. However information literacy then has to take its place with a multiplicity of other information concerns. Time and resources are always constraints and information literacy has to compete with other priorities. A third and probably the cheapest option is to form a community of practice. Most of its work will probably be online but face to face meetings are also possible. An existing example is 'Information Skills for a 21st Century Scotland' [8]. It is an online community of practice which is open to everyone both within and outside the information profession, primarily in Scotland but also elsewhere. The community is open to everyone who is interested in information literacy and associated skills and competencies and wants to share practice, contribute to the community's knowledge of information literacy activities, and contribute case studies and news, reports of conferences and events and information about new research. One of the community of practice's key tasks is to further develop the Information literacy Framework Scotland by enriching it in the areas where it is still underdeveloped. Another area requiring attention is the identification and addressing of training needs, preferably in conjunction with the relevant professional body.

A recent report from the Republic of Ireland recommends a similar approach [9]. Its results derived from data collected from 26 information literacy experts including seven from outside Ireland. There are two principal recommendations:

- The setting up of a high level advocacy committee, composed of leading figures within the profession in Ireland (high level strategists and managers)
- A practitioner led community of practice, composed of innovative practitioners, who manage and implement information literacy programmes throughout Irish libraries

'The high level advocacy committee would operate both within and outside the profession: Within the library profession, a high-level advocacy committee would provide a framework that supports and facilitates the work of the community of practice'. 'Outside the library profession, a high-level advocacy committee would liaise with other national library organisations, collaborate with non-library groups whose information literacy goals are aligned with those of libraries, and lobby local and national government agencies to support information literacy initiatives across public life.' The information literacy community of practice would have both online and offline components and would provide one online centralised resource for information literacy practice in Ireland. An online community would be a repository for information literacy literature, an opportunity for networking and sharing knowledge, an opportunity to communicate with peers and a greater sense of inclusion for practitioners in small or remote organisations. Research, collaboration and continuing professional development are also recommended. This model is, in part, derived, from the Scottish and Welsh experience and could be applied much more widely. While formal education is not central to this paper there are relevant issues. Lifelong learning means just that but little work has been done on the earlier years in primary schools or nursery education, and this is also an age group with whom librarians have little engagement. Information literacy skills can be taught at nursery and early years in primary schools. However it is difficult to make progress if teachers are not trained in information literacy skills, and there is, as yet, little interest in information literacy in departments of education. Vigorous advocacy campaigns directed at departments of education and senior teachers are needed. The Welsh Information Literacy Project is addressing this issue. Meetings have been held with head teachers and deputy heads in different parts of Wales and, at the time of writing, two case studies are to take place in two secondary schools. Contact has also been made with two teacher training colleges to highlight the importance of information literacy to student teachers before going out on school placements [9]. It is also desirable that information literacy outcomes should be written into national school curricula.

As with all information literacy activities we need to share, report at conferences and write about them more as sometimes great initiatives and projects go unnoticed.

Information literacy is an information ideology with huge potential but also many challenges to face.

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Information Literacy, a Cornerstone of Democratic Society: A Component of an Information Policy

Egbert J. Sánchez Vanderkast

National Autonomous University of Mexico (IIBI-UNAM), Mexico
egbert@unam.mx

Abstract. Among the many declarations about the use of information made between 1997 and 2012, the Havana Declaratory (15th action) concluded that “Multi-literacy has to be promoted as collaborative work between different agencies”. A national information policy is a cardinal point in accomplishing this proposal in order to have programs that can achieve short-, mid- or long-term goals. This paper will discuss three components of multi-literacy; computer literacy; information literacy; and the political literacy needed for these processes to reach an informed citizenship as a step in the construction of a democratic society.

Keywords: Information literacy, political literacy, information policy, citizenship, democracy, democratic society.

1 Introduction

The idea of relating informational fields to other literacies were agreed it in the Seminar *Lessons Learned in ALFIN Programs in Latin America* (2012). The Seminar participants supported “a cooperative task and network creation for the growth of informational literacy in the context of Latin American countries” (La Habana Declaratory) [1]. It should be noted that the final action expresses the following: “establishing links and cooperative relationships among organizations, areas, sections, and other institutions, in several contexts, educational levels, and scopes, that work to train in the fields directly or indirectly related with information and its efficient, ethical, and critical management to search for spaces and a manner of training which tend for the integration of several fields and necessary literacy (multi-literacy) to properly interact in the current information society (written-read literacy + functional + informatics + visual + media + academic and/or informational)” [1].

This proposal combines several factors which deserve our attention, such as multi-literacy, information policies, and the creation of democratic societies.

2 Literacy and Multiliteracy

Progress in policy and practice from Prague [2] to Fez [3] has established the bases for a declaratory supported by concrete actions all communities to engage in the globalized knowledge society.

I agree with Luke's statement, "how will literacy practice be redefined in a relation not only to the emergence of digital technologies but also to other emergent blended forms of social identity, work, civic, and institutional life, and the redistribution of wealth and power that accompany economic and cultural globalization?" [4]. From a higher education perspective, Pasada Ureña [5], in the theory of multi-modality in communication argues that "the creation/design/production of meaning/texts/representations and its diffusion in any society and time are carried out through several fashions or communication language available such as: written language, oral language, visual representations, audio/sound representations, tactile representations, gesticulation representations, self-representation and spatial representation. Each one of the literacies characteristic of every communication media and fashion demands a well articulated assessment in all educational levels, vital cycle and multi-literacy. In this sense, multi-literacy must be understood as the "acquisition and control of skills centered in the personal, social, and cultural use of several tools and representation languages as a social practice, not only to the instrumental skills of different technologies use" [5].

Another type of literacy considered in the literature is digital literacy which is considered as "ideas and mindsets, within which particular skills and competences operate and about information and information resources in whatever form" [6]. Meanwhile, another trend of digital literacy accepts that it is "a framework for integrating various other literacies and skills sets" [6], but not necessarily all of them. Their main components are:

1. Underpinnings: literacy per se and computer or ICT literacy,
2. Background knowledge: the world information and the nature of information resources,
3. Central competences: reading and understanding digital and non digital formats, creating and communicating digital information, evaluation of information, knowledge assembly, information literacy and media literacy; and
4. Attitude and perspectives: independent reading and moral or social literacy.

From the perspective of communication and multimodality theory, Area Moreira, Gros Salvat, and MarzalGarcia-Quismondo [7] propose an integration vision of literacy, a multi-literacy composed by: Written-read literacy, Visual or iconic literacy, Numerical literacy, Sound or musical literacy, Audiovisual literacy, Informational literacy and Technological or digital literacy. These authors consider the following skills as required to be accomplished:

1. Know how to propose strategies and processes for problem resolution related with information
2. Know how to search for information in databases and files of any nature
3. Know how to analyze and interpret information presented by any format and/or technology
4. Know how to produce information and diffuse it through any format and technology.

On the other hand, the New London Group [8] considers multi-literacy “*as a way to focus on the realities of increasing local diversity and global connectedness. Dealing with linguistic differences and cultural differences has now become central to the pragmatics of our working civic and private lives*”. This means that we need multi-literacy to become effective citizens. Social changes must be made in work life, and public life, as well as in private life where we are members of a life world or small world, as Elfreda Chatman called it. In each circle of our work, public and small world life, information access is an element to be considered. Every circle of life will require mean of access to information for the future since each level will search for different results. For example, work life will search for productivity, public life will search for civic pluralism; and private life a multilevel lifestyle. In the same way, the individual needs to acquire the means to access employment, political power, and cultural recognition. Information literacy plays an important role here, including at government level. As Swindells indicates “*individual citizens are faced with considerable practical difficulties in knowing what government information exists that might help, then searching for it easily and cost effectively and then understanding and utilizing once located*” [9]. To become an effective citizen the following is required: computer literacy; information literacy and access to information; and last but not least, political literacy, which involves the skills related to understanding and using public information. Also the information literate individual has to know and comply with the ethical and legal aspects of information access and use. Ross Corry Alexander [10], has a very particular perspective in which she perceives information literacy as political literacy.

3 Information Policy

The constitutional goals of each country are determined in their laws. In the information field they are determined by “the actual constitutive effect of information creation, processing, flows and use”. So information is not just affected by its environment, but affects its environment as well” [11]. Therefore, the majority of information and communication policies are *constitutional by nature*. According to Braman, the most important role of information in policy-making is its fundamental role as a constitutive force in society. In this sense, information has the ability to shape context. Braman [11] states that “information as a constitutive force in society is at the top of the definitional hierarchy [...] and can be applied to the entire range of phenomena and processes in which information is involved; of any degree of articulation and complexity; and they grant information an enormous power in constructing our social reality”. This also applies to informational literacy. In an information society, the concept of information means power and informational literacy empowers the small worlds of society. Additionally booming digital technologies are transforming the way power is conceived. Power shapes include: Instrumental power that shapes human behaviors by manipulating the material world via physical force; structural power that shapes human behaviors by manipulating the social world via rules and institutions; and symbolic power that shapes human behaviors by manipulating the material, social, symbolic worlds via ideas, words and images and also. Informational power that shapes human behaviors by manipulating

the informational bases of instrumental, structural and symbolic power. According to this analysis, the effective or well-informed citizen may exercise power in different contexts as actual power that is currently being exercised; potential power through claimed resources and sources of power that are not currently in use; and virtual power through resources and technique of power that are not currently extant but that might be brought in existence using available resources and knowledge

Braman states that “the impact of information creation, processing, flows and use is what makes information policy so fundamental to the exercise of power” [11]. This statement gives rise to Arendt’s view that “culture and politics [...] go together because it is not knowledge or truth what is at stake in them, but rather judgment and decision, the sane interchange of opinions about the circle of public life and common world, and the decision about the type of actions that will be undertaken in it, besides which should be its aspect from now on, what type of things should appear in it” [12]. What is really at stake is the daily life of citizens and the construction of a democratic society, where citizens will take the necessary actions to transform society into something real and true. From this perspective, the construction of democratic societies is done at different levels, macro, meso, and micro, where relevant reflections include meta-analysis, meso-analysis, and decision-making analysis. At a micro level, democratization through libraries and other social and cultural institutions have a major role to inculcate democratic life. In this respect, Schull [13] comments “libraries serve the most fundamental ideals of our society as uniquely democratic institutions. As far back as the nineteenth century, libraries were hailed as an institution that schooled in the conduct of democratic life”. Similarly, Kranich [14] emphasizes the existing relationship between society, information literacy, and participation in democratization and citizenship processes. She declares that “If a free society is to survive it must ensure the preservation of its record and provide free and open access to this information to citizens. It must ensure that citizens have the resources to develop information literacy skills necessary to participate in the democratic process” [13].

In short, informational literacy may be promoted through libraries mainly as Schull, Kranich, and other authors have indicated. Libraries also have a relationship with social institutions including with the public, and with school, and universities.

The following Information skills are essential [13]:

Public space, refers to the physical and spatial aspects of the library as the public use and behavior, and underscores the pre-eminent value of the library as a place for common experiences.

Community information as a medium for engagement touches on the library’s ability to play a leadership role through creation of local information network.

Community dialogue and problem solving are essential for addressing important local issues and concessions.

Citizenship information and education lie at the heart of civic life. Citizenship and participation in the culture of democracy are learned skills, which newcomers may lack when they arrive, even many native residents.

Public memory refers to library’s responsibility to preserve and make accessible the records, images and other cultural artifacts that are meaningful to its audience especially as they relate to historical and cultural experience of local residents.

“Literacy is political inasmuch as its use and deployment are acts of power in complex political economies where language, literacy, and affiliated systems of representation are used for the purpose of economic and social power” [4]. At each level, ranks should be closed and different strategies should be developed. Strategies should include whole school and classroom-based pedagogic strategies, curriculum policy selective traditions, and literacy and language education policies that sit well and dovetail with other kinds of overarching state strategies. Intervention and schooling policies are needed to concentrate and coordinate discourse, material and human resources. The support of other actors is needed, like educational institutions in all levels to consolidate everything that has been learned.

4 Information Literacy: A Cornerstone of Democratic Society

Schutz indicates that each society is composed of different kinds of citizens including those called: expert, the person on the street and the well-informed citizen [15]. According to the author “to be well-informed” means “to arrive at reasonably founded opinions in the fields which as he knows are at least mediately of concern to him although most bearing upon his purpose at hand”. In this sense, Morales Campos [16] argue that “the starting point of the information generation process is the involvement of the whole society which will have as outcome that will take advantage of the information”. Every society has a different way of participation whether it may be a democratic society or not, participation depends on the value they have given to the information and its function in society. According to Morales Campos, the discourses are focused on the strategic value of knowledge, on information and the autonomy of the well informed citizen to gain access to knowledge and the use they give to data and to the information. About the aforementioned, Archibald MacLeish and Luke have made some questions like:

Can a form of government and a way of life, in which the basic decisions are made by the people themselves, in people’s interest, and after the discussion and reflection, survive in competition with a form of government and a way of life in which the basic decisions are made in secret by a single will? [17]

If the basic decisions are to be continue to be by the people, and if they are now to be made by the people, ... how are the people to be informed? [17]

How can government policies, including language, literacy and educational policy, be coordinated to enable the “just in time” access and the delivery of the requisite kinds of educationally required capital, health and social resources, jobs and work to enhance communities and individuals’ lives?[4], that needed to be answered.

Most of the discussion about information literacy has given attention to literacy events as [18] “occasion in which a piece of writings is integral to the nature of the participants interactions and their interpretative processes”. However, a literacy event is a component of literacy practice, which is considered as “higher level abstraction and refers to both behavior and social and cultural conceptualization that give meaning to the uses of reading and/or writing. In this context, library practice has a close link with culture and power structure. Street found out that most library practice incorporates literacy events, community model and ideological preconception that underpin them [18]. According to the aforementioned most of the studies on

information literacy can be describes as literacy events. There is a need to develop abstraction, depersonalization, syllogistic reasoning, even, and some formulation, of modern orientation and democratic inclination [19]. In this sense any kind of literacy can be seen as a type of communication practice. Because of this policy interventions are, by definition, synergistic and potentially counter-synergistic in local effect, both across government silos and within each department or ministry such as education. That is, educational policies are never stand-alone phenomena. In order to be effective they must orchestrate a series of inter-textual embedding in relations to other extant educational and social policy [4].

From an ideological viewpoint literacy, in this specific case informational literacy, will be of great help for the construction of a more participative and a better democratic society, which will foster the citizens to seek those instruments of political constriction (laws), of social constriction (customs), of moral constriction (norms) and test theme with the reality (facts) [20]. Considering literacy as a social practice and also as a social problem, an interest group can provides direct support for the policy preference of the elite considering interest group as organizations that seeks to influence government policy- to obtain benefits, subsidies, privileges and protection for their sponsor, be they financed by and responsible to corporate, banking, financial, professional, legal, media or civic institutions that compose the national elite [21]. The opportunity for the library and librarians to become an interest group and to be in the picture is a must. In this particular scene we can act as an agent between the citizens, from a top-down policy making process or from a bottom-up process. In this particular scene literacy practice should be seen as a general cultural way of utilizing literacy that people draw upon in a literacy event.

Working from the bottom-up policy process model, librarians, the library and other social and cultural institutions can define plans of action organize themselves and gain access to government to promote issues concerning information literacy and literacy promotion. An information literacy action plan is more a consensus of the literacy events and those interpretative processes such as those undertaken and in the Havana Declaration. On the other hand, in top-down model process environment, a plan of action must be seen as an outcome from the literacy practice, with an emphatic ideological preconception. Both will benefit the users and citizenry, so libraries as social and cultural institutions have to promote information literacy in a new way to help the reinvention of the citizen communication.

5 Conclusion

Information literacy as a social practice has been studied from the literacy event aspect, but there are a lot of issues for research on the information research practice, in particular community model and the ideological preconception of every community.

The library, librarians and other social and cultural institution may have a more political participation as an interest group to promote information literacy from two scenes: first from a bottom –up process model and from a top-down process model. Action plans need to developed for both processes.

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An Investigation into the Development of an Institutional Strategy to Build Research Capacity and Information Literate, Critical Thinking, Independent Learners in Three African Universities

Mark Hepworth¹ and Siobhan Duvigneau²

¹ Centre for Information Management, Loughborough University
Loughborough, LE11 3TU, UK
m.hepworth@lboro.ac.uk

² British Library for Development Studies, The Institute of Development Studies
Brighton, BN1 9RE, UK
s.duvigneau@ids.ac.uk

Abstract. This paper presents the findings of a study involving the University of Botswana, the University of Zambia and Mzuzu University in Malawi. The study investigated the current situation with regard to fostering information literate independent learners, their vision, challenges and solutions, with the objective of defining a future institutional strategy. 46 senior academics, librarians and support staff took part via interviews and a workshop. It was found that many students, as in other countries, generally lacked information literacy or independent learning motivation. Challenges included staff student ratios, infrastructure and previous education. In addition, a link was shown between academics' pedagogic skills and their research capacity, and their ability to help develop independent, critical thinking learners. Practical approaches to resolve these challenges were identified. The innovative nature of this research is that it involved a cross section of staff, highlights the connection between academic research capacity and students' information literacy. It proposes an institutional strategy which, it is argued, is necessary for the fundamental changes to take place that will foster a future generation of information literate, critical thinking independent learners and build research capacity.

Keywords: Higher education, information literacy, critical thinking, independent learning, research capacity, institutional strategy.

1 Introduction

For many years there has been a recognised need to encourage and foster a future generation of people who systematically capitalise on existing knowledge and create new knowledge. To encourage these capabilities is challenging because many factors have an impact, for example, the learning culture they have experienced in the home

and in school, the information resources they have had access to, personal cognitive, affective and behavioural characteristics. Once in higher education, the resources and the teaching and learning ethos and the support provided will affect the learners' ability and motivation to become information literate, critical thinking, independent learners. It has also been found that the digital literacy skills of "digital natives" do not translate into information literacy [1], and increasingly, it has been appreciated that a holistic approach is required, where information literacy is embedded in the curriculum [2-4]. In some cases compulsory courses are included in the curriculum [5] or incorporated in specific academic subjects, although these are often dependent on informal relationships between librarians and academics. An institutional approach where information literacy, critical thinking and independent learning are integrated into teaching and learning and are explicitly fostered, evaluated and rewarded at an undergraduate and postgraduate level has proved hard to achieve.

1.1 Purpose of This Research

The purpose of this research was therefore to investigate in collaboration with a cross section of staff in three universities, the University of Botswana, the University of Zambia and Mzuzu University in Malawi, whether an institutional strategy could be developed that enabled the development of these student attributes. Objectives included: identifying the current vision for developing students' information and research capabilities; determining the expected outcomes, indicators and impact; identifying challenges and solutions. Key questions included:

- Does the university see the need to develop the capacity of students (at all levels) to undertake independent study and therefore their information literacy, critical thinking and research skills and, if so, what is being done to achieve this?
- Is it feasible to take a university-wide approach; what evidence, in terms of infrastructure, attitudes, roles, teaching and learning etc., would show that the university is fostering an information literate culture?
- In what way do current resources (technology, information resources and staff) either help or pose a challenge?

2 Methodology

This research aimed to elicit the thoughts and experiences of senior staff (academics, librarians, ICT and support staff). These were gathered via 28 interviews with staff in Zambia and Malawi and a two and a half day workshop in Botswana, involving 18 staff. Interviews were transcribed and along with material gathered in the workshop (flip charts and video) the qualitative data was analysed thematically.

3 Findings

3.1 The Need for Information Literate, Critical Thinking Independent Learners

Across all three universities, staff identified a number of graduate attributes (outcomes) that they would like to see relating to information literate, critical thinking independent learners (it should be noted that the full report, where the findings are discussed in more detail, can be freely accessed online [6]):

- curiosity, questioning, problem solving, reading critically, identifying strengths, an awareness of weaknesses and gaps in current knowledge
- having analytical and reasoning skills rather than a descriptive or ‘cut-and-paste’ approach
- knowing how to study and use information resources effectively, including reference services
- managing data, information and knowledge efficiently and effectively, including the organisation and storage of information (skills that will be useful immediately in the higher education context and also the workplace)
- using information ethically

Expected impact included:

- being independent lifelong learners
- creating entrepreneurial, creative and innovative graduates
- being appreciated by employers
- contributing to society (solving and helping others to solve 'real world' problems)
- contributing to the generation of knowledge.

The importance of these attributes for industry was emphasised:

with so much information in the world, if you really want to get ahead, obviously employers are looking for people who can quickly get the information and use it for the benefit of the company.

3.2 Current Indications of a Lack of Capabilities

Students with a positive profile did exist, however, new undergraduates were likened to ‘*a blind person, who doesn’t know the way to go ... you have to show them that they have come here to learn how to use information ... to think critically ... not to take things for granted ... to use information efficiently and effectively*’. Students were described as ‘*passive*’, ‘*surface learners*’ and with an emphasis on ‘*banking*’ information and memorization. In both Malawi and Zambia, staff stated that ‘*some students just want to be fed*’. Furthermore although students thought they knew how to find information because they could ‘use’ the internet, they were seldom aware of freely available sources and made little critical analysis of what was found.

3.3 Current Institutional Initiatives

In all institutions several bodies played a role in improving information literacy, critical thinking and independent learning. These included the Library, Academic Development, Quality Assurance, and faculty, e.g., Information Studies, Computer Science, Education and English Languages. The University of Botswana had developed two credit bearing courses for first year students, and informal courses for upper level students. An information literacy ‘toolkit’ was also developed as a result of a DelPHE project. However, it was felt that there was a need for further collaborative work with academics and support staff and to develop the research capability and pedagogic skills of staff. The University of Zambia provided information literacy training on demand and staff in engineering, who had been trained by librarians, were running online database and data management courses. The health faculty had embedded information literacy. Mzuzu University library was offering a number of courses in information literacy and ICT skills. There was therefore a perceived need for further information literacy capacity development and there was not a holistic institutional strategy. Mzuzu and the University of Zambia both suggested that a centre of expertise was required that would help design and implement innovative teaching that would foster information literacy, critical thinking and independent research capabilities.

3.4 Challenges

Although there were examples of good practice, as with other universities around the world (even those with extensive resources), challenges were experienced.

Factors Affecting Learners’ Information Capabilities. A number of factors were thought to have a negative impact on learners’ information capabilities, including: a lack of a reading culture and limited public services, such as libraries; teacher centred schooling with little project work; large school classes; limited information sources in the home and school and a lack of study space. Additional factors were identified in the university, including: limited research activities and publications, of which one consequence was a lack of local information resources; a lack of study space (Malawi and Zambia); a lack of integrated information literacy, critical thinking and independent learning in undergraduate and postgraduate studies. Inadequate government funding in Zambia and Malawi was also a significant limitation.

Limited Research Activity and teaching capability were both associated with the limited development of independent learners in all three institutions. On a pragmatic level, in Malawi it was stated that *‘when people [lecturers] are more given to research ... they also develop skills they can impart to the student’* and active research provided the opportunity to *‘involve students in real world research problems’* where they actively seek information. This helped students realize the relevance of subject knowledge and fostered motivation because they could see how they could have *‘an impact on society’*. However, a number of staff were thought to lack information

literacy and that all new staff would benefit from information literacy training in conjunction with developing their research capacity. A lack of research and publications was also thought to lead to academic insecurity, making it difficult to provide effective role models; plus it was difficult to involve students in research. Limited published work led to few resources that were relevant to the local context that could be used in teaching. The main perceived barrier to changing this situation and building research capabilities and information literacy were large student numbers and an inadequate number of lecturers. Hence, *'attending to these students, teaching and marking ... you do not have any time for research'*.

A Lack of ICT and Information Resources and Study Space in Zambia and Malawi, discouraged students and staff from accessing and using information. Furthermore *'most of the collection comes from the western world ... there is very little of local content'*. The local repository was regarded as an important resource to *'showcase what is possible in terms of producing local knowledge'*. Digitising theses was underway in Zambia as one way to address this problem. Both were seen as important for supporting research and teaching. Other strategies included, in Malawi, building up core texts but these were still limited and thought to reinforce dependence on the lecturer. Surprisingly, in Zambia it was noted that freely available electronic sources were underused. The reason for this was unclear. It was perhaps due to the ICT infrastructure, access and bandwidth limitations, or the lack of perceived benefit compared to Google, or the lack of local content. However, despite these challenges, it was evident that it was possible to foster critical thinking and independent learning even with limited resources, by taking a creative approach to teaching and using the local environment as a source for problem-based learning and for practising information and data collection.

A Lack of Integration of Information Literacy, Critical Thinking and Independent Learning in the Curriculum was thought to be one consequence of a lack of pedagogic skills among faculty. In Malawi, where greater emphasis had been placed on the teaching process and learning outcomes, it was recognized that *'staff had not encouraged independent learning ... we have focused much more on teacher centred learning so that the student would not miss a lecture, but can write an assignment without coming to the library'*. It was suggested that all staff *'must have a certificate in pedagogy'*. However, one of the biggest problems was a lack of time due to the staff student ratio. In Zambia few faculties had a full teaching head-count. Innovative approaches to teaching were felt necessary, such as making better use of face-to-face time; utilizing e-learning and the use of peer to peer learning and mentoring. Nevertheless, some lecturers did find ways to address these issues, for example: *'mini research projects where they look for information to answer a question'* and the use of *'real world problems'* so that they can *'discover an idea of how to improve things'*. It was also found that where students took part in public competitions i.e. a 'Moot Court', or competed for prizes offered by commercial companies, they rigorously conducted independent research. Furthermore, where staff did involve students in research projects in the community, for example a village

biogas project, the students demonstrated a high degree of motivation and were able to develop research skills and critical thinking, implying that the learning context was a fundamental factor.

4 Conclusion and Discussion

This research clarified the institutional vision for future students and current strategies to achieve these goals. Challenges were identified and solutions suggested, although further work would be necessary to develop a coherent strategy for individual organisations.

Key Findings. As in other countries, many students appeared to lack academic information literacy, critical thinking and independent learning capabilities and were described as passive, 'surface', learners. In general, strategies to strengthen these skills have had limited success, despite examples of good practice. However, when students were involved with 'real world' research, or learning encompassing competition or public presentations, they did demonstrate the motivation, enthusiasm and capacity for developing their information literacy, critical thinking and independent learning.

A number of factors inhibited learners' development and posed a challenge for faculty and support staff. These included: a lack of funding; high student to staff numbers; limited ICT and out-dated and Northern-biased information resources. The wider learning context was seen to have a fundamental impact, including the student's pre-university experience and the teaching and learning culture and pedagogic knowledge of faculty in higher education. Teaching tended to be teacher centred and focused on delivering content. This reflected the educational experience of staff and also the pressure of large numbers of students. In addition, the ability of, and opportunity for, staff to undertake research was seen to influence the inclusion of information literacy, critical thinking and independent learning. A lack of research also led to a lack of local relevant information resources that could be used in teaching. Furthermore, although academic staff may be information literate, they were not necessarily conscious of this knowledge, making it difficult to transfer the knowledge to students. In addition, they needed institutional help to find practical ways to integrate these capabilities into the curriculum, as well as ways to evaluate these capabilities, bearing in mind the staff student ratio. An appropriate learning environment needed to be developed that was informed by the innovative ways of working that some lecturers practised, such as addressing local problems in order to develop research skills and critical thinking. Generally, academic staff aspired to be good researchers and wanted to undertake research and see the results disseminated and used. It was felt that this would set a good example for students and build the local knowledge base which could reside in an open access institutional repository and be used for teaching. However, staff needed support to further develop their research capacity, including their information literacy, and the skills to share these capabilities with the students, as indicated above.

The connection between developing academics' research capability, including their information and digital literacy and enabling students to develop their research skills, information literacy, critical thinking and independent learning is an interesting finding and could indicate a novel way to encourage faculty to change practice and take on new skills and approaches that would foster independent learners. Focusing on developing staff research capacity and better student 'researchers', rather than focusing on teaching information literacy, could provide an effective method to gain faculty support for change and foster a culture that encourages information literate, critical thinking independent learners. Faculty are more likely to engage with new teaching practices if they contribute to their ability to do research. Involving students in research could also create a powerful virtuous circle where students contribute to the faculty research while developing their own information capabilities.

To achieve this change, a centre of expertise, cutting across current support services, was recommended. This would be comprised of people with knowledge of pedagogy and how to develop effective teaching interventions and who could provide support and build research capabilities. However, to move in this direction would require backing from the highest level in the institution, as well as external organisations such as ministries of education, accrediting bodies and employers. To effect this degree of change, ideally, all stakeholders would need to be involved in a collaborative, participative process where the vision for future faculty and student capabilities is agreed and a strategy formulated that achieves clearly defined outcomes, indicators and impact. This would enable the various actors to collaborate, sharing expertise and world views and work towards a shared, sustainable, goal.

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Activity Theory as a Framework for Understanding Information Literacy

Nabil Ben Abdallah

Equipe de Recherche de Lyon en Information et en Communication (ELICO)
IUT Dijon, BP 17867 - 21078 Dijon Cedex France
nabil.ben-abdallah@iut-dijon.u-bourgogne.fr

Abstract. Information literacy is often described as a set of skills allowing an individual to find, evaluate, and use the information that he needs. In this paper, we discuss the value of re-examining the information behaviour models in order to understand the skills and motivations necessary for the performance of different types of information activities. We also determine the benefits to be gained from the use of activity theory, with the aim of understanding and defining the literacies underlying the success of information activity. Engeström's model of conceptualization of the structure of activity is mainly explored to understand interrelated elements in information activity. The results of our research show that information literacy is essentially a social practice that cannot be reduced to the knowledge of information retrieval stages. These results lead us to think that an information literacy program should be perfectly integrated into its context of implementation and exploitation.

Keywords: Information literacy, information behaviour model, activity theory, information activity.

1 Introduction

Information search can be viewed as a simple or indeed trivial activity in the sense that it is easily mastered by individuals. However, it can also be seen as a complex activity requiring special skills. The latter view implies that the methodological and theoretical questions must be dealt with in order to know how to address the problems of information search and, therefore, to input the processes and skills underlying such activity. This activity is motivated by the desire to satisfy an information need depending on the cognitive (declarative knowledge, procedural knowledge) and psychological (feelings, thoughts, etc.) states of the individual. It is oriented towards the objective of finding the relevant information among the information provided in the environment which is to be explored, an environment often offering a variety of search tools and information sources (documents, work colleagues, experts, etc.). These few arguments in favour of complex activity place information search on a more general level, which is that of , Information Literacy (IL) with whatever it implies regarding acquired social and individual skills.

A great part of the literature concerning IL provides a considerable number of definitions all based on the dominant assumption that IL is essentially the knowledge

of the procedural steps for the search, use and production of information. For Eisenberg [1, p. 40]: "IL is the set of skills and knowledge that not only allows us to find, evaluate, and use the information we need, but perhaps more importantly, allows us to filter out the information we don't need". This definition focuses primarily on the ability to "filter" information in order to rule out what is not relevant. It is a difficult task with which Internet users are confronted daily. Today, having "good filters" to retain only reliable, useful and relevant information is a prerequisite to benefiting from the various information environments. These filters privilege the intentional retrieval and use of information, and demonstrate that information literacy is not just a catalogue of skills that the individual must acquire and assimilate.

Street [2, p. 77] distinguishes two models of literacy, namely an "autonomous" model as well as an "ideological" model. The "autonomous" model conceptualises literacy from the hypothesis: "*that literacy in itself -autonomously- will have effects on other social and cognitive practices.*" In this model, literacy is primarily an individual attribute and an intellectual capacity, which can be described in terms of expectations and predefined objectives. Learning to be literate is supported and determined by dominant "ideologies", isolated from the context in which they are applied. According to the "autonomous" model, IL and Information and Communications Technology Literacy (ICTL) for example, are important elements of development and professional success. Indeed, given that information technologies are evolving very rapidly and that information environments are constantly changing, employees, students, as well as citizens must generally undergo a regular "reskilling" so that they maintain a proper or even higher level of IL and ICTL.

The "ideological" model conceptualises literacy in a socio-cultural perspective of learning. Literacy is seen as a social practice focused primarily on the learner (employee, student, etc). There is no universal definition of literacy and its evaluation is based on ethnographic approaches. All literacy practices are embedded in a social context. Thus, being literate depends on each individual and on his/her social and cultural context, a constantly changing context, which determines what society expects of its literate people. As the expectations of a society keep changing, the definitions of literacy must change to describe 'naturally' shifting objectives better. Objectives of literacy are not limited to individual results. According to the "ideological" model, the Information and Communications Technology (ICT) and information environments in general are an integral part of all literacy practices.

Nowadays, the information activities of people, regardless of the context of search and use of information, are highly mediated by technological tools. Thus, mastering information is necessarily linked to Information and Communications Technology Literacy. As for IL, ICTL cannot be reduced to a set of skills. In fact, the technological tools at our disposal do not only support our information activities, they largely condition and shape our way of retrieval, seeking and even producing information. These tools are not neutral; they contain socially-constructed practices within themselves. Changes and developments in ICT change the way we define and conceive IL, and act directly or indirectly on many of our cognitive and non-cognitive capacities. For this reason, it is not always easy to separate skills related to ICTL from those related to IL.

We will begin by reviewing some results of research on Information Behaviour (IB) and Information Literacy, by focusing on identifying outstanding questions

regarding these behaviours and their consideration in information literacy programs. The Engeström's model [3] as a form of conceptualization of the activity structure, will be essentially explored to grasp the inter-relational elements in an information activity.

2 Advantages and Limits of Information Seeking Models

According to Saracevic [4], there are two types of user studies: one theme is more pragmatic, closely related to the design of information search systems including web search engines, and the other one is more theoretical, providing models to deepen the understanding of information practices.

Information behaviour models are often used as a theoretical framework to develop hypotheses of research or to explain aspects of information behaviour. We learn from these models, such as those of Ellis [5] and Kuhlthau [6], that individuals, in their search for information likely to meet their needs, go through different stages, and that each stage corresponds to a cognitive and emotional state, and specific actions (exploring sources, selecting resources, etc). The Bates' model [7] focused more on the information searching and retrieval process emphasises that people use multiple sources, transform their queries as they interact with the information system, and proceed by successive selections to locate and retrieve the information they need. In an information searching process, the steps defined by these models are not all mandatory. Depending on the situation and context of the information search, individuals can choose between the various stages of the process. Ellis, for example, showed that the characteristics or steps of the model may vary from one group of people to another.

These three models (Ellis, Kuhlthau and Bates) provide a relatively complete description of the processes underlying the search and retrieval of information. This description can guide and direct the implementation of an information service or development of a method for teaching and learning information-literacy skills. For example, the Guided Inquiry method [8] was developed from the Kuhlthau model. It aims at developing students' skills for a better control of information environments integrating various technologies.

Unlike the Ellis, Kuhlthau and Bates models, the Wilson and Dervin models [9] are based on a more global process of information seeking. For example, the Wilson model specifies, among other things, personal and environmental variables that can shape and influence the individual's information behaviour. These variables expand the usefulness of the model, which, in addition to the description of the process, provide explanations on the causes responsible for a particular behaviour. Wilson considers the context (the work environment, socio-cultural environment, physical environment, etc.) as an important determinant of the individual's information behaviour. Nevertheless, the model does not explain how, for example, the socio-cultural environment may influence and condition the individual's information behaviour. The model does not tell us either how interactions between the environments of the context could influence information behaviour. The knowledge

of these causal factors would complement the description of the information search process, which, for example, could enrich the content of IL training. Thus, explaining to the learner (student, employee, etc.) why, in a given situation, they do not need to go through such an information search step or, conversely, they must go through a specific step to complete the search process, generally favours learners' understanding of various actions and operations required for information seeking. It is as if the causal factors determine the 'semantic field' of each step.

At this stage in our work, information literacy is treated essentially as a set of generic skills, which may be used in different contexts. However, recent research [10-13] has started to criticise this vision, and proposes considering information literacy as a social practice determined by culture and the context in which it is set. This vision of IL is obviously very close to Street's 'ideological' model, briefly described in the introduction to this paper. According to Limberg [14], IL is "*a set of abilities to seek and use information in purposeful ways related to task, situation and context in which information seeking practices are embedded*". This definition is clearly different from the current definitions of IL, which tend to reduce the information process to universal sets of skills (recognizing an information need, locating, evaluating, using and producing information). These definitions do not usually question the nature of the information and how it becomes knowledge. It is often seen as something which is external to the individual, which can be managed and retrieved. As a whole, IL is more than a relationship with standardised forms of skill. IL depends on the context and, as such, should be explored through information practices of individuals and groups in situations. This perspective places IL in different social contexts (everyday information practices, leisure, work, and education).

In the next development, we will use the activity theory to answer an important question: what is an information activity? Then, in the light of the activity theory, we will try to demonstrate that information literacy is largely a social practice, which varies from one context to another.

3 Origin and Nature of the Activity Theory

The activity theory was initiated by Vygotsky in the twenties and early thirties. According to Vygotsky, higher mental functions like thinking, memory, etc., should be considered as products of mediated activity, where the mediating role is attributed to psychological tools and interpersonal means of communication. Vygotsky's idea of mediation of mental functions by psychological tools is often represented diagrammatically by a triad linking the subject, object and mediating tool (artefact). This triad model ignores social relationships and does not extend the analysis to other subjects involved in the conduct of the activity either directly or indirectly. Indeed, the analysis must be focused on the subject in this motivated and mediated "enquiry" of the object (as defined by the objective of the activity). Engeström has completed the triad model originally developed by Vygotsky, adding the community element and two mediators: the rules and the division of labour.

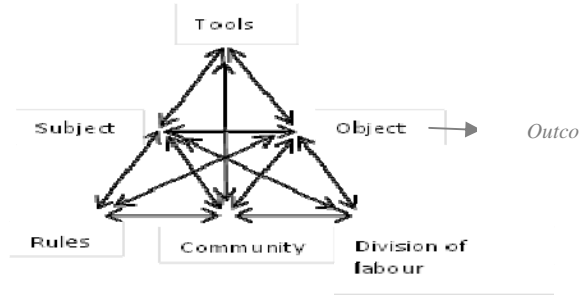


Fig. 1. Structure of the activity system according to Engeström (Source: Engeström, 1987)

The activity is observed as a system with its own structure, own internal transformations, and own development. If we rely on the definition of the activity system, we consider that an activity is performed by a motivated subject; it aims at transforming an object into a result. The object is shared by members of a community working together to achieve a common goal. The tools, rules and the division of labour influence the relationship between subject, community and the object. This definition of the activity system, complemented by the principles of activity theory allows us to answer the main question the following subsection: what is an information activity?

4 What Is an Information Activity?

To answer this question, we consider that the information activity is composed of all the interactions of individuals with the information environment. In the principle of object orientation of the activity, these interactions are motivated and intentional. They can transform the object (a document retrieved from a website, an excerpt from a book or an article, information provided by an expert, etc) regarded as "raw material" into a significant and collectively constructed object (a summary report, a solution to a problem, an idea to develop, etc). This significant object is a form of construction of meaning that reflects a certain form of mastery over the collected information. This mastery depends largely on the ability of the community members to assess the relevance of the information resources. This assessment of the relevance must be regarded as a cognitive activity closely linked to the context (learning, work, daily use of the information, etc.).

Beyond the steps and characteristics of the information searching process defined and described by different information behaviour models, the result of the analysis of an information searching activity, depending on the Engstrom model, reveals that the informational activity is both individual and social. It should enable, according to the motivations and goals of the individual or community, to acquire knowledge, either directly or indirectly. Moreover, information activity is strongly mediated by material or conceptual tools. It evolves and adapts to the different changes that may affect the

subject or the mediation tools. These different characteristics of informational activity lead us to think that the descriptions of information literacy cannot be reduced to the sole cognitive dimension.

5 Dimensions of the IL

Using the preceding analyses of the activity system, according to the Engeström model, we can define IL according to the following dimensions: (1) A social and organisational dimension manifesting itself at several points during information activity. This mainly happens during the interactions of the subject with the community or the group. However, it also happens through the mediating role of tools (physical, ICT, abstract, standards, rules, and division of labour), and the links of the information activity with other activity systems of the organisation (company, school, university, etc.). (2) A cognitive dimension that certainly depends on the motivation of the subject or the community but essentially results in the acquisition of new knowledge during interaction with objects in the information environment. (3) A psychological dimension, which takes into account, among many other things, the motivations of the subject or the community involved in an information activity; according to the activity theory, the motive is at the origin of the target of the activity. (4) A physical dimension, which concerns the interaction of the subject or the community with the objects of the information environment; such interactions are essentially mediated by the ICT. The link of this dimension to the cognitive dimension is obvious: the transformation of raw objects (information resources) into significant objects is the result of both physical actions and cognitive actions. (5) A dynamic dimension, which takes into account the evolutionary aspect of the activity system. Generally, this evolution can only be observed in a medium to long term system. It is essentially subjacent to the profound changes in the tools of mediation.

6 Conclusion

In most of the activities of contemporary society, often called the information or knowledge society, information and communication technologies have emerged as key mediator tools for the search, access and production of information. However, as we have just discovered through the information models described above, the role of these technologies as artefacts or mediators is not studied much or sometimes not at all in the literature of information science. In IB as in IL, it is very important to know that mediating is an essential element in achieving the goal and the result of the information activity. It is also important to explain the historical and cultural influence that mediating artefacts may have on information activity. This is because they were created and produced by specific activities and, therefore, they inherently carry the history and culture of these activities. We believe that the theoretical framework of the activity theory allows us to understand the mediation concept and have a better understanding of the mediating role of tools or artefacts.

The aim of our work is not to design yet another IL model, but to understand and define the underlying literacy required for the success of the information activity. We based ourselves primarily on information models to demonstrate their usefulness but also their limits to define the elements of a model for training and learning IL. Secondly, we used the framework of the activity theory to analyse interrelated elements within an information activity. This analysis allowed us to define IL in terms of five dimensions: social and organisational, cognitive, emotional, physical and dynamic dimensions. These dimensions or facets of IL lead us to think that an IL teaching and learning program should be perfectly anchored in its functional environment.

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An IL Integration Model and Its Application in Curriculum Integration and Staff Development in Higher Education

Li Wang

The University of Auckland, Libraries and Learning Services,
Private Bag 92019, Auckland, New Zealand
l.wang@auckland.ac.nz

Abstract. Wang [1] developed a practical model for curriculum integration of IL in higher education as part of her PhD study. In the last 2 years, this model has been applied to curriculum integration in various faculties at the University of Auckland (New Zealand). A staff development programme on curriculum integration of IL for librarians was also developed based on this model. This paper will explain the model and outline how the model has been applied to curriculum integration in practice, as well as in the development of a staff development programme in the academic setting.

Keywords: Information literacy integration, characteristics of information literacy integration, staff development programme.

1 Introduction

There is strong professional interest in curricular integration of IL in higher education. The curricular integration approach is defined by the American Library Association (ALA) IL Competency Standards for Higher Education [2] as being “woven into the curriculum’s content, structure and sequence”.

Bruce [3] argued that IL does not have a ‘life of its own’, rather it is a way of thinking and reasoning about aspects of subject matter. Both ALA Information Literacy Competency Standards for Higher Education [2] and Australian and New Zealand Institute for Information Literacy Framework [4] advocate for the curricular integration approach. They believed that promoting the integration of IL throughout curricula is the most effective way of providing IL education. This view is supported by several studies [5-10].

2 A Curriculum Integration Model

In 2010 Wang developed an IL curricular integration model based on recent research. As Figure 1 shows below, the model consists of three inter-connected elements: *What*, *Who*, and *How*. The *What* element deals with “*What*” questions. What is

information literacy? What should information literate students be like? What level of IL are students expected to have developed by the time they graduate from the university? What level of IL are graduates required to achieve by accrediting professional organisations? What are the roles of academic staff and librarians in IL education? Understanding the answers to these questions provides tertiary educators with a solid understanding of why IL education is important for students.

The *Who* element deals with who questions such as: Who are the key stakeholders in IL integration? Who are the critical people in IL curricular integration? Who are the key stakeholders who need to be involved in curriculum design and development and how should relationships be established between these stakeholders and in particular, academic staff and librarians?

The *How* element deals with IL curricular design. How can IL be contextualised to become part of the academic curriculum? How can students be provided with an ongoing interaction with information throughout a single course, as well as across multiple courses? How can learning theories / pedagogical and IL theories be applied to IL curricular design?

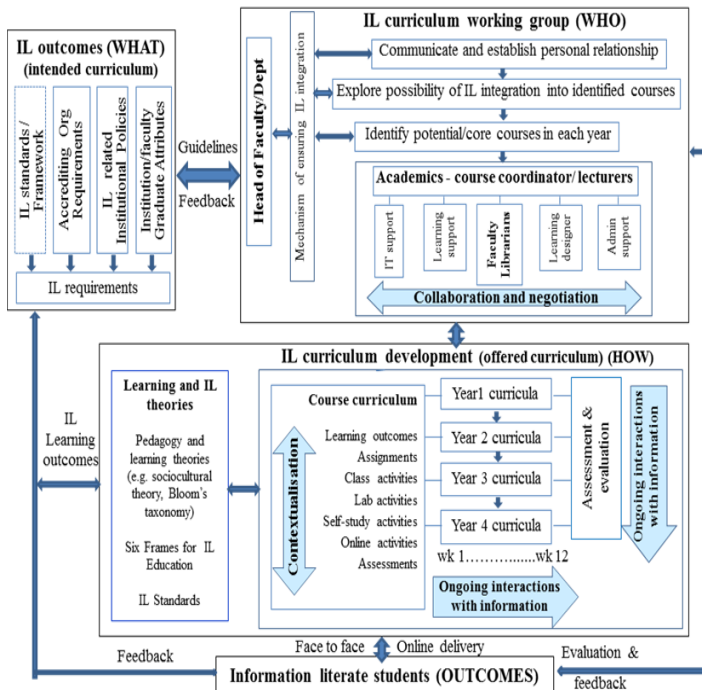


Fig. 1. A curriculum integration of information literacy model (Source: Wang, 2010)

The model’s three key characteristics of curricular integration of IL are highlighted in blue in Figure 1: *collaboration and negotiation*, *contextualization*, and *ongoing interactions with information*. The integration of IL includes pedagogies for contextualising IL in an academic curriculum and ongoing interactions with

information. It also involves collaboration between multiple partners and this collaboration includes negotiation and is built on personal relationships.

3 Application of the Model to Curriculum Integration of IL in Higher Education

The curriculum integration model has been applied to curriculum integration in various faculties at the University of Auckland (UoA), including Arts, Education, Engineering, Law, Medical and Health Sciences, and Science. This section will share the experience of how the three key IL integration characteristics of the model have been applied across a programme curriculum from Year 1 to Year 4, using the engineering programme as an example.

After identifying many IL related issues with students, an engineering subject librarian and a learning services librarian initiated a project to integrate IL into an engineering academic programme from Year 1 to Year 4. In order for the project team to understand the programme curriculum and to identify potential courses in which IL could be systematically integrated, they began by analyzing the programme curriculum. They collected all undergraduate course titles and explanations from departmental websites, the university's academic calendar, and from appropriate course publications. They also collected a list of course coordinators and lecturers for these courses by contacting the departmental manager and the programme coordinators. They identified potential courses for IL integration by analyzing learning outcomes, assignments and assessments for each course. From the analysis they were able to understand whether there was an opportunity to integrate IL into the course in question. Figure 2 below represents potential courses (coded in yellow) where IL could be integrated.

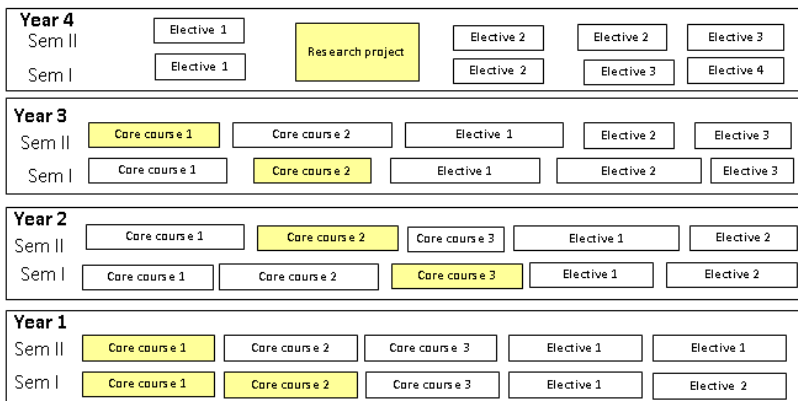


Fig. 2. An academic programme curriculum analysis

3.1 Collaboration

Collaboration is a key characteristic of the model for effective curriculum integration of information literacy. Only when course coordinators or lecturers agree to integrate IL into their course curriculum, can an IL curricular working group be formed to design IL integration into the curriculum.

The engineering subject librarian and learning services librarian met with the head of the engineering department and the course coordinators for potential courses identified during analysis. During the meetings they emphasised that the purpose of IL integration was to help academic staff and to support their students with their learning, instead of asking them for a few hours to allow librarians to teach IL sessions. They also clearly outlined relevance of IL to assist students in meeting the requirements outlined in the graduate attributes rather than talking specifically about IL standards. In this way the faculty academic staff members were clearly able to see the link between graduate attributes and their teaching. Many academics are more interested in graduate attributes than IL standards [1].

After meetings with all potential course coordinators, four IL integration groups, one for each year, were formed. Depending on the need, each IL curricular group consisted of any of the following working group members: course coordinators and/or lecturer, librarians, other support staff e.g. student learning advisors, IT support staff, and learning designers. In order to support student learning, these groups worked collaboratively to design and implement IL curriculum lectures, tutorials, class and online activities, as well as IL assessment.

3.2 Contextualization

Wang's IL integration model [1] clearly outlines IL should be contextualised into all aspects of the course including: the learning outcomes, course assignments, in class activities, lab activities, self-study activities and/or in online activities. IL should also be contextualised in the assessment and evaluation processes by requiring students to apply using information to learn and to research.

In order to contextualise IL into subject content, an appropriate connection between IL and course content needs to be established. For example, IL was integrated into the Year 1 engineering course assignment and assessment by requiring students to search for and evaluate web resources and write a report on what engineers do. It included: an overview of a selected engineering fields, information about the major products or services developed by engineers working in this field, well-known companies or organisations in the field, and career opportunities and types of skills needed in the field. Each student was required to submit a report and list of references outlining their findings, as well as an evaluation form outlining how they found and evaluated the web resources. Each student's web evaluation form and report were peer-reviewed and marked by other four fellow students using an online peer review system.

There were no IL lectures or tutorials offered to students but scaffolding support was provided via an online learning system. These scaffolding documents included: a web resources evaluation template and examples, guidelines of the research process on how to find a professional career using librarianship as an example, an example of

a report provided by the learning advisor, an APA referencing style guide, and information about how to reference web resources provided by the librarian and learning advisor, information about the University's plagiarism policy and how to avoid plagiarism, information about how to use the online peer review system by IT support staff.

3.3 Ongoing Interaction with Information

Wang's model [1] suggests that when designing IL curriculum, consideration needs to be given to students' ongoing need for interaction with information at intervals during their undergraduate study. This regular interaction scaffolds students' experience of information, and consolidates their ability to consume, evaluate and apply the information found in order to complete their study/research tasks during the course of their academic study and beyond. This leads them to develop lifelong learning capabilities around information as part of the graduate attributes.

Outlined below is an example that the students were provided with ongoing opportunities to interact with information at all levels, from Year 1 to Year 4 through activities integrated seamlessly into an engineering programme curriculum.

Year 1 Course. IL was integrated into a course project worth 21% of the course grade. There were three parts to this project. In Part One, students were required to develop information research skills to find information about biofuels and bioenergy. To assist this process an IL tutorial and library tours was offered to students. Students were then required to complete an online IL quiz to reinforce and evaluate what they had learnt.

In Part Two, students drew on the IL and research skills developed in part one to find the definitions for a set of biofuel-related terms. These definitions were applied in a learning context to consolidate students' understanding of the terms' meanings. Students were then required to put together a list of the information sources that they had used in a bibliography using the APA referencing style. Information on avoiding plagiarism and the relevant university policy was included in the course lecture. Students were required to complete an IL quiz which reinforced their understanding of the avoidance of plagiarism. In Part Three, students were required to write a project report applying information found in parts one and two.

Year 2 Course. IL was integrated into the course objectives and class activities. The objectives of the course were to introduce students to land information systems, and modern methods of gathering, processing and presenting information for engineering purposes. The first IL lecture was presented by the subject librarian and was designed to help students to effectively find civil resources and land information resources for their assignments. A hands-on tutorial followed to allow students to do practical exercises to reinforce what had learnt during the lecture. Students were then required to do an online test which focused on database search skills and how to find civil and environmental engineering resources. Assessment included an assignment worth 5% of the course mark.

Late in the semester, the subject librarian was invited to co-teach a lecture. During the lecture, the librarian identified and highlighted common mistakes or problems apparent from the online test and introduced students to the processes for finding specific land information such as, zone information or the population in certain areas of Auckland. A set of land information related questions was provided to students in order for them to practice the IL skills required to find answers using databases and to reinforce these skills.

Year 3 Course. IL was integrated into a course assignment which was worth 15% of the final course mark. Students were required to work in a group of three as engineering consultants to produce a 2000 word report which recommended three ways of measuring river flow. Each group was required to find information from books, academic journals, conference papers and patents. Students were then required to summarise what they had found, evaluate the information and write a report.

To support this assignment one IL lecture was offered by a subject librarian, followed by an IL tutorial. A writing support lecture was then offered by a learning advisor. Students were required to do an online IL test to further consolidate their understanding of relevant information sources and where to find appropriate information. Students were required to find and evaluate information from a variety of references including academic journals, books, conferences and patents. Students submitted the final report via Turnitin, an electronic plagiarism detection system. Students were also required to hand in a printed copy of the report which was accompanied by a photocopy of the first page of each reference used, e.g. articles or book chapters.

Year 4 Project. This was a two-semester research project and IL was integrated into the entire research process. Students were required to write a topic analysis, the aims of the project, a literature review, and a summary of the report.

In addition to the specific IL activities already mentioned above, IL related lectures were provided by lecturers, a subject librarian and a learning advisor throughout the semester. These included an overview of various information sources and how to search for and evaluate them, how to compose a literature review, how to use reference management tools, how to reference, how to write reports, and presentation skills.

As part of their literature review, students were required to do an annotated bibliography containing at least six references. In the annotated bibliography, students needed to summarise and evaluate what they found in variety of sources and to apply them in their report. Support documents, including a template for an annotated bibliography, and an example of bibliography were provided via the university online learning system.

These ongoing interactions with information cross curriculum from Year 1 to Year 4, provided students with opportunities to use information to learn throughout the entire course of their undergraduate studies.

Overall the model provides a theoretical framework of curriculum integration of IL in practice. There are many examples of successful integration IL into the

curriculum or across a programme curriculum in collaboration with academic and support staff at UoA. Many academic staff members involved in these projects acknowledged how much they appreciated the support that librarians provided to their students and also promoted IL integration opportunities to other faculty members in their area. They also appreciated the opportunities to co-present a paper at conferences to share the success of these initiatives.

There have also been challenges. Contextualizing IL into a course curriculum and designing a curriculum requires a good understanding of learning theories, curriculum and learning design. In order to collaborate with academic teaching staff and other support staff, it is important to establish good relationships with them. Although librarians are playing an ever increasing and important role in IL education in higher education, many librarians are not trained in these areas and this has been a real challenge for librarians in university libraries.

Application of the model in the development of a staff development programme on IL and curriculum integration at UoA has provided opportunities to address these challenges. This has empowered librarians at the UoA with necessary knowledge and skills in learning theories, curriculum design, and provided information about how best to collaborate with academic and other support staff.

4 Application of the Model to a Staff Development Initiative on IL and Curriculum Integration in Higher Education

After a needs analysis study conducted at the UoA Library in 2009/2010, the IL curriculum integration programme, based on Wang's integration model [1], was developed by a group of four people. The programme was successfully piloted in 2011 and was fully implemented from 2012 for all new subject librarians and learning support services librarians. Participants who completed the programme reported that they now have a greater understanding of information literacy, pedagogy, curriculum and curriculum integration of information literacy. From 2013, all subject librarians, learning support services librarians and team leaders, regardless of experience, will be required to complete the programme.

The programme consists of five modules:

- Module 1: Understand IL and the role of librarians
- Module 2: Establish relationship with your faculty
- Module 3: Understanding and analyzing your faculty curriculum
- Module 4: IL integration and curriculum design
- Module 5: IL assessment and evaluation

The *What* element of the Model was applied to Module 1 of the programme which provided guidelines of what information literate students should be like and the importance of information literacy.

The *What* element of the Model (see Figure 3) represents IL guidelines in the intended curriculum (what an institution expects its students to learn). These include

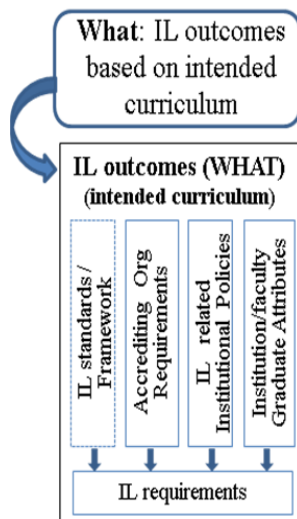


Fig. 3. The *WHAT* element of the IL integration model

institutional graduate IL attributes/profiles, and institutional or national institutionally endorsed IL policies such as IL standards, institutional IL policies, related national IL strategies.

Module one was developed to assist librarians in a deep understanding of what IL is and why it is important, as well as what capabilities information literate students should have when they graduate from university. The module was also designed to generate thinking and discussion about the roles of academic staff and librarians in IL education. It is important to understand the answers to these “*What*” questions before working on curricular integration of information literacy. Understanding the answers to these questions provides librarians as higher educators with a solid understanding of why IL education is important for students.

The *Who* element of the Model (see Figure 4) was applied to Module two and Module four part 1 of the programme. The purpose of the module is to: introduce the key stakeholders who need to be involved in curriculum integration of IL and to provide guidelines on how to establish relationships with faculty.

Module two focuses on understanding academics’ teaching, research and services roles at the university, identifying the key people who need to be involved in IL integration and how to establish relationships with faculty/departmental staff. Experienced academic teaching staff and subject librarians are invited to a panel discussion to share their experiences of how to approach academic staff and how to establish relationships with academic teaching staff and other services providers.

Module 4 Part 1 provides an opportunity for librarians to meet with other people that they can potentially collaborate with when they integrate IL into the curriculum. This includes: learning designers, IT support staff, learning advisors. This provides participants with a good opportunity to meet with people with whom they may collaborate when they integrate IL into the curriculum.

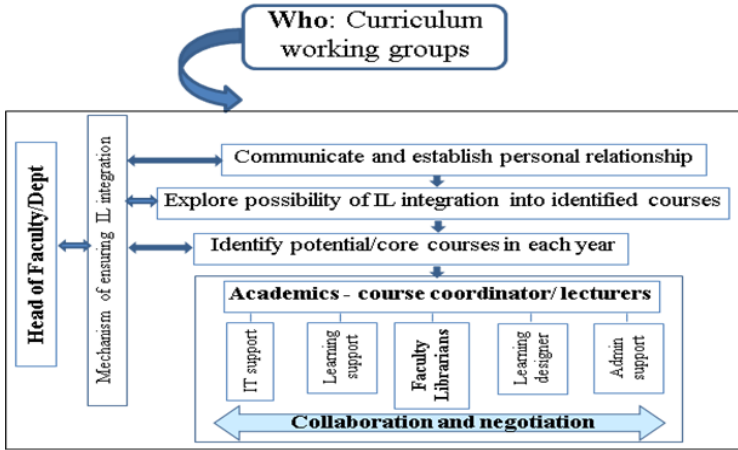


Fig. 4. The WHO element of the IL integration mode

The *How* element of the model (See Figure 5 below) was applied to Module 3 to Module 5. This part of the model provided fundamental learning theories and IL theories. These theories aided librarians in determining what exactly curriculum is, and provided understanding of how to analyse university and faculty curriculum to identify potential courses and course coordinators, how to design curriculum with integrated information literacy components based on learning theories and IL theories, how to scaffold students in their learning (e.g. by applying Bloom’s taxonomy), and how to choose suitable assessment and evaluation tools that can be used when integrating information literacy.

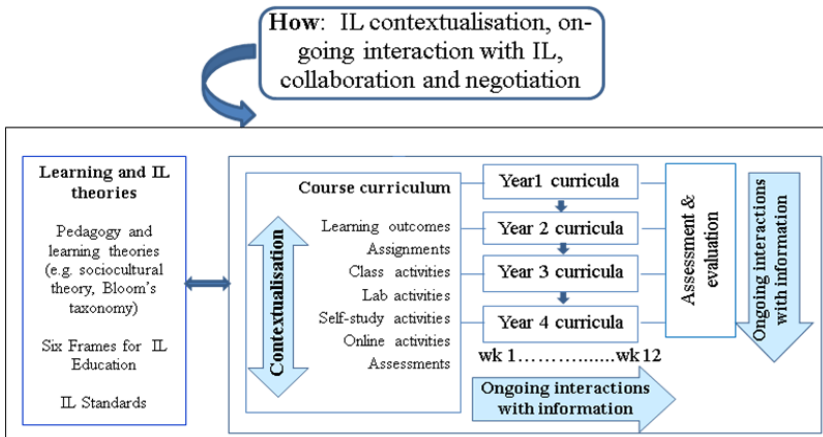


Fig. 5. The HOW element of the IL integration model

The programme and individual modules have been revised on an ongoing basis based on feedback from participants and facilitators. In January 2013 the University of Auckland's Student Learning Center amalgamated with the University Library with a new name created: Libraries and Learning Services. With this in mind the information literacy integration staff development programme will be revised by shifting its focus from IL to both information literacy and academic literacy from 2014. The integration model will still be applied.

5 Summary

The IL curriculum integration model developed by Wang [1] provides a framework for curriculum integration of IL in higher education. The model identified three key characteristics of IL integration: collaboration, contextualization and on-going interaction with information. These three characteristics have been applied to curriculum integration of IL into academic curricula in many faculties and disciplines. For example, IL has been integrated into the curriculum of a four year engineering programme by contextualizing IL with course assignments, activities and assessments, developing an online tutorial based on an engineering case study, scaffolding ongoing activities to foster students use of information to learn and research from a lower to higher level of study. This has been a collaborative effort between academic teaching staff, an engineering subject librarian, learning support services librarian, learning designer and learning advisor.

The model also endeavoured to answer three key questions: *What* (What should information literate students be?), *Who* (Who are the key stakeholders in IL integration?) and *How* (how can IL be integrated into the curriculum?). Focused investigation of these three questions has been applied to the Library and Learning Services' staff development programme – IL and Curriculum programme at the University of Auckland (UoA).

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I-LEARN: Information Literacy for Learners

Delia Neuman

Drexel University, College of Information Science and Technology
Philadelphia, PA 19104-2875, USA
mdn29@drexel.edu

Abstract. The six-stage I-LEARN model—Identify, Locate, Evaluate, Apply, Reflect, kNow—both describes the process of learning with information and presents a mnemonic that can help people accomplish such learning. Built on the three familiar components of information literacy (access, evaluate, and use), the model expands on these to become a *learning* model, not merely an information-seeking one. This focus on learning distinguishes I-LEARN from similar models and makes it particularly relevant for 21st-century learning. Using the model, a learner Identifies what s/he wants to learn; Locates relevant information; Evaluates the information for authority, timeliness, etc.; Applies the information to generate a new understanding—that is, to learn; and Reflects on what has been learned and on the process that has led to this point. In the kNow stage, the learner uses the new understanding as the basis for generating new questions and continuing the learning cycle.

Keywords: I-LEARN, learning, instruction.

1 Introduction

Learning—the construction of meaning from interactions with information and experience—has taken on a new cast in contemporary information-rich environments like the Internet and the Web. Increasingly, learners in every venue, formal or informal, are trying to construct meaning from a sea of text, images, sounds, and other stimuli. Traditional navigational aids—vetted and edited materials, signposts like tables of contents, and the professional expertise of librarians—are often missing when learners search for information that will enable them to plan and make decisions effectively. The six-stage I-LEARN model both describes the process of learning with information and presents a mnemonic that can help people accomplish such learning [1-2].

2 Conceptual Background

I-LEARN is based on the assumption that information itself is the basic building block for learning and that “developing expertise in accessing, evaluating, and using information is the authentic learning modern education seeks to promote” [3].

The model is grounded in research and theory from information science and instructional design—two fields that exist in parallel and that the model bridges by combining core insights from each. In information science, T. D. Wilson’s [4-5] inclusion of “information seeking and *use*” [italics added] extended the notion of information seeking into the realm of user behavior *after* information has been found. Buckland’s [6] insight that information can be conceptualized as process, as knowledge, and as thing, invited information scientists to think about the role of information in learning. Marchionini [7] solidified the connection between information and learning by defining information as “anything that can change a person’s knowledge” and noting that information includes “objects in the world, what is transferred from people or objects to a person’s cognitive system ... and the components of internal knowledge in people’s minds” (p. 5).

Instructional-design researchers and theorists have also studied the connections between information and learning. Gagne [8] proposed “categories of learning” that correspond closely to different kinds of information and information use—from making simple stimulus-response connections through “verbal learning” to engaging in complex problem solving using information presented as “principles” and “rules.” Merrill’s [9] “component display theory” proposed that information to be learned consists of four types—facts, concepts, procedures, and rules—and that learning involves three kinds of performance—remember, use, and find—linked directly to specific information types. Researchers have identified the “learning affordances” of various media formats, establishing links between learning and the different ways in which information is organized and represented: print, for example, has advantages for close study because it is static, while motion media like film can highlight important ideas through zooming. Kozma’s [10] typology of the “cognitively relevant characteristics” of media formats delineates a relationship between learning and information that underlies the full range of information formats. Anderson and Krathwohl [11] added a “knowledge dimension” to Bloom’s 1956 *Taxonomy* [12] that shows how factual, conceptual, procedural, and metacognitive knowledge underlies learning across Bloom’s “levels of learning.”

The information-literacy movement that blossomed in the 1980s and 1990s used concepts from both information science and instructional design to highlight the connection of information and learning. The American Library Association’s definition of information literacy crystallizes this connection:

To be information literate, a person must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information. ... Ultimately, information literate people are those who have learned how to learn. They know how to learn because they know how knowledge is organized, how to find information, and how to use information in such a way that others can learn from them. They are people prepared for lifelong learning because they can always find the information needed for any task or decision at hand [13].

This definition set the stage for several divisions of the American Library Association to develop information-literacy standards that make explicit the link between

information and learning. More recently, groups outside “traditional” promoters of information literacy have also recognized the relationship of information and learning. The Partnership for 21st Century Skills, founded in 2003, identified “information, media, and technology skills” as essential to mastering core subjects like science and language arts. The *Common Core State Standards*—now sweeping the United States as the latest reform initiative—describe the “key design consideration” underlying their focus:

To be ready for college, workforce training, and life in a technological society, students need the ability to gather, comprehend, evaluate, synthesize, and report on information and ideas; to conduct original research in order to answer questions or solve problems; and to analyze and create a high volume and extensive range of print and non-print texts in media forms old and new. The need to conduct research and to produce and consume media is embedded into ... today’s curriculum [14, p. 4].

Because of this “key consideration,” information skills are integrated throughout all the individual subject areas in the *Standards* rather than treated in isolation. As a result, new curricula across the United States integrate information literacy into all content areas and at all grade levels. The centrality of information literacy to 21st-century learning has thus been established not only by its traditional proponents but by the broader educational establishment as well.

3 I-LEARN Stages and Elements

Against this background, the I-LEARN model offers a way (1) to operationalize, teach, and assess students’ mastery of the core concepts of information literacy across the curriculum and (2) to support learners in informal learning environments as well. Because the model is highly flexible and not linked to any specific context, it can be adapted for children and adults and for formal and casual learners. Its six stages—Identify, Locate, Evaluate, Apply, Reflect, and kNow—are its essential components, while its 18 elements are suggestive of ways the stages might be implemented. Table 1 displays the full model, while the paragraphs below the stages elaborate on each stage’s content and use.

Table 1. The I-LEARN Model

Identify	Choose a problem, topic, or question that can be addressed through information
Activate	... a sense of curiosity about the world
Scan	...the environment for a suitable topic within that world to investigate
Formulate	... a problem or question about that topic that can be addressed with information

The “Identify” stage involves choosing a focus for information-based learning. The focus may be large or small, short-term or long-term, simple or complex. The only requirement is that it must be addressable by information (rather than emotion): whether one can afford to buy a boat would be an appropriate focus, while whether one prefers a sailboat over a motorboat (or vice versa) would not.

Locate	Access information, either recorded or in the environment, related to the problem/topic/question
Focus	... on what is to be learned
Find	... the information needed for that learning
Extract	... the most relevant and salient information for that learning

“Locate” refers to finding information that has the potential to address the issue “identified” above. This stage involves, first, initial information seeking—gathering a wide array of possibly relevant information from a range of sources rather than going to only one or two—and, second, taking a first look at that array to select the pieces of information that seem most applicable.

Evaluate	Judge the quality and relevance of the information found
Authority	... credibility of source and/or author, internal logic, accuracy
Relevance	... topic at hand, level of depth required, appropriateness
Timeliness	... currency, accessibility

“Evaluate” requires using clear criteria to judge how well each piece of information addresses the issue. The three elements listed may be expanded to include other criteria or may be replaced in whole or in part. For example, the appropriateness of the information for the learner might be a critical criterion: a doctor would need one level of information, while a patient is likely to need another.

Apply	Use the information for a learning task
Generate	... construct new understanding, personal meaning
Organize	... determine appropriate cognitive structure (e.g., chronological, hierarchical, etc.)
Communicate	... create appropriate product to convey that structure

“Apply” represents the major expansion of I-LEARN from the information-seeking paradigm into a learning model. The elements describe the essence of learning as defined by contemporary learning theorists: constructing a new understanding by integrating prior knowledge and new information; creating a mental representation that organizes the understanding effectively; and (in formal environments) clearly communicating what was learned. Such organization and communication involve selecting the information format that is most appropriate for the learning at hand, based on the unique “affordances” inherent in that format: one would choose a timeline to represent and exemplify historical information, for example, and a simulation to represent and show a process or a skill.

Reflect	Examine product and process
Analyze	... adequacy of both form and content
Revise	... improve as necessary
Refine	... polish as appropriate

“Reflect” continues the expansion of the model into the realm of learning by focusing on metacognitive processes that are crucial to the development of deep understanding. Its placement as a separate stage ensures that this important stage is not overlooked; its key elements of analyzing, revising, and refining are also recursive and iterative throughout the process of learning with information.

kNow	Instantiate knowledge gained so it can be used in the future
Internalize	... integrate with previous knowledge
Personalize	... recognize meaning as a personal construct
Activate	... draw upon as necessary and/or appropriate

Learning results in knowledge, so “kNow” is I-LEARN’s final stage. Here, the learner incorporates the new knowledge into an existing knowledge base. The revised knowledge base is the grounding for continuing the learning cycle: it provides the basis for making better decisions and asking new questions. The final element is “activate”—the first element in “Identify,” with which the model begins—suggesting that increased knowledge is the basis for continuing to learn.

4 I-LEARN in Practice

A variety of initiatives are underway to validate the model in practice and to explore the ways in which it can be adapted to meet the needs of various audiences. During the 2012-13 academic year, a research team used I-LEARN as the basis for a project in which students in grades K-2 researched famous Philadelphians and compiled web-based electronic portfolios of their findings. Also during that year, a doctoral student in Kentucky developed instructional materials based on I-LEARN and implemented them in her classes in information literacy for the university library. Currently and for several years, the author’s graduate students have also been creating “scenarios” both to guide I-LEARN projects in their schools and to contribute to a collection of scenarios that can be used by others.

No formal data analysis from any of these efforts is yet available, so no comparisons with other information-literacy models and evaluation standards are currently possible. Preliminary data suggest that the model is successful in the environments in which it has been used—engaging both students and teachers in the K-2 project, for example, and leading the research team (with enthusiastic teacher support) to propose an expanded study. Additional projects centered around I-LEARN are also planned for other venues in the future.

5 Conclusion

Grounded in theory and research from both information science and instructional systems design, the I-LEARN model bridges these two parallel fields to provide a tool that puts information literacy at the heart of 21st-century learning. The model builds on the familiar information-literacy components of access, evaluation, and use and expands the “use” component by focusing specifically on the way contemporary learning theories tell us that learning occurs. In its “Apply” stage, the model also draws widely on research into the learning affordances of various media formats—that is, the unique characteristics inherent in the ways different formats organize and present information. Understanding these affordances is a critical skill in an age in which learners must construct meaning from a wide array of text, images, and sounds and other stimuli; knowing how to use these characteristics effectively is equally critical to communicating meaning in a similarly wide range of formats. Reflecting on the results of the learning experience and determining how to improve one’s next attempt are key to developing a sophisticated approach to learning. Finally, seeing knowledge as the basis for gaining further knowledge begets the intellectual curiosity that leads to lifelong learning. Ideally, using the stages of the model—Identify, Locate, Evaluate, Apply, Reflect, and kNow—will help learners see the world as an all-encompassing source of information they can access, evaluate, and use to solve problems and improve lives.

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The Influence of Technological Changes on the Definition of Information Literacy

Pavla Kovářová and Iva Zadrazilová

Masaryk University, Department of Information Studies and Library Science,
Arna Novaka 1, 602 00 Brno, Czech Republic
{kovarova, zadrazilova}@phil.muni.cz

Abstract. The definition of information literacy (IL) has undergone development since its first formulation. It has been shaped from the very beginning by information technology, as shown by a document analysis. Other types of literacy more reflect the influence of information technology. The results of analyses reveal that it is not sufficient to accept the importance of information technology for the field of IL, but that the new possibilities created for work with information through these technologies need to be taken into account. The intersections of these two fields should be dealt with in a broad-based discussion of the relevance of technology to the definition of IL. The aim of this article is to provide basic stimulus for this discussion.

Keywords: Information literacy, definition, information and communication technologies, technological changes.

1 Introduction

To define information literacy (IL) is not an easy task. Its conception is not fixed, although it has been used in literature for several decades. The manner of definition differs in space and time, but mainly in the way the definition is transferred to practice in terms of characteristics of an information literate individual. In our paper, we stay at the level of definition of the term, whose analysis will facilitate the move to both the broader and the more specific levels of characteristics.

2 The Development of Information Technology and the Term Information Literacy

IL is in each definition linked with the use of information. Given the increasingly closer connection between work with information and use of IT, these technologies naturally also have an impact on the definition of IL. The development of IT is rapid and often unpredictable and these changes are reflected also in the concept of IL. We may assume that the milestones in the development of IT correspond with the development of IL. Yet, the timeline with milestones in the development of IT and the

more significant definitions of IL, as shown in Table 1, does not indicate a substantial connection between the fields in question. Nevertheless, it is evident that the definition is developing and that significant changes have surfaced over the decades. With regard to the number of definitions and the scope of this article, instead of precise definitions, only key characteristics indicating the shift in delimitation of IL are highlighted.

Table 1. Milestones in the development of IT and the more significant definitions of IL

Year	Milestone (italic) or definition
1973	73 <i>Mobile device; bef.: electronic inf. resources, computer, IT, e-mail, Internet</i>
1974	74 Zurkowski: access inf. usable in real work and in problem solving [1]
1976	76 Hamelink, Owens: use inf. to achieve political emancipation [2] Burchinal: locate and use inf. to solve problems effectively [1]
1979	79 <i>Electronic Commerce / Electronic Government</i>
	87 Kuhlthau: including library and computer skills (to access and use inf.) [3]
	89 <i>WWW (World Wide Web)</i> ALA: be aware of the need, find, evaluate and use inf. efficiently [1] Breivik + Gee: associated with ICT resource-based learning [2]
	90 <i>Search Engine</i> Eisenberg + Berkowitz: define task, strategy, access, use, synthesis, evaluate [4]
1997	92 Doyle: define need, search in sources incl. IT, evaluate, organize and use inf. [1]
1999	93 Kuhlthau: task, topic, pre-exploration, focus, collection, search closure [4]
1999	94 Colorado Educational Media Ass.: use IT to access inf. and communicate [1]
1992	95 <i>Social Networks</i>
1993	97 <i>Google</i>
1994	Bruce: The Seven Faces of IL (using IT for inf. retrieval and communication) [4]
1995	SUNY: be aware of the need, locate, evaluate, effectively use and communicate inf. [1]
1999	99 Byerly + Brodie: find and use information for LLL, incl. presenting inf. [5]
2000	01 ACRL: described ALA definition in detail by 22 indicators and 87 outcomes [4]
2001	04 <i>Web 2.0</i>
2004	06 Castells: handle sources of inf. to reuse the inf. for the benefit of the society [2] Elmborg: to find, use and evaluate inf. to solve problems during LLL [2]
2006	IFLA: access, evaluate and use inf.; extend library skills [6]
2008	08 UNESCO: be aware of the need, find, evaluate, store, use, create and communicate inf. [7]

The emphasis originally placed by Zurkowski on mere gaining of access to information corresponding to the need was promptly expanded with application to solving problems [1, p. 3]. In the 1980s, when it was no longer clear where the information need is being resolved, the use of both libraries and IT is included in the definitions. The end of 1980s brought the ALA definition of IL [1, p. 4], recognized in the long-term as the basic definition and the basis for subsequent formulations (especially in the 1990s these involved minimum changes).

IT plays an ever stronger role in the explosion of information sources, as a result of which it is increasingly important to evaluate information. This influence, together with the expansion of the information society, and with IT becoming part of all areas of life, renders it all the more important for an information literate person to be enabled to satisfy their information needs in economic, public and educational areas. This is reflected in definitions of IL after 2000. Given the strong position of the ALA definition, which was resistant to current influences, a number of related types of literacy have emerged, as described in more detail in section 3 of this paper. Considerable changes in work with information have been brought about by the spreading of the 2.0 concept, when receipt of information is levelled with its production. This is reflected in the latest definitions of IL, but also in some older ones, which include reuse, production and communication of information among the key characteristics.

2.1 IT Affecting Information Environment

IT was not especially prominent in the changes to IL reported in Table 1. This is because IT is not essential until it had spread to the extent that it started to have a significant impact on work with information. This is better illustrated in Figure 1 which shows the results of a document analysis of Library, Information Science & Technology Abstracts, Library & Information Science Source via EBSCO, where the numbers of articles relating to key IT milestones since 1970 were traced without any further limitation in order to obtain data for the entire period relevant for IL. Data are restricted to LIS databases to eliminate the influence of other fields on the results. The possibility of finding non-relevant texts that may contain homonyms exists, but the total results could not have been substantially influenced by this factor. Terms¹ describing milestones in the development of IT and relating key terms in relation to IL were analysed. Terms that did not show any changes in incidence (e.g. PC, browser) were excluded from the results. The year 2013 was not included, as it might lead to a misrepresentation due to its being not finished.

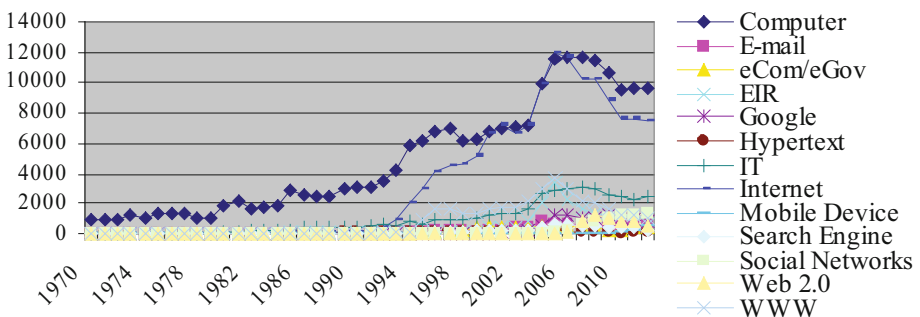


Fig. 1. Occurrence of IT terms in articles from LIS field

¹ In the Fig. 1 and Fig. 2 there are shorten search queries: eCom/eGov ("Electronic Commerce") OR ("Electronic Government"); EIR ("Electronic Information Resources"); IT ("Information Technology"); WWW (WWW OR ("World Wide Web"))

If we compare the occurrence of definitions of IL with this timeline, the links become more conspicuous. Some have already been indicated above (e.g. the impact of the 2.0 concept). In addition, it is evident that the growth in importance of computers and the Internet was reflected in the definition in the 1980s, when they started to spread more widely, but the mass application of specific IT with major impact on the change of information environment occurred only in the 1990s (i.e. after formulation of ALA definition). Figure 2 should facilitate a better identification of the situation in the period since 1990.

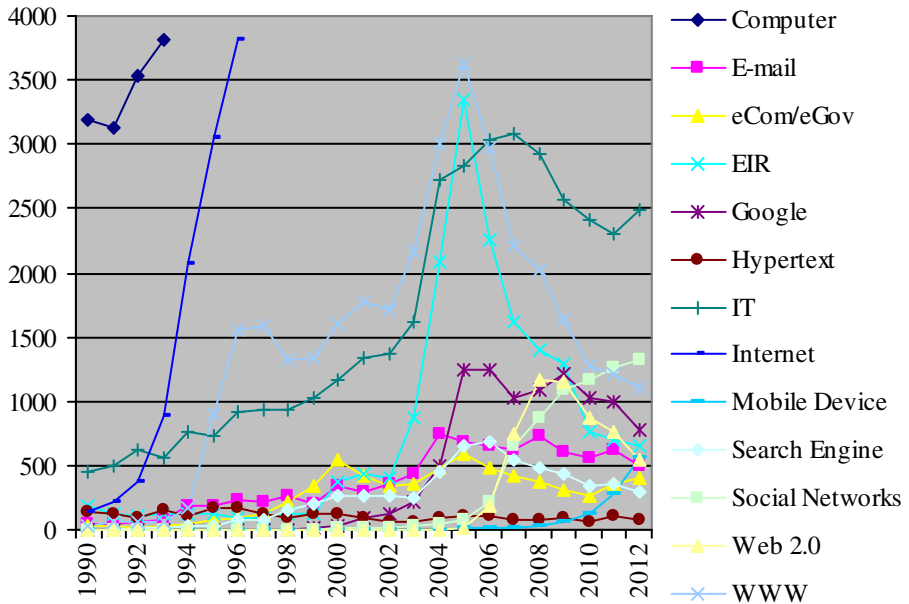


Fig. 2. Occurrence of IT terms in articles from LIS field after 1990

2.2 The Influence of IT on the Discussion of Currency of the Definition of IL

The results suggest that it is not sufficient to accept the importance of IT for the field of IL, but that it is also necessary to include the new possibilities for working with information provided by these technologies. First of all, not only receipt of information, but also its publication and communication need to be accepted. As suggested by the result for eGovernment and eCommerce, IL is indispensable not only for education and academic activities, but is becoming necessary for every individual due to involvement of IT in the economic and public domain of everyday life. An emerging, but turbulent trend is apparent in case of mobile devices, which are not just technical tools. Part of their influence on the information environment can be attributed to the fact that they enable both permanent availability of the individual and information, and also allow greater personalization of work with information because a device is usually used by a single person.

The crucial changes of IT in recent years and the relation to IL are analysed in general terms by Helvoort, who points out in particular:

- “content integration (federated search engines)
- amateur publishing (user generated content)
- use of social networks to find information
- personalisation and push technology
- loss of context / fragmentation of information” [8].

3 Information and Other Literacies

There have been attempts to subsume various types of literacy under a single framework and to define their mutual context and links. We pose the questions whether IL is a superordinate term for computer, media, digital literacy, and other terms, and how it is delimited in relation to them and what they have in common. We tend to forget that the content of these literacies is also developing and that it is therefore necessary to view all these definitions in the light of new possibilities and issues connected with enhancement of IT. All literacy concepts include visual, electronic and digital forms of expression and communication and are thus firmly linked with technologies [2].

The existing framework of the definition of IL can be viewed as too general; it can be in principle described as a mere list of specific abilities and skills that are defined as a sequence of individual logical steps necessary to achieve a goal. It is a linear path. However, models and frameworks defined too generally may disregard the important role played by context and various aspects reflecting the changes in information behaviour and technology. Hence IL cannot be defined without regard to context [9].

Apart from media literacy, whose definition has been developing since the 1960s, all other types of literacy only emerged with the introduction of new technologies. The effort to define their content and differences as well as their relation to IL is thus necessarily linked to the existence of technologies and the current need to place them within the existing framework. Some authors (e.g. D. Buckingham) use the umbrella term "New literacies" for these types of literacy.

We should note that as soon as a new technology arrives, the definition involving older technologies starts to weaken and may gradually lose the meaning it carried when initially adopted. Thus, what we need to do is not to learn new definitions, but to focus on updating the existing ones.

Now, let us divide the content of the definitions of the other literacies to identify any points of contact with IL so that we can demonstrate the links reflecting the significance of IT.

The Table 2. shows a comparison of key characteristics of individual literacies in relation to how IL is defined. The impact of technologies is evident from all definitions, including the definitions of IL introduced after 2000. The concept of IL is a broader term than the other literacies, and all other forms of literacy can be clearly subsumed under this framework. These literacies are part of it and should not be ignored.

Table 2. Comparison of key characteristics of individual literacies

Information literacy [8]	Digital literacy [10]	Computer literacy [1]	Media literacy [11]	Network literacy [1]	New literacies [12]
recognise an inf. need					
formulate a search question				retrieve specific inf. from the range of <i>network</i> tools	
choose relevant inf. sources				awareness of the range and uses of global <i>networked</i> inf. resources and services	
use <i>ICT</i> to consult inf. sources				understanding of the system of generating, managing and making inf. available	
select, evaluate and organise the found inf.	understand and use inf. in multiple formats from a range of sources via <i>computers</i>	ability to manipulate documents and <i>data</i> via <i>software</i>	access, analyse, evaluate inf. in a <i>variety of forms</i>	manipulate <i>networked</i> inf. by combining it with other resources; using <i>networked</i> inf. to analyse and resolve decisions and obtain services	using critical thinking to judge the reliability and credibility of news in a <i>variety of forms</i>
(re)use and disseminate the inf.		create documents and <i>data</i> via <i>software</i>	Communication competencies	enhancing <i>networked</i> inf. or increasing the value of inf.	

We can also note that the definitions of other literacies emphasize an ordered scale which in our table selection involves evaluation and organization of information and its use, communication and dissemination. When interpreting the definition, we should thus pay greater attention to these two fields. In contrast, the necessity to correctly identify one’s information need, to select the information source and

formulate the search question is moved to the background. The next phase, consisting in the use of ICT to consult information sources, is a type of use and can be assigned to the phases emphasized above.

4 Conclusion

There are views (e.g. [4]) that the ALA definition is adequate and that it is not inconsistent with any subsequent definition of IL; it is only sometimes slightly adjusted as a definition used for a comparison with other types of literacy. However, there have been major changes in particular in the field of IT since the formulation of the ALA definition that should be reflected in the definition of IL as they are closely connected with all phases of work with information. The question remains whether a general definition under which a wide range of things can be imagined and which is hence not in conflict with any delimitation is the desired one. In such a case, it is enough to reflect any changes in a specification of the definition for practical use. Alternatively, should the definition be closer to the current information environment, which is radically different from that of 1989? This discussion should deal not only with the technological changes described above, but also with the related types of literacy, since these have recently played a central role in the attempt to address current needs without the burden of previous development.

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From Scientific Literacy to Lifelong Research: A Social Innovation Approach

László Z. Karvalics

University of Szeged, Szeged, Hungary
zkl@hung.u-szeged.hu

Abstract. Scientific literacy does not equal teaching and learning sciences in public education. It is a complex set of knowledge of methods, approaches, attitudes and skills. On the other side, multiplying the numbers of scientifically literate citizens helps to overcome the control crisis of contemporary Science, which needs a real Copernican turnabout to turn (new) brains into problem-solving research mega-machines. Between the ages of 12 and 18, everybody can think and work as a scientist – of course, it does not mean that everybody will be a scientist. But everybody can learn to deal with scientific issues as a part of research communities even after their school life. (We call this paradigm lifelong research.) Our online workflow platform, *Palaestria* supports defining, planning, organizing, performing and disseminating hybrid research projects. Its features (“stock exchange of subjects”, scientific application store, publication module, reward engine) and implementation plan of this future-oriented online tool will be presented.

Keywords: Scientific literacy, research literacy, academic literacy, social innovation approach, lifelong research.

1 Introduction: An Education Perspective

I strongly agree with Mackey and Jacobsen, that “*standard definitions of information literacy are insufficient for the revolutionary social technologies currently prevalent online*”. But not only “*the emergence of social media and collaborative online communities requires a reframing of information literacy*”: the complexity growth and the voraciously integrative nature of digital culture propagates the need for conceptual mapping of “*multiple literacy types*” from time to time. [1]

In the last decade the elementary level of personal information culture [2] became very popular as a target, since it is easy to locate, string out and present all the relevant “skill pieces” in detailed taxonomies, prepared with meticulous care. These voluminous “grids” [3] and sophisticated indicators [4] are reflecting the education needs, almost unexceptionally, providing support in planning, developing and monitoring information literacy related training programs and courses.

Meanwhile, the altering everyday social practice, transformed by the ceaselessly emerging information environment, tools, technology and institutions, has successfully configured a new, medium-level layer of personal information culture. Its advanced,

domain-independent skills are providing solid and reliable interoperability and interconnectivity even in highly elaborated parts of the digital ecosystem. Other literacy forms are connected to special fields of everyday and networked life. In this new activity and responsibility space, the fully digital transaction and interaction forms require special abilities, routines, cognition, and conceptual foundation.

Without reference to legal issues (let’s think only of information privacy, freedom of information, limits of freedom of speech, illegal content, harmful comments, etc.), sensibility to psychological challenges (cyberbullying, attention deficit disorder, online addictions, etc.) and a confident usage of financial background systems, it is hard to imagine the life of a contemporary Netizen.

Table 1. Medium level forms of Personal Information Culture [5]

Domain-independent skills	Social practice
Visual literacy (“Visuacy”)	Financial literacy
Navigation literacy (“Navigacy”)	Participation literacy (“Participacy”)
(Critical) media literacy	Scientific literacy
English proficiency ¹	Legal literacy
Game literacy	Psycholiteracy

In this two-pronged family of literacies scientific literacy plays a special and marked role.

1.1 Scientific, Academic and Research Literacy: Division of Meanings

What does it mean to be “scientifically literate”? This question has been discussed since 1880, as Miller [6] credits the birth of the expression to Thomas Huxley.

Scientific literacy does not equal teaching and learning sciences in public education. It is a complex set of knowledge of methods, approaches, attitudes and skills, revolving around these questions: how to do scientific research? How to think scientifically, critically? What is the best way to discover the state of art in a given field, and how to generate research questions and hypothesis in the hope of producing new scientific results? How to plan your research project? How to cooperate with other stakeholders? How to use resources and facilities, including books, journals, deep Web data collections, tools, labs etc.? How to test and evaluate outcomes? How to share and publish them? How does Modern Science work? What about the disciplinary taxonomy? What is the role of Megascience and Megatechnology? What do we know about scientific agenda setting? What are the basic connections between Science, Policymaking and Business? What is the difference between the dissemination and formation of scientific results? How do we see a scientific career and life? How to become a scientist? What are the main scientific institutions and entities?

¹ For non-native speakers

From an education perspective and a personal point of view, by the (US) National Science Education Standards, scientific literacy means “*that a person can ask, find, or determine answers to questions derived from curiosity about everyday experiences. It means that a person has the ability to describe, explain, and predict natural phenomena. Scientific literacy entails being able to read with understanding articles about science in the popular press and to engage in social conversation about the validity of the conclusions. Scientific literacy implies that a person can identify scientific issues underlying national and local decisions and express positions that are scientifically and technologically informed. A literate citizen should be able to evaluate the quality of scientific information on the basis of its source and the methods used to generate it. Scientific literacy also implies the capacity to pose and evaluate arguments based on evidence and to apply conclusions from such arguments appropriately*” [7, p. 22]. Of course, the same “scientific literacy” has different levels, depth and intensity.

Academic literacy is a narrower concept. It is usually defined as a version of professional writing in university and disciplinary environment: how to make an appropriate scientific text. The scope seems to be broadening recently: “*students (also) need to understand academic culture, at least at a basic level. They need to understand academic values, etiquette, and assumptions*” [8].

Research literacy is also a sub-set of scientific literacy. By the Oxford Brookes University it is “*the ability to be a critical consumer of research, and also, where possible, to design and undertake at least a small-scale research project in the discipline, using appropriate methodology.*”²

In an online environment research literacy is “*the ability to understand and use information technology tools to carry out research, including the use of discipline-related software and online resources*” [9].

But are there any difference between the challenges of traditional, rigid educational practices – evidence-based teaching and learning (EBL), discovery based learning, individual experience focused learning – and the principles of being scientifically literate?

1.2 Learning Environment and Research Literacy

We know from educational action research programs, that being able to build scientific literacy basics for students results in measurable improvements in the effectiveness of their overall learning ability [10]. Thus, scientific literacy is not only an advanced educational domain to create, but a precondition of intentional cognitive development.

From another perspective: a Personal Learning Environment (PLE) and a Personal Research Environment (PRE) are very similar. So, it is not a revolutionary improvement to transform and upgrade the “learning scene” to a more complex environment.

² <https://wiki.brookes.ac.uk/display/GAA/Research+Literacy>

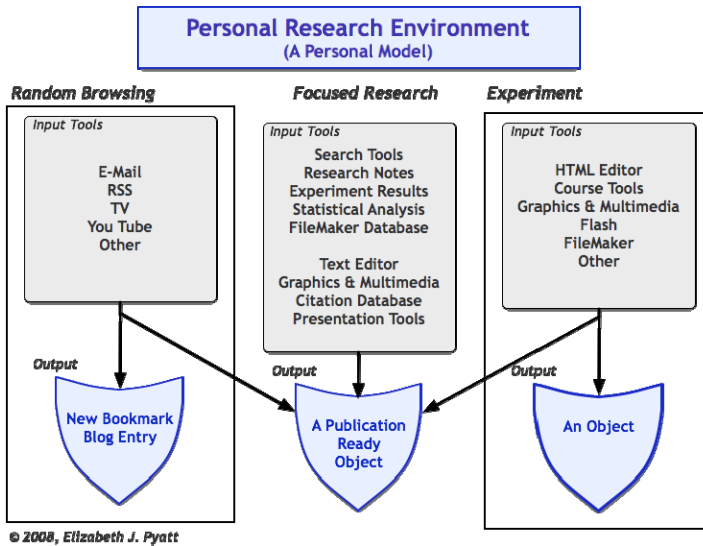


Fig. 1. From learning to research environment (Source: Pyatt, 2008)

In this manner, the main question is the following: why and how to insert which scientific activity and methods into the system of public education.

2 Science and the Digital Initiates

Sure enough, scientific literacy is not only for supporting everyday pedagogical practice. It is supposed to help overcome simultaneously the quantitative aspect of the *control crisis of contemporary Science* itself. (For the control crisis – control revolution model see James Beniger’s pivotal work [12] and one of its satellite papers, dedicated directly to scientific issues [13].)

In a nutshell, the information technology background systems of modern sciences produce an incredible quantity of output signals. For many of the sciences it is more and more problematic to manage the content of their permanently swelling stored background data and information. The small group of researchers, backed by however great amount of computing- and picture-converting capacity, is not able to analyze intelligently the astoundingly large and growing amount of signal production and digitized resources. The development of cyber-environments and cyber-infrastructure does not solve the problem. Science needs a real Copernican turnabout to turn (new) brains into problem-solving research mega-machines.

Where are these brains? If we need them in a “pre-digestive” process, we can easily find them where the task is exactly to enable these brains even to do scientific work: in the school benches. If there are distributable research tasks, scholars and teachers can manage hybrid knowledge-producing communities. Our realistic vision is that one day 800 million students, 40 million teachers and 5 million scientists of the

world will progressively merge into a *scientific problem-solving megamachine*³. To be a partner in real research projects, including agenda-setting related to local problems or civilization issues, it is best to involve the students, and help them understand why they should learn anything “scientific”: in order to be able to take part in cooperative programs.

Between the ages of 12 and 18 everybody can think and work as a scientist – of course, it does not mean that everybody will be a scientist. But everybody can learn to deal with scientific issues as a part of research communities even after their school life. That is why it is timely to call this generation *digital initiates* and this paradigm *lifelong research*.

3 Palaestria – A Way Forward to a Universal Research Literacy

The scientific community has come step by step to the recognition that the bottleneck is in the areas of knowledge and insight that cannot be reduced to algorithms; the process of knowledge production is constrained by human brains capable of interpreting, placing in context, and thereby counterbalancing the sheer mass of raw data being generated. Therefore the new scientific control revolution can only arise from the human infrastructure; it can only be a human revolution — and as such, calls not for technological but for social innovation.

During the past three decades the science establishment has tried to ease the *intensifying pressure with three parallel minor innovations*:

- organizational and institutional solutions facilitating the optimal use of the available capacities and numbers of human brains (*intensification*);
- interconnection of existing research staffs into virtual communities of ever growing size (*concentration*); and
- attempted massive mobilization of new brains capable of being involved in the solution of scientific problems (*extensive growth*).

Each of these solutions yielded some temporary and partial results—but these results paradoxically ended up by reinforcing the basic problem, because of the increased demand for data production stimulated precisely by successful feedback. Neither of the three approaches can be expected to promise further advance. Yet each of these three attempts has made a significant contribution to identifying the feasible path toward the real control revolution with radical renewal of the methodology and organizational sociology of cultivation of science, making people conscious of the challenge from a fresh respect, and the elaboration of matured or tried proposals, targeting the production of new scientific results.

The realization of this idea faces the science of pedagogy and everyday schoolwork with shocking challenges. However, changing existing “science teaching” patterns is a long road to follow, so the idea needs a social innovation buoyancy. That’s why we

³ We use the famous metaphor of Lewis Mumford.

developed an online workflow platform to define, plan, organize, perform and disseminate hybrid projects, called *Palaestria*.⁴

On Palaestria pages, three stakeholders, Scholars, Teachers and Students are managing scientific research programs.

To become a citizen of Palaestria is easy with a simple registration. The Hungarian language version, introduced in 2011 could successfully serve the first pilots, so it's time to make other national language platforms, and by the end of 2014, establish an English language global platform.

The "home" of the project is the Informatorium, a 400 square meter ultra-high tech information visualization, processing and service center of University of Szeged⁵, a new generation, integrated dissemination, research, project management and community space of information culture. With its services, screen performance, group work tools, test corners, experimental modules, teleconference and tele-coordination facilities, the Informatorium could become an excellent, ideal mission control place for the development and hosting of the full Palaestria project⁶.

In the last chapter we will present the proposed features and implementation plan of this future-oriented online tool.

3.1 Life in Palaestria – How Does it Work? Five Steps

1. The Scholars define research topics, designed for Student teams in different sizes (from a few dozens to ten or hundreds of thousands) in a standard description format. They try to recruit partners in those fields of study or experiments, where the reason to involve lots of students comes from the distributable nature of the scientific challenge, which results in clear need for human resources, and the proposed activity is interesting enough to create strong motivation to participate (STOCK EXCHANGE OF SUBJECTS).
2. Teachers and Students are looking into the theme supply regularly, choosing the most appropriate and impressive topics, taking turns discussing the possibilities and making common decisions about whom and how to join, and how to insert new scientific projects into everyday school life. After the required number of team members is reached, the hybrid research team will be set up, and the DEDICATED PROJECT PAGE is generated for the team, which is the fixed platform for online collaboration during the whole project.
3. Scholars and Teachers are initiating conciliation about those well founded sets of basic skills and knowledges, which meet project needs, and require systematically planned preliminary and preparatory teaching sessions in the partner schools before starting the research process. They identify the different tasks, share the jobs, make tight timing, conceptualize the accumulation logic and logistics of the

⁴ In the Greco-Roman world Palaestra was a part of the Gymnasium, devoted to physical education. Our neologism, "Palaestria" gives a utopistic flavor to the word, suggesting a meaning, close to "the (global) land of training of the future generation".

⁵ See: <http://informatorium.hu/en/>

⁶ The research was supported by TÁMOP 4.2.2.C – 11/1/KONV program.

future results. (JOINT PROJECT PLANNING). Regarding the need for hardware/software solutions and special research tools, they use the SCIENTIFIC APPLICATION STORE to download, acquire and distribute infrastructure components within the team. Teachers are not simple mediators, but full equivalent partners in planning, involving partly their students, too, if they feel it necessary.

4. After the preparation and arrangements, the team-members open IMPLEMENTATION, using community media tools to communicate. In this phase Teachers switch to a new, quality assessment role, while the scholars are continuously answering the questions raised during the execution, and trying to help solve the emerging problems. After the fulfillment of the sub-duties, everything is accumulated in a RESERVOIR, beginning the PROCESSING of results. Depending on the nature of the projects, the students can also take part in further phases (testing, secondary analysis, hypothesis generation, literature pre-processing, etc.).
5. The results of the projects are PUBLICATIONS. Scholars and Teachers are named authors, while every team member is also a co-author: it is indicated in the scientific journal articles with a special Palaestria link, where the names of all participants are listed. Students are parts of a special reward system, collecting points according to the value of their acknowledged efforts – making the “game” more joyful. “Palaestria points” can serve in their future (university or voluntary/citizen scientist) life as important and acceptable indicators.

3.2 Personal Messages and Considerations for Future Palaestria Stakeholders

Scholars. Crowdsourcing opens new avenues in Science. Getting around the distribution anomalies and the bottlenecks in fund-raising, researchers can acquire well organized, trained and creative human resources in an adequate amount to serve given scientific goals. That’s not be sneezed at in formulating attractive research plans to capture fresh brains in a sensitive and motivateable phase of life. And, what is more, the increase in geographical and linguistic diversity and the rapid growth of the involved students and teachers make thinkable research projects of a size, complexity and even timeframe greater than ever before.

Teachers. Some time ago every teacher had to decide after graduation: science or public education? An artificial line of demarcation disappears when cultivating science, as participating in different research projects will be an important part of a teacher’s everyday work. Becoming a part of Palaestria provides lot of new possibilities, contacts and challenges. They will also easily understand that there is no stronger motivation for their students to learn than properly putting up a good show in jointly selected, personally meaningful projects with their peer group.

Students. It will be proven soon for them, that science is not only about getting acquainted with disciplinary basics and existing knowledge by teachers, textbooks, multimedia contents and experiments, but they can become constructive elements of

scientific problem-solving projects and communities – intensively engaging in important, interesting issues of their own selection, creating new type connections with contemporary fellow students. We have to change our minds: it is not a privilege of talented ones, the prodigies or Wunderkinds to be student scientists – everybody should have that opportunity for that. “Palaestria is cool and fun”.

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Research Data Literacy

René Schneider

Haute Ecole de Gestion, 7, route de Drize, 1271 Carouge, Switzerland
rene.schneider@hesge.ch

Abstract. This paper describes a pragmatic approach for the mediation and the teaching of research data literacy, i.e. those dimensions of information literacy that are dedicated to the creation, management, and reuse of research data. Based on prior work concerning the foundations of information literacy and curricula construction for data curation, the paper will begin with the definition of research data literacy, before describing an approach based on a fusion of core skills and a two dimensional matrix that reflects on the one hand the different student populations, and on the other hand a scale of various teaching modules. This matrix might serve as the basis for an operational implementation of different study programs.

Keywords: Research data management, data scientists, data curation cycle, research data literacy.

1 Introduction

Research data management, i.e. the processing of all types of raw or primary data, that are created along every research process, will not only play a crucial role for many scientists in the next years, but will also have strong implications for library and information science [1]: information specialists will become data librarians on the one hand; on the other hand, they will have to teach students, scientists, data managers and information specialists in order to prepare them for the new challenges of providing and using data infrastructures in almost all scientific disciplines.

Due to the fact that not only the current scientists, but also the actual and forthcoming generations of students of almost all disciplines will have to work with the research data, the paper will mainly discuss the need for teaching the students in a new sub-discipline of information literacy, namely “research data literacy”. As this term shows, there are strong parallels with information literacy and the first can be seen as an offspring of the latter. This parallelism will be shown in reference to prior works concerning the definition of prototype curricula before striving towards the formulation of a complementary curriculum for research data literacy.

After establishing a fused list of core skills, the major competences of data management will be allocated to these core skills to be classified according to a scalable range of teaching units and different target groups.

2 Research Data Management and Information Literacy

In this section we will briefly discuss the definitions and relations that exist for and in between the terms "research data" and "information literacy," and present a new term proposed to combine them: "research data literacy." Basically, research data literacy is seen as a new sub-discipline within research data management that emerges from the need to educate students and scientists of all disciplines and to train information scientists from library and information science to do so.

Research data management is a method that enables the integration, curation and interoperability of data created during the scientific process, i.e. the production, access, verification, persistent storage and reuse of this data with the help of adequate and easy-to-use tools in virtual research infrastructures. These data are the essential part of the curation cycle [2] that comprises the following steps: the conceptualization, creation or reception, appraisal, selection, ingestion, preservation, storage, access, use and reuse, and transformation of research data. All data should be kept available in the three different domains that a scientist needs to do his work effectively [3]: a private, collaborative and public domain that are permeable for curation transactions.

The fact that almost the whole research process has to be transparent might lead to the assumption that research is on the way to becoming a utilitarian system of permanent control and evidence. As a matter of fact, the opposite is true, and research data management should be seen as "a liberal act" since it guarantees sustainable transparency for science through a "critical reflection on the nature of information itself, its technical infrastructure, and its social, cultural and even philosophical context and impact" [4]. Thus, the seven dimensions of information literacy curriculum in Shapiro and Hughes' paper can easily provide a basis for establishing a curriculum for research data literacy: tool literacy, resource literacy, social-structural literacy, publishing literacy, emerging technology literacy and critical literacy. As for the mediation of these literacies, a number of core skills have been defined: we refer firstly to the Big 6 defined by [5], which sought to teach how to "clarify, locate, select/analyze, organize/synthesize, create/present and evaluate" information. As for higher education, this list of skills was transformed to the seven pillars for information literacy, namely "identify, scope, plan, gather, evaluate, manage and present" [6]. As shall be seen later, these pillars build the starting point for the development of a curriculum for research data literacy.

The most striking difference between the terms "research data" and "information literacy" may be the fact that the first focuses on data and the second on information. This distinction has not been done to separate the terms from each other, they were coined within their own contexts at different points of time, but the line separating them is rather thin: research data management is interested in raw data from creation until extinction or archiving; information literacy has always been interested in the proper understanding and use of data that - only through the ability to use it - is converted into information. The focus on *data* in research data management can be explained with the primary and simple intention of getting back or giving testimony of the basics of research. After having focused for a very long time and always giving

preference to theoretical hypotheses, these are nowadays considered as being only one side of the academic research process, as opposed to the data. Thus, research data management is never only interested in raw data or the pure archiving, but on the use and reuse of data and its embedding context, which once again wipes out the border between data and information. Therefore the argument to recognize research data as information was proposed in the 2011 report of the Research Information Network [7]. Hence, data management and data curation can be seen as a logical extension of information literacy concepts [8].

In this sense, both the data and the context create - due to their innate relationship - the famous “difference that makes a difference”. The problem of dissociation of data from its context is at the heart of the data management problem. If the context is lost, the reuse becomes difficult, if not impossible, i.e. that preservation and the other activities of the data curation have their place in problem solving, but if the problem of losing the persistent connection between data and context is not solved, all efforts remain worthless.

This problem may be compared to a treasure box: the data is the treasure, preservation the box, and the context the map to find the way to the box, once it has been stored in its repository. The action of a person that knows how to decipher the map and find the way to the treasure box, brings us finally back to the topic of this paper: research data literacy, i.e. the human competence to locate, analyze, organize, present and evaluate the treasure, i.e. research data in its context.

Actually, it should not be forgotten, that until now most of the questions concerning research data management are about to be asked, not answered! We see that there are different stakeholders, i.e. data creators, data scientists, data librarians, and data managers [9], all familiar with their situation and experts in their domain but lacking to a considerable degree literacy concerning most of the aspects of the curation cycle. Therefore, the most important aim besides the creation and provision of infrastructures must be the mediation of the know-how needed to use them for an efficient collaborative curation of the data to be stored. Due to the variety of the stakeholders and the varying degrees of knowledge, there is a need for flexible and scalable approaches that take into consideration the diversity of the stakeholders.

3 Building a Flexible Curriculum for Research Data Literacy

The need for flexibility can be illustrated by the different lenses that reflect the different points of view that people have on a specific matter; this is definitely true if the matter is information or data: they are “different in different contexts and for different ages and levels of learner and also dependent on experience and information need” [6] and any literacy approach must take into account the personal context in which the individual operates.

In our case, the differences can be found first and foremost in the variety of topics that deal with research data management, ranging, for example, from legal issues to metadata, from storage to marketing and from disaster management to data modeling. These topics are in relation to the manifold types of stakeholders implied in research data management: creators, curators, users whose implications are related to the different roles they play - being professors, research assistants or students doing

research - librarians, data scientists and curators, computer scientists, editors etc. - which lead to the need for flexibility and scalability concerning the width and the depth of the curriculum. In other words: different people have different needs; we therefore propose an approach for the education of research data literacy that does not solely focus on data managers but on distinct student populations or target groups.

Table 1. Synopsis of information literacy and research data skills

Big 6	Seven Pillars	DPOE curriculum
Clarify		
Locate	Identify	Identify
Select /Analyze	Scope	Select
Organize /	Plan	
Synthesize	Gather	Store Protect
Evaluate	Evaluate	
	Manage	Manage
Create / Present	Present	Provide

To do so, we compared - in a first step - the previously mentioned core skills of the Big 6 in Information Literacy and the seven pillars of information literacy in higher education with the six major data curation skills taken from the DPOE curriculum that was established by the Library of Congress for their “Train the Trainer Program in Digital Curation”, namely: “Identify, Select, Store, Protect Manage, Provide” (<http://www.digitalpreservation.gov/education/curriculum.html>) (see Table 1).

As can be seen, they do not differ considerably either in quantity or in quality; most of the differing terms can be seen as synonyms, such as “Scope” and “Select”, “Gather” and “Store”, and “Present” and “Provide”, whereas the latter can be seen as another term for the original double concept of “Create/Present”. Interestingly, data curation skills contain a further concept, namely “Protect”, which is definitely at the heart of sustainable data management. On the other hand, the information literacy skills name explicitly “Plan”, which is contained in the “Store” activity of data curation, and “Evaluate”, which is not explicitly mentioned in the DPOE curriculum.

For optimal use, we decided to fuse the seven pillars and the curation core skills to an optimized list of eight core activities for research data literacy: identify, scope, plan, store, protect, evaluate, manage and provide, which gives us the variety needed for the flexibility and scalability of the program. We set aside the Big 6, since they are fully absorbed in the extended list.

In the second step, our list of core skills was compared to the core skills of data management as described by [9] (see Table 2). The discrete allocation of exactly one data management skill to exactly one research data literacy skill is certainly not sufficient: only a few do - as a matter of fact - deal solely with one of the information literacy skills, though most do show a certain interconnectivity to the neighbouring literacy skill; some are of higher importance than others and indispensable for any understanding, while others are of secondary interest and will only be taught when enough time is at one's disposal.

Therefore, we connected - in the third step of our curricula building process - the qualitative aspects of the skills to the quantitative aspects of the teaching units. This was done via a simple contingency matrix (see Table 3), that combines the core skills with several teaching units as listed hereafter: a) a two-hour unit: a short introduction to a matter, that might be taught to any clientele with the aim of providing a general overview to the novice who wants to learn the basic principles and methods; b) a full course or workshop: an either one-spot intensive workshop of one or two days or a consecutive course taught over 10-15 weeks that gives a broad theoretical overview and a first introduction to the methods and tools used; c) a full module: a teaching unit that consists of several courses and seeks to give a complete overview of the discipline in theory and practice, taught over a longer period of time, generally between six months to a full year; d) a specialization: being part of a larger study program in which the student specializes in almost all techniques and prepares himself for working in this field after completion of the studies; e) a full study program: a complete program to form research data managers and data curators during approximately two years, based on the foundations of information science and the new competences needed for research data management; f) a certificate: similar to a full study program, but directed to teach people who are already working in a job related to the matter taught, who want to acquire the knowledge needed to work as a data curator or data manager.

Table 2. Research data literacy and data management competences

Research Data Literacy	Data Management Competences
Identify	Documentation (research environmental, temporal) / Context / From Information Management to Knowledge Management
Scope	Monitoring Process / Extracting Information from Data Models (and People)
Plan	Data Modeling / Meta Data / Standards Development
Store	Data Analysis and Manipulation / Merging, Mashing, Integration
Protect	Data Preservation / Data Security / Access Authentication / Conditions of Use / Data Legislation
Evaluate	Data Appraisal and Retention / Value of Data / Economic Issues
Manage	Complaints and Expectation Management / Coordination of Practice across Institution / Negotiation Skills / Risk & Disaster Management / Contingency / Advocacy, Promotion, Marketing
Provide	Facilitation, Communication / Raising Awareness

This range comprises the whole academic ‘instrumentarium’ of teaching programs that is currently in use and has proven to be effective for the organisation of higher education as well as programs dedicated to train people on the job.

Similar to the preceding table (i.e. Table 2), the discrete allocation does not have to be interpreted in an absolute manner but should rather be seen as an indicator of where to place emphasis: Since “Provision” comprises understanding and publication, it is seen as a skill that is of importance for everyone, whereas in a two-hour course unit, the emphasis should be placed on the identification of research data and the understanding of the curation process. A full course could be dedicated to the

selection and integration of the data with a special focus on the metadata, i.e. the modeling of the context. A full module would be dedicated to the core skills of the curation process and only the full program would introduce the main skills of the management process.

In the fourth and final step of our curricula building procedure, the different teaching units are allocated to the corresponding target groups or student populations. This matrix (see Table 4) defines the groups of people that might, should or must become literate in the field of research data and combines them with the qualitative and respectively quantitative aspects of the study programs discussed above. The lines of this matrix represent firstly the four different student populations that might be implied to different degrees in the research data management process and four different target groups of people that are already working in their job.

Table 3. Research data literacy - Organization matrix

	Provide	Identify	Scope	Plan	Store	Protect	Evaluate	Manage
2 hour unit	*	*						
Full course	*	*	*	*				
Full module	*	*	*	*	*	*		
Specialization	*	*	*	*	*	*	*	*
Full study	*	*	*	*	*	*	*	*

Table 4. Research data literacy - Curricula matrix

	2-hours unit	Full course	Full module	Specialization	Full program	Certificate
Any Bachelor student	+	*	-	-	-	-
Any Master student	-	+	*	-	-	-
LIS Bachelor Students	-	-	+	*	-	-
LIS Master Students	-	-	-	+	*	-
Data Creators	+	*	-	-	-	-
Data Scientists	+	*	-	-	-	*
Data Librarians	-	+	-	-	-	+
Data Managers	-	+	-	-	-	+

The contingency cells of the matrix are filled with three different markers that indicate the intensity of the contingency between the instances of the two dimensions: these markers range from ‘compulsory’ (+) over ‘optional’ (*) to ‘not an issue’ (-), in order to further classify the needs and demands that the different student or target groups may have.

4 Conclusions

In this paper we described a modular approach for research data literacy in a four-step procedure that can be used to develop curricula for all types of participants implied in the research data management process. The approach aims for granularity concerning the teaching components and flexibility to put them together. It could be shown that the core skills of information literacy can be used as a starting point to build two comparative tables and two contingency matrices that combine different levels of literacy with different activities to represent the different lenses of the stakeholders.

Beside the technological process that fosters research data management and that is already “on the run”, we are in need of study programs for the different stakeholders, hence the motivation to write this paper. We do consider that these programs are founded in the core skills of information literacy and can be built upon them by a new arrangement of already existing components in library and information studies as well as their slight modification and adaption to the specificities of research data management plus the amendment of some complementary components that are only relevant for research data literacy.

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Digital Literacy in a Global Context

Sarah C.M. Arthur

Research School of Humanities and the Arts, Australian National University,
Canberra, Australia
scomarthur@gmail.com

Abstract. This paper begins by presenting an overview of research relating to literacy, and then focuses on attempts to connect digital and new literacies to more traditional notions of literacy. Next it investigates the tensions and complexities underlying the concept of digital literacy through a summary overview of a range of definitions and applications of the term, as well as related terms such as Internet literacies, new media literacies, multi-literacies, information literacy, ICT literacies, and computer literacy. This includes tracing the evolution of such terminology over time.

Keywords: Digital literacy, information literacy, media literacy.

1 Introduction

There is a wide body of research literature engaged with issues of learning in what is commonly referred to as ‘the digital age’ or ‘the information age.’ The impact of digital media for learning and in society more broadly, has been a focus of research for more than two decades, but accelerating technological development means that further studies are required. The changes in technology that have enabled and accompanied globalization have had major implications for schools and indeed for the processes of lifelong learning worldwide. Key shifts and transformations include: changes in the ways that literacy is conceptualized; pedagogical responses to increasing technology and ‘information overload;’ re-examination of the role of schooling; and increased recognition of the importance of access to technology and opportunities to learn about and with technology, particularly for certain sectors of the population such as the elderly, those of lower socio-economic status, ethnic minorities and women.

Two premises underpin this doctoral research: first, that recent rapid advances in technology and communications have led to fundamental changes in society; and second, that the field of education, and pedagogical debate reflects and has needed to adapt to the challenges posed by these tensions. Recent research into digital and new literacies indicates that the field requires better developed theoretical frameworks in order to cope with the complexity of today’s rapidly changing and globalized world. This paper considers the relationship between literacy and digital literacy, from historical and theoretical perspectives. From the introduction of the first printing press, through to the shift from print to screen to interactive computer-driven environments,

researchers from many disciplinary backgrounds have asked questions about the nature of literacy in light of technological change. However, what makes the questions different today is the pace and scale of change. At no time has information and communications technology reached so many people and impacted on society so fundamentally in such a short period of time.

1.1 Origin and Evolution of the Term ‘Literacy’

The term ‘literacy’ has its origins in the process of reading and writing printed text. The invention of the Gutenberg printing press (around 1440, by Johannes Gutenberg) is frequently referred to as the first chapter in the history of literacy. Taking printed material to the general public resulted in a democratization of knowledge and is linked with the beginning of the modern era. Many have gone so far as to assert that the impact of technology on literacy today is no less significant than the printing press was in its time. For centuries literacy has been a focus and concern for governments – for improving the skills of a workforce and the economic prosperity of a nation – and also as a tool for controlling the population and constructing the rules and expectations of society. In today’s globalized world, where technology plays an expanding role in the lives of individuals and the socio-economic and political life of nations, the evolving concept of literacy is as pivotal and significant as ever.

Conceptualizations of literacy and the terminology surrounding this concept have shifted and expanded as information and communication technology has permeated society. Following World War II, references to the role of literacy in social and economic development began to appear in UNESCO papers [1, p. 95]. At this time literacy was conceptualized as skills-based and ‘functional’. In the decades that followed, literacy research was driven by changes in technology and society and was also influenced by growing research interest in literacy as a socio-cultural practice [2]. However, it is the field of literacy studies since the 1960s that sets the immediate context for this thesis. During the past fifty years, various perspectives, disciplinary foci and methodologies have shaped the field of literacy studies. During that period literacy development has been increasingly understood as influenced by social and cultural issues as much as by cognitive factors that previously dominated literacy research.

The theorization of literacy as socio-cultural practice, localized in time and space, has underpinned research in New Literacy Studies and New Literacies [3], which are related to the emergence of the concept of digital literacy. Buckingham, a prominent critic, argues that “literacy is a phenomenon that is only realized in and through social practices of various kinds, and it therefore takes different forms in different social and cultural contexts” [4, p. 44]. The level of proficiency required for a person to be considered literate, or digitally literate, in one particular place (geographical or online) and time is very different from that required in another. Buckingham asserts, therefore, that definitions of literacy can only be ‘ideological.’ This perspective highlights the difficulty in developing widely applicable frameworks of reference, standards and processes for attaining and measuring literacy, and digital literacy. The socio-cultural emphasis in literacy studies has been controversial and contested. Since the early 1980s, terms such as ‘literacy crisis’ have been in regular use, and calls for

standardisation of curriculum and increased accountability for student achievement have remained at the forefront of educational debate at the state and school level in developed countries¹.

1.2 Computer Literacy to Digital Literacy, and Related Terms

The term ‘computer literacy’ had its origins in the late 1960s. By the 1980s the term computer literacy was widely used to describe the computer skills required to use the basic software that was installed on the personal computers emerging at this time². The usefulness of computers in learning was emphasized in the notion of computer literacy [5]. Martin refers to this phase as the ‘mastery’ phase, lasting from the late 1960s to the early 1980s, characterized by a vision of the computer as a powerful tool requiring specialized user knowledge [6, p. 157]. By the late 1980s, Martin contends the ‘application’ phase was underway, characterized by easy to use software applications which opened the doors for technology in education, work and leisure domains. At this time, significant numbers of IT certification schemes arose and literacy activities in school and work domains focused on the acquisition of basic IT skills.

Driven in part by the emergence of the World Wide Web, the term ‘information literacy’ gained popularity in the 1990s (emerging initially from the USA). It claimed a broader scope than had computer literacy, including the location, evaluation, organisation and use of information via computers. Martin refers to the period from the late 1990s onwards as the ‘reflective’ phase, characterized by more reflective and critical approaches to IT use, particularly to enable pedagogical change. The term information literacy is still used interchangeably (although to a lesser degree) with the term ‘information technology literacy’ and more recently, ‘ICT literacy’ (information and communication technology literacy). A related term is ‘media literacy’. Seen as similar to information literacy in some respects, definitions of media literacy focus more on the role of the author and viewer of material produced in a variety of digital mediums, as opposed to the accessing and evaluation of content. In this way, media literacy is also different from the concept of digital literacy. However, it should be noted that the term media literacy is widely in use in parts of Europe in a manner that aligns it closely with digital literacy.

More broadly, notions of literacy (once a relatively static concept) are in a state of flux and transformation directly prompted by technological development. As Hannon points out, “The nature of literacy in a culture is repeatedly redefined as the result of technological changes” [7, p. 22]. Literacy practices are evolving faster than ever before and with each technological development new literacy practices emerge. While the questions surrounding digital literacy cross traditional national and language boundaries, differences exist between the character and motivations of

¹ In 2012, for example, there is reference to an “international literacy crisis.” See <http://www.worldliteracy2012.org>

² IBM’s first personal computer became available in 1981. Apple’s ‘Finder’ operating system was launched in 1984 and Microsoft’s ‘Windows’ in 1985.

countries and communities. Consequently, the nature of digital literacy and the issues that are prioritised vary between contexts. However, at each scale there exists an increasingly blurred boundary between education, learning and society and there is growing uncertainty about the future, with unprecedented speed of change in technology and communication, and with daily life increasingly influenced by trends in technology.

2 Recent Understandings of Digital Literacy

A decade ago, a European Commission report on ‘Understanding Digital Literacy’ described the change as a change in our environment, “in which our senses are extended, our intelligence is broadened, and our arms are lengthened (namely, our ability to manipulate objects)” [8, p. 50]. The report argues that the cognitive and operative changes required by this new environment go “far beyond the straightforward individual acquisition of abilities or skills” and that indeed we are “witnessing a change that has a profound effect on mentality and society” [8, p. 50]. The enormity of the change we are experiencing and the central role of digital literacy within this is captured by the powerful description that digital literacy is

...a new process of enculturation that is profound and intense. It will disrupt many existing values and referents that have been in place in our cultural environment up till now. It must therefore be recognised as a historical process of undeniable importance that could change the direction of our history [8, p. 57].

2.1 Global Trends: Summary

It could be said that three key themes permeate the recent research literature on digital literacy. Firstly, it is widely acknowledged that no single understanding or conceptualization of digital literacy has been agreed upon. Multiple conceptualizations of digital literacy exist at the global level, and even at the national level, there is a lack of consensus as to what digital literacy is. For example, within Europe there has been a concerted effort to focus on digital literacy for the past decade, but European policies have taken a number of approaches to this task and policies have often emphasized different aspects of digital literacy³. Furthermore,

³ Kirsti Ala-Mutka, *Mapping Digital Competence: Towards a Conceptual Understanding*, JRC Technical Notes, European Commission Joint Research Centre (Institute for Prospective Technological Studies) (Luxembourg: Publications Office of the European Union, 2011), http://ftp.jrc.es/EURdoc/JRC67075_TN.pdf. highlights these various approaches and conceptual emphases with examples including: DG Information Society and Media (INFSO) which focuses on participation in the digital society, DG Enterprise and Industry (ENTR) which emphasises ICT skills needed within innovation and industry and DG Education and Culture (EAC) which views digital competence as the foundation of lifelong learning.

there are a large number of related concepts. These factors make the formulation of shared conceptual understandings a difficult task. In an educational context, this complicates the design of curricula, learning tasks and assessments and is one of the reasons why few measurement criteria have been designed for digital literacy.

Secondly, there exists a growing focus on digital literacy as life skills rather than as a set of technical skills used to operate a computer and access the Internet. Eshet-Alkalai goes as far as asserting, in the title of a 2004 article, that the technological skills and competencies embraced by such terms as digital literacy are “survival skills in the digital era” [9]. The nature of digital literacy is increasingly viewed as being broader than purely technical skills and tasks. ‘Attitudes’, ‘competencies’, ‘cognitive skills’ and increasingly ‘values’ are terms which appear regularly in the research literature and policy relating to digital literacy. On one hand these aspects are acknowledged as being more difficult to define, more difficult to ‘teach’ and very challenging to measure. On the other, they are seen as being more abstract and therefore as better adaptable to a changing technology environment. Lankshear and Knobel refer to this division as being between “standardized operational” and “conceptual” definitions [10, p. 2]. While standardized operational definitions dominated policy in the 1990s, during the last decade conceptual definitions (that have tended to be more abstract) have increasingly formed the basis of policy documents, often with little explanation or elaboration. While defined skills and procedures can be measured and assessed, more abstract constructs of digital literacy present a significant challenge to educational systems where standardization of curricula and assessment is increasingly sought.

Thirdly, digital literacy is increasingly being viewed as a socio-cultural practice which includes participation in popular-culture activities and importantly, blends the boundaries between formal educational experiences and digital technology use in ‘informal’ environments, particularly the home⁴.

3 Future Directions

The plethora of definitions that exist globally for digital literacy suggest significantly different conceptualizations. Some definitions situate digital literacy as socio-cultural practice/practices. Others emphasize the production and evaluation of information and knowledge. Some conceive of digital literacy as a set of skills, largely technological, needed to use a computer and the Internet. An increasing number highlight civic responsibility as a core goal and many define digital literacy as a combination of these

⁴ The PISA 2009 survey demonstrated that 86% of 15 year-olds say they frequently use computers at home, but only 55% do so at school *Are the New Millennium Learners Making the Grade?: Technology Use and Educational Performance in PISA* (Paris: Organisation for Economic Co-operation and Development, 2010). cited in Ala-Mutka, *Mapping Digital Competence: Towards a Conceptual Understanding*, 20. Lankshear and Knobel favour an “expansive” socio-cultural view of digital literacies, capable of encompassing the digital literacy practices that occur both in and out of formal educational environments Lankshear and Knobel, “Digital Literacies,” 2.

broad perspectives. These various constructs allude to differences in purpose including increasing economic productivity, developing active citizenship, enhancing cross-cultural communication and improving instruction in digital media and Internet use.

The relationship between digital literacy and traditional literacy sits at the heart of the digital literacy debate and is central to this doctoral research. This relationship has been explored/discussed from a range of perspectives. One body of research has focused on the impact of digital technologies on a traditional notion of literacy. From this angle of inquiry, some researchers see technology as acting to transform literacy. Donald Leu is commonly cited as one such theorist. Leu asserts that digital technologies “rapidly and continuously redefine the nature of literacy” [11]. An opposing view is offered by other theorists who encourage us to consider technology as having the capability to extend elements of a traditional notion of literacy. Kress gives the historical example that “when the printing press became commonly available, and replaced the medieval scribe...it was the forms of writing of the medieval scribe which came to dominate the new technology” [12, p. 83].

A further perspective is focused on the distinction between skills, information and knowledge [13]. How information is acquired and presented via technology has formed the majority of this work. Conversely, the underlying nature of knowledge in today’s ‘digital age’ and how to use this productively has not received as much attention in research. While more recent digital literacy policies frequently speak of ‘civic responsibility,’ they rarely, if ever, identify the nature of the required knowledge or what it might mean to use it for the good of society. A fundamental tension therefore exists between the way digital literacy is often conceptualized (as a set of skills), and the discourse of public policy where concepts including ‘life-long learning’ and ‘civic responsibility’ are frequently the focus. If digital literacy is understood, as it commonly is, in terms of skills and acquiring information, then there is little room for the underlying question of the nature and purpose of knowledge.

In conclusion, this research indicates that one of the observations to be made is that despite the diversity and richness in the research, much of it tends to use theory developed in other disciplinary areas. Some argue that what is needed is *new* theory where “the Internet is to be respected as a unique context for literacy and used to build its own theoretical foundation” [10, p. 12].

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Methodological Literacy of Doctoral Students – An Emerging Model

Jela Steinerová

Comenius University Bratislava, Faculty of Philosophy,
Department of Library and Information Science, Bratislava, Slovakia
steinerova@fphil.uniba.sk

Abstract. The goal of the paper is to describe methodological literacy based on the concept of information literacy as information practice. This qualitative study models the information practices of doctoral students. A model of methodological information literacy and recommendations are presented in which closer work with basic concepts and visualization of knowledge are emphasized. Final recommendations include improvement of skills in information synthesis. The findings can be mapped as new services of community information gateways. The model can help improve interactions in digital libraries.

Keywords: Methodological literacy, doctoral students, modeling interactions.

1 Introduction

Information literacy is a complex concept based on cognition and behavior of people with regard to use of information. It is usually integrated with other cognitive, cultural, or media literacies. However, new approaches to the concept are required and therefore in this paper we conceptualize the issue of methodological information literacy based on the research of information practices of doctoral students.

For the purpose of this paper the core meaning of information literacy covers information practices, values connected with information use, and understanding of information. We emphasize the concept of information literacy as a construction of knowledge and the evaluation of information. This is in accordance with the model of the “seven faces“ of information literacy as determined by Bruce [1]. It covers basic library literacy and computer literacy which include recognizing information needs, distinguish ways of addressing gaps, constructing search strategies, locating and accessing information, comparing and evaluating, organizing and communicating, synthesizing and creating knowledge.

According to Bawden and Robinson [2] digital literacy can be described as an ability to understand and use information from a variety of digital sources. In our approach we introduce a broader approach to literacy to include the concepts of research literacy, critical literacy, social-structural literacy, and personal information management.

The general model of digital literacy is based on “knowledge assembly”, retrieval skills, reading and understanding digital texts, awareness of tools and social networking, use of filters for managing information, as well as publishing and communication [2]. It also includes the ethical use of digital information.

Another inspiration for a broader approach to the concept of information literacy was the concept of “guided learning” [3] which can help understand the interactions of doctoral students with supervisors and experts. The six principles of guided learning are based on knowledge of cognition and learning with children, but can be transformed into interactions of doctoral students in their own learning spaces. The transformed principles of guided learning can include: active engagement in learning and reflecting on experience, use of prior knowledge, development of new ideas through guidance at critical points in the process of information use and production, building personal information styles (and modes of learning), learning through social interaction, information use and learning through cognitive construction and experience.

Other sources for this new approach to information literacy drew upon several models of information literacy in library and information science, including Doyle [4], Eisenberg and Berkowitz [5], Lloyd [6], and Limberg [7]. A broad concept of information literacy [2], [6] emerges from the above theories and from knowledge of the information behavior of doctoral students.

A model for digital literacy includes reading digital information, creating and communicating digital information, evaluation of information, knowledge assembly, and also moral and social literacy. The concepts of information literacy and digital literacy are important in different contexts such as workplaces, research and education. These contexts can illuminate the information behavior of doctoral students and help model their methodological literacy.

The first section of the paper presents the results of previous studies of relevance assessment and information ecology with regard to information literacy. The second section describes the qualitative study of information practices of doctoral students. The third section depicts a model of methodological literacy, and finally recommendations for education and digital libraries are presented.

2 Studies of Relevance and Information Ecology

In 2005-2007 we designed and conducted a study aimed at discovering perceptions of relevance in information use as part of the research project VEGA 1/2481/05. We applied semi-structured interviews with 21 PhD students of the Faculty of Philosophy, Comenius University Bratislava, Slovakia [8]. Findings suggest that relevance assessment perceived as value, utility, and importance of information should be part of information literacy. We also identified a concept of ecological information literacy and presented a model including semantic, cognitive (visual), behavioral and social dimensions [9]. Students need support in discovering, decision-making, and participation. Relevance assessment and ethical information use should be developed as part of information literacy. Such tools as concept mapping and other digital organization tools can support information filtering and processing.

A study of the information ecology of the academic information environment (2010-2011) was based on a series of semi-structured interviews with 17 managers of universities in Slovakia [10]. To improve information literacy support was recommended to enhance interest, motivation, and technological tools. Ecological elements were expressed metaphorically as cleaning and finding consistency of information worlds. Since 2002 we have run the course on Research Methodology in information science for PhD. students in Library and Information Science. This experience with about 50 doctoral students inspired the development of the methodological literacy concept including methodological paradigms and modes of research [11]. Other challenges included tools for data acquisition, analyses and syntheses, and for presentations, as well as project management [12]. These findings were the starting point for a design of a new study of information practices of doctoral students.

3 Study of Information Practices of Doctoral Students

The context of the study is embedded in a research project focused on cognitive traveling on the web. One part of the project concentrated on the information needs and activities of doctoral students aimed at modeling information interactions in research behavior, information use, information production and social media. The research instrument for gathering data was semi-structured interviews including 28 questions. Altogether 16 doctoral students participated in the study.

The concept of the study is summarized in Table. 1. Data were gathered from October 2012 to June 2013. As part of data acquisition we also applied the method of visualization of information horizons. We selected representatives of different disciplines including informatics, social psychology, philosophy, law, mathematics, and other disciplines. In the sample we identified 9 men and 7 women whose average age was 26.9 years. Interviews lasted 1 hour on average. Subjects came from Comenius University, Slovak Technical University, and Technical University Košice.

Table 1. The concept of the research

Aspects	Characteristics
Research behavior	<ul style="list-style-type: none"> ▪ selection of topic ▪ planning of the research process
Information behavior in information use	<ul style="list-style-type: none"> ▪ information strategies, practices ▪ serendipitous information gathering
Information gathering and seeking	<ul style="list-style-type: none"> ▪ types of sources ▪ information horizon
Organization of information	<ul style="list-style-type: none"> ▪ sorting of sources ▪ sorting tools
Social media	<ul style="list-style-type: none"> ▪ use ▪ benefits
Information behavior in production	<ul style="list-style-type: none"> ▪ publishing ▪ types of sources; selection of journals, publisher, forms

The results confirm differences in information handling in various disciplines and hence the need to pay more attention to methodological training of doctoral students. As for the types of research, the combination of theory and empirical research dominated, but there were also experiments, simulations, software design and text interpretations in humanities. Motivational factors included curiosity and interest in the topic, previous study (theses) and the role of supervisor.

From the perspective of information interactions, browsing on internet was mentioned most frequently. Students often used keyword searching, filtering, citation chaining, and monitoring of works of selected authors (authorities). The information resources include especially Google (Google Scholar), digital libraries, and scientific journals. Consultations with supervisors and experts, colleagues and friends were also considered. Information need is initiated by natural curiosity and connects with the verification of information, problem solving, looking for arguments, and elaboration of the topic. Information sharing is mainly realized by discussions and forums, but also through wiki systems, blogs, and social media. Informal information interactions included conferences and informal social events.

Students use social media mainly passively for reading and sharing. They perceive the benefits of social media as including access to the opinions of colleagues, and for sharing experience and documents. In relation to feelings, positive feelings of happiness, joy, and relief were expressed. Negative feelings such as anger and frustration are connected with inaccessibility of information and lack of time.

The academic community can help to navigate, guide in concepts, help in international mobility and through information literacy training. Negative influences included assessment of publishing and problems with communication. The most important barriers were lack of time, access to sources, and disintegration of systems and services. Information overload is often experienced. Students critically evaluated information systems and interactivity of online catalogues. The problematic issues included terminology and outdated publications in libraries. They need help in writing works, citing, and shared use of sources.

Methodological knowledge relates to modes of research and characteristics of knowledge production and use. It covers statement of the problem, concept mapping and terminology, selection of methods and tools for data gathering and data analyses. Our findings concur with those of similar research projects and especially the survey of doctoral students in Oslo, Copenhagen and Vienna [13] which emphasised the availability and visibility of sources for students, and three principles of content, convenience, and context. Special courses and information spaces can help support methodological literacy.

Results also show differences in disciplines regarding methodological literacy. Another research report [14] confirmed the problems in managing digital documents, preferences for human communication, and information overload. It has also been confirmed that relevance assessment is dependent on methodological knowledge [8], [15]. As for the social networks it was noted [16-17] that doctoral students are in the process of creating their expert networks. The role of supervisors was emphasized in all of the studies as most important. In this respect doctoral students would benefit from creation of a common electronic space for interactions, communications and networking.

4 A Model of Methodological Literacy for Doctoral Students

We identified the common characteristics of the information practices of doctoral students as curiosity, critical thinking, discovery of knowledge and research ethics. Methodological literacy can be understood as knowledge of problem statement, project management, analysis, synthesis, interpretation, knowledge of main methodological paradigms, and methods of research, as well as abilities to apply this knowledge into research projects and in publishing. Comparisons of disciplines confirmed that especially in the humanities interpretation, browsing, and cognitive filtering are applied. Social sciences are mainly oriented toward human behavior including the analysis of data and modeling. Sciences and medicine apply laboratory experiments, measurements, analyses, and interpretations. In technical sciences simulations, modeling and experiments prevail.

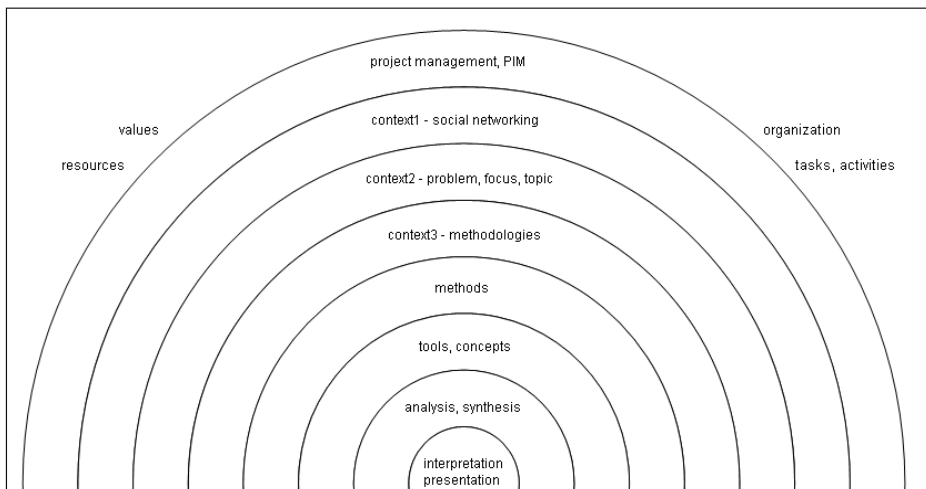


Fig. 1. Model of methodological literacy of doctoral students

Principles of methodological literacy include values, community, and tools in contexts. The main information interactions of doctoral students were identified as orientation/navigation, acquisition and selection of information, concept structuring, knowledge organization and relevance judgments, learning and interpretation, social networking and collaboration. Ecological information interactions can then be further differentiated by adaptations and cultivation of the information environment with support of information technologies. Methodological training of doctoral students can help support the efficiency of research. Based on the empirical data we developed a model of methodological information literacy of doctoral students which is presented in Figure 1.

The model determines the strata of methodological literacy which are nested in the environment (organization, tasks, and activities) and operate on values and resources. Starting with practical project management and personal information management (PIM) as a condition for every research project, the strata depict different types of

methodological knowledge and skills embedded in contexts of social networking, problem statement, finding focus, and knowledge of existing methodological approaches. In further strata the knowledge of different sets of methods is important, followed by tools for the particular research project, and the determination of basic concepts and relationships (concept maps, terminological analyses). General information and epistemological processes of analysis, synthesis, interpretations and presentations are then included in the picture as the main target and focus of methodological literacy.

The model can be used as a scheme for the content of methodological literacy courses for doctoral students. We can integrate the model with information ecology principles and recommend closer work with basic concepts in disciplines (concept mapping, terminology), advanced information seeking and use skills, visualization of knowledge and information sources, interactive communications with supervisors and colleagues. The model can be used for design of community portals for doctoral students based on academic repositories and digital libraries.

5 Conclusions

The model of methodological literacy covers the main information seeking and use strategies, intellectual information processing, project management and publishing. It is a multifaceted model which represents the main procedures of methodological literacy, including contexts of social networking, knowledge of methodological paradigms, problem statement, methods and tools for information searching and use, conceptual infrastructure, and interpretation and presentation.

Our findings and the model confirm the need to cultivate information styles and to improve skills in deep analytic and synthetic information processing. These findings and features can be mapped into new services of digital libraries and information gateways. The model can help develop features of digital libraries, especially faceted and collaborative search, social networking and discussion forums.

Doctoral students confirmed information needs as support of common cognitive and value characteristics in methodological collaboration, teaching, publishing, and information and research ethics. They needed help in handling intellectual property issues, publishing, relevance judgments, and sharing expertise with colleagues.

The community gateway for doctoral students could offer help in modeling these activities as methodological value-added services, including personalization and social networking. It could also help in writing theses, handling references and citations, sharing sources, tools, opinions, and results. It can lead to support of creativity and knowledge management. Methodological literacy could be supported by e-learning, discussion groups, collaboratories, peer reviewing, and consulting with experts. Case studies, ethical dilemmas and methodological examples could form a knowledge base as part of emerging digital scholarship.

The proposed model and practical application of the community portal could support the methodological needs of doctoral students by improvement of methodological awareness; the availability, visibility, and convenience of sources, tools and methodological expertise with the emphasis on sharing experience and collaboration.

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The Impact of Information Literacy Education for the Use of E-Government Services: The Role of the Libraries

Elitsa Lozanova-Belcheva

Sofia University "St. Kliment Ohridski"
Sofia, Bulgaria

lozanovabe@phls.uni-sofia.bg

Abstract. The article discusses the low level of the use of e-services by citizens in national and international contexts, due to different reasons, including lack of information literacy. The hypothesis of the author is that insufficient use of e-services is caused by a lack of information literacy and especially e-government literacy and that e-government skills can be obtained through library information literacy training. The conclusions of the paper illustrate that the insufficient use of e-government services could be changed with the active role of the libraries as e-government intermediaries, providing information literacy training programs in e-government issues.

Keywords: E-government education, information literacy education, e-government skills, public libraries information literacy programs, LIS programs, library qualification.

1 Introduction

The last two decades have been characterized by a rapid technological progress and intensive use of ICT in everyday activities. All new tools and channels for interaction and communication undoubtedly have great advantages. But there are some difficulties associated with the use of information and communication technologies in terms of the digital divide. Some of the problems are technological such as the need for a broadband network, Internet access, or computer. Other difficulties are educational such as a lack of basic computer skill and information literacy. A further difficulty involves psychological barriers in using ICT. Therefore the need for training in information literacy continues to grow in importance and becomes a major factor in the development of modern e-society and an active, effective and responsible citizenship. To participate in public life each person needs to acquire specific skills – from basic literacy, to communication and information literacy skills [1].

1.1 E-government and the Role of Public Libraries

“A global phenomenon e-Government” [2] has transformed the traditional bureaucratic model of government and offers a new way of interaction between

citizens, business, and public administration. E-government basically refers to the functional technological resources that may lead to improved administrative service, organization and management and is seen as a tool for technological provision of electronic services. It may be defined as an “internetworked government” [3], and as a model of online transactions with good returns at relatively low cost for citizens, industry, state employees, and other stakeholders [4]. In other words, e-government may be seen as using information technology, in particular the Internet, for the provision of public services in a far more convenient, client-oriented, cost-effective, completely different, and better way [5].

Within the theoretical rethinking of the philosophy of e-government, many researchers have analyzed the relations between public management [6], reinventing of government [7], and e-government initiatives; the anticorruption effect of e-government [8]; the role of e-government towards good governance [9]; and the importance of information technologies as an instrument or catalyst for the administrative reforms [10]. But there are also a significant number of studies and research papers about the social aspects of e-government development and problems concerning usage of e-services - digital divide [11], e-inclusion [12], e-accessibility [13], and e-readiness [14].

The role of libraries in e-government has many aspects: 1) libraries are public places which provide free access to computers and the Internet, and thereby access to e-government; 2) training citizens to work with ICT; 3) assisting citizens in their communication with government agencies; 4) advising citizens on work with e-services; 5) and helping elderly people and people in difficulty to use e-government services. Nowadays public libraries must be able to provide patrons with help using a wide range of e-government information and services [15].

2 E-government Services Usage – Reasons Why Citizens Are Abstaining from e-Government Services

2.1 Key Factors Impacting the Use of E-Government

According to both national and international statistics and based on official statistical research there are objective and subjective factors for insufficient use of e-government services. Among the objective reasons we can list the cost of the Internet access and technical equipment; a lack of a broadband network within the area; lack of computer and information skills; lack of e-government skills; the cost of e-services (in the Bulgarian case, also the cost of an e-signature); a physical disability and the low e-accessibility of government websites. The subjective reasons include the psychological barriers for using ICT; a lack of trust in online information; personal data protection, privacy and security issues.

One of the critical factors for the use of e-government services is the access to Internet. According to the Official European Statistics (Eurostat) [16] the main reasons why there are a lot of households without Internet are: the access costs are too high (e.g. telephone charges.); privacy or security issues; a lack of skills; the access is not wanted (because content is perceived as harmful) the access is not needed (content is not

useful, or not interesting); physical disability; the equipment costs are too high; or the access is available elsewhere. As an illustration for the Bulgarian situation, three of above-mentioned reasons were selected which are also related with the use of e-government. These are presented in comparison with other European countries in Table 1.

Table 1. Households without access to Internet (% of households with at least one member aged 16 to 74)

Reasons for households not having Internet access	Bulgaria	EU 27
because of lack of skills	34% (2006); 42% (2012)	27% (2006); 35% (2012)
because the access costs are too high	20% (2006); 22% (2012)	23% (2006); 24% (2012)
because of privacy or security concerns	1% (2006); 8% (2011),	5% (2006); 7% (2012)

The data in the table were given for 2006 and for 2012 (or 2011 if there isn't 2012 data), because the author's idea was to present situation in Bulgaria before it joined the EU and the current situation. If we compare the percentage of households without Internet access due to the lack of skills, Bulgaria is not so different than the average percent for EU – 34% (2006) and 42% (2012). The highest percent in this category is for Estonia – 57% in 2006 and 70% in 2012 and the lowest is for Denmark with 6% (2006) and 29% (2012). For the second factor, the high costs for Internet access, Estonia is again in first place with 64 % (2006) and 55 % (2012) and Denmark is lowest with 11% (2006) and 5% (2010¹). In the same category Bulgaria has 20% (2006) and 22% (2012) in comparison with EU 27 – 23% (2006) and 24% (2012). And for the last reason, privacy or security concerns: Bulgaria has 1% for 2006 and 8% for 2011; EU 27 – 5% (2006) and 7% (2012); the highest percent is Germany with 14% (2006) and 21% (2012). The analysis of the statistical data shows that the Internet connectivity in Bulgaria is close to the average value for the other EU countries.

It is important to outline the e-government usage by individuals in EU countries - the percentage of individuals aged 16 to 74 who have used the Internet, in the last 3 months for interaction with public authorities (i.e. having used the Internet for one or more of the following activities: obtaining information from public authorities web sites, downloading official forms, sending filled in forms) (figure 1) [17].

The average for EU 27 is 24% (2006) and 32% (2010). Bulgaria has 8% (2006) and 15% (2010) and is one of the lowest places in this category. In comparison Denmark is in second place with 43% for 2006 and 72% for 2010 (Iceland is in first position with 77% for 2010).

The conclusions of the statistical data are that in Bulgaria the e-government usage is very low and this is connected with the objective and subjective factors for the use of Internet and that the lack of Internet skills (respectively – e-government skills) increases from 2006 to 2012.

¹ There are no data for 2011 and 2012.

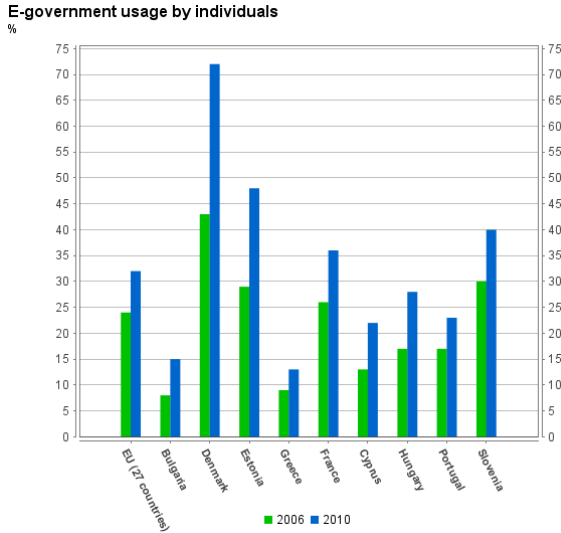


Fig. 1. E-Government usage by individuals (Source: Eurostat²)

2.2 Analysis of the Use of E-Government Services Based on the UTAUT Model

“The Unified Theory of Acceptance and use of Technology” (UTAUT model) proposed by Venkatesh, Morris, Davis and Davis [18] was applied and tested in different research articles and studies for the analysis of the user acceptance of new technologies. In the context of the e-government it was validating by Wang and Shih [19] with the accent on the use of information kiosks and by AlAwadhi and Morris [20] for the use of e-government services in Kuwait. In the present article the UTAUT model was applied just to illustrate the acceptance of e-government as a new technology.

In the UTAUT model “performance expectancy” is defined as the degree to which an individual believes that using the system will help him or her to attain gains in job performance; “effort expectancy” is defined as the degree of ease associated with the use of the system; “social influence” is defined as the degree to which an individual perceives that important others believe he or she should use the new system; “facilitating conditions” is defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system; “voluntariness” is the extent to which potential adopters perceive the adoption decision to be non-mandatory [18]. The UTAUT model can be validated for different types of innovations and new technologies through detailed questionnaires. If we apply this model for the user acceptance of e-government and e-government services, we have to analyze all objective and subjective factors and relations between them.

² Last update: 21.05.2013. <http://epp.eurostat.ec.europa.eu/tgm/graph.do?pcode=tsdgo330&language=en>

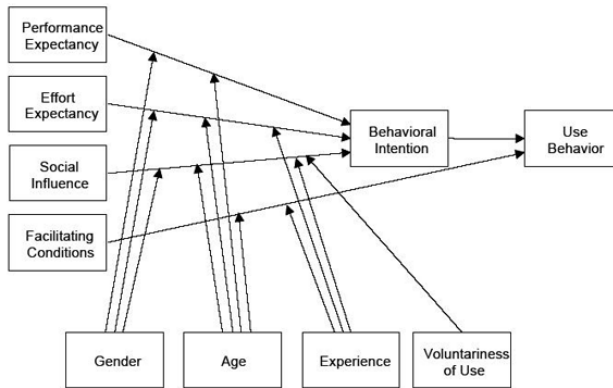


Fig. 2. UTAUT model (Source: Venkatesh, 2003)

The low level of user acceptance of e-government services are recognized as an endemic problem for government policy makers, government agencies, and e-government services providers, and therefore behavioral issues of e-government research are markedly more important than technological ones [21].

3 E-Government Education within Information Literacy Training in Public Libraries

Since the rise of Internet across the world in early 1990s, public libraries have offered training programs for the use of Internet services [22]. The Information Literacy movement introduced information literacy training as an activity in the libraries during the 1980s and even the 1990s (in some of the countries) and now it is one of the basic library services in almost every public, academic and school library. But information literacy education in the context of e-government and the use of e-government services, viewed as a part of library and information service, is a less explored but very important topic that requires a reconsideration of the mission and the major role of libraries. The present challenge facing the libraries is e-government education as specific training programs for the citizens.

Many citizens have trouble using e-government services which is a result of a lack of familiarity with government information and organization, lack of technological literacy (computer and information literacy), or lack of access to computers and Internet. As a result, many residents use public libraries for access to and assistance in using e-government. And “as people trust public libraries and the assistance they receive from libraries, they are more likely to trust e-government information and services when they access them through the public library” [15].

The hypothesis of the author is that insufficient use of e-services is dependent on the lack of information literacy and especially the e-government literacy and that the e-government skills can be obtained in the library information literacy training.

The official data from a survey of Alpha Research for Global Libraries Bulgaria Program [23] and from the National Statistical Institute [24] shows that the percentage of the individuals using the Internet for interaction with public authorities changed from 10% for 2008 to 27% for 2012 [24]. Now 42% of the patrons of the public libraries, which are part from Global Libraries Program for Bulgaria, use administrative service from libraries [23]. And one very impressive piece of data – 21,398 citizens have been educated in computer literacy between 2009 and 2012 within the Global Library Program [23].

4 Conclusion

The public libraries are seen as the most logical, most convenient and trusted place which provides patrons not only with free Internet access, but also with consultations, individual help, and training programs. As the ALA President Molly Raphael said: “Public libraries are the most cost-effective bridge for the ever present digital divide: they offer the digital literacy skills training and broadband access mandatory for success in the 21st-century global marketplace” [25].

The insufficient use of e-government services could be changed with the more active role of the libraries as e-government intermediaries and even more by providing information literacy training programs in e-government issues or e-government training. Bulgarian libraries have a little experience in this field in the context of Bill and Melinda Gates Global Libraries Program, but they have successful practices in information literacy training, including consultations and individual training. As a final conclusion e-government literacy is an important part of information literacy and it plays critical role for the use of e-government services.

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How Could Library Information Science Skills Enhance Information Literacy in the Tunisian High Independent Elections Authority (ISIE)

Yousra Seghir¹ and Souad Kamoun Chouk²

¹ Bibliothèque Numérique et Patrimoine, ISD-Tunis, Tunisia
yseghir@yahoo.fr

² ESC Tunis, LARIME ESSEC, Tunis, Tunisia
souad_chouk@yahoo.com

Abstract. Our intervention as experts in LIS field within the first High Independent Elections Authority (ISIE) in Tunisia, aimed at educating the members of this institution to make them independent in their daily work in terms of information processing. In this paper we will describe the methodology followed during the first year of its creation and the difficulties faced during our intervention as LIS experts.

Keywords: Tunisian High Independent Authority of Elections, information literacy, political decision making.

1 Introduction

Tunisian people have taken part in the historic first transparent election (National Constituent Assembly (NCA) of 2011) in order to establish an electoral culture. What can we learn about the means to preserve memory of the electoral structure and to manage its information system presented as information literacy skills? How could Library information science skills enhance information literacy in the Tunisian High Independent Elections Authority (ISIE)?

In this paper we will describe the methodology followed during the first year of its creation and the difficulties faced during our intervention as LIS experts. Steps 2 and 3 as imagined by the experts will be presented in the second part of the paper. They will be suggested to the new team of election organizers as a way to build upon the experience of the first step.

2 Information Literacy

As defined by Punia Turiman et al. [1], Information Literacy (LI) means “the ability to evaluate information across a range of media; recognize when information is

needed; locate, synthesize, and use information effectively; and accomplish these functions using technology, communication networks, and electronic resources.

The combination of the two skills: IL and technological literacy (TL) allows the institutionalization of a new culture of decision making. But, if decision makers don't perceive these skills as a priority relying on the LIS specialists of their organizations, the institutionalising process will be slowed. LIS, as a third skill could give to information specialists a supplementary power since they are sensitive to the importance of traces and to the value of a document as the memory of the organization. This sensitivity is what distinguishes them from the other users of information.

3 LIS Skills Support

LIS support is crucial for Information Literacy (IL), it is "...knowledge rather than simply skill, achieved by education rather than training, created through partnership between professionals and is a lifelong endeavour that is contextual in field and service access." [2].

Vasiliki Molea et al. [3], consider that "As the role of library follows the latest trends in technology and information, a new concept arises, which gives IL its basic character: this of the learning library" The learning library promotes active learning in a collaborative environment and it tends to become a centre of educational experiences, "where resources, faculty members and the academic staff collaborate, in order to provide the user with the essentials of information retrieval and use" (Young and Gibson) [4]. According to Nugget, C. and Meyers, R. [5], the library should focus on every aspect of the academic procedure, being a centre of information access, a working place for every scientific activity taking part inside the academic institution, and a place of knowledge.

Our intervention as experts in LIS field within the first High Independent Election Authority (ISIE) in Tunisia, aimed at educating the members of this institution to make them independent in their daily work in terms of information processing.

4 The Electoral Structure Context: Information Literacy Needs and Skills

The electoral culture based on information literacy, technological literacy and LIS competencies, needs an educational program to be rooted in the electoral structure. Experts in the different fields could help in such education process. Learners must be enabled to provide citizens with electoral information and prepare them to acquire skills to get involved in local politics. These skills result from learning how to use, select and interpret electoral information.

4.1 The Benefit of a Constructivist Pedagogy in Implementing a New Electoral Authority

The concept of electoral information literacy skills is becoming crucially important to enable citizens to learn how to become highly-aware voters. Tunisian citizens should become literate citizens in order to be well-prepared for their future elections. Owing to the complexity of the electoral process, ISIE as an electoral structure must invest in the organization of its information system to provide people with the right to access and to use the outputs of this information system.

The educational and lifelong approach of information literacy is needed for newly established institutions embodying individuals who are not familiarized with the use of information in policy making. Such experiences are good opportunities for constructivist pedagogy. “Constructivist pedagogy is thought of as the creation of classroom environments, activities, and methods that are grounded in a constructivist theory of learning, with goals that focus on individual students developing deep understandings in the subject matter of interest and habits of mind that aid in future learning” [6]. Constructivist pedagogy seems to be well suited to the ISIE context because it allows setting an environment which is favourable to one-to-one learning, the capitalization of knowledge and experimentation, and a shared leaning process between both experts and learners.

4.2 The Learning Information Processing Model

Information literacy in such contexts should follow a step-by-step process allowing people to become familiarized with the new tools and procedures. During the process, coaching by experts could help overcome the shortage in skills.

These steps were summarized by Boekhorst [7], showing that all definitions and descriptions of information literacy can be highlighted in three concepts which can be adopted by ISIE:

- *The ICT concept:* Information literacy refers to the competence to use ICT to retrieve and disseminate information.
- *The information (re)sources concept:* information literacy refers to the competence to find and use information independently or with the aid of intermediaries.
- *The information process concept:* information literacy refers to the process of recognizing information need, retrieving, evaluating, using and disseminating information to acquire or extend knowledge.

The ISIE has ended the first step of its information literacy process. The information processing model had three principal steps: the learning process with information literacy, the content/tools for using the library information system, and the outputs to the electoral structure, which are illustrated in Figure1.

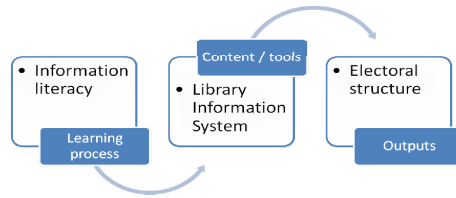


Fig. 1. The learning Information processing model

According to the information processing model adopted by ISIE, IL has learning benefits. It helps the staff to gather, to manipulate, to organize and to retrieve information in a specific way.

5 The Empirical Research in ISIE

As a research method, we have chosen a qualitative study to see how device support and advice (one expert and two researchers/experts) can provide assistance learning. To gain knowledge, we carried out action research relying on our experience since 2011 in ISIE. We have joined the ISIE in June 2011 (one expert and two researchers/experts). Initially we examined the structures of ISIE to learn about the nature of electoral activities. Because of the exploratory character of our study, we had to be on the alert to recognize new ideas, find new hypothesis and swing our research in new directions until we had exhausted it or found a better idea. We didn't use a formal protocol during the data gathering but rather undertook a survey of individuals who were apt to have ideas on the general subject. We also analysed selected cases to search for hypotheses of value.

Six Information & Documentation (ID) and archive specialists were selected (2 archivists and 4 information specialists in Documentation, Library and archival discipline) to reinforce the external experts team. The members of ISIE (16) are the second source of our investigation. Data provided are related to the nature of the documents produced and the processing procedure followed to obtain secondary documents (exploration of the content of legal text). Our study aimed at assessing the ability of the staff of documentary service and the members of the different structures of the central ISIE (16 members) to share knowledge, contribute to the learning process and capitalize knowledge for further-uses.

5.1 The Emerging Learning Process

Information literacy is a dynamic form of learning which includes the ability to manage the information problem. In ISIE, the information specialists needed to acquire skills to learn how to solve technical information problems. Specifically, ISIE focused on building the capacity of the documentary center to ensure access to the information for all citizens and support transparent administrative practices.

To achieve this goal, the ISIE, a new-born institution needed first to install itself and to acquire some experience before facing the citizens.

5.2 The Main Implementing Process Steps

As experts and specialists, we adopted a three-step process being backed by LIS.

- The first step was the establishment of an election resource centre based on information from the documentation centre. We identified the structures of ISIE and we met the heads of departments to teach them how to evaluate and to preserve documents, to guide them towards the best sources, and to show them how and where they can find the right information from the right place at the right time.
- The second step was the empowerment of the members of the ISIE central and regional offices, thus enabling them to become autonomous in organizing and digitalizing information in order to facilitate the work of the information specialists and to ensure the preservation of the ISIE memory. To realize this step we moved to regional bodies and we held a workshop to help the members develop their information literacy skills.
- The third step was the extension of the IL endeavour to the citizens through the ISIE website election resources. By this means, we gave the citizens the ability to recognise, to locate and evaluate their needs for information and to advance their global democracy knowledge.

5.3 The Teaching Strategy

To initiate the learning process, we conducted information meetings with the staff of the documentary center to explain work procedures. The important question asked by the staff was about how to identify the types of documents in a new-born institution?

The strategy followed in teaching them was as follows:

- We proceeded first of all by giving them the method to read the legal texts and then to identify the different functions of the structures of ISIE. From these functions, we detected the documents resulting from the exercise of each function and an initial list was defined.
- Then, with this list, we initiated communication with the information specialists who were responsible for the different structures of ISIE in order to complete the list;
- We progressively received documents from the different structures, and another kind of learning was achieved: through the inventory of documents received from the central and the regional locations, information specialists identified the component parts of records. This task allowed them to complete the initial list and to take corrective action on the set of documents;

- Interviews were carried out with the staff on how to maintain records to identify their needs for document retrieval and to show them how to organize their documents.

5.4 The Content/Tools

To introduce the information specialist team to the use of tools (ICT, Standards) we exhorted them:

- First of all, to download an open source tool (Greenstone) for the resources digitalization. All the collection was integrated and was organized in databases into Greenstone. The learning was about how to select the vital documents intended for scanning. Collection of information is made electronically using media watching and Boolean research. A formal process is used to gather the audiovisual records available in the media institution;
- Another tool was introducing information specialists to the use of standards. To analyse and describe the content of electronic (digital) documents (HTML, PDF, Web page), we used Dublin Core Metadata. The metadata provided by the experts enabled the information specialists to retrieve, store and disseminate the information needed by the policy makers.
- At the time of the integration of the digital collection, information specialists had encountered technical problems. In order to resolve these problems, they exchanged emails with the expert in technology.

5.5 The Outputs

To gather the knowledge for the users of ISIE, we have produced several types of databases: Press review, TV broadcasts of statements by members of ISIE, Legal texts, Voting Minutes. These databases offered the possibility for information specialists to help citizens to retrieve all kinds of information in relation with the elections of the National Constituent Assembly (NCA) of 2011, by using electronical collection.

The outputs of the electoral structure include also:

- Typology of specific documents for ISIE,
- Classification scheme of documents,
- Records retention schedule.

The outputs resulting from the learning process and the information system provide the staff of the documentary center with the status of a constructivist learner who is able to communicate with the citizens about the electoral process and to disseminate the information needed during the democracy transitional phase.

Mediated communication with the citizens through the ISI website could help the spread of technological literacy and contribute to the citizens autonomization.

6 Conclusions

With the LIS skills, we feel we helped the information specialists providing them with:

- Procedures of working allowing them to resolve technical problems;
- Technical tasks like analysis, description, evaluation, retrieval and diffusion of information;
- Documentary production tools and services which will be used by the users of ISIE;
- Collaborative work with staff of ISIE.

These skills offer them the possibility to manage information in the form of paper documents, electronic files and databases.

Finally, we can say that Information literacy, technological literacy and LIS skills value different skills and develops mixed profiles among staff who develop a sense of document (historian) and organizational skills (information specialist and the technology specialist).

Some difficulties are worth mentioning related to relationship among the ISIE information specialists. It was difficult for the experts to settle a faithful climate which could encourage fluent communication between persons who are not used to working together.

Further steps in this study will try to give answers to the next hypothesis:

1. Political contingent decisions are a critical factor which could influence the ability of the new electoral authority staff to capitalize information literacy, technological literacy and LIS skills.
2. A new electoral authority experience of a transitional democracy can be transferred to a similar context with certain conditions. Research in this field could be of precious help to politics mainly in the spring Arab countries.

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Digital Rights for Digitally Literate Citizens

Daniela Živković¹, Aleksandra Horvat¹, and Vesna Čučić²

¹ Faculty of Humanities and Social Sciences
University of Zagreb, Ivana Lucica 3, Zagreb, Croatia
{dzivkovi, ahorvat}@ffzg.hr

² Dubrovnik Libraries, Croatia
vesna.cucic1@du.t-com.hr

Abstract. The aim of this paper is to show that digital literacy should be understood in a much broader sense than is the case now, and that its full achievement is impossible if new digital rights are not introduced in society and understood and accepted by citizens. To prove their presumption that little is known about digital rights even among students, the authors conducted small-scale research among LIS and non-LIS students at two different universities in Croatia - the University of Zagreb and the University of Dubrovnik. On the basis of the findings, the authors concluded that LIS educators and librarians have special responsibilities as regards digital rights: educators should reformulate study programmes and incorporate the topic of digital rights, while librarians should strive to speak for their users and incorporate users' rights into library legislation.

Keywords: Digital literacy, digital rights, e-book, LIS education, library legislation, Croatia.

1 Introduction

In 2010 the new European strategy *Europe 2020* [1] was launched by the European Commission in order to prepare the European economy and European societies for the next decade. The strategy acknowledges the key role of information and communication technologies and deals with it further in a document titled *A Digital Agenda for Europe* [2] in which proposals for action that need to be taken by 2020 are made. All public and commercial services should become available in the digital environment. Much of the content accessible today in cultural institutions such as libraries, archives and museums should also become available in digital format. To achieve this, the Digital Agenda envisages the creation of a trustworthy and secure environment, fast and ultrafast Internet access, and the enhancement of digital literacy and skills of citizens. The implementation of the aims of the Digital Agenda will certainly have a serious impact on European citizens. Closely linked to the Digital Agenda is *Horizon 2020* [3], a new research and innovation programme, due to start in 2014, which reiterates the need for the development of inclusive, innovative and secure societies and emphasizes the need to ensure cyber security, trust and privacy.

The prerequisite for digital inclusiveness is the acquiring of digital literacy. The aim of this paper is to show that digital literacy should be understood in a much broader sense than has been the case so far and that its full achievement is impossible if new digital rights are not introduced in society and understood and accepted by citizens.

2 Digital Literacy

According to Bawden [4], the term digital literacy first appeared in the 1990s and was used to denote an ability to read and understand hypertextual and multimedia texts. Further meanings of the term developed over time and it has also been used to convey the meaning of traditional literacy (reading, writing and understanding) in a new digital surrounding. However, it should be kept in mind that the term appears along with a multitude of similar terms which might contribute to uncertainty and insecurity in its use. Sometimes it is used interchangeably with terms like information literacy, media literacy, Internet literacy or even AV literacy [5-8]. Bowden [4] goes on to show how the terms information literacy, computer literacy, library literacy, media literacy, network literacy, Internet literacy and digital literacy have gradually come into use since 1980 and provides an extensive interpretation of the meanings of these terms based on a survey of professional literature. The appearance of various kinds of skill-based literacies in recent years is often related to the increasing complexity of information and technological development. However, some authors point out that literacies should not be considered as skill-based only, because they are also related to acquiring knowledge. Some authors emphasize the importance of critical thinking in assessing information as a component of literacy. Dobson and Willinsky [5] state that digital literacy has democratic qualities because it allows everyone not only to read, i.e. to receive, but also to send, i.e. to speak out and make one's views widely available. For Koltay [6], acquiring different literacies means feeling comfortable with all media and developing a critical approach as regards the quality and accuracy of content. He defines digital literacy as an ability to read and understand information from a variety of digital sources. But he also emphasizes, and to our mind rightly so, that apart from reading and understanding, the ability to publish and communicate information should be a part of digital literacy. Sourbati [7] describes the drive for universal access to services in the European Union and validly comments that access to the Internet is a broader concept than service. Therefore, physical access to the Internet and connectivity are not adequate to fully understand media use. According to Sourbati, access policies have to be reformulated on a local basis for certain groups of the population. A more recent and extensive survey of scholarly literature on new literacies was conducted by Potter [9]. In his view, authors use the terms more or less to suit the purpose of their papers. Speaking about media literacy, he states that it should be understood as political, social and cultural practice. Apart from developing skills, it requires acquiring knowledge about the digital surrounding.

More and more often, authors investigating media literacy or digital literacy agree that physical access to the Internet and developing computer and communication

skills are not sufficient to achieve digital literacy. Acquiring knowledge about the digital surrounding appears as a legitimate component of digital literacy [8].

In this paper, the authors will attempt to show that digital literacy based on a set of skills and the knowledge needed by an individual to feel at ease in digital surroundings also requires determining and agreeing on certain rights belonging to every participant in society. The EU idea of inclusive societies and the importance of making citizens digitally literate in order to be able to receive services are acceptable provided that those who seek and receive these services know the conditions surrounding their provision. However, this seems not to be the case at present, because individuals either use the services offered without an adequate knowledge of the consequences of their acts, or, as in the case of e-books, a service cannot be obtained at all.

3 Digital Rights

Digital rights may mean different things to different people. Postigo [10], for instance, describes the situation in the United States and the development of digital rights organizations which take a stand in specific cases when individuals have been taken to court by the content industry allegedly for infringement of the law in the digital environment. However, the term is prevalently used to denote the rights that allow individuals to access, use, create, and publish digital media or to access and use computers, other electronic devices, or communication networks. The term is particularly related to the protection and realization of existing human rights, such as the right to privacy or freedom of expression, in the context of new digital technologies, especially the Internet [11]. EU documents often use the term, but strangely enough in the 2012 Code of EU online rights [12] the word online (not digital) was used. The Code contains the basic set of rights and principles enshrined in EU law that protect citizens when accessing and using online networks and services. It is not enforceable in itself, but serves as a sort of reminder that certain rights are guaranteed for citizens, but are scattered over various directives, regulations and conventions. A set of rights applicable in the digital environment has been described by Horvat and Živković [13] who write about the right to access the Internet, the right to speak freely, the right to privacy and the right to be forgotten. Some of these rights have been considered to be basic human rights and have been known and accepted for some time, while others, like the right to be forgotten [14], have been introduced only recently as concepts and have yet to be adopted in practice. Similarly, the right to access e-books in libraries is a new concept born in library circles after publishers decided to deny access to e-books for library users. If this right is indeed denied, the traditional role of the library will be negated and its future becomes uncertain. Therefore, we believe that this particular right deserves more detailed explanation.

3.1 Right to Access eBooks

At its recent annual conference held in Copenhagen in May 2012, EBLIDA stated that libraries and citizens have very few rights due to the current situation in the e-book market and consequently launched the European Campaign for e-books in libraries

[15]. The aim was to draw the attention of politicians and citizens of the European Union to the disadvantages for libraries and their users. This action was strongly driven by the fact that publishers were reluctant to recognize libraries as customers of their e-books which could be lent to library users. At approximately the same time, IFLA released a Background Paper on e-Lending [16]. It set itself the task to identify e-lending models that provide the broadest possible access to e-books in keeping with traditional library values of collection development, user privacy and freedom of access to information. In 2013 IFLA put forward the Principles for Library eLending together with Principles for the Licensing/Purchase and Use of eBooks in Libraries [17].

It is a fact that the property rights model for print books is hard to apply to e-books, although it is generally agreed that a definition of the e-book should include both the digital nature of the e-book and analogy to the printed book. However, the concept of acquisition and use of the e-book indicates growing divergence from the printed book concept for which the property rights model is characteristic. E-book buyers visiting collections at e-book platforms are normally granted a licence to access e-books and only rarely can they buy a digital copy which becomes their property. Distribution rights for e-books are defined by the location of the online buyer, while for analogue books a physical place of sale is crucial. In order to achieve a favourable and consequently competitive environment for e-books, worldwide distribution rights for e-books purchased online should be established and the interoperability of formats across e-book platforms achieved. Cloud-based access to streamed e-book content will certainly increase accessibility of such content. E-books should be accessible, and the critical aspects of its use, like copyright and the privacy of readers, should be solved.

Accessibility depends on pricing which is conditioned by taxation like value added tax. Policy makers should consider harmonizing the VAT rate across physical and digital media for books. They also have to determine whether the e-book is a service or a product. The fixing of e-book prices by publishers as an instrument to protect culturally valuable content and diversity, applying restrictions to free market forces, is under consideration in both the US and the EU. The language diversity of e-book collections also appears to be a prerequisite for digital literacy.

4 Investigation

To prove or possibly refute the presumption that little is known about digital rights, even among students who could rightly be regarded as the true Internet generation, a small-scale investigation was conducted among LIS and non-LIS students at two different universities in Croatia in May 2013. Students were chosen as the target group because they use the Internet in both their education and recreation and are likely to possess the necessary digital skills for its use. A questionnaire consisting of 15 questions was developed in order to learn about their attitudes and expectations in the digital environment. Optional responses were offered to speed up the process of filling out the questionnaire, but an opportunity to fill in comments was also provided. The population investigated consisted of two groups: 68 students of LIS enrolled in

Zagreb University and 28 students of Art and Restoration studies in Dubrovnik University. As no significant differences in responses were found between LIS and non-LIS students, a decision was taken to present the overall results in this paper. It should be emphasized here that the sample of respondents is by no means conclusive for the whole student population in the country, but it is representative of respective classes of LIS students at Zagreb University and students of Art and Restoration at Dubrovnik University, and the findings might hopefully offer guidance to their teachers.

Students were first asked about the time they spent daily on the Internet. The overall number of hours spent on the Internet confirms the important role it has in satisfying the students' needs for education, recreation and information. More than one third of respondents reply that they spend between 3-5 hours per day on the Internet and no one spends less than 2 hours. They access the Internet mostly at home (77.1%; n=74); 34.4% (n=33) state that they use their mobile phones for access. Asked if the Internet should be accessible to all, the majority (89.6%; n=86) agree, and less than 10% chose *no* for a reply. It appears that students take it for granted that the Internet is open to all and that its contents are accessible free of charge. But when asked who has the right to control it, they are divided in opinions: a little less than one third of students (27.1%; n=26) would allow the government to control the Internet, approximately one third (37.5%; n=36) would give parents the right to control the contents used by their children, 14.6% (n=14) agree that employers have that right, 25% (n=24) are against anyone's control, while slightly less than 20% (n=19) cannot provide an answer.

Although well aware of possible intrusions in their privacy, they are active members of social networks (78.1%; n=75 are members of Facebook); nevertheless, the majority (72.9%; n=70) limit access to friends only, although according to their comments they are well aware that this restriction is insufficient to provide privacy. Surprisingly enough 19.8% (n=19) are not members of any social network and a few of them feel the need to explain and attribute their abstaining to the very fear of losing privacy. A total of 64.6% (n=62) agree that harmful content should be removed from the Internet, 26% (n=25) do not agree. Many of them add their comments, e.g. everything has to be accessible, examples of hate speech too; hate speech is an ambiguous concept; who will decide what is harmful?; each person should choose intelligent and useful content, and the smartest of them all: harmful contents cannot be eradicated, it is better to invest in education about them.

Asked if they download music from the Internet, the overwhelming majority (90.6%; n=87) reply that they do. Films are downloaded by 85.4% (n=82) of the students. Only a few (8.3%; n=8) state that they do not do so and add a comment such as: it is immoral, or such an act shows lack of respect for performers, etc. At the same time, 86.5% of respondents (n=83) have never paid for downloaded music or films.

The aim of the questions related to e-book use was to find whether students use e-books on the Internet at all and, if they do, under what conditions. The findings show 62.5% (n=60) use free e-books, 28.1% (n=27) use the password provided by the institution for access, 1.04% (n=1) pay for access and 22.9% (n=22) do not use e-books. As many as 94.8% (n=91) do not have their own e-book readers, while only 4.16% (n=4) have them.

5 Conclusions and Discussion

The limited sample of respondents does not allow for broader conclusions. However, to our mind, the answers obtained reflect very well the general attitudes of young Internet users in Croatia. The Internet is considered to be free and open to all and it should be so. The existence of harmful content is acknowledged, but opinions about whether it is justified to remove harmful content are divided. The content used is also regarded as basically free and if certain use requires payment, this is evaded. It is probably appropriate here to refer to the new “right to share” initiative of the organization Article 19 of April 2013. In the words of the organization, this is a right needed to balance copyright and freedom of expression [18]. Moreover, the initiative proposes a decriminalisation of non-commercial use of contents protected by copyright. There is no doubt that this proposal is in accordance with the expectations and behaviour of the majority of our respondents. It should be mentioned here that the right to share is certainly not among the rights mentioned in the EU Code of online rights, and that the use of copyright-protected content without authorization and payment is a critical issue in EU countries, as the recent adoption of the so-called three-strikes legislation in some member countries clearly shows.

Students learn about privacy on the social network, they understand its shortcomings, but tacitly accept the rules provided by the owner of the network. It should be borne in mind that owners of social networks are private corporations who determine the rules of behaviour on the network. Newspapers and Internet portals report daily about the dangers posed by the Internet and about users and even government representatives who request the removal of incorrect or unfavourable material and who do not succeed [19]. The right to be forgotten should be implemented, and users should learn about it as their right. As concerns the student population, we can only plead for information on personal data protection and guidance on behaviour on the net to be introduced in the curriculum of LIS, but also non-LIS, studies.

Students’ replies concerning the use of e-books and the possession of e-readers point to the low use of both e-books and the equipment needed for its use in the country. There are several Croatian e-book platforms available, but students mostly prefer to access or download free of charge and do decide not to buy an e-book which includes the online purchase and provision of access to e-books. Again, this finding is found to be correlated to the low level of digital literacy, but it can also be related to government policy on scientific research. Namely, the Croatian academic community is supplied with considerable subject collections of international titles in electronic formats through access and licensing models chosen and paid for by the Croatian Ministry of Science, Education and Sports. Libraries outside academia in Croatia are mostly involved in activities to allow access to local digital content already owned by them and to a lesser extent in developing platforms for managing e-books purchased from rightholders. In the Science and Technology Policy, the Croatian Government supports open access to publicly funded scientific information. Educational institutions opted for open access even before the Croatian Declaration on Open Access that was presented in October 2012 and that is accessible at the Hrcak

(Hamster), the open access scientific journal portal, which today hosts 330 Croatian scientific and professional journals.

Schools and universities are ideal places where knowledge of digital rights could be acquired. LIS educators have special responsibilities as regards digital rights; they should reformulate curricula and incorporate the topic of digital rights into them. At the same time, practicing librarians should strive to speak for library users and incorporate users' rights into library legislation.

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Digital Divide in Higher Education Students' Digital Literacy

Rita Santos¹, José Azevedo², and Luís Pedro³

¹ Águeda School of Technology and Management, University of Aveiro, Portugal
rita.santos@ua.pt

² Faculty of Arts/CETAC.MEDIA, University of Porto, Portugal
azevedo@letras.up.pt

³ Communication and Art Department /CETAC.MEDIA, University of Aveiro, Portugal
lpedro@ua.pt

Abstract. This article explores the Internet-use attitudes behaviors, and skills associated with digital literacy amongst students in higher education. A survey was administered using a sample of 148 first-year students and qualitative data was collected by means of 22 individual interviews and two focus groups. Elements of digital literacy such as confidence in sharing contents, privacy and protection, information literacy skills and ethicality/responsibility surrounding the access and use of digital information were analyzed from participants' online activities. The research was taken with a particular focus on online activities carried out by students within an academic context. From the data analysis it is suggested that there is some variation in students' online skills and these are not randomly distributed. These results are consistent with the idea that even among a highly wired group of young adults, the use of ICT does not necessarily mean 'meaningful use of ICT'.

Keywords: Digital literacy, digital divide, higher education students, Internet use.

1 Introduction

It would be incorrect to assume that by using the internet people develop or improve advanced online skills [1]. With this reality in mind, several European action plans and research have argued that the original digital divide in access has evolved to a digital divide in the type of engagement and skills to use the internet [2-5].

Drawing on the assumption that higher education students constitute the group that shows the most intense and varied use of digital media, these students are often associated with an image of "new millennium learners", a concept that aims to reflect the idea that students "[...] are expected to use a variety of digital media to a very intense degree, and for a vast range of purposes, including personal entertainment, personal and social communication as well as learning" [6]. However, it would be dangerous to assume that being deeply attached to the internet automatically transforms students into "new millennium learners" [6]. In several dimensions of

internet use, the digital divide exists [7]. Despite these concerns, pointed out in several studies on higher education students and internet use, there is little research providing a deeper understanding of the several dimensions of the digital divide among this specific group. As [8] notes, the study of a group with high levels of access to and use of the Internet, as is the case of higher education students, is ideal for studying nuances in usage because access differences can be controlled.

Departing from this discussion, this article explores the internet-use attitudes, behaviors, and skills associated with digital literacy amongst students in higher education. The following study is part of a wider research on the uses of internet by higher education students, with digital literacy being one of the dimensions of analysis.

2 Internet Use and Digital Literacy

The importance of individuals displaying a particular set of skills and knowledge when engaging with the digital surroundings, in other words, digital literacy, has been increasingly emphasized since it allows the access to opportunities and experiences that are beneficial in social, economic, political, health and cultural terms, either for themselves as individuals or for society [9-10]. As mentioned by [11] based on a 2002 research paper from Bonfadelli, “[d]ifferences in skill may also increase the “knowledge gap(...) A person’s ability to search online could also influence the kind of material he or she finds on the Web and thus influence the knowledge gap”.

For all these reasons, a growing research body has come to suggest the emergence of initiatives for the development of digital literacy, as well as considering digital literacy as one of the dimensions of analysis on the use of the internet. For example, in several studies carried out by the Ofcom on the use of the internet, not only were they able to ascertain the extent of the usage of the internet, but also determine the ‘depth’ of this use by collecting information regarding the attitudes and skills associated with the use people make of the internet [12].

The review of the research on digital literacy disclosed online shows that several approaches have been used to ‘measure’ the digital literacy of higher education students. Some studies ask students about the perception that they have about their own skills [13], whilst others develop and apply instruments intended to evaluate their actual skills¹. Additionally, some studies elaborate more closely on the attitudes and skills of high level digital literacy [13] and others on the more technical skills [14-16].

Considering the studies review, it was established that, overall, young adults and higher education students have a quite positive perception of their skills and appear to perform a set of activities that suggest digital literacy. The authors of a study with North-American higher education students claim that, generally speaking, the respondents consider themselves quite qualified in terms of information literacy when using the internet, with 80 % considering themselves experts or highly qualified in

¹ See, for instance, Hargittai and Hsieh (2012) who, in their article make recommendations for the development of questionnaires with a number of variable items, to be used in different populations with the ultimate goal of measuring the competences in the use of the internet.

surfing the internet effectively and efficiently. The study makes further reference to the fact that, overall, these positive perceptions are maintained despite age, gender, area of specialization in any given course and type of institution [13]. Also, an Ofcom study shows that 80 % of the individuals between the ages of 16 and 24 display a confident attitude when performing 'creative' activities like creating blogs or sharing photographs [12].

In most of these studies, the authors highlight the fact that men frequently evaluate their skills higher than women, despite similarities in actual skills [11].

3 Methodology

A paper questionnaire survey was used on 148 first year students, in which one of the sections required the students to evaluate elements of digital literacy such as confidence in sharing contents, privacy and protection, information literacy skills and ethicality/responsibility surrounding their access and use of digital information on the Web. The sample selection process was conducted so as to allow the analysis of the data by gender, education subsystem (university and polytechnic) and course of study area (technological and non-technological). Two focus groups with university system/ technological area students (group A) and with polytechnic system/ non-technological area students of (group B) as well as 22 individual interviews with the students that took part in the focus groups were carried out. In these interviews, some of the questions were connected with the skills, attitudes and knowledge of digital literacy associated with students' use, with a particular focus on online activities carried out within an academic context. Hence, by resorting to different instruments, we wanted to obtain a holistic and yet detailed vision of the studied problem, which is considered to be difficult to achieve solely with the use of a research instrument.

4 Results

The components of digital literacy in which the students display a more favorable opinion were: to be careful with the information provided online and the crossing of several sources to make sure that the information collected was reliable. On the other hand, being truthful when sharing online contents, and confirming the safety of the visited sites, are the components of digital literacy that obtain greater discordance (see Table 1). As to finding the information that is required in a quick way, there is a high percentage of respondents that neither agree nor disagree.

It became apparent that some characteristics significantly influenced the students' perception regarding their digital literacy. Girls display a higher level of agreement when seeking to respect the authorship rights associated with contents that others provide in the internet, which they intend to use. However, a superior percentage of boys show their concurrence when dealing with the capacity to find the necessary information more rapidly. Similarly, students of the university system as well as students of the technological areas appear to be more confident in what regards this last ability.

Table 1. Higher education students understanding regarding their digital literacy (%)

	Disagree/ completely disagree	Neither disagree nor agree	Agree/ completely agree
Confidant in sharing online contents such as videos, images, music, slides	12.8	37.8	49.3
Careful so as to avoid posting information that can be used to harm me	0.7	3.4	95.9
Careful to check if the sites I visit are safe	8.2	14.3	77.6
Try to respect the authors' rights associated with contents provided by the Internet	7.4	18.9	73.6
Crossing several sources of information in order to evaluate if the contents I find are reliable	2	6.8	91.2
Can find the information I need quickly	5.4	31.8	62.8

Through the analysis of interview data, other differences in attitude and online behavior among students became more evident.

The respondents seem to be less confident in posting comments, for instance in Facebook, than sharing contents. One of the respondents noted that 'it is evident that there is a lot of content sharing. Even if afterwards there are not a lot of people visiting and saying 'I am interested in seeing this', most people do not feel comfortable in commenting it. However, there is a lot of content sharing. On my part, I enjoy posting' - *female, group A, focus group*. Perhaps because they post comments or share contents more often than girls, boys seem to display more confidence in the making of these activities.

It was also observed that, despite the fact that students display a critical attitude towards the contents some people post online, take into consideration if the information provided online is used to harm them and display some understanding of the impact social networks sites can have in the life of each person, sometimes their actions on Facebook² did not reflect the viewpoints or attitudes they claimed to have or stand for. These situations were a little more evident in group B.

Another aspect studied were the concrete actions that students performed to protect and maintain a good online reputation. In addition to claiming to be careful with what they write in social networks, some of the students also referred that they only allow 'friends' to visualize and comment on the contents associated with their profile. Furthermore, to give proper attention to the information provided in the profile, and not make it public, and the selection of friend requests were two referred actions mentioned by the girls as being important for the students to protect their image in the online community: 'when I started, I used to post everything and more. I wrote where I was from. Now I don't do that, I removed some things.' - *Female, group B, focus group*.

The students that were interviewed do not come appear to be particularly sensible to the attention one must have when using contents provided by others and to the

² The authors were given access to the Facebook activity of the students that were interviewed.

ethical questions connected with the use of information gathered online, seeking refuge in the fact that they are developing assignments in an academic context.

Finally, the opinion of students on the easy access and information evaluation was deepened. When addressing digital literacy, this was the moment when the differences between the students of the two groups were more evident. The students belonging to the group A, maybe due to the fact that they had to perform research activities more frequently because of their study course, displayed a more confident attitude in the results of that same activity. They even mentioned that they frequently performed that activity to complement their study or other necessary tasks performed in an academic context. As to the students in group B, they displayed a perception about their ability to carry out efficient research far less confidently, having mentioned difficulties in the process of selecting the appropriate words for the research and in the filtering and evaluation of the information's reliability.

5 Final Considerations

Given the specificity of the collected data and the group of study, the task of comparing it with other studies becomes complicated.

It is important to note that some questions regarding the quantitative part of the study refer to the perceived skills instead of actual skills. Nevertheless, this limitation is somewhat counteracted by the interviews and the observation of activities carried out by students in Facebook, which allowed the authors to make their evaluation of the skills and attitudes of the students and obtain a more complete view of digital literacy in those that took part in the study.

This study allows us to understand that higher education students that took part in the study have a rather positive perception about some of their digital literacy skills and behavior, with higher percentages of agreement being obtained in both attitudes related to information-crossing in order to assess whether the contents that one can find online are reliable or not, and awareness regarding the information provided online. Considering this last aspect, the interviews and observation of Facebook activity suggest that the students may not fully understand the real impact of their activity in those social networking sites since, in the opinion of the authors, comments and contents are placed that are not in harmony with a responsible attitude that the students claim to have online.

There are, however, aspects in which the perception of the students is not so positive, for example, the confidence in posting online comments and with the ability to find information quickly.

The study revealed some differences in gender, teaching subsystem and course of study, although it is necessary to stress that a deeper statistical analysis should be made so as to comprehend if those differences are explained by those variables.

These results are, therefore, consistent with the idea that even among a highly digital group of young adults, "(...) [the] use of ICT does not necessarily entail 'meaningful use of ICT'" [17]. This has important implications for higher education institutions, which can have a key role in helping students meet the additional demands that society has placed on young people by developing new skills and attitudes valued in a networked and knowledge society.

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Bridging the Digital Divide with Changing Information Literacy Methods in Post-apartheid South Africa

Segarani Naidoo and Mousin Omar Saib

Durban University of Technology Libraries, Durban University of Technology,
Durban, South Africa

{naidoose,mousino}@dut.ac.za

Abstract. This paper reports on a study done at the Durban University of Technology (DUT). The aim of the study was to identify innovative teaching and learning methods that would accommodate the diverse student population in the IL classroom and to recommend guidelines for teaching and learning of IL. The digital divide is defined as the gap or divide between those with access to and skills in information and communication technologies (ICTs) and those without such access or skills. Qualitative and quantitative methods were used. Self-administered questionnaires were administered to 227 students from the Faculty of Health who were engaged in the IL module, Subject Librarians (SL) teaching IL and the Co-ordinator of the IL module from the Centre of Excellence in Learning and Teaching (CELT) at the Durban University of Technology were interviewed. The findings of this study could be applied globally.

Keywords: Information literacy, digital divide, user education.

1 Introduction

Higher education in South Africa has been transformed. Prior to 1994, higher education (HE) institutions had a homogeneous population whilst today a heterogeneous population exists. Students arriving at HE institutions come from diverse backgrounds. The digital divide, according to Cullen [1] has been defined as the gap that exists between those students with ready access to information and communication tools (ICTs) and those without such access or skills. South African HE institutions have students who fall into both these groups. The web-based learning environment makes ICT skills essential [2]. Post-apartheid HE institutions in South Africa have a vast majority of underprepared learners who grapple with ICTs and information skills.

Information literacy (IL) classrooms comprise students who have grown up with technology and those with limited or no exposure to technology. An IL classroom has students who can be described as “digital strangers” and “digital elite” [3]. Students who were not born into the digital world but had to adopt and adapt to the digital

world have been referred to as “digital strangers” [4]. The “digital elite” on the other hand are students who have grown up with technology and are accustomed to the digital world [4]. Sadly, the latter term does not describe post-apartheid South African HE environment, as many students, while born in the digital era, do not have prior experience or exposure to ICTs of today.

2 Background to Research

During the apartheid era education was separated along racial lines. Student bodies were homogenous by race as they had to attend segregated education systems. Today, the student population is heterogeneous by race, economic, educational and digital background. Patterns of segregation and unequal provisions led to inequitable student experiences by white and black students [5]. Apartheid education promoted segregated development, providing inferior education to previously disadvantaged groups [6]. The problem that this paper addresses is the impact of having students with mixed abilities in the same information literacy classroom, expecting them to achieve the same information literacy skills without frustrating students from either group.

3 Objectives of This Paper

The objective of this paper is to highlight the digital divide experienced in post-apartheid HE institutions and recommend methods to develop an educational environment that supports ICT development in South Africa and other developing countries by recommending teaching and learning methods that accommodate both the digitally advantaged and the digitally disadvantaged students.

4 Review of Related Literature

Interest in information literacy as a lifelong skill started in the 1990's and has expanded due to the information explosion [5]. IL is defined as the ability to identify the need for information; know the importance of accurate and authentic information; develop search strategies to assist in finding information; source information; evaluate information; use and organise information effectively [6]. IL as explained by Rippey [7] is not just the process of acquiring knowledge and doing research in a particular field but more importantly, retrieving and evaluating information responsibly. The majority of students entering HE institutions have little or no exposure to libraries and information resources and lack skills to utilise the technology and resources that are available at HE institutions [8].

The majority of students entering HE institutions received “apartheid designed education” which did not expose them to technology and digital information, as these schools were largely under-resourced [9]. South Africa is nineteen years into democracy, yet, the imprints of apartheid are still prevalent. Disadvantaged students

arrive at HE institutions without previous encounters with learning and information resources, making the role of the librarian more crucial in bridging the information gap.

According to a report by the Department of Basic Education, South Africa [10], from 5931 schools in KwaZulu-Natal, 1199 schools do not have libraries, and an astounding 4939 schools do not have access to computers. This is indeed a sad situation. This situation has resulted in having both 'digital elite' and 'digital strangers' in the same IL classroom. Many students entering HE institutions had no access to libraries or computers [11]. South Africa is a country that still experiences deep social divides and the digital divide is worsening.

In response to the explosion of information, the role of librarians has changed. Many libraries have had to rethink the roles of professional librarians. At the Durban University of Technology, Subject Librarians find that they are teaching information literacy to a mixed group of students.

The evolving environment demands that society constantly develops and enhances information and technological skills [12]. The information explosion resulted in widening the digital divide. The problem with the digital divide is not just restricted to third world countries. One of the main issues of concern is access and use of computers [13]. There is no consensus on the definition of the digital divide. It is pointed out by Romelia [14] that the disagreement arises from the existence of multiple definitions of the digital divide due to varying aspects to the digital divide. This paper, however, aims to address the inequitable access to ICTs and the lack of prior experience with ICTs.

5 Overview of Methodology

The methodology used to collect data included qualitative and quantitative methods. It was envisaged that triangulation would increase the validity of the study [15]. Self-administered questionnaires were administered to 227 of 303 Faculty of Health students, engaged in the information literacy module, interviews were conducted with the Subject Librarians (SL) who were teaching IL to these students, and a separate interview schedule was used to conduct an interview with the co-ordinator of the information literacy module from the Centre of Excellence in Learning (CELT) and Teaching at the Durban University of Technology (DUT). In addition, a wide variety of literature was consulted.

6 Findings and Discussions

The report by Department of Basic Education, South Africa [10] reflected that of 5931 schools in Kwa-Zulu Natal, 1199 schools do not have libraries and 4939 schools do not have access to computers. This report supports the findings by Naidoo [15] that many students entering HE institutions in South Africa do not have prior computer skills or experience and that many students have not encountered libraries before.

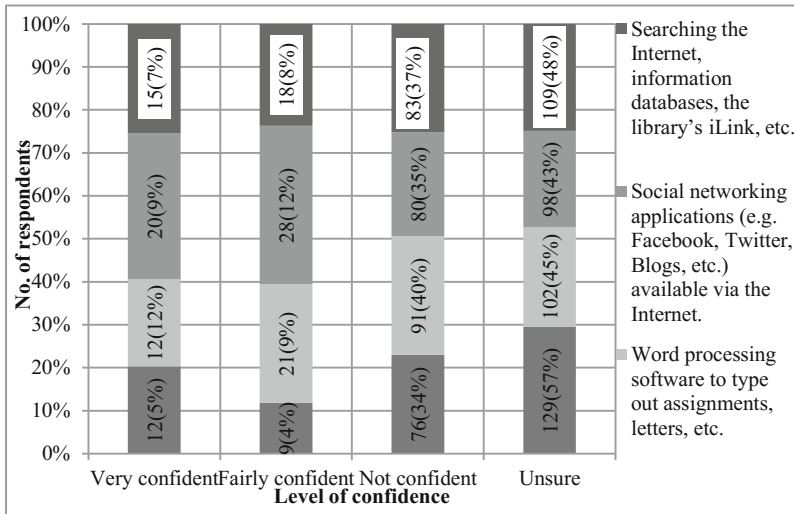


Fig. 1. Level of confidence in using different parts of the computer and other ICT applications

The survey done at the DUT of a total of 224 students revealed that 148 (66%) students had little or no ICT experience [15]. This indicates the grave digital disadvantage that students face at HE institutions in South Africa. Core to information literacy training is the need for students to be able to use ICT. However, basic computer skills, for example, keyboard, mouse, navigational, etc. skills are lacking.

The study further revealed that there is an equal number of students with and without access to computers where they live while attending university. Subject Librarians surveyed found that this situation hindered the delivery of the IL lessons. The IL co-ordinator agreed that having both the digitally advantaged and digitally disadvantaged in the same IL classroom could pose a problem to effective teaching and learning. The IL lessons often progress at a very slow pace due to having both of these groups in the same IL classroom.

Naidoo [15] also reported that 34% of the participants in the survey at the DUT were not confident in using the different parts of the computer and other ICT applications and 48% were unsure of their level of confidence in using parts of the computer and other ICT applications (refer to Figure 1). This clearly demonstrates that one can find an expert user in ICT applications as well as the digitally disadvantaged student, lacking basic computer skills, in the same IL classroom. This is a concern in any academic environment. Salinas' definition espouses that the digital divide is the disparity that exists between those who can use electronic information and ICT applications and those who cannot [14]. This is seen in the South African IL classrooms. Only (9%) of students surveyed indicated feeling confident or fairly confident in using the different parts of the computer and other ICT applications [15]. The survey found that only 21% of participants were confident or fairly confident in using social media applications. Are we then bridging the digital divide or are we widening it? The researchers of this paper acknowledges the importance of applying

current technological trends, however, this must be implemented in conjunction with other traditional methods.

The survey done by Naidoo [15] further revealed a large number of students (85%) were not confident or unsure of searching the Internet, information databases, library's online catalogue, etc. These are salient skills required to access information, yet these students lacked the confidence or were unsure of using information resources or ICT applications.

The study by Naidoo [15] lastly revealed that an overwhelming number of students (75%) agreed that creative teaching and learning methods would enhance the IL lessons thereby accommodating the digitally advantaged and digitally disadvantaged student.

It could therefore be established that IL must accommodate both the digitally advantaged and the digitally disadvantaged students by ensuring that the methods used in the teaching and learning of IL would accommodate both groups.

7 Recommendations and Conclusions

Important conclusions were drawn from this paper and based on this, recommendations are made:

- The inadequate resources provided in South African secondary schools have resulted in underprepared students entering higher education institutions, contributing to the digital divide;
- The lack of ICT experience by a significant number of students entering HE institutions has an impact on their participation in IL classrooms;
- Students should undertake computer literacy before information literacy equipping them with ICT skills;
- Active student-centred learning and teaching methods may interest the students in the IL classroom thereby encouraging participation by both the digitally advantaged and the digitally disadvantaged students;
- Creative teaching methods should be used in conjunction with traditional teaching and learning methods to accommodate the diverse groups of students;
- Games often result in learning taking place without students knowing that learning has taken place, accommodating both digitally advantaged and digitally disadvantaged students.
- Online tutorials are fairly new in the teaching and learning environment in South Africa. The advantage of online tutorials is that it allows students to work at their own pace;
- Group work provides students with a learning space free of intimidation, allowing students to communicate freely with their fellow classmates. Subject Librarians must ensure that groups comprise students of mixed abilities;
- Interactive websites could be used to facilitate learning of certain IL skills;
- Preferred teaching and learning methods should be used by librarians.

Although the study was confined to teaching and learning of information literacy at the Durban University of Technology, the issues and trends discussed in this paper could be applicable to other HE institutions and other developing countries.

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Media Competencies in the Context of Visually Impaired People

Monika Weigand¹, Johannes Zylka², and Wolfgang Müller³

¹ Vocational Training Centre for the Blind and Visually Impaired, Veitshöchheim, Germany
weigand@bfw-wuerzburg.de

² German Institute for International Educational Research,
Technology Based Assessment (TBA), Frankfurt am Main, Germany
zylka@dipf.de

³ University of Education Weingarten,
Media Education and Visualization Group, Weingarten, Germany
mueller@md-phw.de

Abstract. Information and media literacy are indispensable in the modern world. Only little attention has been paid to the specific aspects of information and media literacy suitable for disabled people, and specifically, for blind and partially sighted individuals. In fact, media and technology are even more important in the world of VI (visually impaired) people. Media literacy and skills imply personal independence and augmented quality of life. In this paper we analyze the necessary skills required by VI people to participate in the knowledge society. We relate these handicaps to additional skills and competencies necessary and link this to the current discussion on information and media literacy. Furthermore, we present general principles and concepts in teaching information and media literacy.

Keywords: Information literacy, media literacy, visually impaired people, competencies, assistive technology.

1 Introduction

Information and media literacy are accepted as indispensable in the modern world. For instance, the European commission highlighted in 2006 the importance of digital competence as a key factor for enabling lifelong learning for citizens in the knowledge society [1]. Various initiatives worldwide therefore seek to foster media literacy education, though there is not always agreement on specific skills that should be included, and there exist quite a few different proposals and approaches under terms such as information literacy, media literacy, or media competency (for an overview see [2]). As a consequence, the discussion on aspects to include is ongoing, and generally agreed and binding standards are mostly missing. Media and technology represent indispensable elements in the world of blind and partially sighted individuals (visually impaired (VI) people), and corresponding media literacy and skills are the essential basis for personal independence and augmented quality of

life. They enable VI people to take jobs, to communicate and to learn, and thus expand the world of blind and visually impaired persons in many significant ways. Without such competencies VI people will never succeed in the modern working world, because in most cases it's only the use of media and technology that enables them to do a certain job. In this paper we analyze the necessary skills required by VI people to participate in life in the knowledge society.

2 State-of-the-Art: Media Literacy, Accessibility and Assistive Technologies for Visually Impaired People

Only little attention has been paid to the specific aspects of information and media literacy suitable for disabled and, specifically for blind and partially sighted individuals. Alper [3] examines a theoretical overlap between approaches to the early literacy education of children with blindness and visual impairments and the New Media Literacies (NML) framework [4]. However, the analysis does not provide any concrete guidelines. Schiff [5] reports from own experiences in teaching information literacy for VI people.

2.1 Significance of Media for Visually Impaired People

With the development of personal computers approaches commenced to utilize these to support persons with disabilities by developing special assistive technologies (for an overview see [6]). The development of the Web Content Accessibility Guidelines (WCAG) represents a big step in the direction to ease access to web content for people with disabilities. They are the result of the Web Accessibility Initiative (WAI) started by the World Wide Web Consortium (W3C) in 1997. Since 2008 these guidelines have existed in version 2.0 [7]. They describe three levels of accessibility and rules to comply with these levels. The WCAG also provides detailed technical discussions and best-practices for achieving accessibility for web content.

The WCAG have been recognized as a de facto standard for providing accessibility to the web, and as such have served as a basis for legislation in a number of countries (see [8] for details). For instance, since 2001 the EU requires commission websites to comply to WCAG 1.0. In Germany, however, the BITV 2.0 (Barrierefreie Informationstechnik-Verordnung, Regulations for accessible information technology, [9]) based on WCAG 2.0 have applied since 2011. This illustrates the differences in legal regulations, but there is also a lack of regulations in large parts of the world such as India and China [10]. As a result, the compliance to accessibility standards is not widespread. For instance, Parton et. al. [11] found limited accessibility support for university and school district sites. For VI people this means that on a regular basis they still have to handle websites and technologies that have not been adapted to their skills.

Progress in the field of electronic assistive technology has been enormous during the last decade: Screen-reading software such as JAWS (Job Access with Speech, <http://www.freedomsci.de/prod01.htm>) or NVDA (Non-Visual Desktop Access,

<http://www.nvaccess.org/>) enables VI people to work effectively with many common computer programs and web technologies. Braille displays and speech output allow them to control what they write, screen magnifiers help those who are partially sighted, and video magnifiers and OCR software can even make written information accessible. VI people who have learned to use all these devices in an appropriate way, are able to reach a normal pace at working and turn out to be successful in working life [12].

Mobile devices partially did add to the support for VI people. Apple's iPhone and iPad are quite well accepted by such users due to the built-in accessibility technologies, such as VoiceOver, and the availability of a number of supportive apps for VI people, like magnifiers or color identifiers. Even standard applications such as Apple Maps in combination with GPS and VoiceOver prove very helpful, for navigating in cities. However, accessibility functions don't work with all types of apps. Again, this highlights that accessibility standards and assistive technologies do not provide the necessary support for VI people today, and additional skills and competencies are required to overcome technical and design limitations of media and information technology.

2.2 Handicaps and Media Competencies

As was shown above, media and technology are of very special importance in the world of visually impaired people. Assistive technology helps a lot to overcome existing barriers, but there are relevant handicaps for VI people that even optimal assistive technologies are unable to compensate:

- The use of the computer mouse, which is the most important input device, is out of reach for blind people as well as for users with a severe visual impairment. Only keyboard functions can be used. Have you ever tried to check your mails without using your mouse or touchpad?
- All graphic information is not accessible for blind people. Both screen reading software and speech output may only communicate text-based content.
- Moreover - probably worst of all - VI people don't have a screen overview, no fast survey, no quick understanding of the situation at a glance. All information must be collected line by line - a permanent loss of time that needs to be compensated.

To counterbalance these remaining handicaps when using modern media and information, VI people need a number of additional skills and competencies sighted people are not even aware of. Many of these requirements are of a technical nature:

- Fluency in typewriting is a fundamental requirement for VI people.
- Learning to read and write braille is indispensable. Like children in school VI people must step by step get familiar with this system for writing. It requires a lot of time, great patience and an enormous self-discipline to learn braille as an adult and to reach a satisfying proficiency in reading and writing.

- Using assistive technology means dealing with additional hardware like a braille display, a video magnifier or a scanner. Handling and operating these devices requires additional knowledge and practical skills.
- In addition to hardware devices VI people must also be familiar with additional software like screen-readers and speech output, screen magnifier or OCR-software.

In this way assistive technologies make computer workplaces complex and highly sophisticated. To handle all these technical devices professionally, visually impaired users must bring along or acquire during their training programs the necessary personal competencies:

- a lot of imaginative power to get a kind of mental image of the various screen layouts and program surfaces;
- a deeper technical understanding of how an application works;
- a better familiarity with the application's navigation, function and commands; and
- a remarkably high memory performance to keep all the necessary commands in mind that sighted users just see on a graphical surface.

This short overview shows that media and information literacy is a much greater challenge for VI people than for sighted users. Quite a lot of additional technical and personal competencies are needed to do a computer-assisted job. Computer training programs for VI people should therefore be planned and organized very carefully. The quality and the procedures of training programs largely determine the later success of VI people in working life.

2.3 Linking Media Competencies of Visually Impaired People to Theoretical Approaches to Media Literacy

Taking these considerations as a basis for structuring media competencies for VI people, the question remains how these are linked to the general discussion on media literacy and, in specific, competencies for Information and Communication Technologies (ICT).

Considering the German but also international discussion around ICT and media related competencies, one has to acknowledge a large variety of approaches, terms and understandings [13-15]. While in some countries the discussion around media literacy has existed for more than 50 years and started with media such as books or television, other countries have just begun looking at media literacy recently when rapid ICT developments created large job opportunities [2]. This basic distinction accounts for largely differing theoretical as well as practical approaches, which is – amongst other things – leading to discrepancies in terms of societal desirability.

Established theoretical approaches on media literacy and competency, for instance differentiate heterogeneous dimensions, largely depend on the understanding of the underlying term literacy. From an international view, the term media literacy can be seen as established, although it proves to have severe problems related to translation into different languages. On the other hand, the use of the term competencies is

moreover current in context of ICT-related skills and abilities and is – at least compared to the term media literacy – focusing more upon basic skills and therefore shall be used at this point.¹

With respect to the specific requirements of VI people, the focal point of the media competency concept should be moved away from dimensions such as critical thinking or knowledge of general tools towards basic knowledge and abilities related to the use of special ICT tools enabling participation in private and working life. In this way the media-related competencies of VI people fit quite well with concepts of media competencies [17-19], just differing in the detail of the necessary set of competencies.

3 Teaching Media Competencies for VI People

If - as we have seen - media and information literacy is of crucial importance for VI people, computer training programs are the key to success. Unfortunately there are no generally agreed and binding standards, no committed curricula and no generally approved and reliable teaching methods. Even the DBSV (German Association of the Blind and Visually Impaired People) [20] only provides a rather vague list of learning objectives and teaching methods. How can the above-mentioned additional handicaps be compensated? How can the additional competencies be taught?

Institutions in Germany for vocational rehabilitation nevertheless are quite successful in enabling VI people to handle computer and media and help them on their way back to the job. The Vocational Training Centre for the Blind and visually impaired people in Würzburg, for example, achieves employment rates of about 70 %. Experience shows that appropriate general conditions and the compliance with some basic teaching principles are responsible for this success.

3.1 General Conditions

In order to make training programs successful, some basic requirements must be met:

- The educational institution must have adequate technical equipment; hardware and software must be available in sufficient numbers for all participants. Computer and assistive devices must up to date and must work trouble-free;
- In entry-level courses, it is crucial that all workstations are set up and configured identically. All participants should have the same hardware, the same tools, the same screen readers and the same settings;
- The institution needs well-trained teachers who not only have the necessary computer skills, but are also familiar with all the electronic aids. Ideally, the trainer - though sighted - should also be able to complete all upcoming tasks blind;
- Therefore, it is highly advantageous to employ not only sighted but also blind teachers, who are able to demonstrate that the skills that are demanded of the participants are actually feasible;

¹ Although the term competency shall be used at this point, there also exist extensive discussions around this term. For a basic overview see [16]

- The training program must include sufficient time for practical application. Computer skills and media literacy can't be acquired theoretically, and VI people require sufficient time for practicing.

3.2 Teaching Principles

Apart from appropriate conditions it is promising to follow some leading teaching principles:

- Typewriting should always represent the first step. VI people definitively need a sufficient security in typing, otherwise input is too uncertain and too slow.
- Although modern screen-readers all include speech output, braille is indispensable. Especially beginners need a haptic response to their input. Braille output is more detailed and can be controlled more easily by the user. Moreover, working exclusively with speech has a negative influence on the students' orthography. When there is no mental image of the written word, it's very difficult to keep the correct spelling in mind. The student's spelling soon gets worse and worse.
- As learning to read and write braille definitively is a great challenge for an adult person, it is necessary to prohibit other output devices such as speech or screen at the beginning. Experience shows that students will never learn braille thoroughly as long as there is the possibility to check information per speech or on the screen. Later on speech is a very useful support for VI people - in fact most of the blind and visually impaired people chiefly use speech and only switch to the braille display when necessary [21] - but this is no reasonable way of working for beginners.
- Software skills, information literacy and operating assistive technologies cannot be separated, but have to be learned and practiced side by side.
- Software and media should be selected carefully. Software must be fully accessible and easy to handle, tasks should be very simple at the beginning.

4 Conclusion and Future Work

This article presented basic information on the connection of media literacy discourse and visual impairment. Media literacy is playing a major role in terms of bridging the existing gap of societal participation for VI people. Although vocational training centers achieve remarkable successes and are able to provide many VI people with the necessary competencies, much more could be achieved if the following serious problems were solved:

- There are hardly any reliable teaching materials that are accessible for visually impaired persons and match their special way of working;
- Software and media used in working life should all be accessible for assistive devices. Quite a lot of applications, tools, and websites still are not usable for VI people and therefore act as a barrier for integration in work;

- There is a serious lack of software developers who are able to prevent or remove such barriers;
- Financial restrictions are the reason for a lack of time in training programs;

This article presents ideas for amending existing concepts of media literacy and media competency. Hence, an internationally valid concept of media literacy and related competencies is necessary, to support teaching and assessment. Even though the basic dimensions of media literacy for VI seem to meet internationally discussed approaches of media literacy, further investigations on the peculiarities for individual VI people are necessary. Also, how media literacy of VI people can be accessed to meet the requirements of established quality criteria, needs to be addressed

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Media Information Literacy: The Perspective of Saudi Blind and Visually Impaired University Students

Maryam S. AlOshan

Imam Mohammad bin Saud University, Riyadh, Saudi Arabia
maoshan@imamu.edu.sa

Abstract. The purpose of the study is to shed light on blind Saudi students' media information literacy status and experiences. The study used International Media & Information Literacy Survey (IMILS). Blind people ranked major search engines such as Google and Yahoo as the top resource consulted, followed by social networks sites such as Facebook and Twitter. When evaluating information, currency and trust were the main consideration. The most common application tools used to support search process by blind people were microblogs such as Twitter and Voice over Internet Protocol (e.g., Skype) Blind people face many difficulties when undertaking a search, such as having to sort through all the irrelevant results, evaluating the outcome of the search, and narrowing down the area of search. Blind and visually impaired people are at greatest risk of being socially excluded as a result of poor access to information.

Keywords: Media information literacy, blind students, visually impaired students, Saudi Arabia.

1 Introduction

This paper aims to investigate the levels of media information literacy of blind Saudi college students. The purpose is to identify and understand how information literate they are, their media information literacy skills, and make recommendations to improve their information awareness. The scope of the research is to establish the nature of the media information status and experiences by Saudi blind and visually impaired people.

The research paper is structured as follows. It starts with a literature review on blind people's use of ICT and related research on their information literacy skills. Then the current research will be described which will be follow with a discussion of the findings and suggested recommendations for Saudi blind collage students media information literacy skills.

1.1 Background

We live in the information age where information resources are increasingly available; however, it is not always easy o find high-quality information in a fast and

affordable way. It is not enough to be able to use information technologies to find and manage information. An individual should not only be able to critically evaluate information but also be able to apply the information found to problem solving. The concept of information literacy was first introduced in 1974 by Paul Zurkowski, as "People trained in the application of information resources to their work can be called information literates" [1]. Recently, information literacy has been defined as a set of basic competencies that should be used by everyone [2]. The Chartered Institute of Library and Information Professionals CILIP in its latest definition of information literacy described it as "knowing when and why you need information, where to find it, and how to evaluate, use and communicate it in an ethical manner" [3]. People obtain information using all of their senses but sight is the most important sense, where 80% of information queried is found [4]. For blind and visually impaired people dealing with information using computers and other devices, they encounter not only conceptual difficulties of how to narrow down a topic when searching for information but also difficulties in adjusting themselves to the screen. Even more, at times they are not able to locate something as basic as the search button because of the design complexity of the screen.

1.2 Blind People Using the Web

There are millions of blind and visually impaired people around the globe for whom the Internet can be of great value because it makes them less dependent on printed materials. When using the web, blind people use screen readers such as JAWS and Window Eyes, which can be used with many other applications. Blind and visually impaired people, like any citizen in society, have the right to access online information for which E-Accessibility was introduced. This term refers to online web pages designed with disabled people's information accessibility needs in mind. Screen readers that are used by blind and visually impaired people should be able to interpret the website content, both text and images.

Unlike printed information, the World Wide Web empowers blind and visually impaired people as it allows them to browse information without needing help from others. It has been noted that the Internet is a major discovery after Braille technology because it provides information access to blind people as well as sighted people [5]. Blind people are now not only able to access information but also to participate in online social media in unprecedented way [6].

It had been noted that the opportunity of blind people to communicate with both disabled and nondisabled through social media could compensate for the low functionalities they face. Social media is an important communication tool for blind people, enabling peer to peer support. However, blind people believe some social media tools are complex and hard to follow, making it a necessity to train them [7].

1.3 Media Information Literacy

There is a rising concern relating to students' information seeking strategies and the level of information literacy [8]. Information literacy is defined as "set of abilities

requiring individuals to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information” [9]. Students' information literacy is the subject of numerous studies and research resulting in several models and indicators for measuring their competency [10-12].

There is little research on the media information literacy levels of young blind people. Young people are exposed to a wide range of information and media content through a variety of channels, and they incorporate electronic information and use social media much quicker than expected, raising the question of how media information literate they are?

According to [13] there is no standard definition of MIL universally, however, information and media literacy are very important tool for individuals, and societies', development. It prepares them with the necessary competencies required to engage effectively with both information communication technologies and media information systems. An information literate citizen of a society is able to search for, assess and create information content effectively for their personal and social needs. In IFLA media and information literacy recommendations it is noted that MIL "consists of the knowledge, the attitudes, and the sum of the skills needed to know when and what information is needed; where and how to obtain that information; how to evaluate it critically and organize it once it is found; and how to use it in an ethical way"[14]. For every citizen in the new increasingly developing information societies MIL is seen as a fundamental human right. Even more, for blind people the skills of MIL could act as empowering force by bridging the digital gap that divides the haves and have-nots.

2 Participants and Survey

This research was conducted on blind and visually impaired students attending Riyadh universities of which there are approximately 300 total. Participants were

Table 1. Profile of participants of completed surveys (n=46)

Variables	Value	Frequency	Percentage (%)
Gender	Male	13	28
	Female	33	72
Age	18-20	12	26
	21-29	28	61
	30-39	6	13
Level	Preparation year	4	9
	First year	11	24
	Second year	8	17
	Third year	7	15
	Forth year	16	35

approached in many ways: through universities' centers of people with special needs, their emails, and email lists, which generated 46 responses.

The online questionnaire (in Arabic) was adopted from the International Media & Information Literacy Survey (IMILS), which was designed to provide information about the views of participants on media and information literacy [15]. It was translated into Arabic language and formatted using Google Docs since it best to use with the screen readers that are used by the blind. The survey starts by assessing the media and information literacy skills possessed by participants along with some demographical information. It then investigates the difficulties they face to use information successfully.

3 Findings and Analysis

When asked about which topics they have searched in the last six months from a list of eleven general topics, searching for social contact comes at the top (n=33; 12%), followed by spiritual information (n=32; 11%), finding news/current events (n=30; 11%) and purchasing something (e.g., product or service) (n=29; 10%). At the end of the scale blind students searched least possible housing locations (n=16; 6%) and career related information (n=16; 6%). Only 19 participants searched for information which might help them to plan a trip or for travel information. 7% reported that they searched for advocacy information such as finding out about different political/social causes.

Almost all participants (94%) turn to search engines as their top resource for use in their daily lives. Blind people depend a lot on friends and family, which ranked second (78%) from the top of the scale. Surprisingly, participants turn to social media contacts for information (67%) very frequently. However government websites and both the library and librarians were relied on infrequently and were ranked the lowest when looking for information for use in their daily lives.

One of the criteria used to evaluate information on the web is timeliness and authority. Participants were sensitive to whether a website's information dates of publication were current or out of date. They ranked currency (up to date) the highest priority (n=31) and author's credentials the second (n=26) when it came to evaluating web resources. Another criteria participants used to evaluate the accuracy of information found on the web is citation (n=24) and the subjectivity of the author's opinion (n=22) followed by how familiar is the website to the user (n= 21). Again, at the end of the scale of evaluation criteria participants showed no interest in knowing if web resources had been mentioned by a librarian or the origins of an URL address.

More than half (n=25) of the students reported that the most difficult challenges of everyday life searching is knowing whether the sources found are credible. Participants' acknowledgment of this difficulty is an indicator of their behaviors regarding efforts to validate found information.

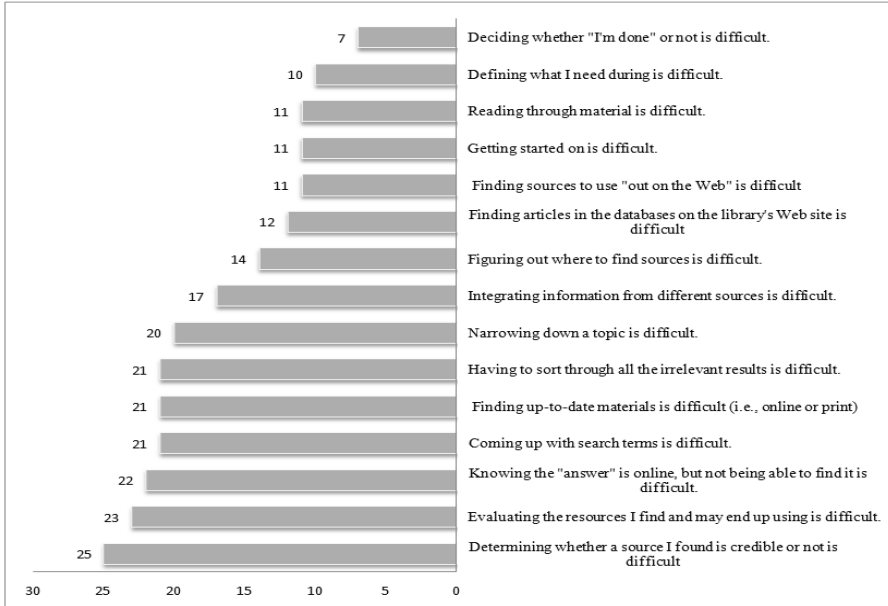


Fig. 1. Difficulties faced in everyday life searches

Another frequently reported problem that blind students have (n=23), which is also linked to the previous one, is the ability to evaluate information. Knowing that the answer for an everyday life query is online but not being able to find it (n=22), come up with effective search terms (n=21), and sorting through all the irrelevant results (n=21) are some of the problems that more than third of our blind participants reported having. However, starting a search, defining it, and ending the search were ranked as the least difficult tasks.

As expected, during the last six months the most common application tools used by blind people in this study to support their everyday life search queries were microblogs such as Twitter and Facebook (n=32, 70%), followed by Voice over Internet Protocol (e.g., Skype) (n=28, 61%) and blogging (e.g., LiveJournal) at the rate of (n=23, 50%). The least commonly used tool (n=8, 17%) were photo sharing site such as Flickr and Photobucket.

4 Conclusions and Discussion

Findings show that major search engines were used as the main source for everyday information needs, with Google accessibility features containing keyboard shortcuts and screen reader support. This was anticipated. The fact that participants consulted librarians and the library shelves less is maybe due to the low priority of university libraries to provide services to blind and visually impaired students. Government websites as a source of information was very low in the ranking is also an expected

outcome since very few government websites worldwide have some form of disability access [16].

Generally, the study found that Saudi blind students have fair level of media information literacy skills. Social media tools that contain user-generated content and is published and shared via a social environment was favored, but not all social media tools are suitable and user-friendly for disabled persons [17]. Findings show that Saudi blind collage students most frequently use blogs, wikis, and social media network, which allow the consumption and production of content in non-traditional formats. However, sorting and assessing this large amount of information proves very difficult for the participants. Assessing information involves critical thinking and decision-making skills to validate information resources based on evaluation criteria of its credibility, and usefulness. Participants were not confident in their abilities to evaluate the accuracy of information found over the web. Comparatively, these difficulties were reported as major issues found in many previous studies [18-19], [8] about collage students when searching for information over the web for both course related and everyday life needs. Information literacy here is not just about accessing the information and being able to find it, it moves beyond to the ability to critically assess information found on the web. A higher level of information processing where users need to be selective is an essential tool which blind participants in the study rate as their most challenging skill when searching for everyday information.

Finally, to survive and be an active citizen in the society blind people need not only to have access to information and knowledge but also to communicate with the rest of the society. The connection to both content and people improves the quality of their lives. This study has generated some interesting findings, and it needs further investigation and analysis of the data. Media and Information Literacy is recognized as a lifelong learning process and a main component of individual development and empowerment. It could be concluded that blind and visually impaired people are at the greatest risk of being socially excluded as a result of poor access to information. Preparing a national strategic plan for Blind Media Information Literacy is a very important for their social inclusion.

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Digital Library Training for Elderly Students at the Open University of Japan

Makiko Miwa, Hideaki Takahashi, Emi Nishina, Yoko Hirose,
Yoshitomo Yaginuma, Akemi Kawafuchi, and Toshio Akimitsu

The Open University of Japan, 2-11, Wakaba, Chiba-shi, Chiba, Japan
{miwamaki,hide,nishina,hirose,yaginuma,kawafuchi,
akimitsu}@ouj.ac.jp

Abstract. The Open University of Japan (OUJ) offers distance-learning programs through courses broadcast by TV and radio, in addition to face-to-face courses offered at 50 study centers nationwide. Recently, the OUJ started to implement ICT, including Web-based delivery of courses and online registration, but these options have not been fully utilized by students. This is mainly because some older students at the OUJ had little experience in using PCs and/or the Internet. To prepare students to use the Internet and maximize Web-based learning opportunities, the OUJ began offering a digital literacy training (DLT) course at each study center in October 2010 as a 12-hour intensive course, using standardized teaching materials and a common syllabus. A series of checklist surveys was conducted before and after each course to measure the learning outcomes and perceived self-efficacy of the students. Learning outcomes and student perceptions of their digital skills were significantly improved.

Keywords: Digital literacy training, faculty development, lifelong learning, information literacy for adults.

1 Introduction

Digital literacy is a component of the concept of information literacy which was initially defined in 1974 as ‘techniques and skills’ known by the information literate ‘for utilizing the wide range of information tools as well as primary sources in molding information solutions to their problems’ [1]. The expansion of virtual environments in the early 21st century have gradually shifted the world toward a knowledge economy in which people need to keep learning, even after graduating from formal education, to cope with the rapid changes in society. In response to social reform, the concept of information literacy has expanded to include digital literacy, network literacy, media literacy, and library literacy for lifelong learning [2]. Digital literacy, the ability to locate, organize, understand, evaluate, and analyze information using information and communications technology (ICT), has become increasingly important in knowledge-based societies, which call for lifelong learning. It involves a working knowledge of current ICT and its use. Digitally literate people can communicate and work more efficiently by using their knowledge and skills of ICT.

The Open University of Japan (OUJ) offers distance-learning programs through courses broadcast by TV and radio, in addition to face-to-face courses offered at 50 study centers nationwide. The rapid popularization of the Internet and the progression of information and communication technology (ICT) have provided virtual environments for e-learning, the online provision of distance courses using networked computers and mobile devices. Recently, the OUJ started to implement ICT, including Web-based delivery of courses and online registration, but these have not been fully utilized by students. This is mainly because some older students at the OUJ had no formal training at their compulsory education (1-9) and had little experience in using PCs and/or the Internet. To prepare these students to use the Internet and maximize Web-based learning opportunities, in October 2010, the OUJ began offering a digital literacy training (DLT) course in classrooms with networked personal computers at each of 50 study centers. Lecturers from the OUJ headquarters taught a 12-hour intensive DLT course at the study centers each year, using originally developed standardized teaching materials and a common syllabus. The OUJ began offering a similar but more advanced DLT course on TV in April 2013 based on the shared experience on classroom teaching of DLT. This paper reports the process of collaboratively planning, developing, offering, and evaluating the DLT course with instruments we used, as well as its' impact to students.

2 Related Studies

The term “digital divide” refers to the fundamental gap between those who have access to computers, the Internet, and online information. Studies reported older age as one of the significant sources of the digital divide in addition to gender, salary, education, and professional practices [3-5]. Schaffer [5] proposed that a generation-specific media use reflects what they learned during adolescence and with the media available at that time. Other studies identified cognitive abilities, computer self-efficacy, and computer anxiety as mediators of age and digital divide [6].

On the other hand, Dickinson and Gregor [7] reported that the access to computer has no demonstrated impact on the well-being of older adults, based on the review of literature which claimed computer and Internet use has positive effects on the well-being of older people.

However, access to information resources on the Internet is necessary for older people even after retirement. For example, older students who are studying in e-Learning environments are expected to use digital libraries, internet search engines, word processing software, spreadsheets, and presentation software on the same level as younger students.

3 Characteristics of OUJ Students

In Japan, DLT was embedded in formal education in 2002, when it was incorporated into the official Course of Study for elementary and junior high schools. As a result, the digital literacy skills of freshmen in Japanese colleges increased dramatically and

by 2006 the majority of new students could use computers to type, write papers use word-processing software, create tables and graphs using spreadsheets, and prepare presentations [8].

The age distribution of the students of the OUI are presented in Figure 1.

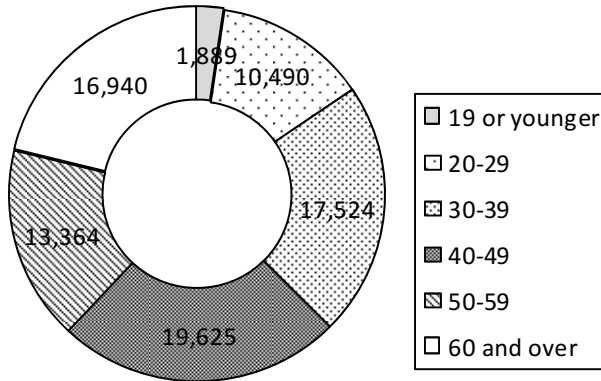


Fig. 1. Age distribution of OUI students (as of Spring, 2012)

Older students did not receive DLT during their formal education in their adolescence or early adulthood more than 30 years ago. Although they may have acquired digital literacy skills at work or during self-regulated learning, it is likely that the majority will have relatively poor ICT skills. These student characteristics, and the urgent need to prepare students to be able to take Informatics classes, have resulted in the OUI headquarters establishing the Taskforce of Information Literacy, a group of instructors who will initiate the introduction of DLT for OUI students.

4 Methods and Results

This section introduces the course design, characteristics of classroom DLT students, and instruments used for formative evaluation of skill and knowledge learned by the students.

4.1 Course Design

The DLT Taskforce was formed in December 2009 to plan and prepare for the course. The goal of the DLT course is to prepare students to be able to utilize the OUI's virtual environments, and to provide the basic ICT skills required for taking informatics course. We assume that hands-on training is necessary for students to learn how to use computers and the Web. Once they learn how to access the OUI's virtual environments through the Internet, they should be able to acquire higher-level ICT skills by taking e-learning courses online. Thus, we planned to offer

a face-to-face digital literacy course, ‘Beginner’s Course in Personal Computers’, once a year at each of the 50 study centers located in the prefectures of Japan.

We developed a common syllabus (Table 1) for the DLT course in the early taskforce meetings. We held the first faculty development (FD) seminar in September 2010, where we used presentation slides and demonstrations to teach the 24 lecturers at the OIJ headquarters on how to teach the DLT course. The first DLT course was offered in October 2010. We asked lecturers to share their teaching experiences and suggestions for improvements using OIJ groupware called ‘Cybozu’, and held a series of FD luncheon seminars between November 2010 and February 2012.

The DLT course was designed as a two-day (12-hour) course of intensive classes, including hands-on training as described in Table 1.

Multiple teaching assistants were employed at each study center to help instructors with the hands-on training. We suggested that study centers assign teaching assistants to individual staff members so that they could provide feedback after the class.

Table 1. Outline of the syllabus

Course Name	Beginner’s Course in Personal Computers
Course Description	This course is for students to learn to use a PC for the first time. It includes learning how to use the keyboard and mouse, how to find information on the Internet, how to use e-mail, and how to use Word and PowerPoint. Students will be able to access ICT at the OIJ, including Wakaba, Campus-Net, and Digital Library Services.

4.2 Age Distribution of DLT Students

In total, 755 students attended the DLT course between October 2010 and August 2011. Their age distribution is presented in Figure 2. Distribution of classroom DLT students’ age is higher than general distribution of students’ age. Thus, we can declare with some confidence that older students who are likely to lack ICT skills tend to attend the classroom DLT course.

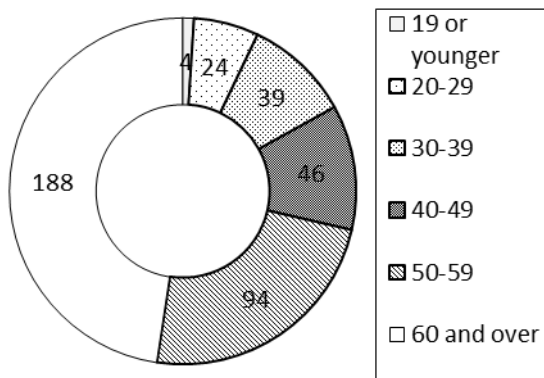


Fig. 2. Age distribution of DLT students (as of Spring, 2012)

4.3 Formative Evaluation of DLT Courses

We developed a checklist to measure students’ digital literacy skills for each learning outcome. The students completed checklists before and after the intensive course to measure the attainment of their learning goals on a five-point Likert scale, and their perceived self-efficacy on a four-point Likert scale.

Table 2. Students’ learning outcomes (numbers in italics indicate statistically significant improvements)

Learning Goals	Fall 2010						Spring 2011					
	Before			After			Before			After		
	N	<i>M</i>	SD	N	<i>M</i>	SD	N	<i>M</i>	SD	N	<i>M</i>	SD
Able to boot, logon and logoff study center PC	358	<i>2.73</i>	1.46	360	<i>4.21</i>	0.98	378	<i>2.89</i>	1.46	381	<i>4.31</i>	0.93
Able to input Japanese letters using keyboard	364	<i>2.73</i>	1.46	360	<i>4.15</i>	0.87	383	<i>3.51</i>	1.23	386	<i>4.30</i>	0.81
Able to run application software	351	<i>2.67</i>	1.38	354	<i>3.91</i>	1.03	372	<i>2.78</i>	1.42	384	<i>3.95</i>	1.11
Able to access OUI’s website	360	<i>2.82</i>	1.51	361	<i>4.17</i>	0.97	380	<i>2.95</i>	1.52	386	<i>4.20</i>	0.98
Able to search for information using search engine	358	<i>2.69</i>	1.45	354	<i>3.89</i>	1.05	383	<i>2.80</i>	1.43	383	<i>3.89</i>	1.08
Able to exchange e-mail using OUI’s account	363	<i>1.89</i>	1.29	353	<i>3.61</i>	1.19	382	<i>1.96</i>	1.32	387	<i>3.67</i>	1.20
Able to change own password at OUI	362	<i>2.05</i>	1.39	358	<i>4.03</i>	1.06	384	<i>2.25</i>	1.48	384	<i>3.91</i>	1.25
Able to access Campus Network Homepage	361	<i>2.65</i>	1.55	358	<i>4.22</i>	0.97	385	<i>2.78</i>	1.56	387	<i>4.26</i>	1.00
Able to access OUI’s courses on the Internet	362	<i>2.35</i>	1.57	359	<i>4.06</i>	1.11	384	<i>2.43</i>	1.56	388	<i>4.09</i>	1.11
Able to send questions at the OUI’s Q&A site	359	<i>1.74</i>	1.25	353	<i>3.29</i>	1.35	383	<i>1.78</i>	1.28	380	<i>3.43</i>	1.26
Able to track own records on Wakaba	364	<i>2.37</i>	1.56	360	<i>4.12</i>	1.07	384	<i>2.50</i>	1.60	386	<i>4.08</i>	1.17
Able to register courses on Wakaba system	362	<i>2.34</i>	1.56	356	<i>3.65</i>	1.34	383	<i>2.47</i>	1.58	384	<i>3.77</i>	1.38
Able to answer Web-based trial examination	359	<i>1.66</i>	1.20	353	<i>3.46</i>	1.34	384	<i>1.81</i>	1.32	383	<i>3.67</i>	1.31
Able to check out books using OUI’s OPAC	357	<i>1.62</i>	1.19	353	<i>3.55</i>	1.21	384	<i>1.75</i>	1.27	385	<i>3.66</i>	1.19
Able to counteract the computer viruses	360	<i>1.52</i>	1.03	353	<i>2.95</i>	1.33	383	<i>1.65</i>	1.17	380	<i>3.02</i>	1.35
Able to explain etiquette for using the Internet	364	<i>1.57</i>	1.03	354	<i>3.39</i>	1.12	381	<i>1.64</i>	1.14	385	<i>3.41</i>	1.13
Able to compose a simple essay using Word	365	<i>2.43</i>	1.29	361	<i>3.83</i>	0.98	385	<i>2.55</i>	1.31	386	<i>3.84</i>	1.05
Able to write and print out own documents	364	<i>2.79</i>	1.43	363	<i>4.08</i>	0.99	382	<i>2.97</i>	1.42	387	<i>4.10</i>	1.06
Able to copy, save, delete, and move files	366	<i>2.58</i>	1.39	360	<i>3.86</i>	1.00	384	<i>2.78</i>	1.37	387	<i>3.88</i>	1.12
Able to create 5–6 slides using PowerPoint	362	<i>1.53</i>	1.05	360	<i>3.51</i>	1.10	382	<i>1.63</i>	1.14	382	<i>3.59</i>	1.19

Statistical analysis was conducted to determine the attained learning outcomes and any changes in self-efficacy [9]. Although Likert-scale data are rank-ordered, for convenience, we calculated the mean values for pretest and posttest results as if they were interval scores. We then performed a Wilcoxon signed-rank test, a nonparametric alternative to the t-test for correlated samples, to identify whether there were significant improvements in attaining learning objectives and improving perceived self-efficacy. Cases with missing values were removed from the analysis.

Table 2 presents the differences in students' perceived levels of skills between pretest and posttest for 20 learning goals. Values under the M (mean) column indicate the statistical difference ($p < 0.001$). All 20 measures for students' study outcomes were significantly improved. Table 3 presents the differences in students' perceived levels of self-efficacy between pretest and posttest for five items. Values under the M (mean) columns indicate the statistical difference ($p < 0.001$). Four measures of students' self-efficacy showed significant improvement. The fourth measure (PC is useful in everyday life) did not improve significantly, but the improvement approached significance ($p < 0.0013$). The results indicate that the DLT course was successful. Students reported that they were eager to learn how to use a PC and would actively use the PC after attending the course.

Table 3. Students' perceived self-efficacy (numbers in italics indicate statistically significant improvements)

Perceived Self-Efficacy	Fall 2011						Spring 2011					
	Before DLT			After DLT			Before DLT			After DLT		
	N	<i>M</i>	SD	N	<i>M</i>	SD	N	<i>M</i>	SD	N	<i>M</i>	SD
Using a PC is enjoyable	360	<i>3.01</i>	0.76	358	<i>3.42</i>	0.67	369	<i>3.02</i>	0.82	383	<i>3.46</i>	0.70
The PC is useful for studying at OIJ	362	<i>3.55</i>	0.62	357	<i>3.79</i>	0.51	375	<i>3.59</i>	0.63	382	<i>3.82</i>	0.39
I feel anxious using PC	360	<i>2.58</i>	0.89	359	<i>2.43</i>	0.89	374	<i>2.68</i>	0.95	382	<i>2.36</i>	0.90
A PC is useful in everyday life	361	3.63	0.53	359	3.77	0.51	376	<i>3.66</i>	0.59	382	3.77	0.48
I would actively use a PC from now on	362	<i>3.65</i>	0.53	359	<i>3.72</i>	0.55	376	<i>3.70</i>	0.59	385	<i>3.73</i>	0.55

5 Conclusion

The OIJ began offering a digital literacy training (DLT) course at each of the 50 study centers in October 2010 in order to prepare students to use the Internet and maximize Web-based learning opportunities. Lecturers from the OIJ headquarters taught a 12-hour intensive course at the study centers each year, using originally developed standardized teaching materials and a common syllabus.

A series of checklist surveys was conducted before and after each course to measure the learning outcomes and perceived self-efficacy of the students. The classroom DLT course seems to have been successfully conducted in terms of in-class student performance as reflected by the checklists and the increase of students' ratio who registered courses using online system.

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The Information Literacy Self-efficacy of Disadvantaged Teachers in South Africa

Sandy E. Zinn

University of the Western Cape, Department of Library & Information Science,
Cape Town, South Africa
szinn@uwc.ac.za

Abstract. The aim of this study was to gauge teachers' information literacy self-efficacy thereby eliciting clues to possible gaps in teachers' knowledge and skills which could be addressed during an information literacy education course. Twenty nine teachers completed a pre-and post-course information literacy questionnaire. The teachers were part of a school librarianship programme offered at the University of the Western Cape. The results of the study indicate that the intervention of the course had a positive effect on teachers' information literacy.

Keywords: Information literacy, teachers, self-efficacy, South Africa.

1 Introduction

The South African school curriculum implies that schools have access to a range of information resources. One of the cross curricula outcomes states that learners will be able to collect, organise, analyse and critically evaluate information. The irony is that 80% of schools in the Western Cape Province, where the study was conducted, are without functioning libraries or librarians. The onus then surely rests on teachers to mediate information literacy (IL) in the classroom.

The researcher undertook to investigate teachers' IL using 29 volunteering teachers participating in an information literacy education (ILE) course, one course in a school librarianship programme. The participants came from a mix of urban and rural schools and their average age was 46 years. One common element was that the schools they represented are some of the poorest in the country and without school libraries.

The research questions asked: 1) What are teachers' beliefs about their information literacy abilities? 2) At what level are teachers' knowledge and skills? 3) How familiar are teachers with research protocols/practice? 4) To what extent can an intervention change teachers' information literacy outlook?

2 Self-efficacy

Self-efficacy can be defined as an individual's own beliefs about what he or she is capable of doing. A person's ability to actually achieve a goal is related to whether or

not that person believes that the goal can be successfully achieved [1]. The concept of self-efficacy is central to Bandura's social cognitive theory, which posits that personality is an interaction between three components: the environment, behaviour, and one's psychological processes. A person develops a sense of self-efficacy through actual experiences, observation of others' experiences and through listening to other people's commentary about the person's capabilities [2]. Self-efficacy is about beliefs and not actual skill levels. According to Bandura's theory, people with high self-efficacy believe they can succeed and are more likely to tackle difficult jobs thinking they can accomplish them. Alternatively, people with low self-efficacy believe that tasks are more difficult than they really are and tend to avoid them [1]. Self-efficacy beliefs determine the lengths to which people will persevere and how resilient they will be when faced with difficulties and how much effort they will expend on an activity [3].

Self-efficacy has been used in a variety of fields since Bandura developed the concept in 1977. For example, Schwarzer & Jerusalem's [4] health psychology generalised scale; Waldman's [5] study on freshmen's use of the library's electronic resources; the Pajares & Schunk [6] study of self-efficacy in academic achievement; and Kurbanoglu's [7] link between self-efficacy and IL.

The researcher had previously taught ILE to a group of teachers in a different South African province. The experience presented her with troubling questions about IL and teacher education, one of which was related to self-efficacy. The IL self-efficacy 28-item scale presented a way of identifying the *perceived* competency and confidence in IL. The scale is not intended to measure the actual IL capabilities of participants. The pre-test questionnaire assisted the researcher in determining a baseline of confidence in IL amongst the participants. High confidence levels are associated with positive outcomes. In academic studies it has been found that students with high self-efficacy beliefs achieve successful outcomes by increasing motivation, effort, and focus on the task at hand while decreasing anxiety and dispelling negative thinking [2]. These studies show that 'self-efficacy beliefs influence self-regulatory processes such as goal setting, self-monitoring; self-evaluation and strategy use'. The higher the self-efficacy of students the more likely they will aim their goals higher and their self-monitoring strategies will be more effective [6], [5].

Self-efficacy varies from one subject to another. For example, a person may have high self-efficacy beliefs in using printed information such as books and magazines but may have low self-efficacy beliefs in using online information. Self-efficacy beliefs are also not static and may change over time with different experiences and exposure. It was hoped that with different and positive experiences participants' self-efficacy in relation to IL would rise. Seventy six percent (76%) of the study participants teach in primary schools. These teachers trained before the new curriculum came into being in 1997. The training did not include IL nor did it provide a method for teaching children how to conduct research projects, a vehicle for developing IL. Participants were not expected to conduct research themselves so that conducting and writing up research was very new to them.

2.1 Links between Self-efficacy and Information Literacy

Pajares and Schunk [6] and Waldman [5] show through their studies that "self-efficacy beliefs influence self-regulatory processes such as goal setting,

self-monitoring; self-evaluation and strategy use". An information literate person embodies the attitude that learning is lifelong. To be a lifelong learner you need to be able to self-regulate – actions of independent learning and self-reflection come into play here. Such a person understands that the only constant in today's knowledge society is change. This person adopts a flexible approach to learning, aware that the information landscape is constantly changing. An IL person has traits that recognize that IL skills and abilities need to be honed and that excellence in knowledge production takes time and perseverance. An IL person in today's information society has a high self-efficacy because such a person can use an inquiry-based framework to read for understanding, ultimately creating new knowledge and understanding.

The developers of the IL self-efficacy questionnaire utilized well known IL standards and outcome statements emanating from the AASL [8], ACRL [9], SCONUL [10], and Doyle's [11] traits of an information literate person, amongst others [3]. The questionnaire addresses IL according to the following seven broad criteria: 1) Defining the problem (Section A); 2) Developing a search strategy (Section B); 3) Finding & gathering information (Section C); 4) Evaluating & using information (Section D); 5) Synthesizing information (Section E); 6) Presenting findings (Section F); and 7) Reflecting on the process and product (Section F). The Likert scale range is as follows: 7= almost always true, 6= usually true, 5= often true, 4= occasionally true, 3= sometimes but infrequently true, 2= usually not true and 1= almost never true.

3 Results of the Study

The questionnaire was developed and refined by Kurbanoglu, Akkoyunlu & Umay over a period of a few years (2003-2006). The 28-item IL self-efficacy questionnaire with a seven point Likert scale has a high Cronbach's alpha of 0.91. The correlation coefficient of the test-retest indicates reliability for the 28-item scale as high.

The null hypothesis of the current study is that there is no difference between the IL scores on the 28-item scale before and after the ILE course. Table 1 on the next page compares the mean scores per item (28 items) for the pre- and post-course IL self-efficacy for the 29 participants.

Both the pre-course questionnaire scores and the post-course questionnaire scores were taken from the same source of 29 participants with each data value in one sample having a corresponding data value in the other sample. By applying the Jaque-Bera test to the sample paired differences, the conclusion reached at 5% significance level ($p=0.05$) is that the population paired differences can assumed to be normally distributed. Thus, based on the mean summaries in table (1) above, the mean pre-course scores and the post-course scores are tested for significant differences or not.

With $d=24.7$ (the mean of the sample of paired differences) and $s=40.1$ (standard deviation of the sample of paired differences), then the t-test statistic = -3.3 and the critical value is $t=-2.8$ with 28 degrees of freedom, $p=0.005$. Therefore, because the critical value (-2.8) is larger than the test statistic (-3.3), the conclusion reached is that there is enough statistical evidence to suggest that the pre-course IL self-efficacy scores and the post-course self-efficacy scores are statistically different.

Table 1. Comparison of mean scores for the pre-and post-course IL self-efficacy (n=29)

Items		Pre-test		Post-test	
		μ	s	μ	s
A1	Define the information need	4.5	1.4	5.3	1.1
B2	Identify a variety of potential sources of information	4.7	1.1	5.3	1.1
B3	Limit search strategies by subject, language and date	4.5	1.0	4.9	0.9
B4	Initiate search strategies by using keywords and Boolean logic	4.3	1.2	5.1	1.1
C5	Decide where and how to find the information needed	4.7	1.2	5.3	0.7
C6	Use different kinds of print sources	5.0	1.6	5.5	1.1
C7	Use electronic information sources	4.4	1.5	5.5	1.2
C8	Locate information sources in the library	4.8	1.4	5.4	1.1
C9	Use library catalogue	4.4	1.8	4.8	1.3
C10	Locate resources in the library using the library catalogue	4.3	1.2	4.6	1.4
C11	Use internet search tools	4.3	1.8	5.3	1.0
C12	Use different kinds (types) of libraries	4.5	1.6	5.2	1.0
D13	Use many resources at the same time to undertake research	4.4	1.5	5.5	1.3
D14	Determine the authoritativeness, currency and reliability of the information sources	3.8	1.4	4.8	1.2
D15	Select information most appropriate to the information need	4.5	1.3	5.4	0.9
D16	Identify points of agreement and disagreement among sources	4.0	1.4	5.0	0.3
D17	Evaluate World Wide sources	3.7	1.4	4.9	1.1
E18	Synthesize newly gathered information with previous information	4.3	1.3	5.1	1.0
E19	Interpret the visual information (graphs, tables, diagrams)	4.5	1.5	5.2	1.2
F20	Write a research paper	3.5	1.4	4.8	1.3
F21	Determine the content and form the parts (introduction, conclusion) of a presentation (written, oral)	4.3	1.3	5.2	0.9
F22	Prepare a bibliography	4.2	1.5	5.4	1.3
F23	Create bibliographic records and organize the bibliography	4.0	1.4	5.2	1.2
F24	Create bibliographic records for different kinds of materials (i.e. books, articles, pages)	3.7	1.4	4.8	1.2
F25	Make citations and use quotations within the text	3.6	1.4	4.9	1.1
F26	Choose a format (i.e. written, oral, visual) appropriate to communicate with the audience	4.0	1.5	5.4	1.2
G27	Learn from the information problem solving experience and improve information literacy skills	4.1	1.3	5.5	1.0
G28	Criticize the quality of the information seeking process and its products	4.0	1.4	5.3	1.1

4 Interpretation of the Results

The pre-course and post-course questionnaire results are interpreted below:

4.1 Interpreting the Pre-course Questionnaire Results

The pre-course mean total of 117.6 (SD 31.7) or 4.2 in terms of the Likert scale indicates that the participants' self-efficacy was above average to begin with. The IL attribute about which participants felt most confident was *using different kinds of*

print sources (score of 5=often true). This result makes sense as the teachers (participants) have had the most exposure to printed sources both in their pre-service and in-service training. The lowest IL attribute went to *writing a research paper* (F20) which scored on average 3.5 (sometimes but rarely true). Seventy six percent (76%) of the participants were primary school teachers who attended teacher training colleges where writing a research paper did not form part of the training. The category in which participants had the least self-efficacy was F — *presenting or communicating information* — with seven items and a mean score of 27.3 or 3.9 on the Likert scale. If teachers were themselves not confident and competent to do research and present their findings with the attendant bibliographic conventions, they could not be expected to be able to teach these tasks to their learners.

Category D, which involves engaging with different sources of information and assessing their worth, had two items scored below a 4: D14 — Determine the authoritativeness, currency and reliability of the information sources (score of 3.8; and D17 — Evaluate World Wide sources (score of 3.7). Teachers seem unfamiliar with the act of evaluating a source to determine its worth, particularly when it comes to online information. As mentioned before, teachers are more comfortable in the printed environment, but then again they seem to have taken printed material at face value not concerning themselves with bias or accuracy of printed sources.

4.2 Interpreting the Post-course Questionnaire Results

Statistically, there was a fairly significant leap in self-efficacy from the beginning of the course (total mean score of 117.6, SD of 31.7) to after the course (total mean score of 143.9, SD of 21.9). The category in which participants improved their self-efficacy the most was F which advanced by 8 points on average (from 27.3 to 35.3). In the pre-course questionnaire, category F scores were on the whole the lowest. The course intervention seems to have boosted participants' confidence in carrying out research and communicating findings using academic conventions. The participants' perceived self-efficacy went from a low "sometimes but rarely true" to a relatively positive "often true" in terms of the Likert scale.

Category C, *locating and assessing resources*, improved from 35.7 to 40.9, a difference of 5.2 points and the second largest increase in self-efficacy. Ninety three percent (93%) of the schools in which these participants teach do not have libraries. Using catalogues to locate resources would require lots of practice which the participants seemed to lack at the beginning. For 83% of participants the public library is within a 5km radius of the school, but few indicated that they were active members of the public library. The teachers had already completed the School Librarianship course *information sources and reference services* but still lacked confidence. During other school librarianship courses participants were introduced to different types of libraries such as university and education libraries and they were taken to exemplary school libraries. As part of the ILE course, participants' attitudes towards public libraries were challenged. As the majority had no school libraries, it was ludicrous to ignore a library in the community. Participants were exposed to the extensive collection of the education library, EDULIS. Teachers had to provide evidence that they had exposed learners to a wide variety of information sources.

They had to show how learners had used different sources and provide a list of references in the correct bibliographic format.

Within category C, items C7 and C11, both related to searching and using online tools, leapt from an average of 4.4 - 5.5 points and 4.3 - 5.3 points respectively. Successive exposure to online catalogues, electronic journals and web-based information increased the self-efficacy of the participants. For the ILE course in particular, teachers had to locate a minimum of five sites for each school subject to recommend to their colleagues. They were also taught to evaluate sites and expected to use resources in their research project with their learners. Within a short space of six months (a university semester) the teachers' self-efficacy grew remarkably.

Three category D items, D13, D14, and D17, improved on average by one point: D13 went from 4.4 to 5.5; D14 went from 3.8 to 4.8; and D17 went from 3.7 to 4.9. In preparing teachers to mediate IL in their classrooms, teachers themselves needed to be comfortable using several sources simultaneously (D13). Teachers were taught how to ascertain the reliability and authoritativeness of information sources (D14) and to approach —based information more critically (D17)— with less trust and more skepticism.

There are only two items in the G category both of which are related to reflecting on the IL process and skills and reflecting on the product. Both items had improved scores rising from 4.1 to 5.5 and 4.0 to 5.3 respectively. For the course assessment teachers had to implement a research project in their respective classrooms. The experience will have taught them invaluable lessons which would feed into an improved subsequent research project. One of the best ways of learning is through application in a real situation and/ or teaching others. When one teaches others, you first have to understand the topic or subject oneself which requires comprehension, interpretation, synthesis and reflection. It is through reflection that metacognition occurs. Teachers have gained confidence through the course by not only learning *about* the information seeking process but by having to *implement* or apply it in the classroom.

5 Conclusions and Discussion

The general self-efficacy scores of the participants rose from 117.6 to 143.9 or Likert scale 4.2 “occasionally true” to 5.1 “often true”. If this study's results are compared, for example, with those of the Kurbanoglu [7] study on self-efficacy and IL at the Turkish Hacettepe University, these results relatively improved more from the pre- to the post-questionnaire. This study's scores went up by .9 whereas the Turkish study saw only slight improvements in comparing students' IL self-efficacy from first to third year: between first and second year there was an improvement of .6 points and from second to third year, an improvement of .26 points. Again, these are not actual skills being rated but beliefs or perceptions about being able to accomplish them.

The most important finding is that the ILE course appears to have improved the self-efficacy of the majority of participants in the study. Teachers' confidence in Web search skills and research practice appear to have improved after the course intervention. Measuring teachers' actual information literacy goes beyond a study based solely on self-efficacy.

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Building Information Resilient Workers: The Critical Ground of Workplace Information Literacy. What Have We Learnt?

Annemaree Lloyd

School of Information Studies, Charles Sturt University, Wagga Wagga, NSW, Australia
anlloyd@csu.edu.au

Abstract. Work-related research has produced an understanding of information literacy that may sit uncomfortably with educational interpretations. Information literate workers draw from a wide range of information sources and engage with information related activities that enable them to know the information landscape of the workplace, to understand how information is situated within it, and, how to connect with the performances of work as it happens. This way of knowing about how work happens leads to challenges for the educational sector. In particular, practitioners need to know how best to support the development of work readiness in the transition from education to work. The critical ground of work-related information literacy will be described through lessons learnt. A people-on-practice approach will also be described; this approach represents the drawing together of previous conceptualizations of workplace information literacy by the author. Finally the challenges for IL educators will be considered.

Keywords: Workplace information literacy, workplace learning, information resilience.

1 Introduction

In the workplace the practice of information literacy (IL) is not often considered to be actual labour, because it is often interwoven within other work related tasks/practices. However, in the 21st Century when much of the labour in a multimodal society is undertaken with some reference to team-based working skills, information and communication technologies, and to a wider range of new literacies (data, media, financial, business, digital) then the notion of labour needs to be redefined. Without access to information relevant to their productivity, employees will find it difficult to solve workplace problems and employers lose their competitive edge in rapidly changing marketplaces. The modern multimodal workplace requires IL practice to facilitate access to information as it is created, manipulated, remediated, circulated, accessed and used. Research has demonstrated that IL practice situates workers by connecting them to the structural aspects and performative dimensions of work [1]. It should therefore be a critical practice of information work.

The reshaping of work across all sectors is a product of the continued dominance of technology into the workplace. This reshaping has resulted in the contextualization of IL into new literacies (e.g. digital, media, communication) and the accelerated demand for worker productivity and innovation to compete in globally competitive markets [2]. An outcome of this reshaping is that knowledge is now seen to have a central value in the workplace and it is not enough to be able to operationalize information skills: to locate, access and organize it. Workers must be able to transform information to create new knowledge or to use it as the leverage for new ideas and innovations [3-4]. The modern multimodal information-based workplace requires workers who have the capacity to cope with the overload and uncertainty caused by the exponential growth of information and use of information and communication technologies. To cope with the demands of information intensive work, and the need to transform and adapt as the rhythm and demands of the workplace alter, workers must develop *information resilience*. Through the practice of information literacy people develop the capacity to respond to uncertainty. The ability to develop ways of knowing about the information landscape, to operationalize information skills and activities to gain access to information sources results in the building of resilience which underpins the capacity to adapt and transform in times of significant change

Drawing together previous studies [1], [5-6] and lessons learnt from workplace research, a people-in-practice approach that conceptualizes how IL is shaped in the workplace, and how workers become enacted in the performances and practices of work is described. This approach highlights the complexity of the workplace landscape: the role of co-participation in the shaping, negotiation and renegotiation of workplace knowledge, and the wider range of information modalities that workers must draw from in the course of work.

Next, a broader perspective that frames work-related IL research will be considered, and in doing so, the concepts of *information work* and *information resilience* will be introduced. Finally, the implications research and education agendas are discussed.

This conceptualization of information work and IL practice leads to challenges for librarians in the preparatory contexts of school and university sector, in particular, how best to develop work readiness and the capacity for information resilience of students as they transition from education to work. It also presents challenges for librarians and educators about how to reconcile their own understanding and training in IL as it is practiced outside the education sphere. The need to refocus research agendas towards the workplace in order to inform the preparatory education sectors is also a constant theme that runs through this paper and echoes the concerns first raised by Paul Zurkowski back in 1974 [7].

2 Issues in the Critical Ground of Workplace Information Literacy Research

While there has been some interest in this area of IL research [7-13], in general, the uptake of research in this field has been limited. Where research does exist it is generally focused on competency identification [10], information skills and alignment

to IL standards, or focused on exploring IL in the professions (business people, scientists, auditors) where IL is likely to reflect librarians/educational understanding of the practice [9]. An added complication is that there is often an interdisciplinary approach where research is framed through other fields (e.g. workplace education/adult learning, [1], [11] and this has the effect of distancing workplace IL from the practitioner field.

2.1 Reshaping of Work and the Building of Capacity through Information Literacy

The multimodal nature of the workplace information landscape means that it is no longer enough for workers to simply be able to locate and access information. Workers need to build their capacity to search for saliency across distributed networks and to engage with a wider range of articulation activities through which a complex mesh of information sources are drawn from and used in the planning and operationalization of work-based tasks and in knowing the structure and social conditions which prefigure the workplace as a social site. These activities include discovery, collecting, analyzing, integrating and organizing activities, in addition to the ability to effectively communicate and share information; to recognize salient information sources in order to adapt and transform in uncertain times, and to develop competent information skills in support of their learning. This reshaping has resulted in a greater demand for critical literacies from employers.

Research by Central New York University [14] has identified that universities and academics need to pay more attention to what employers are saying- namely, while students may leave formal education with an ability use computers, what they are lacking are the critical information literacies that enable them to think creatively, to find solutions to real world problems (some that surprisingly don't require fingertip knowledge that comes from a Google search or #help on twitter!). This finding has been supported by other studies of employers expectations of graduates [15], suggesting that a broader view of how the workplace operates and the role of IL in supporting that operation is required [16].

2.2 What Have We Learnt from Work Related IL Research? Lessons and Themes

Drawing from IL research [1], [5-6], [12] into workplace and everyday settings a number of lessons and themes are described that explain how IL emerges, what IL is, and, how it is enacted as a practice.

Lesson 1: Workplace IL is a Situated Practice. Workplaces are characterized by people who are engaged in the pursuit of a particular purpose - productivity. The construction of workplace knowledge and of knowing about the performance of work is reflected in the ongoing process of collaboration between people through the sharing of information and mediated through the social conditions and material artifacts of the setting. The translation of library based conceptions of IL in terms of the operationalization of skills runs into difficulty, because there is currently little

evidence to support the idea that workers currently consider the cultural, ethical, economic, legal or social issues surrounding information use.

Lesson 2: Information Needs are Hierarchical and Referenced against Normative and Social Dimensions. The recognition of an information need is identified as a foundational prerequisite for IL. In the workplace this has been questioned [12] as information needs are often predetermined for workers and are therefore approached reactively rather than as the product of independent reflection (e.g. novices will follow the directions and advice of experienced workers). Research with renal care nurses [6] identified a mismatch between nurse's occupational discourse and the discourse that reflect the medical community. Information need in medical discourse is situated around adherence to treatment regimes, whereas nurses' needs are often driven by patient needs, patient care and advocacy. Consequently in the dominant medicalized fields of health, the nurse's information needs in relation to patient care and outcomes may be silenced in preference to the information needs of doctors [6].

Lesson 3: The Performance of Work is a Collective Endeavour. In workplaces that are often driven by technical or embodied knowledge or where value is placed on experience or tradition, issues of plagiarism do not necessarily resonate, because knowledge is considered to be a collective possession [17] and is disseminated often without due reference to provenance. Important concepts that need to be explored in the context of workplace IL research and education include the role of IL in support of teamwork and group problem solving (aimed at collective knowledge building) – where knowledge about 'how to go' may be spread across a team rather than located within an individual [1].

Lesson 4: Workplace Information Landscapes are Composed of a Range of Modalities, Which are Critical for Workplace Learning. The importance of experiential, corporeal and social knowledges has been highlighted by a range of researchers [2], [18-20]. Each of these knowledges is reflected through information modalities from which workers draw to learn about how work happens. Developing a way of knowing about how these modalities are situated with the information landscape and the way in which to operationalize access to this information form part of the information work required in IL practice.

While the lessons learnt enable us to view IL as a practice that is situated, collective and specific to particular settings, a number of themes also emerge from the workplace research that emphasize how IL enacts people into the workplace. People are enacted through:

- *The negotiation of practice.* As a collective practice, IL emerges through negotiations with others about the knowledges and ways of knowing that are accepted and legitimized. This negotiation can often be contested, particularly in interdisciplinary contexts. Research in nursing [6, 21] highlights the importance of

nurses engaging with their own occupational and professional knowledge and the tensions this produces, which is then constructed through actual practice, with the gold standards of evidence-based practice. Nurses are required to reconcile their own knowledgebase with the discourses of the medical profession, and to develop their information practice in ways that allow them to legitimize knowledges constructed through embodied experience in situated practice related to caring, practice and solidarity[6].

- *The practice architectures of a setting.* Engaging with employment necessitates connecting with the discourses and ongoing discursive practices of a particular kind of work performance. The practice architecture of a site shapes the type of activities and information skills that are important in the construction and access to knowledge. In the emergency services sector, and in the medical sector, workers engage with particular types of practices that are shaped by the cultural-discursive, material economic, and historical features and conditions that shape the information landscape of the setting. Entering the workplace necessitates a ‘buy-in’ whereby we actively engage with the sayings and doings [22] and relatings [23] that shape the narratives of the setting about how work is done.
- *The affordances of activities.* The emphasis on skills limits attention to the affordances furnished by activities that enable skills to emerge. IL is a social practice that has spatial and temporal dimensions, i.e., it occurs in space and time. Activities such as sharing information over morning tea to encourage the alignment of new members into the team or workplace, or seeking information in order to solve specific problems, or to improve the performance of a particular type of work task, afford opportunities to connect with information and the specific ways of knowing that are legitimized within the workplace.
- *Ways of knowing.* Knowing is a collaborative activity and something that people do in co-participation with each other [17], knowing how to connect with the range of knowledge and modalities of information in an information landscape, the ability to understand how the information landscape is constructed, and the ability to operationalize a range of skills in order to access, use information to support the performance of work.

3 A People in Practice Approach

These lessons and themes from the workplace IL studies have been used to frame a practice-based conception and approach of *people-in-practice* [24]. The approach draws from practice theories [17], [22-23], [25-26] that emphasize situatedness and the role that ongoing interaction plays in shaping and reshaping levels of IL, as people ‘buy-in’ and learn to go on in a particular setting (e.g. as people transition from novice to experienced worker).

A people-in-practice approach represents a shift in attention towards the enactment of IL as a social practice, and away from the information skills approach that has dominated IL research and education. The approach highlights the role of co-participation of the community in shaping the production, reproduction and

circulation of knowledge, including knowledge about the appropriateness of information skills in relation to the context. This contrasts with the conventional approach to IL where there has traditionally been a focus on the information skills of individuals as something that can be learned and transferred independently of context. Without the catalyst of IL, workplace learning cannot occur. The two are entwined in joint enterprise.

3.1 Critical Features of a People-in-Practice Approach

For researchers the emphasis of this approach is to understand how:

- information is enabled, afforded, nuanced or contested in a setting;
- the modalities of information are considered credible and authoritative to the setting;
- participants operationalize appropriate information skills, to access information and knowledge of the setting;
- participants learn to ‘go on’ in the performance of working [24];
- engaging with the activities and skill of the practice is constituted through information work that contributes to building information resilience of workers; and,
- recognition that the practice of IL is composed of activities and skills that enable knowing about the landscape.

4 Information Work of Information Literacy Practice: A Workplace Perspective

The concept *information work* is introduced here as a way to conceptualize the often hidden information activities that are a central part of IL practice as it is operationalized as part of a worker’s daily routine. As an information practice, IL connects people with declarative, procedural, local, social, corporeal and experiential forms of knowledge through epistemic, social and corporeal modalities of information. This connection occurs through information work.

The idea of information work has been explored by a number of authors [27-28] and defined as “broader than information seeking but narrower than information behavior [28, p. 3]. Information work is contextual and emerges in the routine activities that compose everyday life as “something essential, dynamic, ongoing and social that intermixes with, complements, supports and is supported by other kinds of work” [28, p.4]. Information work can be understood as a type of ‘articulation work’ [28] that is expressed through activities that allow the work to get done (e.g. planning, organizing, integrating etc.) and it represents actual labour related to information activities such as locating, gathering sorting, interpreting and producing information [28]. The fundamental point that can be made about information work is that without information work, other types of work cannot be undertaken or completed [28].

IL is a fundamental practice of information work. Lloyd [27] defined information work as the strategies that are employed not only by members but also the collective strategies of the community engaged in joint enterprises to ensure that members engage with information, sites of knowledge and employ appropriate information skills that reflect the ways of doing things as sanctioned by the community [27]. Lloyd argues that, as with IL practice, information work will be operationalized according to the knowledges that are valued by the domain.

5 How Do We Build Information Resilient Workers?

The concept of resilience is associated with adaptability and learning, and the ability to use this learning to transform, while at the same time continuing to function [29]. Central to the ability to overcome adversity and uncertainty is the capacity to understand how information is situated within a landscape and the ability to operationalize information skills to address challenges. Information resilience therefore can be described as an outcome of IL. Workers who develop information resilience have the capacity to connect and engage with information in order to solve problems, adapt to change or to novel situations, transform workplace practices and to reduce possible sources of conflict or stress that arise when there is uncertainty about the type of information that is required, or where to locate it in the information landscape.

As a transformative and adaptive information practice, IL, particular workplace IL presents a difficult challenge for librarians and IL educators, who are bounded by the contexts in which they deliver their main service. It also presents challenges for library educators and those who are involved in developing IL practice in students who are about to transition from formal education to work. Questions that need to be explored as part of the reflexive examination of our own practice include:

- What role should librarians in education and vocational sectors play in workplace IL?
- How do librarians build information resilient workers who can deal with rapidly changing information environments, with information overload and with high levels of information complexity while at the same time being resilient enough to cope with the continual demands of fast capitalism which have changed the nature of work and of working?

6 What Can Be Done?

Developing the people's capacity for information resilience should quickly become the mandate of librarians in both the education, vocational and public sectors. But is not enough to just state that this is a focus, what is required is a proactive response, which brings together the limited research findings from the workplace and commences the process of translating this work into the practical solutions which will accommodate workplace IL. Among this work is an acknowledgement that IL is

situated and contextual. Consequently workplace IL will emerge in a different way and this will require that practitioner's work to translate this research-based knowledge. Developing IL pedagogy that takes into account the transition from learning to working is a first step in the practical support of students, is one specific example.

Practitioners in higher education sectors should also be encouraged to connect with workplace knowledges of their disciplines. By this I am not suggesting the epistemic knowledge that forms part of subject specialization, but with workplace knowledge that is grounded in the practice and performance of work and ways of knowing that form part of that practice. Encouraging the education sector to offer pro-bono support for graduates in their first year of working and then using this opportunity to understand what is required of the new graduate in terms of IL training. This suggestion should be viewed as value adding for the higher education sector, and may work as a point of difference. This approach would also act to promote librarians as stakeholder's workplace IL practice.

7 Conclusion

The critical ground of the workplace creates a significant challenge for employers, for IL researchers and for educators. The central issue for librarians working in the education and training field is how to ensure that graduates and trainees develop information literacies and skills that ensure their readiness to undertake information work embedded within all forms of workplace performance.

Based on the research into workplace IL to-date, researchers and practitioners recognize that workplaces are complex and messy, and that programs of IL that adopt a linear or systemic approach and focus on text do not prepare people to transition into the workplace or to manage the uncertainty that may occur within the first few months.

The critical ground of workplace transition must therefore become the focus of research and reflection. In particular, how do we build effective IL programs that will encourage information-resilient and resourceful workers who are able to transition into work, and who have the capacity and ability to cope with the exponential increase of information that has resulted from the growth of information communication technology and applications and the increasing demands for informal on the job learning.

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Is Information Literacy Enough for a Knowledge Worker?

Katarzyna Materska

The University of Warsaw, Information Science and Book Studies Department,
Warsaw, Poland
katarzyna.materska@gmail.com

Abstract. In the context of knowledge-driven economy and knowledge-intensive organizations one of most important information user communities appears to be “knowledge workers”. What is the information landscape in which knowledge workers operate and what is their personal and organizational information literacy (IL) landscape? What differentiates knowledge workers from other information users? Is IL enough for a knowledge worker or is the term “information fluency” or “knowledge literacy” more relevant in this case? This paper attempts to clarify relations between information literacy and knowledge literacy and answer the title question. Analyzed studies of workplace IL imply the need to broaden the basic definition of IL.

Keywords: Knowledge workers, knowledge literacy, information literacy, workplace literacy, personal information management, questionnaires.

1 Introduction

The understanding of information literacy (IL) has changed over time. Many authors confirm that the definition of IL is not constant – each decade a new scope of IL is specified. Sheila Webber [1] states that “Information literacy differs” and indicates “progression in information literacy each year!” while the SCONUL Working Group emphasizes in its publications [2-3] that every year “we live in a very different information world”. Therefore it is expected that a new, continuously updated model of IL retaining its basic principles will be created.

In order to facilitate it, SCONUL encourages researchers/scholars to build a series of complementary “lenses” - “for different user populations to enable the model to be applied in specific situations” [2]. However, the concept of lenses proposed by SCONUL would be incomplete without “workplace lens” (or “knowledge workers” lens) assigned a set of attributes created and developed with the most characteristic features of knowledge workers community taken into consideration.

In the context of knowledge society, knowledge-driven economy, knowledge-intensive organizations (KIOs), knowledge management (KM) systems, network society, learning and attention economy etc., two questions are asked more and more often - how to educate in the global knowledge economy and what competencies are needed for that purpose?

Any IL development should be considered in the context of the broad information landscape in which an individual operates. What is then the information landscape in

which knowledge workers operate and what is their personal and organizational IL landscape? What types of “information” are important for them? What differentiates knowledge workers from other information users - aptitude, background and experience, aims, skills, knowledge, knowledge sharing behaviors, personal qualities of researchers at different stages of their careers? Is IL enough for a knowledge worker or is the term “information fluency” or “knowledge literacy” more relevant in this case?

2 Methods

Conceptual analysis was performed to clarify the issues listed above and answer the title question. Selected studies of knowledge workers’ workplaces were subject to critical analysis. It was observed that both sociology and management literature on the issue of knowledge workers lacked examinations of knowledge workers’ information practices, which results in a general assumption that information skills of knowledge workers should be discussed in the context of their workplace practices.

Specific features of knowledge work and knowledge workers can be approached from a variety of angles. In this paper the definition of knowledge workers and their competences will be discussed solely from the information literacy point of view.

3 Knowledge Workers

The number and importance of knowledge workers has grown in the recent decades. They are claimed to represent more than half of all employees in advanced economies [4] and appear to be one of most important information user communities, usually identified as those performing knowledge-rich jobs or, in other words, professionals whose position relies on their ability to find, synthesize, communicate and apply knowledge [5].

Knowledge workers are very well-educated (at least in their field of knowledge). They often possess knowledge which is not widely and easily available, even to their superiors. Research conducted by Mládková [4] shows that knowledge workers develop this type of knowledge through long practice (41 percent) or through a combination of long intensive study, long practice and special talent (39 percent). The majority of respondents use both tacit and explicit knowledge for their work (57 percent), only 15 percent of respondents mostly use explicit knowledge. Sixty-five percent of respondents report that the results of their work are non-material while thirty percent claim them to be both material and non-material. Sixty-seven percent of respondents prefer the combination of teamwork and individual work. Knowledge workers understand broader context of their knowledge better than anyone else.

While discussing information literacy it is important to remember that knowledge workers need not only codified knowledge but also tacit knowledge. In the non-communicative stage tacit knowledge is applied rather than shared and it is available to other actors exclusively through socialization mechanisms such as observation and participation. Knowledge is intangible - it means that the work performed by knowledge workers remains hidden; they use their brains more than their hands which results in the production of intangible outcomes such as procedures, ideas, services.

Knowledge workers are likely to be given more autonomy in their work. They can set their own work standards and select their own methods of working, addressing and solving problems; they work and make decisions independently.

4 Demanding Knowledge-Based Organization as a Workplace of Knowledge Workers

The general feeling is that information literacy (IL) is not enough in the era of knowledge economy. The concept of IL developed within the library and information science (LIS) community appears incompatible with the needs of modern organizations. Knowledge intensive, intelligent and adaptive organizations create specific workplace context and need intelligent workers who can solve problems with adequate proficiency.

According to the authors of the Australian Standard, the “challenges of a knowledge-focused organization may require additional skills, attitudes and mind sets” on top of basic IL and new technology (computer) literacy. Examples they provide involve: skills such as storytelling, participating in strategic conversations, engaging with content, documenting processes and mentoring; attitudes such as openness to new ideas and willingness to share knowledge; abilities such as assimilation of new knowledge into existing knowledge frameworks and effective participation in cross-functional teams [6].

These additional skills, attitudes and abilities are labeled *knowledge literacy*, the term enjoying very little currency in the LIS community. Jan Houghton and Sue Halbwirth used it in their paper and discussed the need for information professionals to develop additional skills “if they are to continue their role as a change agent within the information environment of an organization in the process of moving from information management to knowledge management” [7].

Lee-Kelley et al. [8], who studied 148 knowledge workers discovered many significant relationships within learning organizations, including personal mastery, shared vision, team learning, job satisfaction and systems thinking. Knowledge-related work requires thinking - not only monitoring, browsing, searching, selecting, finding, recognizing, sifting, sorting and manipulating but also being creative, always questioning, interpreting, understanding situations, adapting to changes, tailoring, handling data created e.g. in the lab, with particular focus on how to put questions, draw inferences, give explanations and conclusions, prioritize. Cognitive skills fostered by education should be problem-solving skills that enable individuals to process information effectively and work within complex, ever-changing environments.

The organization as a “knowledge ecosystem” consists “of a complex set of interactions between people, process, technology and content” [6]. Knowledge emerges through connections, dialog and social interaction. Social sources of information and knowledge in organizations play significant role in knowledge production/development. Knowledge sharing and other social activities are competencies indisputably needed in a workplace. Sharing includes exchanging resources, ideas, and experiences within workers' networks as well as through the collaboration with other team members. Individuals' knowledge creates corporate knowledge.

Knowledge workers cannot be understood as “homo oeconomicus” only - creatures driven by cold and decisive rationality and fundamentally rooted in self-maximising tendencies. Human economic behavior in the workplace seems to need a more critical and complex approach. One of these alternative approaches focuses on the mental and emotional states that human individuals and groups go through in the course of their everyday activities and use them to explain their economic and information behavior. Approaches in question include such factors as positive and negative attitudes, prejudices, myths, standards and value-orientations. People use information selectively to avoid embarrassment, conflict or regret; to maintain self-image; and to enhance personal status or reputation.

The high level of work autonomy allotted to knowledge workers means that for a remarkable extent of time knowledge workers are managers of their own work, which has twofold consequences: the content of managerial functions and roles undergo changes while, parallel to this, new functions and role expectations emerge. More and more often knowledge workers become information managers. In the electronic environment they can form their own information grounds and systems of personal information management. Many knowledge workers use the information manager’s toolbox: content management, document management, environmental scanning, information auditing, leveraging information repositories, and taxonomies and thesauri. Managerial skills enhance typical information literacy skills.

Information literacy and the fostering of an information literate workforce are also key components in any KM initiative. As the goal of knowledge management is to maximize the use and creation of knowledge in organizations, IL significantly contributes to knowledge management. In this sense, IL represents a fraction of the KM domain, so attempts to conflate those two may cause confusion rather than provide a pathway for information professionals and others pursuing workplace IL. Knowledge management techniques engage employees across the organization in identifying, codifying, and integrating knowledge resources (textual, visual and personal ones). These techniques allow for better utilization of the knowledge resources that exist throughout the organizations.

Close to the IL concept in knowledge-focused organizations is the very interesting idea of Personal Knowledge Management (PKM). The aim of PKM is “helping individuals to be more effective in personal, organizational and social environments”. The last two dimensions visibly distinguish PKM from IL with PKM being a continuous process of seeking, sensing, and sharing [9]. Seeking is finding things out and keeping them up-to-date. Building a network of colleagues is helpful for this purpose as it does not only allow to “pull” information, but also to have it “pushed” by trusted sources. Sensing is how people personalize information and use it. Sensing includes reflection and putting into practice what one has learnt. Often it requires experimentation, as humans tend to learn best by doing.

More and more workers have their own sources of information and knowledge, often on mobile devices, but they usually lack means or internal support to link their knowledge to that of others to get the work done. Supporting PKM, in particular internal sharing, can help information flow more freely.

5 From Information Literacy to Knowledge Literacy - a Discussion

Information literacy means the ability to recognize information needs, to search and locate information and to evaluate and use information in a critical and ethical way. Knowledge workers experience IL in various ways, including basic literacy (the ability to read and comprehend), technology (computer) literacy (the ability to use appropriate tools) and information literacy (the ability to find and use information). Jennifer Kirton and Lyn Barham, for instance, argued strongly that IL “goes beyond simply acquiring the skills to use information tools and to find information resources. It includes lifelong learning and professional development, and the ability to interact in the information society” [10]. It involves seeking and using information for independent learning, lifelong learning, participatory citizenship and social responsibility.

It is worth mentioning some studies on workplace IL, because they do not only suggest the need to broaden the basic definition of IL, but also strengthen the perception of significant common points between IL and KM. Annemaree Lloyd argues for the extension of the concept of IL to include physical and social information aspect of knowledge [11]. This view of information literacy corresponds to and indeed is central to knowledge management interest in the capture of tacit knowledge. The workplace IL research mentioned earlier draws researchers' attention to non-codified forms of knowledge in the work environment, notably, the social sources of knowledge. In this case what libraries do as IL instruction makes no longer any sense, since they refer only to codified and largely textual dimensions of knowledge. The focus is on the generation of new knowledge and innovation, as distinct from the transmission of the existing stores of corporate knowledge.

This is not to suggest that the development of workplace IL is not going to have a significant impact on an organization's ability to learn. On the contrary, the implication is that workplace IL is a narrower area of endeavor than the KM initiatives outlined earlier. The sites of information may be broader in a workplace context than they are in an educational institution [4]. When it comes to workplace IL, the focus is still on the professional development of people within organizations, from novice to expert, with individuals developing the ability to work collectively. With knowledge management, the focus is on the organization itself. It is the organization's capacities for learning that are central in this case, not those of individual members, however important individual capacities may be.

Professional bodies such as the Australian Library and Information Association promote IL as a key to fostering “lifelong learning, personal fulfillment, improved decision making, knowledge development, innovation, imagination, creativity and cultural continuity” in ‘a democratic, progressive, technologically sophisticated and culturally diverse society’. One of the issues that remains largely unresolved, however, is whether the literacy developed in the school and higher education sectors is transferable to work-based or societal situations once students complete their formal education [12].

The workplace IL model draws researchers' attention to the fact that there *does exist* a gap between the traditional view of IL and the knowledge literacy promoted by KM proponents. Some of the skills, attitudes and abilities associated with knowledge

literacy do not relate to formal educational environments but to a different type of “learning organization”, one in which knowledge including its explicit forms (information) as well as tacit, embedded, procedural and anecdotal knowledge, is seen as the lifeblood of a corporate organism that needs to adapt quickly to its external environment, such as the market, competition, government regulation or globalization. Knowledge management is focused on the organization perceived as the “learning organization”, and hence on ensuring that information is readily available and renewable and that individual capacities and knowledge sharing processes support the required levels of organizational learning.

“In the knowledge-based environment, the concept of information literacy moves towards a concept of knowledge literacy” [13]. More proponents of “knowledge literacy” can be encountered in the field of knowledge management (e.g. [12]), in particular knowledge-based organizations [14]. In his guide Sheridan proposes an inspiring concept of so-called “inferential operators”, i.e. various cognitive processes whereby one develops an understanding of any issue(s) or a resolution of any problem(s) – an approach which could be useful in the course of the analysis performed in the paper.

Knowledge literacy includes skills that go beyond basic literacy, computer literacy and “information literacy”, and include activities such as storytelling, documentation of processes and mentoring. Attitudes associated with knowledge literacy include “openness to new ideas and willingness to share knowledge” while abilities include that of assimilating “new knowledge into existing knowledge frameworks” [6]. People who work in KM sectors should not have any problems with the notion of knowledge literacy and related skills. The concept of knowledge literacy, with its wide-ranging set of attitudes and abilities, is a long distance away from traditionally understood IL, and the differences between KM and IL are as significant as commonalities they share.

6 Conclusions

The main aim of this paper was to provide an answer to the title question. Most studies of knowledge workers’ IL suggest the need to broaden the basic definition of IL. The aforementioned findings indicate knowledge workers’ IL would be a mix of workplace literacy, information management and knowledge management. Certainly the shift in interpretations of information literacy should be from text-oriented perspective towards socio-cultural one. In the library and information science environment, in particular, there are problems associated with the attempt to broaden the term “information literacy” to include the understanding of social sites of information in an organization. To stress this aspect even further, proponents of KM tend to suggest “knowledge literacy” term as more suitable. This term better covers the issues of tacit knowledge, affectional problems, managerial attitudes to sources in the processes of problem solving. It focuses not only on the personal development dimension but also on the development of the knowledge-intensive organizations.

Undoubtedly the information behavior of knowledge workers as learning organizations’ leaders, critical thinkers and innovators, is subject to particularly

accelerated changes. In the near future, the author is going to conduct empirical research on IL, workplace IL and information and knowledge management which should enable the development of most up-to-date framework for SCONUL postulated lenses for the knowledge workers community. In the world of global and mobile networks and a cornucopia of technological solutions it is extremely important to avoid drowning in information while dying from a lack of knowledge at the same time.

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Empowering through Information Culture: Participatory Culture, a Stepping Stone? A Theoretical Reflection

Yolande Maury

GERiCO, Lille 3 University, Library and Information Science, France
yolande.maury@noos.fr

Abstract. This paper explores the role of “information culture”, -used in preference to “information literacy” in the French context, with emphasis on the social and cultural dimensions - in empowering people in relation to the field of library and information science, at the time of networks and web 2.0. We will focus on the ongoing changes, including the phenomenon of digital convergence and the hybridization of cultures (digital, media, information culture) that accompanies it. These changes are at the origin of a participatory and contributive culture, often presented as an opportunity to increase the "ability to act", providing more control over contents. After defining the concept of empowerment, we will question the claims about the potential of participatory culture. Are “social” media fundamentally different from “old” media? Are they a new area of knowledge and a stepping stone to become autonomous actors, creators of contents and knowledge (*versus* mere consumers)?

Keywords: Empowerment, information culture, information literacy, participatory culture.

1 Introduction

The Alexandria Proclamation adopted by IFLA and UNESCO in November 2005 defines “information literacy” as a mean to “empower people in all walks of life to seek, evaluate, use and create information effectively to achieve their personal, social, occupational and educational goals”. Referring to the access to more power, and overflowing from the academic sphere, the "power of information" is presented as an aid for the social integration of individuals, allowing them to access the knowledge they need to improve their everyday lives and reach their full potential [1].

In this paper we will explore the role of “information culture” - used in preference to “information literacy” in the French context, with emphasis on the social and cultural dimensions of this "culture" - in empowering people in relation to the field of library and information science, at the time of networks and web 2.0. We will focus on the ongoing changes, including the phenomenon of digital convergence and the hybridization of cultures (digital, media, information culture) that accompanies it. These changes are at the origin of a participatory and contributive culture, often presented as an opportunity to increase the "ability to act", providing more control over contents. These are affirmations that will be considered here.

After defining the concept of empowerment - a concept that needs to be used with caution - we will examine the ongoing shift in the approach of information, from the individual to the collective, and the changes in the way of thinking information culture. Are “social” media fundamentally different from “old” media? Are they really at the origin of a revolution in practices, introducing more horizontality in the interactions and in the dissemination of information? Are they a new area of knowledge and a stepping stone to become creators of contents and knowledge (*versus* merely consumers)? We will question these claims about the potential of participatory culture in terms of empowerment through information culture. Doing so, we will discuss information culture as an initiatory process informed by experience (embedded in social-cultural practices) and as an introduction to the world of information-documentation (in the sense of “becoming a member”, in an anthropological meaning).

2 Empowerment through Information Culture, Definitions

Since the 1970s, the new semantics developed in the discourse of major international organizations and institutions highlights the concept of empowerment related to information literacy. The reflection on this concept is far from being an innovation [2], but from autonomy to empowerment, shades are perceptible which indicate a change in the approaches and reflect a redial movement.

Defined as the ability to determine by oneself (*autos*) in accordance with its own act (*nomos*), autonomy is generally presented as an attempt to use its own capacity to act, without being guided by another. With the concept of empowerment, an economic concept initially, the focus is on the idea of power. Julian Rappaport, usually mentioned as a reference, defined it as a dynamic process of appropriation or re-appropriation of power in everyday life, "a mechanism by which people, organizations and communities gain mastery over their affairs" and a more global mastery over their lives [3]. Emphasis is then placed on the process of emancipation, of capacitation, involved in empowerment: in theory, it leads to a greater feeling of ownership of the situations, being exerted both against the inertia of things, and against the resistance of the opposing parties.

Power, understood as "an opportunity to create new possibilities" is strategic; it involves both the allocation of resources (assets), the ability to use these resources (skills), a plan of organization of these resources (skills, tools, instruments) and a minimal information (knowledge) [4]. At the individual level, it is the way a person increases his skills, developing his capacity for mobilization, initiative and control, which promotes self-esteem and self-confidence.

In the field of education, while autonomy refers to self-directed learning, empowerment implies for the learners to become aware that they can have an impact on their environment and exert some control over their circumstances [5]. Related to information and media education, empowerment is a step beyond the old library

skills, it provides users with knowledge and transferable skills they can use for all sorts of information uses enabling them to cope with the Information age [6].

Considered as a process - of initiation, acculturation, according to a socio-cultural definition of information culture¹ - empowerment is built in the interactions with the exterior and in a return on oneself in a movement of self-organization that shows the interweaving of the individual and the social [7]. As a prerequisite for a full exercise of citizenship, it is directed to the acceptance of diversity and social inclusion. In this approach, appropriation or (re) appropriation of power is materialized - ideally - by the (re) appropriation of rules and standards for the individual himself. The individual is invited to "allow himself", to find within himself new rules as part of his social relations, or more generally in society, both to free himself, to release creativity and to provide answers to situations that may affect him.

In practice however, the strengthening of empowerment through the acquisition and the organization of resources does not guarantee that the individual knows spontaneously how to use this power. It is through a series of actions related to the environment that the development of the ability to act can be actualized, with the production of a concrete result. And if a key emphasis is placed on action, the action is not enough, it is necessary for individuals to be the "authors" of their actions on the basis of a free and critical participation through empowering situations [8]. In this sense, the approach is singular: the terms, the forms it can take is dependent on the context and the people. In the same way, under cover of affirmation of identity, points the risk of a normative vision of the changes, reduced to the interiorization of rules and standards, the project of empowerment becoming in its turn a standard: the individual having to take charge of his destiny or his learning; and then, being placed in front of his responsibilities in situations that can be of pressure or emergency, and not of free choice. This, without having the resources and capabilities needed to achieve them.

Thereby, even if instrumentation and education foster the conditions of its emergence, empowerment is mainly a matter of experience. And it requires an awareness of the links between individual experience and environmental conditions, which in return provides an essential experiential basis for praxis and an increase in self-empowerment.

¹ By information culture, used preferably to information literacy, in the orientation of the Technological Research Team in education (ERTé) "*Culture informationnelle et curriculum documentaire*" (Annette Béguin dir., Lille 3 (France), 2010), we mean a set of shared skills and knowledge, social patterns of behaviors, norms and values, involved in defining the importance of information, and allowing a wise and ethical use of this information. Information culture is both the basis of a common heritage and an educational project taking information and media as an object of study in response to individual and collective needs. So, information culture is considered from an anthropological point of view, informed by experience, and rooted in social practices.

3 In the New Informational Ecosystem, Participatory Culture, “An Opportunity to Create New Possibilities”?

This issue of the “power to act” (*potentia agendi* according to Spinoza's philosophy) is at the core of the reflection on the phenomenon of digital convergence, a phenomenon which is marked, beside the social and cultural dimensions, by a rise of participatory and contributive culture. According to Henry Jenkins, empowerment comes from making meaningful decisions within a real civic context, “we learn the skills of citizenship by becoming political actors and gradually coming to understand the choices we make in political terms”. For him, media convergence, which is seen as a process, not an endpoint, has altered the relationship between technologies, industries, markets, genres, and audiences. At the origin of a mini-revolution in information practices, it is changing the way of thinking the relation to media and information; and it leads to rethinking the “twenty-first century literacy”, whose evolution “from individual expression to community involvement” is affirmed. The challenge ahead is then to bridge the participation gap by preparing young people for full participation in the society of tomorrow [9-10]. In this context, the new informational ecosystem that is taking place is often presented as a new area of freedom, which plunges the web users in a multiplicity of digital microspheres, inviting them to a “media participation” likely to turn into “political participation” [11].

So, while new media are affirming themselves as spaces of interaction, the communication relations and the role of actors are displaced, overflowing from local context (and school context): increase of the “ability to act”, via archiving, annotating, appropriating, and recirculating media contents, giving more control over these contents [9-10]; logic of creation and circulation of information on a planetary scale, communication from the mass to the mass [12]; emergence of new hierarchies, new rhetoric on a narrative mode [13]; network approach, with shared knowledge based on a link and a leak mode. When participatory culture focuses on information and knowledge sharing, contributive culture represents a step forward in social engagement, involving beyond expression and exchange, community involvement and active stake in the culture that is produced [9-10]. The new forms of participation that are developing, supported on enabling environments, are presented as broadening the worldview and bridging the gap between social practices and academic knowledge, whereas the actors are placed in the heart of the system (and no more at the periphery). “Knowledge is not located in texts as such – or in the individual’s head. Rather it involves the co-construction of situated meanings, and takes place in networks of actors and artifacts” [14].

These claims about the potential of new media, especially their participatory potential, bearer of democracy and empowerment, are not new. Such arguments have been developed about older media (radio, television, press), also presented as bringing power to people, enabling new collaborations and questioning control of knowledge by elites; but what seems new with social media is that creating and circulating contents is apparently made easier and that they are blurring the lines between information, media and digital cultures.

Far from opposing "passive old media" and "interactive new media", David Buckingham, focusing on media education, denounces a form of "policy marketing-speak", with claims false about selling media literacy on the back of a whole series of others desirable commodities. Participation is seen as a good thing in itself although it is not clearly defined: being often confined to basic and operational functions, which fall within the "how to do?" [14]. This, following the idea that using technology is beneficial and that technology is somehow empowering: it promotes innovation, creativity, learning and social harmony. It appears that this approach, celebrating creativity and participation, rests on a form of technological determinism (technology autonomously producing social change): while the apparent participatory possibilities of new media are an effective means of targeting consumers and gathering information about them [14]. In another vein, communication from the mass to the mass does not guarantee more horizontality in the relationships and in the dissemination of the information, new hierarchies (phenomenon of concentration and power of big companies, intellectual authority measured by popularity...) are taking place that are likely less visible but equally present [12], [14].

So, new media are seen as a catalyst for changes, while the digital natives discourse embodies a kind of essentialism which ignores diversity and inequalities in young people's experiences [16-17]. The challenge, then, is both cultural and social. Becoming an autonomous user implies to acquire skills and knowledge that a mere access to information or a superficial use of it do not provide; and these competencies are not always new: participation in community life begins by reading and writing through several kinds of media, and regulating media use without being seduced by formats of texts because they are fashionable [18], which refers to traditional standards of information literacy based on generic skills [14]. And becoming a creative producer involves taking distance to its own action: understanding functions of media, critically evaluating their content, in order to make informed decisions. In the same way, empowering through civic participation implies that these experiences are true experiences (not only a pretext), and that media productions have a real audience, beyond the familial or the school circle [18].

Therefore, when it comes ensuring that new media and participatory culture are "an opportunity to create new possibilities", resources and spontaneous practices are not enough, the actors should be aware of their "power to act" on their environment and circumstances. The real question is a question of "state of mind" and culture, it means going beyond an adaptation speech turned towards consumption-production, and developing a common language on communication, participation, accompanying it with a reflection fostering a critical and distanced view on new media and their operating modes: worldviews these media are carrying, value systems they convey as communication systems, at the opposite of the idea of neutrality of technology, transparency of tools, or immediacy of information. Granularity of media (social networks, blogs, micro-blogs ...), levels of usage (consultation, documentary activity, creation ...), levels of interaction and their issues (with collectors, joiners, creators...) are some of the main categories around which this emerging vocabulary in the process of being built is organized [19].

In this configuration, information culture is much more than information literacy in its traditional and functional meaning, it is an “introduction” to the world of information-documentation (in the sense of constructing an “informational view” and “becoming a member” of this world). Shaped by the culture and the context, embedded in practices, information culture is developing then at the articulation between “the space of knowledge” and “the space of being in the world” [20].

4 Perspectives: Challenges for Information Culture

Information culture seems indeed to be a significant prerequisite for fostering equitable access to information and knowledge and for promoting free and independent use of media and technologies. The rise in power of participatory culture as a part of information culture constitutes the marker of an evolution, “from individual expression to community involvement” [9-10]. While this culture is initially a field culture, the challenge is beyond the local, the specific, and the piecemeal acquisitions, to provide tools for thinking in a generic and comprehensive way in order to give meaning to the situations; and to construct a common language fostering mutual understanding and facilitating transfers and (re)appropriation of power in everyday life.

Two elements seem essential to meet this challenge: adopting an integrative approach in the way of the C. Bruce’s model which differentiates three stages, as a basis for long life learning, articulating knowledge construction process and knowledge transmission [22]; and opting for an ecological perspective, with focus on environment and emphasis on social and cultural dimensions, considering information culture as an initiatory process, built through dialogue and interactions.

But if the new informational ecosystem invites to a re-conceptualization of information culture to meet new needs and expectations - social practices constantly questioning existing configurations –it is in the sense of an expansion of knowledge rather than of a substitution of new knowledge to old knowledge. The dynamics are integrative: the community dimension of the web acts as a catalyst, renewing and/or reactivating old problems and issues [21]. In a world in constant change, aiming for empowerment does not consist of freezing informational knowledge but inscribing this knowledge in a historicity that gives it meaning and depth, and allows to better understand its scope.

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Perceived Barriers in Relation to Health and Lifestyle Information among Icelanders

Ágústa Pálsdóttir

University of Iceland, Faculty of Social and Human Sciences, Reykjavík, Iceland
agustap@hi.is

Abstract. The study examined Icelanders' perceived barriers to health and lifestyle information, their motivation and information seeking behaviour. The data was gathered using an internet and a telephone survey using a random sample of 1200 adults. Response rate was 58.4%. Four clusters were drawn by k-means cluster analysis. FANOVA was used to explore differences in motivation and perceived barriers across the clusters. The results show a connection between motivational factors and information seeking. For all clusters, 10 out of 13 statements represent barriers while three statements do not. Significant difference was found across the clusters for two of the statements. The least motivated cluster seeks information least often but reported lower barriers than clusters that are more motivated and active at information seeking.

Keywords: Barriers, information literacy, information seeking, motivation.

1 Introduction

It has been emphasized that interventions which aim at not only preventing ill-health but also promoting public health are of great importance and significance in encouraging people to be more actively involved in health promotional interventions through life-long learning. An essential part of life-long learning is information literacy, a competence that allows individuals to “ recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information” [1]. Various factors may have an impact on information literacy and act as barriers [2], e.g. beliefs about access and availability of information [3], lack of time to seek it and financial cost [4], difficulty at interpreting information [5] and beliefs about reliability [3]. Other essential matters are how people are able to seek online health information [6] and beliefs about the ability to do so [7]. A crucial issue is people's potential for life-long learning and informed decision making is a crucial issue, yet there is still a number of unanswered questions about the barriers that exist and may have impact on peoples' information literacy. The aim of the current study is to examine the perceived barriers to health and lifestyle information among Icelanders, as well as their motivation and information seeking behaviour. The paper will seek answers to the following questions: 1) What barriers do different groups of Icelanders experience in relation to health and lifestyle information? 2) How do the perceived barriers reflect the motivation and information seeking behaviour of different groups of Icelanders?

2 Methods

2.1 Data Collection

Two samples were used and the data was gathered using an internet and a telephone survey. For the telephone survey, a sample representing the adult population in Iceland, consisting of 600 people from the whole country, aged 18 years and older, was randomly selected from the National Register of Persons in Iceland. For the internet survey, a random sample from the Social Science Research Institute at the University of Iceland Net panel of 600 people from the whole country, aged 18 years or older, was used. The data was gathered in spring 2012. Response rate was 58.4%.

The characteristics of the respondents were compared with population parameters derived from Statistics Iceland. The distribution of men and women was found to reflect the population. There are more people in the age group 60 years and older and fewer people in the group 18 to 29 years, compared to the population. Other age groups reflect the population. The ratio of people with secondary education is representative of the population but more people with university education and fewer with primary school education responded to the questionnaire, compared with the population.

2.2 Measurements and Data Analysis

1. Socio-demographic information included the variables of sex, age, marital status, geographical residence, education and income.
2. Purposive information seeking. A list of 25 information sources channels, grouped into four channels which are Media, Health specialists, Internet and Interpersonal sources, was presented and respondents asked: 'Have you *sought* information about health and lifestyle in any of the following sources'? A five-point response scale was used (Very often – Never).
3. Motivation was measured by two questions about interest in information about health and lifestyle; and how often this topic was discussed with others. A five-point response scale was used (Very interested/often – Not interested/Never).
4. Information barriers were measured by 13 statements, each with a 5-point response scale (Strongly disagree – Disagree – Neither agree nor disagree – Agree – Strongly agree). In addition to measuring barriers by each of the statements, it was decided to use factor analysis to extract latent factors on the statements. The Principal Component Factoring method of extraction was employed to examine the factor structure. The criteria for factor loadings were set above 0.3 and varimax rotation (Kaiser) was adopted. Multiple criteria, based on eigenvalue > 1.00 suggested that extracting two factors would be adequate. The factors were named External barriers and Internal barriers. The factors explained 55.06% of the total variance in the data. The scales were checked for internal reliability and Cronbach's alpha was 0.84 for External barriers and 0.82 for Internal barriers.

K-means cluster analysis was used to determine how the participants formed distinct groups based on their purposive information seeking. Only those who gave answers

about 20 sources or more were included (N=674). Based on theoretical reasons, which were built on analysis of data in previous research, a four-cluster solution was drawn. Due to different response rates in educational groups and two of the age groups, the data was weighted to ensure that each group has the correct proportionate weight in the overall results for the sample compared to the population as a whole. All results are shown weighted. For the questions about motivation, and the barrier scales, as well as each of the 13 statements about barriers, FANOVA, controlling for sex, age and education, was used to explore significant differences between the means of the clusters on the dependent variable. A post-hoc test (Tukey) was conducted to examine which of the four clusters differ significantly.

3 Results

Four clusters were drawn and named Inactive cluster (N=219; 218), Contemporary cluster (N=59; 63), Conventional cluster (N=156; 176) and Enthusiastic cluster (N=211; 217), with reference to their information seeking activity and choice of information channels. The numbers for each cluster are first shown as weighted, after that, as actual number of respondents. The socio-demographic characteristics of the clusters were examined. Women are a majority in all clusters ($\chi^2(3)=45.61$, $p=.001$) except the Inactive cluster where men are a majority. The Contemporary cluster has the highest rate of young participants and the Conventional cluster the highest rate of older participants ($\chi^2(12)=71.90$, $p=.001$). The Contemporary cluster has the highest rate of members with university education and the Inactive cluster has the highest rate of members with primary school education ($\chi^2(6)=20.20$, $p=.010$).

3.1 Information Seeking Activity and Choice of Information Channels

Information seeking activity was assessed by computing total mean scores for each information channel and post hoc tests (Tukey) used to examine statistical differences across the clusters, see table 1.

Table 1. Purposive information seeking activity across the clusters

Information channels	Inactive	Contemporary	Conventional	Enthusiastic
Media	1.54 ^a	2.54 ^b	2.93 ^c	3.58 ^d
Health specialists	1.54 ^a	2.04 ^b	2.74 ^c	3.41 ^d
Internet	1.38 ^a	3.24 ^c	1.92 ^b	3.41 ^d
Interpersonal sources	2.22 ^a	3.75 ^c	3.39 ^b	4.04 ^d

A cluster mean is significantly different from another mean (Tukey, $p<0.05$) if they have different superscripts.

Table 1 shows that the Inactive cluster seeks information significantly least often and the Enthusiastic cluster most often in all information channels. The Contemporary

cluster seeks information significantly more often than the Conventional cluster, in the channels Internet and Interpersonal sources but the Conventional cluster seeks information more often in Media and from Health specialists.

3.2 Motivational Factors

A significant difference was found across the clusters for both interest in information ($F(3,597) = 32.28, p < .001$) and how often they discussed information about health and lifestyle with others ($F(3,598) = 34.27, p < .001$). The results are presented in mean figures in figure 1, 1 is lowest, 5 is highest.

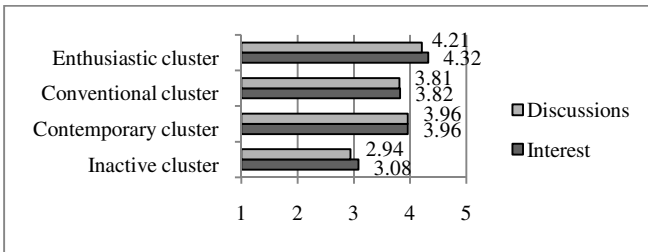


Fig. 1. Motivational factors – discussions and interest

Figure 1 shows that the Inactive cluster is the least motivated while the Enthusiastic cluster is most motivated. The Contemporary and Conventional clusters do not differ significantly from the other clusters.

3.3 Perceived Information Barriers

FANOVA was used to examine if the clusters differed in their experience of barriers. Results about the scales from the factor analysis revealed no significant difference; External barriers, $p = .258$, Internal barriers, $p = .203$. Results about differences across the clusters for each of the 13 statements are categorized in two groups in consistency with the scales and presented in figures 2 and 3.

Figure 2 shows that the value for all the statements are above median (3, neither agree nor disagree), for all the clusters. Statements number 1, 4, 5 and 6 represent barriers that are highly problematic for all the clusters, with values close to or above 4. The value for statements 2, 3 and 7 are a bit lower but they nevertheless signify considerable barriers. A significant difference was found across the clusters for statements 1 and 6. For statement 1 ($F(3,531) = 4.36, p < .05$) the Conventional cluster was significantly more in agreement than the Inactive cluster. For statement 6 ($F(3,526) = 3.00, p < .05$) the Enthusiastic cluster was more in agreement than the Inactive cluster.

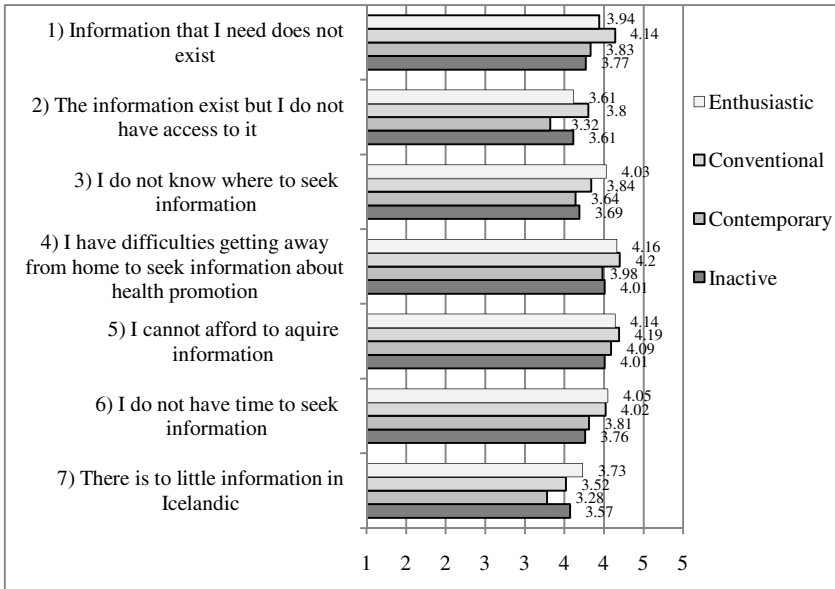


Fig. 2. External information barriers

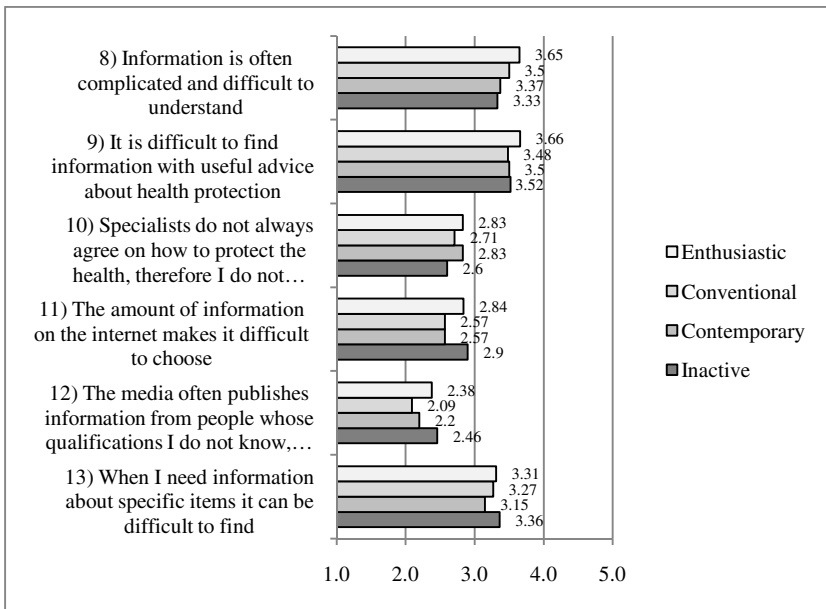


Fig. 3. Internal information barriers

Figure 3 shows that statements 8, 9 and 13 have values above 3 (Neither agree nor disagree). Statements 8 and 9 represent considerable barriers while number 13 stands for lower barriers. The value for the statements 10, 11 and 12 are below 3, indicating that they do stand for barriers. No significant differences were found across the clusters.

4 Discussion and Conclusion

It can be argued that it is vital for people's well-being and quality of life to possess the competence that information literacy stands for, and, thereby, the capacity to improve their understanding of the importance of a healthy lifestyle. People's beliefs about barriers in the information environment may be linked to their motivation to adopt information literacy skills. Certain trends were noted about the clusters' experience of barriers. For all clusters, 10 out of 13 statements represent barriers. Although the experience of barriers varied, the results indicate that the clusters had considerable problems related to their information literacy. Results about significant differences across the clusters show a connection between motivational factors and information seeking. The Enthusiastic cluster sought information most often and was most motivated, while the Inactive cluster which sought information least frequently, was the least motivated. Furthermore, a significant difference was found across the clusters for two of the perceived barriers. The Conventional cluster was more in agreement than the Inactive cluster that needed information that does not exist, and the Enthusiastic cluster experienced higher barriers in relation to problems at finding time to seek information than the Inactive cluster. Thus, the cluster which is least motivated and seeks information least frequently reported lower barriers than those which are more motivated and sought information more often. This appears illogical. Although competency theory was not used as a theoretical framework in the study, it may perhaps offer some explanation. It argues that people with low skills not only perform badly but also lack ability to recognise it, which in turn results in a tendency by them to overestimate their performance [9].

The study is limited by a response rate of 58.4% which raises the question whether or not those who answered the survey are giving a biased picture of those who did not respond. However, the findings are strengthened by the fact that the sample was found to reflect population parameters fairly well. In addition the data was weighted to ensure that the sample more accurately reflects the characteristics of the population.

The ability to make effective use of the information environment to enhance one's knowledge throughout life has been described as basic human right of lifelong learning [10]. It can signify insufficient information literacy skills if people are, for example, not aware of available information or believe that they lack knowledge to seek and make use of it. The results of this study indicate that participants in all clusters are faced with hindrances that may minimize their chances to benefit from information. It is therefore a challenge of utmost importance for the society to react and remove, or at least minimize, the barriers that confront people.

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Information Literacy in Europe: Ten Years Later

Sirje Virkus

Tallinn University, Institute of Information Studies, Narva mnt 25,
Tallinn 10120, Estonia
sirvir@tlu.ee

Abstract. This paper is a follow up to the article “Information literacy in Europe: a literature review”, which was published in the electronic journal *Information Research* in 2003. This paper examines the information literacy movement in Europe ten years later, since 2003, and provides an overview of some trends and developments. The overview is based on literature reviews, personal observations and involvement, and an exploratory study. The exploratory study attempted to understand the experience of those involved in the development of information-related competencies in European open and distance learning higher education institutions.

Keywords: Information literacy, information-related competencies, higher education, open and distance learning, multiple case study, research, Europe.

1 Introduction

This paper is a follow up to the article “Information literacy in Europe: a literature review”, which was published in the electronic journal *Information Research* in 2003. From that overview of the literature on information literacy (IL) activities in Europe it was apparent that much work was undertaken on the part of librarians to deliver IL or information-related competencies (IRC). Interest in ‘information literacy’ was illustrated by the number of projects, conferences, workshops, working groups, adaptation of IL competency standards, teaching initiatives in many institutions, development of Web sites and Web-based tutorials, and in the area of research. However, the majority of initiatives came from formal education settings and examples in the workplace, community and continuing education context were very rare. IL initiatives in higher education took a variety of forms: stand-alone courses or classes, Web-based tutorials, course-related instruction, or course-integrated instruction. Although during earlier years much of the teaching activities were separate from the curriculum, there were trends towards the integration of IL into subject areas. References to IL initiatives in Europe were, however, quite rare and fragmented. The majority of publications came from the United Kingdom. Part of the problem of understanding European IL activities stemmed from the language barrier. The paper outlined the initiatives that might be called as ‘information literacy movement’ in Europe to 2003 [1].

This current paper examines the IL movement in Europe since 2003 and provides an overview of some trends and developments. The overview is based on literature reviews, personal observations and involvement, and an exploratory study. The exploratory study attempted to understand the experience of those involved in the development of IRC in European open and distance learning.

This paper is divided into three parts. The first briefly reviews the conceptual development of information literacy. The second discusses strategy and policy aspects of IL. The third focuses on the exploratory study carried out by the author. This analysis is covering the period 2003-2013 and the focus here is on Europe. However, the paper presents only a very selective overview of some aspects of IL due to the limits of space of this publication and a more comprehensive overview will be published elsewhere.

2 Conceptual Development of Information Literacy

The starting point for this section is my observation from 2003 that highlights the context- and content-dependent nature of IRC, links it closely to learning, and with the characteristics of constructive learners:

... the constructivist approach to learning has close connections with the process of information-seeking and use [...] to learn constructively involves active seeking, processing and using of information, critical analysis and metacognition. In this context, information-related competencies may be viewed as *context-* and *content-dependent competencies* which are integral elements in a constructive learning environment and are closely related with the characteristics of constructive learners (prior knowledge, metacognition, motivation, and the complex variable 'learning style') [1].

During the last decade the individualistic, context-free and instrumental approach towards IL has been much criticized. There has been a shift in focus from the generic functional skills possessed of an individual to the situated social practices [2-5]. This shift in thinking draws on a socio-cultural approach to learning and practice. It is believed that it is a new emerging framework for IL [4] that offers a view of IL as 'a dimension of modern literacy' [6]. IL is perceived as a plural construct and terms like information literacies and multi-literacies are recommended [7-9].

Savolainen uses the term 'information practice' as distinct from 'information behavior' as its emphasis is on people as members of communities [10-11]. He defines information practice as 'a set of socially and culturally established ways to identify, seek, use and share the information available in various sources' [11]. Thus, our understanding of IL has shifted from 'skills-based approaches towards a broader and more social understanding of information practice' [12].

However, there is still a lot of confusion around the term. Herring refers to the plethora of definitions of IL as evidence of a lack of agreement on the meaning of IL

[13]. A lack of clarity with regard to the term of IL and what it means can often be an obstacle for formulating an institutional or national policy as well as collaborating internationally [14]. It is also believed that it can lead to IL 'not being fully embraced by practitioners and can contribute to a lack of recognizing IL's importance amongst policy-makers, the public, and indeed, library users and patrons' [15-16]. Limberg and Sundin have highlighted differences between practitioners' and scholars' conceptions of IL [19]. Problematic connections between IL and basic literacy are also highlighted [17], and with the explosion of digital information, IL is increasingly linked with digital literacy [18].

An increased interest in the relationship between information seeking research and IL, and in the connections between information use and learning process can be noticed in the last decade [19-20]. Five main relationship categories of information use and learning have been identified on the basis of relevant research literature: (a) learning is a part of information use; (b) information use is a part of learning; (c) learning affects information use; (d) information use affects learning; and (e) information use and learning interact. Kari and Savolainen found that all five connections identified between information use and learning offer differing points of view from which to consider these phenomena. They conclude that information use and learning are not separate processes, however, not all information use involves learning and not all learning involves information use. They argue that 'research that aims to explain the connections between information use and learning is only taking its first steps' and combined efforts from information studies, pedagogy and psychology are needed in this area [20].

However, debates about the nature of IL and its relationship to other literacies continue [18], [21]. Tuominen et al. believe that the IL debate is a necessary one because background assumptions and theories have crucial effects on how IL training is implemented [2].

3 Policy and Strategy Aspects of Information Literacy

Policy and strategy at international, national and institutional level are regarded as important factors in the development of IRC [14].

The debate on the necessary competencies¹ for the knowledge society has been an ongoing, persistent and evolving process in Europe. Key competences have had a prominent place in European educational reform process and lifelong learning (LLL) strategies in the last decade [22]. At the end of 2006 the European Council and the Parliament adopted a *European Framework for Key Competences for Lifelong Learning* that identifies, for the first time at the European level, the key competences that citizens require for their personal fulfillment, social inclusion, active citizenship and employability in the knowledge-based society. Competences are defined in this document as a combination of knowledge, skills and attitudes appropriate to the context. Although IL is not explicitly mentioned in this document several IRC can be

¹ The terms 'competencies' and 'competences' are often used interchangeably. In this paper these terms are used as referred to by authors and institutions cited in this paper.

found as a part of communicative competence, digital competence and learning to learn competence [23].

The OECD *Definition and Selection of Competencies (DeSeCo)* project has had a significant influence on the development of competence frameworks in the EU. IL is named in this document as ‘information competence’ and having the competence to use information effectively is highlighted throughout the document [24].

Skills issues and policies are also major features in the Europe 2020 policy vision. The *Agenda for New Skills and Jobs* and *Youth on the Move* initiatives, as well as *Innovation Union* and *A Digital Agenda for Europe* underline the importance of skills and announce a series of actions related to that dimension. One can clearly find IRC in this initiative [25].

However, several authors argue that the policy dimension of IL has not received sufficient attention in the academic literature [26-27]. There are only few discussions on the IL strategy and policy at the European level in the reviewed period. For example, Corral explored strategic commitment to IL in UK universities [28]. In 2011, a special issue of *Library Trends*, *Information Literacy Beyond the Academy, Part I: Towards Policy Formulation* was issued. Several European authors examined various policy documents and IL from the strategic perspective in this issue [8], [26-27], [30].

Basili analysed the data collected by the European Observatory on Information Literacy Policies and identified fifty-four policy initiatives in Europe. She found that courses generally dominate and policies are less important. She concluded that in most countries in Europe IL has not yet entered the policy agenda and it is still necessary to promote policy awareness regarding IL [26].

Some recommendations were formulated to influence policy makers’ perceptions and actions to support mainstreaming of IL within the EU-funded EMPATIC (*Empowering Autonomous Learning through Information Competencies*) project [31].

Basili believes that IL is still in a pre-policy phase [26]. Whitworth also argues that IL is rarely recognized at the highest political level, being ‘subsumed within an ‘information society’ agenda focusing primarily on the promotion and development of ICT skills and infrastructure’ [27]. The most influential events are still the Prague meeting in 2003 and the High-level Colloquium on Information Literacy and Lifelong Learning in Alexandria in 2005 and the strategic documents of those events as mentioned by several authors [1], [6], [27], [29].

However, European cluster on key competences has been very active, aiming at fostering cross-curricular competences and designing instruments to implement and assess these [32]. On the basis of analysis of the European strategy and policy documents we can confirm that although IL is not always explicitly mentioned, IRC are embedded in those documents.

4 An Exploratory Study

During the period of March 2003 to October 2004 an exploratory study was conducted in European open and distance learning (ODL) higher education institutions (HEIs) to understand the experience of those involved in the development of IRC.

The research problem was concerned with why progress in developing IRC in higher education has been so modest and the belief that a better understanding of what academics, senior managers, librarians and students are thinking and doing would help better to engage them in effective development of IRC.

The research involved a mixed methods research strategy, using both quantitative and qualitative methodologies, built into a two-stage research design. The first stage was a small-scale questionnaire survey of European higher ODL institutions. The results of the survey provided a broad picture of a phenomenon and helped to identify relevant institutions where good practice was taking place. The second stage involved the collection of qualitative data, by means of a multiple case study within the post-positivist paradigm. Site visits, observations, document analysis and 72 in-depth interviews with four actors (students, faculty, senior managers and librarians) were conducted in six European ODL institutions. Descriptive analysis was applied to the questionnaire survey data, while the qualitative data was analyzed using a constant comparative method of data analysis to provide a holistic picture of the contextual factors influencing the development of IRC.

Findings from the survey indicated that there were some promising developments in the area of IRC in European HEIs of ODL in terms of institutional policy, faculty-library collaboration and staff development. Limited progress was identified as regards IRC being incorporated into governmental agendas, into teaching and learning or developing research and supervision partnerships. Survey findings showed that European higher ODL institutions were actively involved in the development of IRC but the manifestation of that involvement was patchy and varied in the period of this study.

Case study data enabled an exploration of where perceptions and experiences came together and diverged among the four actors. These findings suggested a framework for the development of IRC consisting of four dimensions: strategic, educational, professional and research. Central to the findings is the illumination of a complex interaction of factors in each of these dimensions that enhance the development of IRC. Therefore, the lack of a holistic approach to IRC in European HEIs may be an obstacle for the effective development of these competencies. Differing perceptions and expectations of different actors' roles and responsibilities in academia might create unexpected behaviors and so have an adverse impact on the implementation of programmes that facilitate the development of IRC.

Findings suggested the need for leadership development, increased collaboration and partnership between faculty and librarians in curriculum development, supervision and research. In addition, institutional and governmental support through clear and effective policies and commitment to human and physical resource development to achieve the efficient development of IRC are also required. The concept *university as a learning organisation* is suggested as an umbrella construct which ties together the four dimensions that emerged from this research and forms a framework which illuminates the overall goal of the strategic, educational, professional and research initiatives within the university [14].

5 Conclusion

During the last decade our understanding of IL has shifted from skills-based approaches towards a broader and more social understanding of information practice. IL is embedded in European strategy and policy documents, although not always explicitly mentioned. However, there is still confusion around the term.

Research findings showed that European higher ODL institutions were actively involved in the development of IRC but the manifestation of that involvement was patchy and varied in 2003-2004. The lack of a holistic approach to IRC in European HEIs may be an obstacle for the effective development of these competencies. Differing perceptions and expectations of different actors' roles and responsibilities in academia might create unexpected behaviours and so have an adverse impact on the implementation of programmes that facilitate the development of IRC.

Findings suggest the need for leadership development, increased collaboration and partnership between faculty and librarians in curriculum development, supervision and research. In addition, institutional and governmental support through clear and effective policies and commitment to human and physical resource development to achieve the efficient development of IRC are also required. The concept *university as a learning organisation* is suggested as an umbrella construct which can tie together different IL dimensions and form a framework which illuminates the overall goal of the strategic, educational, professional and research initiatives within the university.

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Information Culture, Media and Information Literacies in Russia: Theory and Practice, Problems and Prospect

Natalia I. Gendina

The Science Research Institute for Information Technologies
in the Social Spheres, Kemerovo State University of Culture and Arts,
Kemerovo, Russian Federation
nii@kenguki.ru

Abstract. The purpose of the survey is to analyze information literacy and media education in Russia, and to highlight their similarities and differences. It was commissioned by UNESCO's Information and Communication Sector. The Russian publications on media education and information literacy were examined. The main results concluded that there is a domination of the term "information culture" in Russian-speaking research as a most capacious integrative concept in the sphere of information education. The term "information literacy" is not so popular and is not widely used. Schools, universities, libraries, mass media, professional associations and other institutions play a serious role in information literacy and media education. The problems and prospects of information and media literacy integration are discussed at international and national levels.

Keywords: Information literacy, information culture, media literacy, Russia.

1 Integration of the Terms “Information Literacy” and “Media Literacy”: New Initiatives of UNESCO and IFLA

In 2010-2013, UNESCO and IFLA suggested to unite two directions - information literacy and media literacy which were developing in parallel earlier. The following was made for this purpose:

- The expert group meeting “Development of Media and Information Literacy Indicators” 4-6 November 2010 Bangkok, Thailand.
- Media and Information Literacy Curriculum for Teachers (prepared by UNESCO) (Paris, UNESCO, 2011).
- International Conference “Media and Information Literacy for Knowledge Societies” (Moscow, 24 - 28 June 2012).
- First WSIS+10 review meeting “Towards Knowledge Societies for Peace and Sustainable Development” (Paris, 25-27 February 2013).

Anticipating this meeting, the Communication and Information Sector of UNESCO did a series of research papers titled "Conceptual Relationship between Information Literacy and Media Literacy". It was executed by leading world experts and published on UNESCO site <http://www.unesco.org/>.

The results of my survey were included in this series 'Media and Information Literacy in Russia and the Countries of the Commonwealth of Independent States (CIS)', a survey undertaken on behalf of UNESCO's Communication and Information Sector.

As a result of these UNESCO and IFLA initiatives, a new integrative concept was offered: "MIL is defined as a combination of knowledge, attitudes, skills, and practices required to access, analyze, evaluate, use, produce, and communicate information and knowledge in creative, legal and ethical ways that respect human rights. Media and information literate individuals can use diverse media, information sources and channels in their private, professional and public lives" (The Moscow Declaration on Media and Information Literacy, Moscow, 28 June 2012).

2 Information Literacy and Media Literacy: Features of Russian Terminology

Concepts such as "information training", and "working with information" do not have clear definitions. They comprise a large spectrum of knowledge and know-how in the areas of information and technology that facilitate individual's work in the same area. The reason for this uncertainty is connected to the varieties of information types (text, audiovisual, computer identifiable, etc.), arrays of information sources (article, book, patent, movie, broadcast, web site, etc.), and varieties of equipment and technology of replication, processing and information transfer: from a nib, Guttenberg's press to electronic devices, electronic book and the Internet.

Information education changed during the various historical periods according to evolution of information sources, development of information equipment and technology. It was reflected in the terminology. It is possible to highlight two main fields in Russian terminology:

1. Information training, whose definition comprises concepts such as library and bibliographic literacy, library and bibliography-related knowledge, the culture of reading, information culture, personal information culture, information competence, information literacy, computer literacy, Internet literacy, ICT literacy and so on. The term information culture is the most widely used in Russian literature; the term information literacy is the most widely used in English literature.
2. Media education, whose essence reflects concepts such as screen culture, visual culture, video culture, cinema and video culture, visual literacy, audiovisual literacy, media literacy, media competence, media culture, culture of media perception, etc.

Nowadays, in Russia, the term “information culture” is an all-inclusive and integrative concept in the domain of information literacy and it can be “personal information culture”, which is closely linked to the fostering of the information society [1-2].

3 Theoretical Base of Information Training and Media Education

Information training and media education have a fairly strong theoretical base in the Russian Federation. In many Russian cities, research is conducted in these fields, a number of specialized books and periodicals (both in traditional and electronic formats) are published, dissertations are defended and a number of scientific conferences are held.

Table 1. Classification of analyzed publications by subject and type (1990 - 2010)

	Theses	Books	Articles	Total
Information Literacy	319	130	366	815
Media Education	149	74	202	425
Total	468	204	568	1240

Results of theoretical research accumulate in theses, and development of the theory of information training and media education in Russia is concentrated in the sphere of pedagogical sciences.

The significant amount of scientific conferences devoted to these problems is a sign of attention among scientists and experts to information training and media education. For the period from 1993 to 2011, more than 30 international, Russian and regional scientific conferences on the information training, accompanied by published articles (papers) were organized. These conferences took place in the Russian cities of Krasnodar, Moscow, Kemerovo, Novokuznetsk, Novosibirsk, Omsk, Perm, Samara, and St. Petersburg.

More than 20 international, Russian and regional scientific conferences in the sphere of media education were organized in Belgorod, Ekaterinburg, Kemerovo, Magnitogorsk, Moscow, Omsk, Taganrog, and Tomsk between 2002-2011.

Unfortunately, as it is shown in the analysis, problems of information training and media education in Russia are considered in publications and discussed at separate and conferences independent from each other. There is no interdisciplinary research integrating theoretical achievements in the field of information training and media education in Russia. Therefore, there is no interaction of scientists and experts in the field of these two parallel yet independent disciplines [3].

4 Practice of Information Training and Media Education in Russia

Authorities, scientific and educational institutions, libraries, professional associations, public organizations, and mass media make their own contributions to the development of information training and media education. A list of these contributions is detailed below.

4.1 Contributions of Authorities to Information and Media Education

Contributions of authorities to the development of information training and media education in Russia consist of creation of conceptual standards and legal bases in the sphere of information, informatization, and formation of information society in Russia. They are found in the following documents: *Federal laws*: On information, information technologies and protection of information; on provision of access to information about activities of the state and local authorities; and on protection of children from information, which is harmful to their health and development. *Strategies*: Strategies for information society development in the Russian Federation. *Doctrines*: Information security doctrine of the Russian Federation. *Concepts*: the concept of national information policy; and the concept of information society in Russia; *Government programs*: State program of the Russian Federation “Information Society (2011-2020)”; and national program of support for the development of reading.

In Russia, there are a lot of conceptual and standard regulations developed by the Russian authorities, however among them there are no the documents purposed for the solution of problems of information and media education [3-4].

4.2 Contributions of Scientific Institutions to Information and Media Education

Contributions of scientific institutions (universities, scientific libraries, research centers, institutes and laboratories of the Russian Education Academy, regional centers of media culture and media education) to the development of information training and media education in Russia consist of organizing different sorts of scientific conferences and seminars, and scientific research, including theses, and scientific publications [3-4].

4.3 Contributions of Russian Educational Institutions to Information and Media Education

The REI has introduced and required a number of courses which cover information and media education. The subject ‘Information science and ICT’ was as an obligatory discipline in schools and colleges since 1985. Another course, ‘Introduction into

specialty (profession)' has been obligatory since 1974. The basics of bibliography and information science are included in this course.

Since 1991, 'Informatics' is as an obligatory discipline in all universities of Russia. Nowadays in Russia, information training is taught in the framework of an obligatory discipline 'Information science and ICT'.

Unfortunately, information education is understood narrowly. It is realized, first of all, as elimination of computer illiteracy and studying the basics of ICT. However in this case, skills and know-how in possessing scientific and professional information are not formed, methods of critical analysis, analytical and synthetic processing of information are not conducted, communication between efficiency of study and professional activity with information literacy and information culture of the person is not revealed. And only in 1990, at the end of 20th century, facultative courses 'Principles of personal information culture', 'Information culture', and 'Information culture of a specialist,' etc., were implemented in Russian universities [5].

Media literacy is not a required course of study.. Media education is realized in the informal education system for children (film and video clubs, young journalist communities, etc.). In 2002, 'Media education' was implemented in teacher education. In 2012, in the Sholokhov Moscow State University for the Humanities implemented a correspondence course called 'Media education' in their Master's program in journalism. As it is shown in the research, there is no interaction between the development of information training and media education in educational institutions; both of these directions developed separately [3-4].

4.4 Contribution of Russian Libraries to Information and Media Education

Libraries have a rather significant amount of various resources to teach information seeking and skills of working with different types of information, usually documentary information. Libraries raise information awareness through library classes, library excursions, book exhibitions, 'Information Days', discussions, etc. Recently, the libraries have adopted a systematic approach to information training. Courses offered in this approach include 'The fundamentals of library and bibliography literacy', 'Fundamentals of personal information culture', 'Learn to learn', 'Basics of information science and information library technologies', and 'Basics of computer literacy'.

Information training in libraries includes learning the search algorithms of documentary information, working with reference editions, and library catalogs, including their electronic versions. Media libraries, which are structural divisions of the Russian libraries, teach readers the rules of searching and using media information.

Training activities in libraries encounter a number of difficulties and problems. There is no requirement to study the course 'Fundamentals of personal information culture', and there is a lack of library staff who can professionally manage and provide information training. All these problems demand the decision at the government level, for their efforts as enthusiasts in libraries and educational institutions aren't enough to increase the level of information education in all Russian society.

Research shows that there are two professional groups which are the most prepared to develop ideas of media and information literacy in Russia: teachers and librarians [3-4]. Since 2012, in school libraries of Russia, a new profession as a teacher-librarian which duties include formation of school students' information culture is implemented.

4.5 Contributions of Russian Associations to Information and Media Education

The most important activities of these associations are [3]:

- Conducting scholarly research on media education
- Holding scientific conferences, seminars
- Developing media educational centers in different regions of Russia
- Developing electronic resources for media education:
 - Association of film education and media pedagogics of Russia <http://eduof.ru/mediaeducation/> on the Russian general education portal
 - Information, educational and scientific portal "Information literacy and media education" <http://mediagram.ru/>
 - Open electronic library "Media education" <http://edu.of.ru/medialibrary/>
 - Electronic scientific encyclopedia "Media education and Media Culture" <http://www.edu.of.ru/mediacompetence/default.asp>
 - Library "Single window of access to educational resources" (Section "Media education") <http://window.edu.ru/>

Detailed information about activities and publications on media education in Russia are presented on the association's site: <http://mediagram.ru/>

4.6 Contributions of the Russian Library Associations to the Development of Information Education

There are two Russian Library Associations in the Russian Federation: Russian Library Association (RLA) and Russian School Library Association (RSLA). The main activities of RLA are connected with information training of users and protection of users' rights; and scientific, practical, cultural and educational activities. RLA initiated the development of Model Standards for public, children's, junior and special libraries of the Russian Federation. These Model Standards contain the section "Development of Users' Information Culture". For the first time in the Russian library practice, formation of information requirements and information culture for both readers and the population was allocated as the independent direction of library activity. The list of definite actions, and events are provided in these Model Standards. Activity of RLA is presented in the site: <http://www.rba.ru/>.

RSLA pays special attention to the formation of school students' information culture. School Library Journal has a constant heading "Information Culture". In the appendix of the Journal, books on theories and methods of person's information

culture formation in the conditions of school library are constantly published. RSLA is the initiator of the annual Forum of Russian school librarians. Training workshops and seminars for school librarians on methods of teaching the training course "Fundamentals of a person's information culture" are regularly organized during the forums [3], [6].

RSLA acted with a social initiative of implementing a new professional position in school libraries – "Teacher-librarian". The duties of "teacher-librarian" include promoting information culture among school students. Information about activities of RSLA is presented in the site://www.rusla.ru/

4.7 Contribution of the Russian Committee of UNESCO Information for All Programme to the Promotion of Information and Media Literacy, Information Culture

For more than 10 years, the Russian Committee of UNESCO Information for All Programme, chaired by E. I. Kuzmin, has been coordinating the activities of the Russian academic library, and information-related institutions, research teams and individual researchers in the field of information literacy, thus (a) promoting one of the most important priorities of 'Information for All' Programme, i.e. information literacy, and (b) developing national traditions in the formation of the personal information culture. The major areas of the Russian Committee in this field are managerial, information and publishing-related, and educational. For this work, the conferences, round-tables, and seminars are constantly organized [3]. Information about activities of the Russian Committee of UNESCO Information for All Programme is presented on the site://www.ifapcom.ru/.

4.8 Contributions of Mass Media to Information and Media Education

More than 150 Library and Information Journals reflect the problem of media and information literacies in Russia. The most prominent periodicals are "Library in School", "Bibliography", "Scientific and Technical Libraries", "Library", "School Library", "Librarianship", "World of Library". In the sphere of Media Education, there are such journals as "Media Education", "Media Library and the World", "Education. Media. Society: Space and Cooperation" [3].

Electronic journals are providing a significant contribution to the development of information training and media education:

- "Media education". Russian journal on the history, theory and practice of media pedagogics (<http://www.mediagram.ru/mediaed/journal/>)
- "Media. Information. Communication". International electronic scientific and educational journal (<http://www.mic.org.ru/index.php/about>)
- "Mediascope". Electronic journal of Journalistic Faculty of Lomonosov Moscow State University (<http://www.mediascope.ru/>)
- "Elementary media school". Electronic scientific, pedagogical, cultural and educational journal (<http://www.mediashkola-plus.ru/>)

5 Main Research Results

1. Domination of the term "information culture" in Russian-speaking research (publications) as the most commonly used integrative concept in the sphere of information education. Term "information literacy" is not so popular and is not widely used.
2. The existence in Russia of a rather developed theoretical base of information training and media education: conducting of scientific research, editions of specialized periodicals (traditional and electronic), theses proving, holding of scientific conferences.
3. Information training and media education in Russia is provided generally at schools, colleges, universities and libraries. Scientific and research centers, professional associations, public organizations, mass media, and authorities also contribute to the development of information training and media education. The main professions focused on information training and media education are teachers (educators) and librarians.
4. Concentration of information training and media education in educational institutions and libraries. Training on informatics and ICT bases is obligatory, and as for media education it can be a facultative course in the general education system. The libraries play the significant part in information training and in media education as this role is defined as additional education for children.
5. Distinctions in information training and media education. Information training is directed on studying of opportunities of personal computer use and ICT during the work with different documents, creation of the information products connected with professional and educational activity of trainees.
Media education is focused on studying different media texts demanding possession of special methods of analysis and technology of photo, video, filming and installation; development of perception skills and analysis of movies and telecasts, studying of screen art language, and development of amateur journalistic and video arts.
6. There is an overlapping and lack of interaction in the development of information training and media education in Russia.

6 Issues of Information Training and Media Education in Russia

1. At the level of the Ministry of Education and Science of Russian Federation information education is understood as being separate from computer illiteracy and training ICT skills. Ideas and the principles of the integrative approach of UNESCO and IFLA are not widely known, and the potential of such directions as formation of information literacy and media literacy, and formation of person's information culture remains underestimated and poorly used.
2. Russian society as a whole, as well as the heads of educational governing bodies, educational authorities, heads of educational institutions, teachers, professors and

librarians are poorly informed about the benefits and opportunities of information training and media education in the sense that UNESCO and IFLA now interpret the new concept "media and information literacy." Society still not aware that media and information literacy is the foundation of lifelong learning. It greatly affects a person's ability to make competent and independent decisions necessary to participate in the democratic process, and access to the global information network to improve the quality of life.

3. Absence of a standard and legal base regulating and supervising the development of information training and media education for citizens in Russian Federation. Absence of a center which would coordinate the efforts of experts in various spheres of knowledge, for development of information training and media education for citizens of Russia.
4. Lack of the qualified pedagogical and library staff and specialists working with information, who provide information training and media education for citizens. Lack of the educational and methodical editions for information training and media education.

7 The Problem of Integration of "Information Literacy" and Media Literacy": Perspectives on the International and National Levels

For a long time, media literacy and media education have evolved in isolation from each other; their representatives were not communicating enough with each other. Each of these fields has its own specifics. The transition to a unified concept of media and information literacy, promoted by UNESCO and IFLA is a big and complex problem. Its solution, in my opinion, should be done at both national and international levels. For each country, the integration of media and information literacy should be conducted in accordance with national traditions and historical development of culture and education, experience of information education and media literacy. For example, in Russia it requires the state approach to the organization of information and of media education:

- It is necessary to establish the priority of national and regional programs of information and media education;
- It is necessary to develop national standards for information and media education;
- It is necessary to include information culture and media literacy into curricula of schools at all stages and levels of education;
- Special training of teaching and library and information staff, providing information and media education of citizens is required.

The problem of integration of information and media literacy cannot be solved mechanically, by simple union of these two directions. First it is necessary to conduct research to answer the question: How should media and information literacy integrate?

Solving the problem requires new interdisciplinary knowledge, which is owned by scientists and experts from different fields of knowledge together. It is necessary to bring together scientists and experts in different fields (teachers, librarians, psychologists, media educators, IT- specialists, and possibly others) from around the world. Only representatives of various sciences and disciplines can create science-based recommendations on how to teach media and information literacy. Therefore, the complexity and scale of the problem requires coordinated action not only at national but also at international level.

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Technological Developments and Information Literacy in Albania

Etleva Domi

National Library of Albania, Tirana, Albania
etlevadomi@gmail.com

Abstract. The purpose of the research was the study of the current information literacy movement and practices in Albania. The first part of this paper provides background information about technological developments in Albania during the last 22 years. A brief review is given of the implementation of new technologies which have facilitated the access to huge amounts information; information is received at home and at work, in libraries or in bars. Related to the growth of digital information, Information Literacy has become, more than ever before, the country's imperative objective. To respond to the digital environment, efforts have been done to create an information literate society. A lot of ongoing government projects have been initiated recently, focused on modernization, especially of ICT in education, public institutions and public administration. The second part of the paper traces current developments of information literacy in Albania. The concept has spread and is defined correctly mainly among librarians and information professionals but is not explicitly recognized by other communities. The process of becoming information literate has been focused mainly on computer literacy. The paper then moves on to look at the leadership role of the National Library of Albania in developing IL as a component of the lifelong learning process. As the Bologna processes are having an impact on the development of the Albanian curriculum structures, it is necessary to draw attention to the developments of IL at different levels in the national educational system.

Keywords: ICT, information literacy, education, libraries, Albania.

1 Technological Development in Albania

1.1 Information Communication Technology

Democratic changes in the early 1990 in Albania increased the level of demand for easy universal access to information and more information sources. During the last 22 years, there have been demonstrated fast developments in the ICT sector. The implementation of new technologies: mobile, iPod, I Phone, tablets, computer, laptop, internet, home internet users, online communication, and e-Kindle., launched an information and communication revolution with direct effects on everyday life, which are bringing real qualitative changes.

The first private company, which distributed IT products, commenced in 1991. The launch of the first signal for mobile communication in Albania was in 1996 (holds AMC's name). In 2011 the global telecommunication operator Vodafone introduced the 3G technology. The first Internet providers in Albania were UNDP and Soros Foundation who in 1995 provided institutions and universities with emails. The first Albanian Internet Service Provider, created in 1998, made a revolution in Albanian telecommunication services. Indeed we can see this today: never have more people been connected to the new media and the interest of the youth generation who are adept at navigating the fashions.

In the last ten years special attention had been addressed to the establishment of new ICT government structures, such as: ministry, agencies, and faculties. While IT courses started in the mid-eighties at university level, in 2007 the Faculty of Information Technology (Department of Electronics and Telecommunications; Department of Computer Engineering) [1] was established. Created in 2007, the National Agency on Information Society has the mission to guide the implementation of strategies for the development of Information Society and Information and Communication Technologies, while the Electronic and Postal Communications Authority is the regulatory authority for telecommunication in Albania.

A lot of ongoing government projects have been initiated recently focused on modernization, especially in education, health, public institutions and public administration. The Albanian Government has developed the National Strategy on Information and Communication Technology, and has established modern electronic public services through: e-government, e-procurement, e-legislation; e-commerce, e-cards, e-bills; e-business, one stop shop; e-health; e-education; e-driver license for citizens and businesses.

Statistics. The new technology of information and communication's usage actually is evident. If we have a look at the statistics regarding ICT in 2012 compared to 2011, we can observe that the number of Secure Internet Service Providers, home Internet user (broadband access: 27 % of families) has grown [2] as has mobile phone's customer Internet users (access broadband 3G: 139%) [2]. Internet is not a luxury now. According to the World Bank Report published in 2012 Internet users in Albania were reported at 1.441.927 in 2010 [3]. Mobile phone use is widespread. It is hard to find people without a mobile phone. It is strange, but true, that Albanians each have 2 or 3 mobile phone cards number. In 2012 the mobile cellular subscribers was 5.6 million (198 % penetration rate), out of which there were 3.5 million active users (125% penetration rate) [2]. Mobile telephony's penetration rate is above the average level of EU countries [2]. Half of Albanian has a bank-account and online bank access is growing.

1.2 Information Technology - Information Society –Information Literacy

In the 21st century the technological developments have facilitated the access to huge amounts information; - information received at home or work, in libraries or in bars. The growth of digital information is increasing more attention on IL, related indeed to

information technology skills. The new technologies empower Albanian citizens with exciting ways of interacting with world's information. Moreover, when the Internet, with its unlimited "ways" provides access to information in just one minute, it is thus obvious why they warmly welcome and embrace wider uses of technology, but without knowing "how", "when" and "where". The necessity to create an information literate society, - as an important key to country's development, - is evident. Efforts have been made to respond to this electronic environment. Often called "developing countries" are making progress in terms of penetration of information technology, but not information literacy among citizens. In addition, it should be noted that without IL, the information/knowledge society will not be realised.

More than ever the "technological revolution" as well as the "global trend" of making information more and more available through the web, require information literacy instruction for all levels of users/clients. The knowledge society demands literate people, able to use the "power of ITCs" for their needs. "Digital drivers/navigators" have an unexpected profit from the Internet's vast resources and services. A notable share of Albanians associate Information Literacy with the library as "public space", where everyone already has free access to ICTs, and as the "best environment" where users acquire necessary information literacy skills.

The expansion of Internet has made a major impact in the Albanian society as well as in the national library system. The lightning speed of information technology developments lead to a new meaning about the role of Albanian libraries in information literate society: changing from book provider into information center, where librarians guide user's navigation to the enormous information market by helping them to become literate in the digital area. Furthermore, they are making efforts to gain for themselves skills in IL. "Everyone should have the necessary skills to benefit from the Information Society" [4]. But there remains a great deal of work.

2 Development of Information Literacy in Albania

2.1 National Policies

Albania does not have formal national policies on Information Literacy. The different forms of education in Albania do not include Information Literacy in their curricula. Teaching information skills does not start at the elementary level (primary school); it is more central at the higher educational level. The process of becoming information literate has been focused mainly on computer literacy and not on media literacy or web literacy. In higher education institutions conduct only ITC courses and academic writing. It not sufficient to teach only how to write academic research essays. It is also necessary to learn how to find information and use it. Information science was introduced in many faculties as well as in secondary school in the mid-nineties. The Information Literacy movement in Albania has evolved from the National Library of Albania (NLA) and other institutions are at the beginning of this process.

2.2 Concept

It has to be said that in Albania the term *Information Literacy* has spread and is described/defined correctly mainly among librarians and information professionals, as “a set of skills, attributes and behaviors, and as a set of basic competences that should be used by everyone for a given need”. However, IL is not explicitly recognized by other communities. According to my research as well as my own observations of students groups (teaching experience), by the end of the 2010 it can be concluded that the meaning of *Information Literacy* is explained and accepted by librarians and/or communication experts as proposed by ALA in 1989 (80 %); while 25-30 % have information about IFLA IL Section and UNESCO International Literacy Day.

Therefore we could say that in Albania *Information Literacy* is generally well understood as a concept, but is not used widely; is used and defined with clarity mainly by librarians, but not by educators. It is confusingly used by students; the term is not found in textbooks in Albanian or in bilingual dictionaries edited in the country.

While the concept of *Lifelong Learning* become more widely accepted as a cornerstone of education and information society. *Lifelong learning* contains various forms of education and training including the traditional library school system, free user adult education, and professional training. All these forms rely on working methods developing the individual’s ability to search for information and develop knowledge.

In the digital environment, often people act as “Literate citizen” navigating without guide in the “Ocean of knowledge” by identifying, locating, evaluating and using information when it is needed, without known the IL term. “*Information Literacy* lies at the core of lifelong learning. It empowers people in all walks of life to seek, evaluate, use and create information effectively to achieve their personal, social, occupational and educational goals. It is a basic human right in a digital world and promotes social inclusion of all nations” [5].

2.3 LIS Education

The NLA, - as pioneer in the application of Information Literacy, - is becoming more and more a key player in developing Information Literacy as well as the Lifelong Learning Process. Over the last years, it has started to pay special attention to developing programs for its implementation. The waves of the “technical revolution” are lashing even in Albania. Increasing attention to IL in recent years is the result of information overload, especially related to the growth of digital information. In the age of cybernetics, the librarians use literacy skills to interpret the information. Similar to other European countries, the IL movement has evolved from precursors such as: library instruction, bibliographical instruction and reader/user instruction. In the last five years, various faculties supported by NLA started programs on bibliographic research, internet search, search engines, orientation lesson/course in the use of: library homepage, catalogues (manual, electronic, digitized), information resources, and digitalized sources.

However, Information Literacy has been central only in Library Education. In Albania there is strong information and library professional education. The forms of LIS are:

- Formal education;
- Continuing library education;
- Professional Training;
- Postgraduate education.

Formal Education. The formal education of librarians in Albania started in 1969, when the National School on Librarianship (two years) at the NLA was established. Differently from other countries, LIS program is not offered at university level. NLA continue to be the only one legal national center for librarian's education. It is important to point out that during the last decade, under the influences of technological changes in the national library network, the rapid growth of PCs, the development of the web, internet and its trends; the National Library School programs are changing by introducing new modules related to ICT usage and necessary skills. Subjects such as: Organization of information, Information research tools, Digital Library, and Information Technology have occupied an important place in LIS curricula. 422 (234 in the 2010-2012 program) hours are devoted in the last stage of the National School on Librarianship program (2012-2014), while 114 (88 in the 2010-2012 program) hours are spent dealing with Information Technology and Information Literacy. The number of students varies from 35-40 every two years. When we first started, most of the librarians coming in for classes had never used the Internet before and they were curious to see what it was like.

Continuing Library Education. With the impact of digital technologies at the beginning of the New Millennium, has developed news ideas for information literate people: using IT and becoming a lifelong learner. In our society, the amount of information and the new technology effects are challenges for everyone, including even the best educated people. For that reason, the concept of lifelong learning is included in our library's programs. For librarians it is necessary to be technologically "literate"; so that they are able to access and use the technology fluently, to use new media as Internet, online database, and digital collections

It was in 1999 that the Library Training Center (LTC) began to organize regularly one year academic courses for librarians. LTC's curricula objective was to encourage the librarians to develop their leader teaching role in the digital arena. In the past years, in the area of technological sophistication, the programme has focused on acquainting people with new skills in using computers in the library, OPAC and Internet, digital literacy, and media literacy in order to lead/guide the clients/users in how to find and apply the information resources to their life and work. More than 80% of modules in continuing professional education relate to Information Technology and Information Literacy.

Library Professional Training. As the librarians had to be able to act as providers of information literacy for the community, according to their needs and professional level, LTC organizes workshops and offers short training courses on offering contemporary knowledge and skills in librarianship. Its aim is to improve knowledge, skills and competence and how to use the library.

As more people are turning to the Internet first for information rather than to libraries, Albanian librarians try to compile policies to show the users that they are not just concerned with books but with providing information regardless of the medium. Their rich experience had shown that access to the technology requires possession of the necessary technical skills. That is why promoting information skills as well as research skills are the Albanian librarian's most important task.

In recent years the library has been involved in user/student education in the form of one or more of the following: short orientation courses in the use of the library, its information resources, and catalogues. LTC provides training on searching the Web, how to find information, how to evaluate it, how to get information resources.

Postgraduate Education. The first program on postgraduate education studies in librarianship opened in 2009. Before then there were no graduates at the master's level in LIS. It has been organized by the University of Philology in collaboration with NLA. Taking into account the growing interest in information technology and keeping in mind that the IL is a key component of lifelong learning, master's programs for librarians is rich even in module on information literacy. Special attention is given to the IL in digital age, historical IL, concepts, standards, and initiatives.

3 Conclusion

It is apparent that national policy had initiatives being undertaken more on information technology than in information literacy. Information Literacy is incorporated into the daily practice of libraries and library education. The term is mainly used by the librarian community. Students receive university diplomas without having necessary information literacy skills and without being information literate people.

As the Bologna process is having an impact on the development of the Albanian curriculum structures, it is necessary to draw special attention to the developments and implementation of IL programmes in the national educational system, at different levels. The concept of IL has to be promoted from an early age; should be started at primary school and should be continue during the whole education process. In the future librarians have to begin building partnerships with faculties by collaborating in the implementation of designed IL curricula. IL as knowledge, more than skill, must be a part of formal training during the whole educational process in Albania.

While national achievements are evident on ICTs, to achieve performance in Albania society and in the Albanian economy, national authorities have to make efforts to impose the concept of information literacy, and then to compile a National Information Literacy strategy.

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Information Literacy in the Czech Republic: A Territory for Theory, Practice and Co-operation

Hana Landová^{1,2}, Ludmila Tichá³, and Lenka Bělohoubková⁴

¹ Czech University of Life Sciences in Prague, Study and Information Center

² Charles University in Prague, Faculty of Arts, Inst. of Information Studies and Librarianship, Prague, Czech Republic

hanalandova@sic.czu.cz, hana.landova@ff.cuni.cz

³ Czech Technical University in Prague, Central Library, Prague, Czech Republic

ludmila.ticha@uk.cvut.cz

⁴ University of Economics in Prague, Center of Information and Library Services, Prague, Czech Republic

belohoub@ciks.vse.cz

Abstract. The Information Education and Information Literacy Working Group – *IVIG*, part of the Association of Libraries of Czech Universities – *ALCU* has been active in this area since 2000. Its activities cover the introduction of conceptual and theoretical documents, including terminology and definitions, as well as the preparation of teaching materials, the organization of workshops and sharing good practices. Co-operation with the IL key actors within and outside of the Czech Republic has become an essential part of *IVIG*'s work. At the beginning, there was a crucial task to develop a relevant Czech terminology related to information literacy issues. The term *information education* became a part of the discussion and was lately established as a unified term for the activities leading to IL development. Simultaneously, the work on the IL definition was initiated. The final set of requirements has become a basis for creating the *Information Literacy Standards of a University Student in the Czech Republic*. Starting in 2000, six questionnaire surveys were carried out in order to map the development of activities in information education at the public universities in the Czech Republic. In 2008, the *IVIG* working group published a crucial strategic document – *Information Education Strategy at Universities in the Czech Republic*.

Keywords: Information literacy, Czech Republic, information literacy policy, higher education, professional organization.

1 Introduction

Over the past 15 years, the Czech Republic has passed a long way while developing information literacy policies and best practices, especially in the higher education environment. The Information Education and Information Literacy Working Group – *IVIG* [1], part of the Association of Libraries of Czech Universities – *ALCU* [2] has been active in this area since 2000. Its activities cover the introduction of conceptual

and theoretical documents, including terminology and definitions, as well as the preparation of teaching materials, the organization of workshops and sharing the best practices. The co-operation with IL key actors within and outside of the Czech Republic has become an essential part of IVIG's work.

Information literacy support in the Czech Republic was studied comprehensively within the frame of a research project in 1975, followed by a specialized seminar and publication of the proceedings in 1978. The research results have never been applied systematically, and usually focused on informatics and computers [3]. However, some universities provided lectures and published textbooks on research strategy. During the 1970s, bibliographic databases in remote regime were offered by the national information center, and in the 1980s, on-line access to the database centers was enabled. In the 1990s, electronic databases on CD-ROMs were offered to library users. User education and IL courses became a new task for research and university libraries. Before the IVIG Working Group was established in 2000, librarians had been working separately on their own IL courses and teaching materials.

The usefulness of the platform for co-operation has resulted from a common need to develop IL programs, share experiences and discuss the IL issues. Recognizing the implication of IL for higher education, the IVIG working group was formed as a part of the Academic Libraries Section of the Higher Education Council of the Czech Republic. When ALCU was founded in 2003, the IVIG group became its professional committee [4]. The members of the Working Group have agreed on the following objectives: a) supporting the activities of academic libraries in information education; b) providing background and support for libraries that are starting with information education; c) sharing experiences in designing, implementing and practicing information education; d) contributing to the implementation of information education into the curricula; e) providing authority and expertise in negotiating with the administrators of the universities; f) providing and updating a base of theoretical issues related to the topic of IL and information education; as well as g) introducing best practices in information education in the Czech Republic and abroad to the Czech academic librarian community.¹

In order to fulfill the objectives mentioned above, the IVIG team has undertaken many activities in both theoretical and practical aspects. One of the initial tasks was to declare the understanding of the IL issue and to formulate the IL definition.

2 Theory

2.1 Terminology

In the Czech Republic, the term information literacy (in Czech: "*informační gramotnost*") was first included in the public policy documents in 1999. This was the year when the *National Information Policy* was stated as a strategic document and the information literacy was defined as one of the main priorities of this policy. Simultaneously, other public policies were introduced, using the term information

¹ More information available at: Information Education and Information Literacy Working Group: <http://www.ivig.cz/e-komise.html>

literacy as one of the objectives. However, the understanding of the term information literacy in these documents still tended to be closer to what is defined as computer and ICT literacy. The situation has improved thanks to a developing co-operation between the public policy sector, libraries and library science experts.

The use and understanding of the term information literacy in the Czech Republic differs among institutions. However, the IVIG Working Group has, from the very beginning of its existence, provided a common platform within ALCU. The expert team of IVIG defined information literacy and created the information literacy standards. The basis for the IVIG's approach relies on the IALS/SIALS² [5] surveys and their methodology. Information literacy has been divided into the following specific areas: 1) prose literacy, 2) document literacy and 3) quantitative literacy, incl. the ICT literacy, language literacy and ethical principles added by the IVIG Working Group. This approach helps to understand information literacy and allows for the focus on different sets of skills separately. The proposal of an IL definition (the authors prefer using the term "information literacy model") became a subject for interesting discussions, both within and outside of the Czech librarian community.

Simultaneously, the term *information education* (in Czech: *informační vzdělávání*) has become an integral part of the Czech library science terminology, serving as a bridging term for all activities that are intended to improve information literacy. Although the term is mainly being used in the academic and school librarians' community, it is intended to be used for all activities aiming to improve the level of information literacy amongst the entire population.

2.2 Standards

Many national organizations involved in IL have launched standards of information literacy in higher education in order to declare the content of the IL support, as well as to state the competencies, knowledge and skills the students should acquire. The content is similar, but the arrangement and level of generalization differs between the particular standards. Some of the standards issued by ALA /ACRL (*Information Literacy Competency Standards for Higher Education*), ANZIIL (*Australian and New Zealand Information Literacy Framework*), SCONUL (*Seven Pillars of Information Literacy*), CILIP (*Information Literacy: the skills*), have recently been updated. In particular, detailed explanation such as performance indicators and learning outcomes were added. Detailed examples were also added to clarify the meaning of the competencies and the way to achieve them.

The reason for formulating own IL standards was the IVIG intention to prepare the *Information Education Strategy at Universities in the Czech Republic*. The IVIG model of IL was chosen as a starting point [6]. The following components were included: prose literacy, document literacy, quantitative literacy, language literacy and ICT literacy with an addition of ethical and legal aspects of information usage. Each component has defined fields for different competencies. The Standards were launched in 2004, updated in 2007 [7]. Nowadays, the IVIG team is working on another revision of the Standards.

² International Adults Literacy Survey/Second International Adults Literacy Survey

2.3 Surveys on IL Activities in Academic Libraries

Initially, the IVIG Working Group started with triennial questionnaire surveys (2000, 2003), and subsequently, they continued with biannual ones (2006, 2008, 2010, 2012). The surveys focused on the information literacy activities undertaken by academic libraries in the Czech Republic [8]. A series of six surveys was carried out with interesting results.

There were several crucial questions that created a core of the questionnaire and were identical in each of the six surveys: a) Are the IL concept materials included in the official university policy documents and long term plans?; b) How is the percentage of librarians participating in teaching the IL classes changing?; c) How successful is the process of embedding IL into the curricula?; and d) questions regarding the continuing education for librarians related to the IL issues. In addition to the questions mentioned above, every survey included several different open-end questions about new topics regarding IL, as well as questions focusing on the current needs of the teaching librarians. The latter part of the survey proved to be very helpful for planning new activities and seminars organized by the IVIG Working Group. The return rate of the questionnaires was approx. 66 %, or in other words, 16 to 18 public universities out of the 26 existing in the Czech Republic participated in the survey. An analysis of the survey results shows that there are several long term trends:

1. Over the years, there has been a gradual change in the target groups of the information literacy trainings. The results of the surveys show a significant increase of the IL classes for students working on their bachelor or diploma thesis, as well as for the academic and non-academic staff. Nevertheless, most of the one-shot IL classes are provided for the first year students.
2. The number of more sophisticated lessons, e-learning courses and credit IL courses is constantly increasing. Despite of this fact, one-shot instructions and excursions are still the most usual format.
3. Each library participating in several consecutive surveys has shown an increase in the amount and variety of topics included in the IL classes, as well as a continuous increase of participants, both undergraduates and graduates.
4. Libraries are active participants in several grant activities and projects targeting information literacy (including the European Union projects).
5. There is a slow but steady increase in the significance of IL in the long-term university plans: implementation of the IL standards in the long-term plans of the universities increased from 37.9 % in 2006 up to 50 % in 2012. Over the last decade, library specialists took active part in several university educational programs, due to changes in the university policies and deep embedding of the information education into the curricula.
6. There is a substantial increase (51.7 % in 2006, 95 % in 2012) in the number of librarians participating in continuous education, e.g. new e-learning courses open for the teaching librarians, national conferences and workshops focusing on the IL topics.

2.4 Survey on Students' IL level

In 2004 and 2005, a team of the IVIG Working Group members, in collaboration with a sociologist, launched a pilot survey focused on the IL level of university students. The main goal of the project was to define the optimal IL level of university students and to compare it with reality, to identify and describe the shortcomings, conditions and opportunities. At the same time, the aim was to propose measures to improve the IL level of students and to extend the information education framework. The IL model previously defined by the IVIG Working Group was used as a theoretical background, whereas the desired percentage for every component of the information literacy model had been defined.

There were several tasks related to the survey: a) to prepare and verify the methodology; b) to complete the questionnaire, in particular to find the best set of questions for universities with different research domains, study programs and number of students; c) to choose the best combination of methods for selecting the sample of respondents and the best motivation policy to achieve the desired return rate; d) to prepare and test the hypothesis regarding the IL level; e) to collect relevant data and verify the test results; and f) to prepare a set of recommendations for future surveys in this area.

The survey took place at eight universities with close support from ALCU and from the university managements. Thanks to precise preparations, the desired number of selected respondents from the target group - students who are registered users of university libraries – filled out an electronic questionnaire within the requested time frame. The collected data were compared, analyzed and transformed to correlations and definite results.

The project met its goals and the hypotheses concerning the impacts on information literacy of the students were confirmed. The results also clearly indicated the positive influence of the IL courses – the students who participated in the IL courses have reached better scores. The overall IL index of the students was 55 percent on average. The desired score was 70 percent, whereas the only group scoring higher than 70 percent in each component of the IL model was a group of Ph.D. students. That is a situation leaving a lot of space for improvement.

Complete results, information literacy standards and an information literacy definition have been published in journals, presented on several conferences and put on the official web pages of the IVIG group [9], where they are available for other institutions as an open tool. The IVIG Working Group is currently preparing a project proposal to carry out a nationwide survey at all public universities.

2.5 Strategy

From the very beginning of the IVIG Working Group's existence, it was obvious that a strategic document had to be created. However, it was necessary to build it on the solid basis of clearly defined concepts in the IL field and realistic objectives of information education. Therefore, all the activities mentioned in the previous parts of this article had been completed before the IVIG Working Group published a crucial strategic document – *Information Education Strategy at Universities in the Czech Republic* (hereinafter the Strategy) [6] which has gained the approval of ALCU. This document was prepared in order to support the activities of the academic libraries in

the area of information education, to contribute to the development of the students' IL, as well as to create a basis for the teaching librarians who are about to introduce a new information education curriculum at their institutions. The Strategy ensures that institutional IL strategies are being built on a common platform referring to respected nationwide objectives and goals. Simultaneously, cooperation with the faculty when implementing information education into the university study programs is being encouraged in this document and a model action plan is provided.

The Strategy is aimed at academic officials, faculty and academic librarians and it is intended to serve as an explanation of the significance of the IL-related issues, the reasons for implementing information education into the curricula, as a description of priorities and relevant recommendations and as a guide for preparing projects supporting information literacy.

3 Practice and Co-operation

Several issues related to IL have been opened and discussed on the practical level as well: teaching strategies, teaching competences of librarians, IL partnerships and evaluation of the IL courses, to name a few examples. Every year, several workshops are organized for the librarians in order to introduce new topics and share the best practices. Since 2003, an annual IVIG seminar is held in September. The organizers have been successful in bringing respectable international keynote speakers for the annual event, among others Forest Woody Horton, Sheila Webber or Sylvie Chevillotte.

In order to share the experiences at an international level, the IVIG Working Group's members have presented their work and experiences at several workshops and conferences [10], [7]. At the same time, they have participated in the creation of a strategic document for the Central and South-East European countries [11] and contributed to the creation of a publication discussing the IL issues throughout Europe [12] or regarding a particular region [13]. Vivid co-operation has also been achieved with partners and IL actors within the Czech Republic. Several projects have been initiated and discussed by the IVIG Working Group member(s), e.g. a web portal INFOGRAM³.

After more than a decade of its existence, the IVIG Working Group has become a vital part of the Czech librarian community. In order to maintain this position and to retain relevance in the IL field, new activities, projects and research proposals are being prepared. The main focus will remain on the teaching librarians, their further education and sharing the best practices. Monitoring of the international trends in the IL field will be an inseparable part of the future activities, as well as co-operation with partners inside and outside of the Czech Republic. One of the crucial goals will be to define the IL standards across all levels of the educational system in the Czech Republic - from the elementary school to the university.

³ Available at: www.infogram.cz

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Media Didactics in Higher Education: Oriented Media Education

Anna Onkovich

National Academy of Pedagogical Sciences /
National Technical University of Ukraine “Kyiv Polytechnic Institute”,
Kyiv, Ukraine
onkan@ukr.net

Abstract. Networks of new information and communication systems have become a vital part of the present day life. Becoming a part of the environment, they have an influence on the younger generation’s education and upbringing, seriously competing with schools and universities. When they become teaching materials in the classroom, media text taken from newspapers, radio, television, and the Internet become an essential part of the education system, storing, and sometimes enhancing the educational and training system and teaching qualities. That means that media texts become important sources of professional improvement. Each training method has its own ‘horizontal’ since it is aimed at teaching a certain subject. Partial didactics of ‘vertical vector’ complete their tasks by interacting with the didactic’s ‘horizontal’ vector. This report deals with both media didactics and professionally-oriented media education in higher education as new and promising phenomena in education.

Keywords: Media education, professionally-oriented media education, media literacy, information literacy, media didactics, higher education media didactics, media education development vectors, media competence, media culture.

1 Introduction

Media Education, declared by UNESCO to be one of the priority directions in the pedagogy of the 21st century, is common enough in the field of modern humanities and as an integrative discipline. This is evident from media education theories, the creators of which represent various fields of science.

New concepts of higher professional education regard the introduction of media education strategies (especially those aimed at forming media culture) into the educational process as an essential part of future specialists’ professional culture. Therefore, it is urgent to implement media education into higher education through integrating media education technologies into future professionals’ training.

The following challenges of didactics are considered to be traditional: description and explanation of learning processes and determining the conditions for its realization; development of contemporary strategies of learning processes; educational process; new

training systems; and new learning technologies. In selecting both methods and forms of education, the principles of common didactics (the most important among them being the principle of clarity; the principle of consciousness and activity; the principle of availability; the principle of scientific approach; the principle of individual approach; the principle of consistency and sequence; the principle of durability in mastering knowledge, abilities and skills; the principle of interrelation between the theory and practice etc.) are governing since in their unity they objectively reflect the essential patterns of learning,

Each academic discipline has its own characteristics and patterns, which require specific methods and organizational forms of learning. These issues are covered by particular didactics or teaching methods. Some researchers believe all particular didactics to be pedagogical studies based on the same principles that are relevant to general didactics. Thus, general didactics is to be considered as the theoretical basis for all particular didactics and teaching methods; general didactics as well as particular didactics and teaching methods are developing in the close interconnection [1-2].

Nowadays there exists 'particular didactics' regarding different categories of students (pre-school, primary education, high school and higher education) didacticism and methods in different types of educational institutions with various forms of education.

Since we are dealing with teaching different categories of students, we tried to unite 'particular didactics' into the concept of 'vertical vector' in ascending mode. Simultaneously, each training method has its own 'horizontal' dimension, since it is aimed at teaching a certain subject. Partial didactics of 'vertical vector' complete their tasks by interacting with the didactics 'horizontal' vector.

In this connection, there is no doubt that nowadays media education techniques fall within the scope of particular didactics on "horizontal" and "vertical" vectors, since they are both separate education courses and auxiliary components in studying other subjects.

Representatives of different scientific schools consider one and the same object in different ways, applying different system of concepts, highlighting different components and various connections and relationships among them.

We are going to illustrate this by the example of media education: Media education is an active process of cognitive development and self-development of a personality done through mass media and based on mass media materials. Today, it is a relatively new branch of pedagogy, covering several major areas: 1) media education of future media professionals in the press, radio, television, Internet etc.; 2) media education of future teachers in universities, teacher training colleges in the system in service teacher training; 3) media education of pupils and students, as a part of their general education (i.e. media education integrated with traditional subjects) or provided as a separate school subject (e.g. as an optional or elective school subject); 4) media education in institutions of further education and leisure centres; 5) distance media education for pupils, students and adults through television, radio, Internet; and 6) self- or life-long media education [3].

We have purposefully expanded this list by adding 7) media education of future professionals in different fields of training. What we mean here does not have to be

seen as "media for all", since it is a set of teaching methods aimed at helping future professionals gain specific skills they need to effectively use professionally-oriented media texts and improve their professional level through life-long media self-education.

A.V. Fedorov, one of the leading Russian experts in the field of media education, rightly believes that media competency, being the result of media education, helps an individual to extensively use information spaces of television, radio, video, film, media, the Internet, etc., as well as to better understand the language of media culture [4-5].

As the Moscow Declaration on Media and Information Literacy (MIL) has it, "MIL competencies extend beyond information and communication technologies to encompass learning, critical thinking and interpretive skills across and beyond professional, educational and societal boundaries. MIL addresses all types of media (oral, print, analogue and digital) and all forms and formats of resources" [6-7].

In this connection researchers point out that modern society needs media competent professionals who can keep up with the pace of technological development and social changes, using latest media advances and media education approaches will be able to track knowledge that became obsolete due to changes in the scientific and social paradigms and to enrich themselves with up to date information and knowledge. That is why it is appropriate to pay particular attention to general media didactics as well as to its particular methods, with special focus on teaching productive skills, developing students' personality, their independent thinking, stimulating their creativity through involvement in creative activities, perception, and learning about media culture.

2 Current Status of Media Didactics in Higher Education

Below we will consider some of the latest scientific studies that illustrate the application of professionally-oriented media education, as well as the current status and perspectives of media didactics of higher education.

Recently, a series of PhD theses focusing on the use of mass media in higher education has been successfully defended in Ukraine. As a result, we were able to enrich the scientific discourse with the term "media didactics in higher education". Without dwelling on studies dealing with training future journalists and teachers, we will present a few pieces of research that undoubtedly can be considered as pioneering not only in Ukraine, since they regard introducing media education techniques to training professionals in different areas.

For instance, Inna Chemerys in her thesis *Formation of the Professional Competence of the Future Journalists by Means of the Foreign Language Periodicals* [8] theoretically and experimentally substantiated the expediency of using foreign periodicals (i.e. press) while teaching foreign languages in order to form professional competence of the journalists to be. The research lays a special accent on developing *press didactics* and *lingvopressdidactics* (i.e. press-based didactics and press-based language-didactics respectively).

Internet-didactics as a constituent part of media didactics is dealt with in the thesis of R. Buzhikov *Pedagogical conditions of innovation communicational technologies using during the process of teaching students at high economical institutions* [9]. The author offered to classify innovative teaching methods based on the method of material presentation (three main types are distinguished: a linear text based, a hypertext based and a multimedia involving training systems). He also highlighted, as of particular interest to educators, a hypertext based and a multimedia involving training systems since they both enable solving major teaching-learning issues, freeing lecturers from their routine duties, significantly increasing students' interest in the subject of their major, accelerating learning, and improving the quality of acquiring knowledge. The effectiveness of the future economists' professional training increases if their course of Foreign Language for Professional Purposes is designed with the university major in view. Interdisciplinary coordination makes it possible to determine the most relevant, urgent or topical issues in economic studies courses and thus to increase the efficiency of acquiring business terminology, which, in turn, greatly facilitates the process of professional language acquisition due to studying professional foreign-language information sources [9]. The dissertation of N. Dukhanina *Pedagogical Conditions for Media Educational Technologies Use in Training Masters of Computer Science* [10] provides theoretical rationale and experimentally verifies the pedagogical conditions for introducing the developed model of integrating media educational technologies in training Masters of Computer Science. The structure, criteria and indexes of media educational technologies use efficiency are grounded. The researcher has proven that positive results are possible under the following conditions: creation of media education environment, and introducing special courses developed with focus on media education into the training program; and consistency of the educational process with media and cultural education of masters students.

In the thesis *Pedagogical conditions of usage of media educational technologies in the process of professional training of future specialists in oil and gas sphere* [11], Inna Sakhnevych analyses directions, ways, forms and methods of applying media education means and respective professionally oriented technologies based on main theoretical and practical models and concepts of media education technologies. The propaedeutical seminar was decided to be the best-suited form to integrate media education into the professional training, since it takes into account the technical nature of the university major and practice of professional training in the technical university. In-class activities were combined with independent students' study as well as the application of problem-solving teaching methods and individual research based on media education resources in professional areas. Special effort was made to develop media technology application flow sheets and schemes to ensure both efficient planning and to introduce media education technologies into the undergraduate programme at a technical university. The researcher argues that introducing media education technologies is efficient, provided that educators make use of popular professional media resources (such as Internet texts and TV programmes, fiction and documentary films, periodicals covering petroleum engineering issues) to promote knowledge of media, media skills and improving

critical thinking in the professional area. Much effort is taken to create a media education environment and to select efficient kinds of students' media education practice regarding the choice of media education tools and technologies.

Inna Gurinenko, in the thesis *Pedagogical conditions of mass media techniques usage in professional training of future state fire safety officer*, offers a new way to substantiate, determine and experimentally verify pedagogical conditions of using mass media in professional training of future state fire safety officers, which is one of the urgent issues of higher school pedagogy [12]. Public outreach is one of the basic preventive activities done by state fire safety officers, for efficient performing of which they should have well-formed skills of cooperating with mass media and be media competent. Mass media are seen as prospective education means, whereas goals, objectives and methods of using them may vary in every specific case.

Olga Yanyshyn, the author of the dissertation in pedagogy *Forming communication skills in future records managers* [13], is the first to theoretically and experimentally confirm the efficiency of media educational techniques to form communicative skills in future records managers. The functional model of systematic communicative skills forming at all stages of records manager's professional training in higher education is developed, with special focus on integrating media education technologies. Based on the analysis of higher education practice in many countries abroad, the researcher classifies communication skills as transferable (i.e. formed in the academic training and later transferred to professional sphere). Such skills are an obligatory component of professional competencies and are most desired by employers, thus being vitally important for the records manager's professional career. It is emphasized that media education technologies (radio and television didactics, press-didactics, press-linguistic-didactics, video didactics, Internet didactics, web didactics, etc.) are innovative educational technologies using information space, communicative resources and communication technologies of modern media. They prepare future professionals to live in the reality of the information society and to continue their life-long education using media. Media education technologies promote principles of humanistic education and democratization of society and help to improve intellectual, cultural, spiritual world of the individual. Media education techniques can be used together with traditional educational tools through integrating into a variety of training courses, provided that educators comply with the basic principles of integration media education into the educational process.

3 Conclusions

Promoting media and information literacy falls under the priorities of the Strategic Plan for the UNESCO Information for All Programme. Media didactics is seen as a way to fulfil the plan since nowadays, methods of media education (being separate disciplines or auxiliary components of other courses) commonly fall within the scope of particular didactics on both vertical and horizontal diminutions. Media and information literacy today is not only a resource for developing the modern society, but also an essential condition for building a knowledge society in the future. Since

media and information literacy involves handling all types of information resources (oral, written and multimedia), we can predict that in the nearest future the role of private interactive methods of media education in higher education will increase, and professionally-oriented media education will hold a leading position in education. And even more – in higher education.

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State of the Art of Information Literacy in Spanish University Libraries and a Proposal for the Future

Nieves González-Fernández-Villavicencio¹, María-Isabel Domínguez-Aroca²,
and Antonio Calderón-Rehecho³

¹Universidad Pablo de Olavide, Spain
ngonfer@upo.es

²Biblioteca de la Universidad de Alcalá de Henares.
Facultad de Medicina y Ciencias de la Salud, Spain
misabel.dominguez@uah.es

³Biblioteca de la Universidad Complutense de Madrid, Spain
acaldero@ucm.es

Abstract. The design of new curricula, as a result of the European Higher Education Area (EHEA), and new teaching methodology has meant an opportunity to overhaul traditional training provided by Spanish University Libraries (SUL). The aim of this paper is to report the state of affairs of training in information management competency over the past three years in Spanish University Libraries and to present the role of REBIUN (Spanish University Library Network). For this purpose, a diagnosis of the current situation has been carried out. This will enable to have a vision of the practices as well as of the consolidation level of the different training models on Information Competency (IC) and Computing Competency and Information Skills (IC2), taking into account good practices of a number of reference and cutting-edge libraries within the Spanish panorama.

Keywords: University libraries, information literacy, computing and information competencies, digital literacy.

1 Introduction and Theoretical Framework

Since the 1990s librarians have been aware of the need to articulate students' acquisition of information competencies. A milestone was the Information Literacy Competency Standards for Higher Education¹, published in 2000 by the Association of College and Research Libraries (ACRL/ALA); this was followed by the appearance of standards and guidelines addressed to establish the aims of information literacy in University Libraries, training programmes, examples of good practice, definition of competencies of coordinators and librarians responsible for such

¹ <http://www.ala.org/acrl/standards/informationliteracycompetency>
Spanish translation in <http://www.ala.org/acrl/standards/informationliteracycompetencystandards>

training, and so on (ACRL Guidelines & Standards) [1]. This coincided in time with the Bologna Process and the integration of the Spanish university system in the European Higher Education Area (EHEA), which involved the introduction of legislative amendments in the structure of official teaching, the implementation of the European system of credits, and the regulation of undergraduate and postgraduate programmes. In this context, it is remarkable to consider the implementation of a new teaching methodology that incorporates “digital competency” among other key competencies aimed at facilitating lifelong learning. This competency refers to the “management of information” and the competencies needed to search, gather and treat information, using it critically and systematically and evaluating its relevance.

This new panorama offered a good opportunity to go beyond traditional, validated and instrumental user training (UT), taught to students and teachers in Spanish Universities Libraries (SUL) to implement a training programme in ALFIN (also called Training on Information Competency: IC). ALFIN aimed to carry out studies and practical activities, useful for designing new degree courses adapted to the EHEA, in which the “management of information” was included as a cross-curricular competence.

This is recorded in the II Strategic Plan 2007-2010² of the Spanish University Library Network (REBIUN), which takes as a core theme “Learning and EHEA” and considers of high importance the transformation of SUL into services aimed at fulfilling different needs of students and teachers in the development of the new European learning model. This context contributes to the emergence of CRAIs (Resource Centres for Learning and Research), which provide spaces for study and group work. REBIUN includes it in its strategic line 1, establishing two important objectives in order to promote a) University Libraries as CRAIs; and b) ALFIN aimed at “*enhancing and stimulating actions for the development and implementation of information skills as cross-curricular competencies in the new educational model*”.

As a result, some important documents are elaborated, Information Competency (IC) and Computing Competency and Information Skills (IC2) become the major themes since 2008 in ALFIN, SUL and CRAI meetings, participation in ALFARED³ increases and, more recently, the IC2 website⁴ is created. Current Strategic Plan 2020⁵, approved by REBIUN, includes the following statement in its strategic line 2: “*Providing support to teaching, learning, research and management*”, with the general aim of “*progressively integrating Computing Competency and Information Skills (IC2) as an educational strategy in different university study programmes in order to develop valid lifelong competencies*”.

2 Method

The present report aims at describing the state of affairs of training models on information management competency in SUL since 2011. This will enable people to

² REBIUN. *II Plan Estratégico 2007-2010*.

<http://www.rebiun.org/doc/plan.pdf>

³ <http://www.alfared.org/>

⁴ <http://ci2.es/>

⁵ http://rebiun.org/opencms/opencms/handle404?exporturi=/export/docReb/PE_REBIUN_2020.pdf&%5d.

have a vision of practices and consolidation level of the different training models on IC, and IC2, as well as to expose trends and proposals for future action. Good practices of reference and cutting-edge Spanish libraries are mentioned.

With this purpose in mind, a diagnosis of the current situation was applied. It was based on a triple review of:

- Specialized literature about IC, IC2 and UT in Spain: a thorough review of databases was carried out in order to identify a number of articles about specific experiences of implementation of ALFIN, IC and IC2 in SUL⁶.
- Encounters, conferences, specialised meetings, reports from working groups and libraries' training plans, and systematic search in databases and websites of libraries and institutions related to IC training in SUL⁷. Among others, some remarkable events are: CRAI meetings organized by REBIUN, about the evaluation and accreditation of competencies (2011)⁸, and about IC2 (2012)⁹; a meeting on responsible work of ALFIN of REBIUN (2011)¹⁰. In professional events it is also common to find general approaches about ALFIN, such as training plans of specific projects being implemented in university libraries. Concerning reports, we highlight "Digital Literacy and Information Competency" [2-3], and the report UNIVERSITIC 2012 [4], whose strategic priority is the "Management of information".
- Official statistics and training websites of SUL¹¹. All SUL's websites have been reviewed in order to identify the section addressed to training programmes, their proposals and their names. It can be accessed online¹²

The present report does not cover traditional UT or other basic or introductory training models, such as information days, participation in welcoming ceremonies offered by universities to new students, on-demand information, self-training, guided visits, open doors days, and training in the university for the elderly or information beyond the university community.

Regarding terminology used, ALFIN and IC are considered synonymous, whereas IC2, that can be considered synonymous with digital competences, is used to differentiate those libraries whose policy intends to support information competencies together with computing competencies.

3 Results

Traditional UT presents similar characteristics among Spanish universities. However, training in ALFIN, especially when it is integrated in curricular university studies, is

⁶ Document in Google Drive <http://tinyurl.com/BibliographyIL>

⁷ Document in Google Drive <http://tinyurl.com/BibliographyIL>

⁸ <http://www.usc.es/es/congresos/crai/>

⁹ <http://biblioteca.unirioja.es/crai2012/>

¹⁰ http://www.rebiun.org/opencms/opencms/handle404?exporturi=/export/sites/Rebiun/Resu_3JALFIN.pdf

¹¹ Document in Google Drive <http://tinyurl.com/BibliographyIL>

¹² Excel in Google Drive <http://tinyurl.com/SpanishUL>

diverse and complex since there are different proposals, attitudes, priorities or needs depending on the disciplines and areas of knowledge. Even when IC is established, the level of implementation and execution is different, as one must add the continuous change and constant technological development of society nowadays.

3.1 Plans and Integration Programmes

One of the keys for a successful implementation of IC/IC2 has been the development of training programmes and plans in SUL¹³. To this end, the presence of information competencies in university degrees [5] has been studied, in keeping with the strategic recommendations defined in REBIUN strategic plans. All of them sketch out the principles and the context which justify and support the plan. Moreover, they contain an analysis of the training necessities, determine the actions to carry out, segment the target users, establish training levels and modalities (face-to-face, semi-virtual and virtual), stress the importance of the spread of information, and establish a monitoring process (evaluation, revision and updating).

3.2 Type of Training

Traditional “on-demand courses” or “tailor-made courses” are still present on the web pages and they fall within the interest of teachers or students in a specific electronic resource. They are increasingly supplemented by IC courses linked to a particular subject or inserted in the curriculum, presented in different modalities (face-to-face, semi-virtual and virtual) and acknowledged sometimes with ECTS credits or a certification.

Training Offered by the Library and Acknowledged with ECTS. This type of training involves a previous study of needs and resources. Libraries disseminate its training courses, both instrumental and ALFIN, through their web pages, print media and digital/social media [6], [7]. These libraries’ training options existed before Bologna, sometimes as free-choice credits. After Bologna, some of these courses were integrated in the curriculum as free choice courses.

Some libraries are still offering courses without ECTS credits. However, the trend is to integrate this training in the curricular study plans, with ECTS credits offered individually by the library or implying any kind of collaboration. For example, in UNED (National University of Distance Education) courses are compulsory and must be taken before the presentation of the final Master project.

There are some Spanish University Libraries which offer IC and IC2 (the latter very few) training courses acknowledged with 1, 2 or 3 ECTS credits such as Burgos, Castilla La Mancha, Complutense, Santiago de Compostela, Sevilla (COE course¹⁴), Zaragoza; UNED, La Laguna and Polytechnic University of Cataluña (UPC¹⁵).

¹³ Document in Google Drive <http://tinyurl.com/BibliographyIL>

¹⁴ http://bib.us.es/cursos_orientacion/index-ides-idweb.html

¹⁵ <http://biblioteca.upc.edu/content/estudiants-de-grau>

ALFIN/IC Training Integrated in University Degrees (Curricular). Integration means ensuring students' acquisition of information competencies in a curricular manner. In order to design information competency activities across disciplines, the libraries identify in which subjects IC issues are approached. Then, it contacts teachers to know if they are interested in working in an interdisciplinary way or with people responsible for cross-curricular competences.

As a result, IC is mainly integrated in the first years of some degrees (Sevilla, Alcalá, Burgos, Murcia, etc.) where the inclusion of IC in teaching guides is increasing, end of degree projects, Masters and PhD projects (Girona¹⁶ or Granada) and scarcely in higher levels (UPC, Pompeu Fabra, La Laguna, etc.). There are also collaboration agreements with university agents (Barcelona and Carlos III Department of Information Science) and trends towards virtualization (UPC) [8]. The reality is that IC has been integrated only in some study plans, since there is no institutional strategy from the library or the university governing body.

IC2 Training Integrated in University Degrees (Curricular). The impact of digital content on the net pushed toward convergence of IC and computing or technological competencies, leading to IC2, a term coined by REBIUN in 2011, coming from the union of Computing and Information Competencies (IC+I). This concept is closer to digital competencies [9]. The working group of the mixed committee CRUE-TIC and REBIUN elaborated in April 2009¹⁷ the report "Computing and Information Competencies in degree studies", and an IC2 catalogue.

REBIUN has developed an intense plan in order to introduce IC2 in SUL training programmes, creating audio-visual materials¹⁸, an IC2 webpage, adapting tutorials and translating relevant documents. Moreover, it has launched a project for the certification of IC2 competencies. Until now there are only a few examples of integration of IC2 in university curricula, whose premise has been the collaboration between Computing Service and Library: Alicante¹⁹, La Laguna [10], and Sevilla [6]. Other university libraries that have also incorporated IC2 in their strategic policies are Oviedo, Alicante, Pompeu Fabra, Mondragón, Navarra, UDIMA and San Pablo CEU. REBIUN draw a map of IC2 in Spain in 2012 [11].

Training in IC/IC2 Integrated in University Degrees (Curricular) Shared with Other Universities without Credit Acknowledgment. One outstanding example is UNICI2²⁰, a cooperation agreement signed by rectors of a group of universities in order to exchange best practice experiences in IC. Every member library develops or improves different issues related to information. These libraries are from the universities of La Laguna, Alicante, Zaragoza, Huelva and Santiago de Compostela [10], [12].

¹⁶ http://www.rebiun.org/export/docReb/CRAI/X_Bib_Univ_Girona_y_Estudios_de_grado.ppt

¹⁷ http://www.rebiun.org/doc/documento_competencias_informaticas.pdf

¹⁸ Document in Google Drive <http://tinyurl.com/BibliographyIL>

¹⁹ http://biblioteca.unirioja.es/crai2012/documentos/XCRAI_UA.pdf

²⁰ <http://www.unici2.es/>

4 Certification - Accreditation

The evaluation of acquisition of competencies is strategic. This means Spanish University Libraries are looking for a system that could credit these competencies with regard to the labour market. At the European level, there exists an accreditation in computing called ECDL (European Computer Driving License) that in Spain is coordinated by ATI²¹. Several universities have already implemented it, such as Cádiz²², Alcalá and Extremadura. Other universities have established an agreement with the Catalan Agency of Accreditation in ICT (ACTIC)²³. One of the objectives of the III Strategic Plan of REBIUN is to collaborate with such an agency and ensure that universities can provide this certification.

Regarding accreditation of information competencies, universities use different forms to credit their courses, ranging from certificates issued by the library directorate to other formulas such as accreditation provided by other competent bodies within every university (La Laguna, Málaga, Zaragoza). Nowadays, REBIUN is studying how to credit jointly both competences (IC2).

5 Conclusions and Proposals for the Future

Among the results obtained in the study, the following can be highlighted: the generalization (100%) of traditional UT, followed by a reduced supply in IC (75%) and a limited incidence in IC2 (15%); the coexistence of training offered exclusively by libraries (with or without curricular certification) and training where libraries and teachers collaborate within the frame of subjects in a curricular or non-curricular way; the integration of IC/IC2 in new undergraduate degrees, especially in first grades; the trend toward a semi-virtual or virtual IC/IC2 training programmes; the importance of assessment in REBIUN proposals aimed to credit the competencies.

Proposals:

- 1) To prove the value of IC and IC2 for the university.
- 2) Greater collaboration and convergence with other agents involved in training, mainly teachers and computer technicians.
- 3) To improve librarians' knowledge of technological and pedagogical resources.
- 4) Librarians have to explore the intersections between library services and students' learning in order to identify opportunities to impact this learning.

Answers could be transformed in interesting future proposals to reach the goal of including information competencies within study plans, useful for lifelong learning.

²¹ <http://www.ecdl.es/es/acreditacion/procedimiento-y-titulaciones>

²² http://fueca.uca.es:8080/c/document_library/get_file?uuid=3c516cee-32e2-4f77-a5ed-0e4a89065fe1&groupId=10157

²³ http://www20.gencat.cat/portal/site/actic?newLang=es_ES

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Information Literacy in Learning Spaces: A Holistic and Integrative Approach

Christine Gläser

Hochschule für Angewandte Wissenschaften (HAW) Hamburg
Finkenau 35, D-22081 Hamburg, Germany
christine.glaeser@haw-hamburg.de

Abstract. This paper discusses the impact of new learning spaces on information literacy concepts. Therefore the current understanding of learning and characteristics of learning spaces are outlined. On the basis of these developments new opportunities for information literacy concepts and programmes are introduced. The concepts of information literacy in learning spaces are discussed in terms of their holistic and integrative characteristics and relevance for future developments of information literacy.

Keywords: Learning spaces, learning centers, learning commons, competencies, informal learning, social learning, virtual learning, peer-to-peer learning.

1 Introduction

The future viability of library user service concepts is a great challenge; librarians all over the world try to keep up with trends and developments in information literacy and service concepts to answer and even foresee their users' demands.

This paper offers a focused overview as a kind of 'snapshot' of recent developments regarding learning spaces and new approaches to information literacy in the context of the higher education sector from a librarian's perspective. It highlights how these developments influence and enrich each other.

Therefore, technical literature was evaluated and best practice examples analysed. Finally the results intend to give impulses to the professional community for a change in the understanding and implementation of information literacy concepts.

2 Learning in Higher Education

The new learning paradigm is marked by a constructivist approach and understanding of learning¹. It is well acknowledged that the individual situation of the learner with different experiences and influences is crucial to construct knowledge.

¹ The focus on the constructivist paradigm is intended, but is not meant to present this pedagogical approach as the only successful or even to hide the critical views on it [6].

Learning is in this view, defined as an active, constructive, goal-oriented and situated process that requires intensive mental activity and construction of meaning on the part of learner [1].

The education landscape has become complex and dynamic as requirements have grown in terms of lifelong learning. Key competencies and skills become more important in higher education to face the high amount and the dynamics of requirements in academic and working life. These ideas are also a vital part of the European Bologna reform which emphasizes the demands to integrate the key competences into the study programme.

In respect of the higher education sector, the so called ‘Shift from Teaching to Learning’ aims at the above mentioned “active, constructive, goal-oriented and situated process”.

...the paradigm that has governed our colleges is this: A college is an institution that exists to provide instruction. Subtly but profoundly we are shifting to a new paradigm: A college is an institution that exists to produce learning [2].

A changing perspective - away from the traditional focus on the teacher - is necessary “to produce learning”. This leads to a student-centred approach. The role of teachers as “gate-keepers” is vanishing. In a traditional teaching model the student accesses the information via the teacher; this has changed: students become much more independent and self-responsible.

Students’ independence and self responsibility in access and use of information is, of course, also strongly supported and driven by the technological changes and innovations, e.g. by web technology, or more recently, by web 2.0 applications. This development is strengthened by the fact that today’s students are mainly part of the so called NetGeneration [3], who grew up with web technology and naturally use electronic media and information technology.

The increased emphasis on learning outcomes has to be mentioned as a further aspect that is implied by the ‘Shift from Teaching to Learning’ [4]. Learning outcomes are strongly related to the increased importance of competencies for society in general and for higher education in particular.

Competences represent a dynamic combination of knowledge, understanding, skills and abilities. Fostering competences is the object of educational programmes [5].

This understanding of constructivist student-centred, competency-focused learning forms the pedagogical foundation for learning spaces concepts.

3 Learning Spaces Concepts

“Learning Resource Center”, “Learning Center” and “Information Commons” or “Learning Commons” describe new service concepts [7] which evolved within the last two decades in the Anglo-American academic world.

The main characteristics of these “new” learning spaces are that they are service-centered, technology-rich and process-oriented. They focus on the students, their learning experience and demands.

The developments in Great Britain started in the 1990s with the construction of “Learning Resource Centres” which integrated library and IT-departments, bringing together service units and learning resources. They focused on comfortable access to information by electronic means. After that, at the beginning of the 21st century, a new generation of Learning Centers arose which put more emphasis on learning support, including e-learning [8]. The Saltire Centre of Glasgow Caledonian University and the Learning Grid at Warwick University are quite often cited as flagships of these learning centers. The keyword “Super Convergence” [8] describes a further step in organisational change of learning centers. The service concepts grew and expanded through cooperation with a wider range of service units of the universities, such as careers, welfare and counselling, student administration, learning development, and study skills.

Comparable developments in the U.S. and Canada started with the Information Commons concepts in the 1990s, which offered integrated service in libraries “[...] to support the learning needs of the user.”[9]

In the meantime, these concepts grew to a worldwide phenomenon [10]. And furthermore they continued to develop from Information Commons to Learning Commons. A broad understanding of learner support, which is not library-centric but independent of organizational structure, underlies these Learning Commons model:

Typically, the learning commons houses a range of academic services, often including the writing center, the speech center, technology support, library reference, services for students with disabilities, subject area tutoring, and first-year student programs. Usually, the commons includes many types of workspaces: soft seating, tables, group study rooms, traditional study carrels, multimedia bays, and more. In this environment, students can work two or three to a computer, debate with their peers in casual lounge settings, collaborate at project tables, and engage with library, technology, or media staff [11].

The integrated service concepts are important success factors for Learning Commons and Learning Centers; they ensure “a continuum of service” [12]. They support and enable a new learning culture by offering special conditions to facilitate learning:

- Learning spaces offer social space for communication and cooperation. This answers a massive demand since project-oriented and problem-based learning is integrated into the curricula.
- Students have to create and communicate their scholarly results which may be assignments, presentations, multimedia products or e-portfolios. Therefore they need well equipped production environments with appropriate IT and media infrastructure.
- Flexibility and adaptability are also essential requirements. Learning spaces evolve with the students’ learning conditions. It is important to adapt working

spaces to changing demands, if, for example, group- and project work become more importance.

- Learning spaces go far beyond mere working conditions when they arouse users' inspiration by using colours, interior design, furniture and architecture.
- Learning spaces enable a culture of openness and freedom by being less restrictive in terms of use policies and access.
- Physical learning spaces find their supplement and extension in virtual spaces, for example by fostering social web activities.

4 Information Literacy Programmes in Learning Spaces

Based on the preceding explanations, it has become apparent that learning spaces offer very positive learning conditions for today's learners. How these can be used for improvements in the context of information literacy will be explained by analyzing practical implementations.

4.1 Topics and Context

Programmes and courses in learning spaces become holistic and integrative. The choice of topics is student-centred and more and more oriented towards the learning and studying process. Students get help for the "Writing Process", how to handle scholarly communication, or how to manage assignments. Information literacy programmes are offered as part of a range of issues to support academic skills and stimulate key competencies for students.

The "enriched" portfolio can typically consist of "Assignment support, Referencing and Avoiding Plagiarism sessions, Data Analysis, Dissertations, Critical Analysis and IT Skills Support sessions" (Liverpool John Moores University [13]). Cooperation and partnerships with other service units enable this broad range of topics and services, like the Queen's Learning Commons Workshop Series [14], offered by the Library, the Writing Centre, Learning Strategies and IT Services.

4.2 Actors and Facilitators

There is a significant trend towards student peer-to-peer services in learning spaces; students might function as Help Desk staff (Brandeis University [15]), as roaming service (Butler University [16]; Learning Grid Warwick [17]; University of Calgary [18]) or as part of tutorial programmes (Bournemouth University [19]). These services enable student integrated support in social equality and create an informal, communicative atmosphere of learning, which is a vital part of the learning spaces concepts.

Instructional librarians still offer information literacy classes and embedded services in the faculties. But as the partnerships of learning spaces expand, the group of persons dealing with support, information and instruction is growing, for example, with librarians, IT and media specialists, writing constructors, learning advisors and

more partners. Learning spaces offer perfect conditions to blend open and self-directed pedagogical concepts with guided programmes.

4.3 “Learning by Doing”

The learning space can be used for informal and more practical learning and this implies also new forms of information literacy instruction [20]. Instead of teacher-centred presentation, ex-cathedra teaching and ‘click and point courses,’ active-learning is fostered through practical training and an emphasis on application, as, for instance, with Web 2.0 activities by producing Wikis (Purdue University [21]). The students’ involvement is supported by course formats like workshops (University of Calgary [22]), which underline the holistic approach.

The informal and flexible character of the services is enabled by drop-in services and consultations which are offered just-in-time, when questions occur (Learning Grid, Warwick [23]).

Communication and collaboration of net generation students are not limited to physical spaces. Virtual Learning environments answer these demands by offering online tutorials via web or social networking tools like blogs and wikis. Web tutorials build an essential part of Learning spaces services like the “Videos and Interactive guides” at NCSU Learning Commons [24]. These services foster student’s independence and self-directed learning.

As the given examples and explanations illustrate, information literacy concepts change and grow in the context of learning spaces and offer new opportunities to develop students’ competencies.

5 Perspectives for Information Literacy (IL) Concepts

It is a great challenge for librarians to create continuous openness to advances in the field of information literacy. The understanding of IL has changed from past to present and due to the rapid changes in our digitally dominated world. It is even more important to anticipate future demands. This will not be successful by acting within the limited professional views. The upcoming changes require a broader perspective.

The students’ and learners’ situation in higher education need central attention to really integrate the services and programmes into the learners’ study life. Learning spaces like Learning Commons and Learning Centers become vital parts of students’ experience. They function as a kind of ‘natural environment’ for information literacy. These developments offer a great opportunity to rethink well established structures and concepts, i.e., by fostering discussion of different pedagogical concepts. This enables a flexible adjustment to the learner’s needs (integrative approach) which varies from discipline to discipline and depends on the study experience (i.e., freshmen and graduates).

Beard and Dale describe their experiences with developing a learning space concept like this

[...] there needs to be more than simply good design and effective information literacy programmes. There needs to be relevance to the learning and employability of the student with a breadth of literacies relevant to the digital world [25].

Again, it is a view beyond the traditional librarian borders that enables a more holistic approach. Information literacy is right in the centre of academic skills; therefore we need a broad understanding and integrative perspective to find the necessary context and connections. The lively discussion within the professional community about ‘digital literacy’ and ‘e-literacy’ [26] or ‘ICT-literacy’ [27], combined terms like ‘media and information literacy’ [28], and umbrella terms like ‘21st century skills’ [29], are evidence of this development. Concepts like ‘transliteracy’ [30] also try to embrace these changes. In a recent white paper published by the ACRL [31], the term information fluency was chosen to express the deepened and broadened perspective.

The implementation of information literacy concepts will be enhanced by partnerships with other service departments and collaboration with faculty in learning spaces. This should be – of course – a strategic decision to strengthen the institutional commitment by pooling the possible resources for a holistic and viable future of information literacy concepts.

Whilst recognising the continuing importance of IL, it is probably more productive to see it as a component of broader academic literacies. To encompass these, librarians need to step outside of their traditional areas and work with colleagues from other disciplines [25].

Learning spaces function not only as a ‘natural environment’ for information literacy but also as a test bed of viability, how to find the necessary openness and a broad perspective.

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Walking from Concepts to Facts: A Holistic Information Literacy Approach Experience at the University Level

Jesús Lau¹, Alberto Gárate², and Cecilia Osuna²

¹Universidad Veracruzana /
PIMSA-Catedra Distinguida, CETYS Universidad, México
j1lau@uv.mx

²CETYS Universidad, Mexicali, Baja California, México
{alberto.garate,cecilia.osuna}@cetys.mx

Abstract. Education theory and concepts can have daunting barriers to become facts but in the case of CETYS Universidad the will to be competitive at an international level drove the seven-year decision to get successful U. S accreditation. This process placed libraries and information literacy (IL) in the forefront of management priorities. One of the steps to identify CETYS IL standing was to study faculty information demand and competencies. The results, as well as those from a bibliometric analysis, showed the limited use of information and information and communication technologies. This motivated the institution to look for strategies to support faculty in enriching classroom information and ICT use. The main decision was to create guidelines to align the curriculum with information literacy standards and to embed information literacy into the learning process, an outcome that will be ready by the summer of 2013.

Keywords: Information competencies, information literacy, higher education.

1 Introduction

Curriculum alignment with information literacy standards is probably the maximum goal of library and information specialists [1], along with embedded information literacy. However, both goals are a challenge to achieve because institutions, such as universities, are complex and their organizational dynamics can be challenging despite the fact that information literacy is a foundation for learning in our contemporary, fast-paced and changing society [2]. Here, in this paper, a university success story and an action plan in the making are described.

CETYS Universidad, the case study of this paper, was founded in 1961. It is a privately funded university with three campuses in the state of Baja California on the Northwestern Mexico-U.S border, with 6,500 full-time students that includes high school, undergraduate and graduate programs on the three campuses, each one with a library. Its information literacy experience began with the long process, around seven

years, of creating information competencies as required outcomes for graduates. The key step was the high level decision to request accreditation from the United States' Western Association of Schools and Colleges (WASC), a demanding process that required several changes, among them the role and size of the libraries. This was an important decision in a country where academic libraries traditionally play a subdued role in the learning processes that are commonly text-book oriented, except for those few higher education institutions where research is well-established. National accreditation bodies do not demand, on the other hand, library excellence in their evaluation processes, WASC, on the contrary, places libraries as the epicenter of academic life. The WASC accreditation was successfully granted in 2012, placing CETYS as one of the five institutions of higher education accredited by an American body among more than 4,574 [3] that exist in Mexico, and one of the 19 in the Latin American region. The undertaking of an international accreditation program (after previously completing the national one), was a major but a right decision for an institution that needs to be efficient and effective in budget spending while pursuing the goal of international excellence.

As part of the accreditation program, CETYS created a strategic plan where six sets of competencies were identified for future graduates' profiles, with one being information competencies, labeled "Information Culture". The library bonus was that the institution embarked on transforming the libraries' information literacy role enabling them to be instrumental in University curriculum development and the learning process. This created the need to assess the institution's standing in regard to information literacy. Therefore, a study to evaluate information competences and information demand of full and part-time faculty was begun during the first semester of 2012 that later involved two additional processes to find the best information and ICT literacy strategies. The details of the three stages of this information literacy approach are briefly described, focusing more on the faculty survey, in the following sections of the paper.

2 Survey of Faculty Information Demand and Competencies

A descriptive and correlation study was designed to identify the demographics of CETYS faculty, information demand and competencies, as well as the information and communication technology (ICT) use and type of essays they requested from students. The assumption that guided the study was that faculty is the most important actors in the education process. A questionnaire of 27 with mostly closed answers questions was developed with assistance of a panel that provided feedback, plus the pilot testing of the instrument. The questionnaire was uploaded into Survey Monkey, a web-based survey platform. The population consisted of 347 professors (CETYS does not make distinctions between professors and lecturers) that included full and part-time academics. All of them were invited to participate, and 212 answered the questionnaire, 61% of the population.

2.1 Demographics of Surveyed Faculty Population

The results showed that there was a balance of gender, and their age had a fairly normal curve distribution: 23% were between 21-30 years old; and the largest group, 53% were 31-50 years old. The rest had an age of more than 51 years. The question related to teaching experience in higher education showed that 51% of faculty had less than 10 years experience; 24% had less than 20 years; and the rest had more than 21 years of learning facilitation experience. In regard to their highest degree, 16% had a doctorate, a percentage that is higher than the 7% national average [3], while those with Master's Degree were 65% (80% postgraduate in total). Most of them did their postgraduate studies in Mexico, 72%, and the rest, 28%, abroad, mainly in the USA and Spain. The age and experience of the respondents showed that most of them were in the mature age range (or intellectual prime years), and that they had limited teaching experience, and few had a doctorate degree.

2.2 Information Use

The information use component of the survey showed that half of the faculty members use the library online catalog from one to five times during a semester (52%), and 27% uses the catalog more than ten times, while 21% had never used this tool. The catalogue use result was good, taking into account that the Internet is overtaking the provision of general information, leaving to libraries the niche of specialized or refereed sources. The use of databases among the population surveyed reflected that 31% had never used them, a high percentage for higher education faculty, while 16% used them once during a semester. If both figures are added there is a clear opportunity for libraries and CETYS in general, to promote database use because nearly half of the population (47%) hardly uses them. Faculty who did have a demand for databases showed that 19% used them five times during a semester, and 34% consulted them more than ten times during the mentioned time span. The search for information is low compared to Rupp-Serrano and Robbins [4] research results that found 79% of education faculty from 20 large US public universities search or access information on weekly basis. The main subscription database used was EBSCO with 57%, and the rest of responses were distributed among a wide number of subscribed and open access journal repositories, such as REDALyC. Here, some answers had wrong data because some faculty included titles that did not correspond to databases, a sign of confusion of what is a database. In regard to use of library printed materials, i.e. books and other printed matter, 13% had never used them, while a similar percentage had used these materials once during a semester, and the rest, 74%, used them more than five times during the stated period. A good result that can also be seen as a negative indicator is that professors are still heavier users of paper-based materials rather than users of electronic materials. Electronic books are making progress among CETYS professors. They responded that 46% use them more than five times during a semester, while 23% use them once and 31% have never used e-Books. However, the following question, where participants were asked to recall one of the recently used e-Books showed that only 45% remembered such information, a

figure that was much lower than that of the previous item (69% total of those who declared to use them). These last figures show again the opportunity to promote e-Book usage by libraries among CETYS faculty.

2.3 Information Use in the Learning Facilitation Process

The survey component devoted to explore information use in teaching or learning facilitation had results that seem to be similar to international trends, where Google dominated the information search scene followed by a distant percentage of subscription databases. The results were that 84% use search engines, where Google was mentioned by the majority. Far down in the scale was EBSCO, the subscription database that is the most popular among their kind, plus two major open access repositories of Ibero-American scientific journals, REDALyC and Scielo with 35%. Along the line was YouTube and MIT videos (35%), followed by ebrary and Google books, 30%; SlideShare, 19%; and Wikipedia 16 %. Other sources were mentioned such as Facebook and LinkedIn but were discarded because they are not truly information sources. As an indicator of an integral learning exercise that lead to the development of information competencies [5], among others, professors were asked if they requested essays as part of their coursework and 80% did reply that they do so, but 14% did not, and 4% request another type of end of term paper (Bibliographies, laboratory reports). A question followed to identify the extension of essays, the methodology, and the paper layout style. The results showed that 54% required an essay of four to six pages; 25% do not limit the extension, and 20% ask for papers of 10 to 15 pages (1% fell under other type of requirements). The essay methodology showed that 17% request the scientific method use, and 19% indicated that they request an introduction, topic development and conclusions. The rest did not clearly answer the question, results that could be an indication that they did not know or recall the methodology name well. As an indicator of ICT familiarity and the potential positive impact on searching and accessing information on the web, faculty members were asked about the kind of personal web services that they use. The outcomes were that 11% lack any of personal web services; 16% had a personal website; 16% a blog; 79% Facebook; 29% Twitter; 44% LinkedIn; and 8% had other web services. The results show certainly high usage of the social network Facebook, followed by a regular participation in LinkedIn, a more professional social network, but less use of those web services that required more writing skills and that are certainly of more benefit to academia, such as blogs, and Twitter (although it is also a social network). Faculty websites were, on the other hand, low compared to Donovan [6] who reports double figures for education faculty, a result that impact CETYS, because websites can be assumed to be a must for most academics; if they do not have this presence on the web, they do not exist in the virtual world, a world without borders for academia.

2.4 Publications Authored by Faculty

A question with more than one interpretation to the study was related to the kind of publications that faculty had published. The results showed that 36% had not

published any document; 36% had published an article or more in a serial; 12% a book chapter or more; 37% conference papers in proceedings; 10% had published a book; 33% authored a newspaper article or an article for a bulletin; and 11% published other type of documents, a figure that, after a close answer analysis, showed that most of them were not publications. These percentages give a picture of the research skills or research practice that CETYS faculty has, because publications are normally the yardstick to assess research output. Publications are, on the other hand, synonymous with information competencies, reading habits (personal or professional), research skills and good writing capability. However, professors surveyed showed that they had not written a conference paper in most cases, and that most of them neither an article, nor a book chapter, and that a third of them had done none of these publications (if the other document option result is added). In addition, participants were asked to provide the reference (full or partial) of one of their publications to verify the validity of the previous answers and only 62% were able to recall one of their published documents, a percentage that could certainly invalidate nearly 40% of those answers by faculty who stated that they had published a document. The CETYS implications of this faculty development opportunity are complex, because research and writing skills are long-term capabilities to develop.

3 Bibliometric Study of Faculty Publications and Course Syllabus

Survey results may be approximate indicators of reality because of subjective answers, therefore a second study step was to do a bibliometric assessment of faculty publications, those that were reported in the questionnaire (52 reported items, books and articles/conference papers); recent CETYS postgraduate student thesis (92); and bibliographies of current core undergraduate courses syllabi's, a total of 192 documents, as indicators of the kind of information that faculty require of students in their core learning subjects.

The outcome of the bibliometric study included 175 documents in the analysis, because 13% did not have a bibliography (a shortcoming result). The total evaluated references were 5,863. The outcome was that faculty (their publications and course syllabi), and thesis students tend to use books, 3,172 (54%), ignoring to a lesser extent serial articles, 1,661 (28%), and websites 573 (9%), and other alternative sources, 457 (8%) with nearly similar figures; and they, using Price's classification, frequently cite old (archive-type references five years or older) publications, 52% compared to the operative-type references of 48% less than five years old, besides the mentioned cases that do not include references at all. According to Price [7], the average publication life, with variation according to type of discipline, is between 70-80% for operative references in a given average publication. The average bibliography of books included 103 publications, while journal articles included 13. Thesis findings, with 27 bibliographic items on average, had a similar pattern. However, in course syllabi mostly textbooks were included with nearly four publications per course, mostly ignoring journals, and therefore, the wealth of refereed information that libraries have

to offer. The two study results, those of the survey and the bibliometric analysis show that CETYS has several opportunities to enhance information demand and competencies, research skills and teaching capabilities of its faculty by guiding, motivating, evaluating, and training them into the desired organizational information culture, a goal officially adopted through its Strategic Plan 2020.

4 Search for Institutional Information Culture Strategy

Given the study results, the University decided to take an integral approach to find the best strategies to take advantage of the findings and increase the use of information in the classroom, and additionally include the information and communication technology (ICT) element. As a follow up, three more questionnaires were developed/adapted, so that the CETYS community would identify the best alternatives to create an information culture-oriented institution: 1) Faculty ideal information competencies; 2) Ideal information services for the CETYS libraries; and 3) Top 100 ICT Tools for Learning. A sample of professors, high school, undergraduate, and graduate students representing different departments were selected by each dean, plus academic support staff (management, computer and faculty development), and library personnel. They were asked to answer the questionnaires in person, followed by a focus type meeting to further analyze and provide brainstorming on the subjects. Along with the focus groups, interview meetings were organized with deans and directors of academic support services. The data was tabulated and processed with SPSS, and used to identify 50 actions to enhance information competencies, and ICT skills. The actions were addressed to top university management, deans, faculty development and assessment department, computer services and certainly libraries. The report was presented to the University President and the Council's Committee for Library Affairs who considered that 22 of the actions were priorities of high relevance to strengthen CETYS information culture.

5 Curriculum Alignment: A Walk from Concepts to Practice

The 22 narrowed actions of the report were used, in turn, to work on an umbrella strategy: The definition of guidelines to align the curriculum to information literacy standards and the requirements of WASC accreditation, and the creation of guidelines to embed information fluency into the learning process at least in the core courses of the curriculum. A committee of professors that invited library and computer services representatives had the task to develop such guidelines that includes, so far, the adoption of the Mexican Information Literacy Standards [8]. The committee is currently working on the recommendations that will be ready this summer (2013). CETYS, therefore, has walked from theory to a soon-to-be information and ITC literacy formalized practice.

6 Conclusions

The study results of professors' low information sources and of ICT use, limited and authored publications output, and the aftermath follow up processes show great opportunities for CETYS to support faculty to enhance information and ICT competencies, so that they would bring information into the classroom and have the necessary impact to have information and ICT literate graduates. The main study conclusions are that 1) international accreditation, in this case an American one, contribute to position libraries as knowledge centers and key players in creating an institutional information culture, at least in the case of CETYS Universidad. 2) The faculty age seemed irrelevant in information use, but doctoral studies did play a key role in information demand. CETYS is already addressing this opportunity requiring newly recruited professors to hold a Ph.D. 3) The study of faculty information demand and competencies was a basic step to learn what the main learning actors are able to contribute in the classroom. 4) The work required to create an organizational information culture is an institutional task not only that of the libraries. 5) The participatory process to identify the strategies to achieve an information organization was an appropriate process, so that professors, university management and libraries could embrace the needed change. 6) The consensus-building decision to create a professors' committee to generate guidelines and recommendations to align the curriculum to information literacy standards were also an excellent decision that will make CETYS walk from information literacy concepts to facts in the short term.

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Effective Use of Repositories: A Case for Information Literacy Development?

Thomas D. Wilson and Elena Maceviciute

Swedish School of Library and Information Science, University of Borås,
Allégatan 1, Borås, Sweden
wilsonstd@gmail.com, elena.maceviciute@hb.se

Abstract. The investigation reported here use statistical analysis of a repository database, analysis of policy documents, interviews with policy makers and staff identified as *research active*, and an online questionnaire directed at all research active staff in the institution. The results of the research suggest that not all university staff are fully information literate and that university administrators, aided by the university library, need to ensure that everyone is aware of the benefits of open access publishing and the role of repositories, if the institution's policies are to be implemented effectively.

Keywords: Information literacy, academic staff, universities, faculty, research outputs, repositories, open access.

1 Introduction

This paper reports on an investigation into the perceptions of and attitudes towards an institutional repository in a Swedish university. Institutional repositories have become one more form of scholarly communication in parallel with publishing in journals or monographs.

Scholarly communication is understood as the system through which scholars disseminate, exchange and appropriate research findings. It involves creation of scholarly writings, evaluation of their quality and spread within the relevant community. But it also includes other forms of discussions and idea exchange (conferences, seminars, project meetings), as well as network creation, functioning of invisible colleges, exchange of scholars and informal communication. Several definitions restrict scholarly communication to scholarly publishing, especially, publishing of scientific articles. Our understanding of scholarly communication is a broad one as defined by Borgman: "*how scholars in any field... use and disseminate information through formal and informal channels*" [1, p. 13-14], though this investigation is mainly focused on the use of institutional repositories by researchers.

Information literacy investigations have generally considered the faculty member as a partner in information literacy programmes e.g., [2], rather than a category of institutional member in need of information literacy development.

Although the concept of workplace information literacy has been developed and, indeed, is found in the origin of the term [3], only a small amount of work exists on

information literacy development for university staff, e.g. [4]. School teachers, on the other hand, have been given rather more attention, e.g. [5-6], with rather mixed results. Some research finds that teachers are generally information literate; other work finds a more nuanced situation. This is likely to be the case also in universities.

Part of a researcher's training focuses on the ability to report and present research findings with regard to the conventions and norms of scientific and research ethics, as well as skills of information searching and critical evaluation of sources. This can be proved by a number of courses on academic writing and research ethics, which prepare researchers for effective scholarly communication. So, one usually assumes that researchers and academic staff are information literate.

On the other hand, the change in research practice brought about by networks and information technology, new models of resource allocation for research institutions, publishing practices, and the open access movement require constant update of these skills and knowledge. The change is also value-laden and may cause conflict with acquired values and attitudes. Thus, we used the study data of a wider investigation into the publishing policies and practices of one Swedish University to find the answers to the following research questions:

1. What are the attitudes of the University researchers towards open access and the University publication policy?
2. How aware are they of the functions performed by their repository and the quality issues related to its data?

2 Context, Methods, and Results of the Investigation in a Swedish University

Context. Open access ideas are very strong in Sweden: the Swedish Research Council adopted an OA mandate in 2010, noting that, "*Researchers who receive funding from the Swedish Research Council must archive their articles in open databases within 6 months of publication, or publish directly in Web-based journals that use Open Access*" [7]. There were and there are at present several broad interesting initiatives related to it, such as:

- The Directory of Open Access Journals (DOAJ) increasing the visibility and ease of use of open access scientific and scholarly journals since 2003;
- OpenAccess.se, which was implemented during 2006–2009 and evaluated as successful [8]. At present it is run by the National Swedish Library, provides the news of open access in Sweden and coordinates the nation-wide initiatives;
- Creative Commons Sverige – a non-governmental organization, which provides a legal instrument to the authors who want to share their creative production with others freely;
- A project finished in June 2013 "Towards quality-controlled open access monographs in Sweden", funded by the National Royal Library, Swedish Research Council, Riksbankens Jubileumsfond with the participants from Göteborg, Lund, Uppsala, Stockholm, Linköping (universities and publishers).

Most of the Swedish universities have policies regulating open access publishing in their repositories or other OA outlets. All of them have institutional repositories that have to meet the requirements for quality set by SwePub (<http://swepub.kb.se/>), which receives exported input and provides access to the materials in Swedish institutional repositories. Most of the repositories belong to university libraries and they are responsible for the quality control of information. This task is quite important for research departments and researchers as the information is used for a number of decisions, which may relate to resource allocation for a department or researcher's career.

The University participating in our study was one of the smaller universities with research rights (i.e., offering the PhD) in half of its faculties. It also had a publication policy recommending researchers to use open access publishing sources and regulating other issues (such as correct affiliation data in publications). The repository was in place since 2006 and had listed university publications since 1974 (over 4000 items). Most important for us is the requirement to the researchers to report the data about their publications into the local institutional repository. The provision of full-texts in the repository was also recommended. When we conducted the research the responsibility for the quality of the reported data was not specified, but the library had to check if researchers had provided correct bibliographic data. Nevertheless, the data from the repository were used for partial internal allocation of research resources to the departments.

Method. To answer the questions that are formulated in the Introduction we have used the data that were collected by the following methods:

1. Analysis of 300 items in the local repository selected randomly from all collections in the repository.
2. Eleven interviews with active researchers in engineering, social science, nursing, business, and design were carried out. Active researchers in this case mean those who have reported the highest number of publications during the preceding year. We used a critical incident technique in interviewing.
3. An online survey sent to 230 researchers. Survey Monkey was used to access the questionnaire. The Rector's support was enlisted to attract as many researchers as possible to participate in the survey. A response rate of 26% was achieved after five reminders, suggesting that many on the initial list of researchers were not, in fact, "active", and that the results represent the views of the most active researchers.

Results of the Interviews with Researchers. The interviewees were asked questions about two of their own publications retrieved from the local repository with regard to their motives of publishing, source preference, copyright procedures and attitudes. Table 1 shows the main motives that were named for choosing a publishing outlet.

As one can see, the main motives are related to the content of a publication and the audience that researchers wanted to reach. The prestige of a publisher or a journal are also important as well as the impact of personal network. Though open access was not a leading criterion of choice it is still among the important ones.

It is also important that in only four cases out of thirteen the authors considered the possibility of open access when an article was published in commercial outlets. Respondents from engineering field were most considerate in this respect and always published in a high impact open access journal if one was available, but the high impact was always a priority for them.

Table 1. Motives for choosing a publishing outlet (mentioned at least 3 times)

Motives for choosing a publishing outlet	Number of times mentioned
1. A journal on the subject of the article/topic of interest	8
2. Reaching the targeted audience	7
3. Leading or prestigious and visible publisher or journal	5
4. High impact factor	5
5. A publisher suggested submitting a publication	4
6. A request or an idea after a conference	4
7. Publishing time	3
8. Open access publishing	3
9. A special thematic issue of a journal or book	3

The actual behaviour of the respondents can be explained by their attitudes related to the open access. There was no one who did not support the idea of open access as means to disseminate research results, especially when derived from publicly-funded projects. Some were quite ardent in their opinions:

“This is a very good requirement. We are a university, not a company and everything that we do must be transparent and highly visible.” (S3)

“I think it is obvious. I am employed by the state and therefore my results should come out for the benefit of the society. So this is not difficult for me. I think it’s harder to think that one should keep everything to oneself. You have to spread your research as much as possible.”

“It’s natural. It is a part of the review and research is cumulative. You have to see what other researchers do. And it is also a way to get citations. You want people to cite you. So people have to find what you have done. It is a two way street: you want to see what other people have done and you want other people to use your work.”

The others were more restrained, just noting that it is “*a good policy*” and one noted that this policy “*should not be more demanding. One has to publish where the readers are. If no one reads it is not good. But the recommendation is important.*”

It is worth noting here that not all respondents were well acquainted with the open access concept or felt some controversy in the issue. One thought that open access is important mainly for developing countries; another seemed to identify open access only with author-charging commercial journals. There were those who thought that repositories are the only open access alternative and did not accept it as a form of

publishing. One respondent believed that commercial journals pay large fees for peer review and was dissatisfied about having to work as a volunteer for OA ones.

It is interesting that ardent supporters and careful doubters were found across different subjects and there was no clear pattern of attitudes towards the open access related to the field or institutional affiliation among our respondents.

Despite some difference in opinions about the implementation of the open access, the respondents have rated the importance of publishing via open access channels as follows: “*Important*” - 1; “*Very important*” - 10.

The limitations imposed by a copyright agreement were acknowledged by most of the respondents. All those who published in the open access outlets (seven publications out of twenty) knew that there was no agreement to be signed (in one case a license was to be chosen); and no limitations to using the article later. Four respondents did not experience copyright limitations as a problem, because what is published is published and they move to other topics or because they think it is a natural condition in publishing and has functioned well over the years, or see it as an acceptable situation in relation to acquired benefits (reached audience, the rank of a journal, etc.). On the other hand, four authors were very aware of limitations and would prefer open access publishing with the same high rank if possible. Two of them thought that it is very unfair that they cannot use their own work as they see fit, one was sure that the copyright should always stay with an author.

All respondents seemed to treat the issue of copyright not very seriously. Very often they did not remember whether or not they have had signed any copyright agreement. Only one respondent who had problems in signing the agreements remembered the process well. If they have had signed the contracts, they have had not kept their copies or were not sure that they were still in their possession or if they were, no one knew where it was kept: “*must be somewhere*”, “*somewhere on the computer*” was the most frequent answer. One of the respondents said that copyright is not interesting and it would be much easier if everything was open.

One of the most surprising features of the interviewed group was that, although they demonstrated high competence in publishing matters, seven out of eleven did not know about the University’s publishing policy. Two revealed some knowledge of it, though decided to choose the alternative “*Do not know*”. Three knew of the existence of the policy, one admitted knowing what it is about, but doubted if the knowledge was up to date.

Survey Results. The results of the survey mainly confirmed what we have found from the interviews. The vast majority of respondents (82 percent) reported no difficulty in finding an appropriate outlet for their work, and 69 percent of respondents had not considered publication in an open access publication. In the majority of cases (71percent), copyright in the research output was transferred to the publisher and about the same proportion were aware of the limitations this results in for the author (77percent). Worryingly, some 23percent were unaware of the limitations. Only 47percent reported retaining a copy of the copyright transfer document.

The question on the preferences of the open access publishing channels included three options: 1. Payment for publication in journals that are then freely available; 2.

Publication in free open access journals that require no author payment; 3. Depositing publications in an open access institutional or disciplinary repository.

The dominant first choice was publication in open access journals that do not require any author charges; the second, publishing in open access repositories and, finally, the commercial journals charging author fees for subsequent opening of the publications to the audience. Though all three options are not always available and in making the actual choice other criteria are considered, it was an impressive expression of the positive attitude about genuine open access.

The highest priority for everyone was the publication in free open access journals, while the first option of payment solicited some indignation of the respondents:

“Why should we pay for journals when we don’t get paid for reviewing?”

“The first I don’t like at all. Why should I pay?... You shouldn’t pay to be a part of something. That feels a bit... to be able to pay a fee to be in? No, that sounds crazy.”

”Entirely against payment for publications. I would not pay tax money to a commercial journal.”

“This is not good for the weak actors. It means that you have to apply for money to publish. It also when it comes down to it, feeds the big publishers.”

On the other hand, some respondents, though prioritizing free open access journals, raised the question about their ownership as there should be resources for publishing a journal and suggested that funding for OA journals should be transparent.

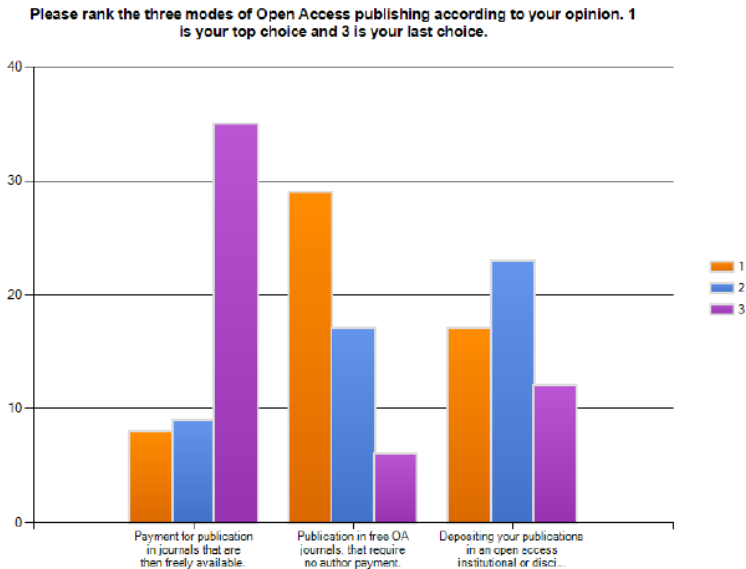


Fig. 1. Preferences of an OA outlet

Eighty-eight percent of respondents thought that the institutional repository supported access to the University's research output either "Very well" or "Moderately well". Only six respondents chose "Not very well" or "Not at all". However, ten persons chose to comment (although this was requested only of those who responded negatively) and the comments revealed some uncertainty about what the repository was and how it could be used. For example, five respondents said that they did not know anything about it, which, given its role, clearly needs to be addressed. Other respondents seemed to believe that publishers would not allow submission of full texts for copyright reasons, in spite of the fact that most publishers do permit deposit of at least the submitted paper. Seventy percent of respondents said that they had deposited a copy of their publication in an institutional repository. Some regarded their own PC or the institution's shared filing system as a repository, which is not what is usually understood by the term. No one mentioned any disciplinary repository, but only 16 respondents answered this part of the question. Less than a third (29percent) had placed their publication on an openly available Website and most of these (71percent) had not received permission from the publisher before doing so.

Analysis of the Repository Items. Out of 300 items retrieved from the local institutional repository 29percent were conference and workshop contributions, 23percent - journal articles. Six entries were missing from the data base (no data under the entry point) and one was withdrawn from the repository. Thus seven items (or 2,3percent) were missing. The distribution of the 300 items by "availability" is shown in Table 2.

Quite a high proportion of items (101 or 33.67% \pm 5%) proved to be available through one or another mode of open access: institutional or another repository, journal, project site, publisher site, author's site, etc.

Table 2. Availability of items entered in the institutional repository

Availability	No	%
Open access	101	33.67
Print	72	24.00
Unknown	63	21.00
Subscription access	55	18.33
Missing	6	2.00
Item withdrawn	1	0.33
Moving image	1	0.33
n/a	1	0.33
Total	300	100.00

From the investigation perspective, rather worrying was that the research team was unable to find actual documents, or bibliographical records of those documents, for 21 percent (66) of the items. In Google searches for these items, very often the only record for the item was in the institutional repository database, meaning, effectively, that for the world at large, the item could not be found. Fifty-two of these items (79 percent) were conference or workshop presentations of one kind or another.

3 Conclusions

What we can conclude is that although the information literacy of academic members of staff may be taken for granted, we found serious deficiencies in literacy relating to institutional repositories, open access, and practices in commercial publishing.

The database analysis revealed that many research outputs were simply recorded and no electronic copy was made available. Furthermore, a significant proportion of entries were for papers in conference proceedings for which no record could be found after an extensive search. As the researchers at that point used to enter the data for their publications themselves, while librarians could only check the correctness of it, but could not remove “empty” entries, this demonstrates the lack of bibliographic awareness in researchers rather than the lack of library competence.

The interviews and the questionnaire study revealed that researchers in this Swedish University support the open access idea and can make ethically correct choices in abstract situations. However, some researchers had a poor understanding of open access in general, the policies of commercial journals *vis-à-vis* open access, and the role of the repository in making research outputs available to the world at large or even of the publishing policies of their own university. One has to point out that what we can regard as information literacy of an academic staff is very unequally distributed within the Swedish academic community. We have met individuals with very high levels of competence in publishing and open access who also demonstrated outstanding bibliographic skills and persons who neither had the competence nor felt any need for it.

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Information Literacy, Mobile Technologies and Study Practices

Trine Schreiber

University of Copenhagen, Copenhagen, Denmark
kqg280@iva.ku.dk

Abstract. Mobile technologies including mobile phones comprise a growing area of research attention with respect to young people's digital technology use. In this field of research, a central question is how the mobile practices intersect with study practices, and what kind of new literacy practices the intersection may involve. In March 2012 two focus group interviews were carried out with 8 students from higher education in each group. The aim of the study was to examine whether and how the intersection of the two practices mentioned may create dilemmas for students in their study practices. In this case, literacy practices are understood as the students' negotiations of the 'acceptable' way to perform mobile practice as part of their study practices. The results indicate two kinds of new literacy practices involving mobile phones: a 'collaborative practice' and a 'knowledge enabling practice'.

Keywords: Information literacy, mobile technologies, study practices.

1 Introduction

Many universities have implemented a kind of digital course management system allowing communication between teachers and students. Thus, announcements and distribution of texts from teachers to students or other kinds of many-to-many communication are made possible. However, not all students use the system frequently. In the study of Thorhauge [1] the students consider the course management systems to be only the teachers' medium, and instead, Danish students use Facebook and Dropbox [1]. The course management system implemented by the university does not seem to suit their communication and information practices. Today, the mobile phone as an artifact integrates the many different personal media represented by the variety of iPhone/smartphone applications (apps). Therefore, it is of interest to explore students' use of iPhone/smartphone (from now on 'mobile' or 'iPhone') in relation to their study practices.

The aim is to take a closer look at the mundane uses of the mobile phone in relation to students' study activities. The mobile is the key communication device and medium for constant updating, coordination, information access, and documentation. At the same time, it is a medium for social networking and important in establishing social norms and rules between people. As Stald [2] has described, the mobile becomes a learning tool for dealing with living conditions in society for young

people, while at the same time it adds to the conditions with which they are trying to deal. However, following Drotner [3], educational settings have not had insight into the competence development which young people have acquired using digital technologies during their leisure time activities. Therefore, a goal is to gain a deeper understanding of students' literacy practices and to find potential disconnects between their information literacies and the educational setting.

A central question is how the mobile practices intersect with study practices, and what kind of new literacy practices the intersection may involve. In the following, an investigation about students' use of mobile and mobile apps as part of their study practices will be analyzed. Two focus group interviews have been carried out in a Danish university and a Danish university college. Because the focus group interviews involved conversations between the participants, it was possible to observe the group's negotiations on the acceptable versus not-acceptable use of mobile and apps in study practices.

The aim of the study is to examine whether and how the intersection of mobile practices with study practices may create dilemmas for students. Dilemmas may indicate the potential disconnects mentioned above. In this case, information literacy practices are understood as the students' negotiations regarding the 'acceptable' way to perform mobile practice as part of their study practices.

2 A Practice Theoretical Approach

Practices, as Schatzki describes them, are social phenomena [4]. He defines practice as an organized constellation of activities. Practices are open-ended, meaning that they are not composed of any particular number of activities. A practice is a set of doings and sayings, which are organized by practical understandings, rules, teleoaffective structures, and general understandings [5]. The practical understandings concern knowing how to carry out actions. By rules he means explicit formulations, principles, procedures that may direct the actions. The teleoaffective structures are normativized and hierarchically ordered ends which are linked to normativized emotions. The general understandings are senses of the worth, value or other abstract understandings expressed in peoples' actions.

A practice involves normativity in the meaning of 'oughtness' and 'acceptability' [4]. Participating in a practice is operating in an arena where certain actions and ends are prescribed, correct, or acceptable on certain occasions. Through the rules and the teleoaffective structures, normativity shapes what makes sense to people to do. Anyone can participate in discussions of the normative content of a practice. However, these discussions need not end in consensus, and can always be reopened.

First of all it is human activity, understood as doings and sayings, which is "the chief dynamo in social affairs" [5]. Practices change through human activity, but also actions of nonhumans contribute to the development. Further, a practice embraces regular as well as irregular doings/sayings. Some of the irregularities, which resulted from reorganizations of the practice's activities, may constitute novel tasks. Newness involved in a practice can also be the result of innovations in the practices' operations

[4]. Artifacts can be involved in innovation of practices as well as their reproduction. On the one hand, practices affect, use, and give meaning to artifacts, and on the other hand, artifacts – as mobiles - channel, prefigure, and facilitate practices.

Wilber (2008) has examined students' literacy and digital technology practices within a variety of contexts, including colleges and universities, and in this connection she has discussed the concept of 'new' literacies [6]. In her opinion 'new' is a concept which marks off one set of literacy practices from another, considered as a change related to the tools and contexts in which they are practiced. Following this assumption, the addition of new tools such as mobile technologies necessarily means a change in existing literacy practices when seen from a particular point in time. She combines this assumption with Lankhear and Knobel's [7] concept of 'ontological' new literacies [6]. New literacies are 'ontologically' new because they are 'new in kind' in that they were not possible prior to the development of certain digital technologies or services. As an example she mentions literacy practices such as blogging. In sum, using the two kinds of definitions, 'new' literacies are understood to mean "ontologically new and always changing, yet context-dependent literacies" [6]. In the following section, the analysis involves focus group interviews, and therefore the interpretation of the data concerning information literacy practices is based on sets of 'sayings'. Thus, the new information literacy practices are understood to mean the students' negotiations of the 'acceptable' way to perform 'ontologically new, always changing, yet context-dependent literacies'.

3 Method and Analysis

Two focus group interviews were carried out in March 2012. In both interviews, 8 Bachelor students participated. In the first interview, the 8 students came from a Danish university, and in the second, they came from a Danish university college. The duration of each interview was 2 hours. Each interview was recorded with a digital recording device. The interviews were conversations, which took their starting-points not in a strict interview guide but in a checklist of six questions. The questions concerned how the students used iPhone and apps, and what they considered a good app.

The analysis of the interviews consisted of at least three steps. Firstly, I classified the 4 hours of video recordings to get an overview of the material. Secondly, I applied the concepts from Schatzki's definition of practice to direct the analysis. It was the concepts such as doings, sayings, activities, understandings, rules, and normative and emotional expressions. These concepts formed the basis of the qualitative coding and categorizing of the data. Thirdly, as a tool for analyzing, I have used the positioning theory, which deals with how negotiations may reproduce or change the subject-positions in a group [8]. This tool supported the analysis of normative elements in the conversations and thereby, the dilemmas.

The analysis describes, firstly, the activity of searching for quick information, and secondly, two different practices, a collaborative practice and a knowledge enabling practice. Both the activity and the two practices involved use of iPhone and apps. In the following section, these findings are presented. The interview excerpts used in the text below have been translated from Danish to English.

4 Searching for Quick Information

In both interviews the students presented an understanding of iPhone and apps as devices which they assumed were simple and user-friendly. iPhone as well as apps had to be “quick” and “efficient” to be used “everywhere”. Nina (university) described that it was “tangible” answers she searched for on her mobile. She told the group that when she was sitting in a car or a bus reading “a book, and I just can’t remember what it was I had to read for the next lesson, then I just take the mobile and look what it was”.

A student, Peter (university college) described how his PC was “for solid work”, whereas the mobile was for “all the ridiculous kind of searching”. Silja (university college) also made a distinction between PC and iPhone in the way she used her PC, when she had “a lot of information, and you need to compare them to one another”, whereas iPhone and apps were used instead for “those more short, concrete, and straightforward answers”.

These presentations were descriptions of an activity we could call ‘searching for quick information’. At the same time, there were included negotiations concerning what was acceptable to do with iPhone and apps, and what was not acceptable. When Anna (university) described her use of two apps, it was obvious that her presentation had a normative content:

“I have the dictionary [Ordbogen] and I have Wikipedia on my mobile, and of course the purpose is getting knowledge quickly, that will say, it is for those situations, where I have to find out an answer. So it is the situations where you haven’t a thorough approach. It is just in that case where you are sitting and reading one or another text, and you just need to consult a dictionary about what the meaning of the word is, - or what the meaning of the concept is. You can say that Wikipedia is not the best source, but for such a quick clarification it is OK” (Anna laughed, while she pronounced the last sentence).

Thus, Anna’s use of the mobile and the two apps seemed to be assessed as a kind of work subordinated to the ‘right’ way to do knowledge work, where she had “a thorough approach”. Thus, the interview excerpt indicated a dilemma for the students. On the one hand they quite often used mobile and apps searching for information during their knowledge work, but on the other hand it was not appreciated as an essential part of their work. Sundin and Francke [9] have referred to a similar kind of dilemma in upper-secondary school concerning pupil’s use of Wikipedia and Google. Searching for quick information was a very common activity, but the students seemed to avoid referring to it or did it only in combination with laughter.

5 A Collaborative Practice

The use of the mobile was also related to group work and collaboration. Once again a distinction between the use of PC and iPhone was drawn, but now it was concerning working in groups. The mobile was described as a flexible tool in relation to group work. When the students participated in collaborative work, it was a very common

activity to use the mobile to search for quick information. Everyone could join the search process and everyone could contribute to it. In contrast to the use of the mobile, one of the students described how the PC caused problems regarding sharing the tasks between participants of a group:

“Because my own experience is that when you are sitting behind a computer and you are the only one, who has a computer, then it is you who are going to be the chairman and the one who in some way manages the work. I don’t think it happens when it is the mobile” (Silja, university college).

The students from both interviews emphasized how they used the mobile in connection with knowledge sharing between students through the apps of Dropbox and Facebook. Thus, the mobile seemed to have a specific status concerning collaboration. The normativity and the feelings here were different from the case mentioned above. Now they did not need to laugh or to explain away the activity. The collaborative dimension had a credibility which immediately involved an acceptance of using the mobile. Thus, this practice did not involve any dilemmas.

6 A Knowledge Enabling Practice

Both groups got the question concerning how they used the mobile in their study practices. In both groups there were students who found it difficult to distinguish between the use of the mobile as part of study practices and as part of everyday activities. The use of apps like “The plan for the journey” [‘Rejseplanen’], Facebook, or mobile banks made sense in connection with both kinds of activities.

However, in both groups some of the students presented a number of apps regularly used on their iPhone, and these apps were first of all related to their study practices. For instance, Sofie (university) presented an app about the brain, which she had found when she needed some knowledge about the subject during a course at university. She went into the Appstore and found this particular app. She described how she could “turn it around”, “you can press at the different fields of the brain, and then it is coloured”, and further “then it spins and you can see where it is located” and finally “you can press ‘information’, and then it is described what it contains and which functions it has”. Sofie laughed at the end of her presentation.

The negotiations on apps like Sofie’s had apparently a normative and emotional content in relation to what was acceptable to do as a student and what was not acceptable. Sofie’s bodily expression, when she laughed, had the purpose to reduce the implications of presentation compared with a more ‘right’ way to perform a student. Sofie’s presentation was followed by this exchange of words:

Anna: “I could have used that one”.

People laugh.

Sofie: “It was a good one”.

Tine: “I really don’t know. Do you have a course specific app?” (Tine addresses the question to Maja).

Maja: “I haven’t any at all”.

People laugh again.

Nina: “The formulary [Formelsamlingen]. That is also one”.
 Anna turns her face towards Sofie saying: “We have to share apps”
 Sofie: “Right”.

This exchange of words indicated on the one hand that Anna was convinced concerning the importance of the presented app for her knowledge work. On the other hand the exchange of words between Tine and Maja showed that only to a lesser degree it was acceptable to present subject-related apps as a convincing information resource. It revealed that Sofie had access to some knowledge, the other ones had not. Her presentation was given at the expense of those who felt they had not access to this particular resource. Therefore, they had to make a kind of distance to Sofie’s presentation.

The same kind of negotiation was carried out during the focus group interview at the university college, but here also another kind of discussion developed. The students discussed how these kinds of apps were related to the set of literature from the syllabus. The routine was that the teachers chose the literature. Thus, the syllabus was a kind of rule managing the students’ reading activities and their examination practices. During the negotiation, Silja (university college) expressed a strategy, which emphasized a need for experts in this field:

“I rather prefer that there are some experts, who are saying: ‘This is a good app. You have to use it’. I will like to get information about it from people who say: ‘You have to know about this one. You cannot do without it’”.

Many in the group supported this proposal. Peter (university college) was of the opinion that the educational institution was responsible for carrying out such a strategy.

The presented apps seemed to facilitate a knowledge enabling practice among the students. However, in this process two dilemmas were highlighted. Firstly, as in Sofie’s case, only to a lesser degree was it acceptable to present these apps as being subject-related and at the same time being information resources others had not access to. Secondly, some of the students felt it was necessary to develop a strategy involving ‘experts’ who could sort out the relevant apps useful in the study practices.

7 Conclusion

As described at the beginning of the paper, students do not use universities’ digital course management systems to a great extent. Instead, their information and communication practices are based on personal media [1]. To avoid potential disconnects between these practices and the university setting, it is essential to gain insight into the intersection of students’ mobile practices and their study practices.

The result of the analysis of the two focus group interviews was the description of the activity ‘searching for quick information’ and two study practices based on personal media as iPhone and apps: a collaborative practice and a knowledge enabling practice. The two mentioned practices were ‘ontologically new, always changing, yet context-dependent literacies’. They were both close to some well-known study practices concerning group work and knowledge production, but the use of iPhone and apps as the pivotal point of the activities meant that they were ‘new in kind’. Both practices included ‘searching for quick information’. The negotiation of this activity

as well as one of the two practices (the knowledge enabling practice) revealed a number of dilemmas between the use of the mobile and the study practices. The dilemmas concerned the following: Firstly, the students preferred to use the activity called 'searching for quick information' as part of their study practices but they were not able to talk openly about the application of this information; secondly, the students knew there were persuasive kinds of information resources in personal media such as the mobile and its apps, but they also experienced a confused situation concerning the accessibility of these; and thirdly, the students preferred to use some of the personal media's information resources but they did not have a forum to discuss the relationship between these resources and the set of literature from the syllabus. Thus, these dilemmas indicate potential disconnects between the students' information literacy practices and the educational setting. Future research has to find some ways of solving these disconnections.

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Promotion of Scientific Literacy and Popularization of Science with Support of Libraries and Internet Services

Radovan Vrana

Faculty of Humanities and Social Sciences, University of Zagreb, Ivana Lučića 3,
10000 Zagreb, Croatia
rvrana@ffzg.hr

Abstract. The first part of the paper describes the concept of scientific literacy and its roles in lives of citizens and development of society. Scientific literacy is a prerequisite for citizens to make informed decisions and to be informed consumers and help in raising the quality of life of an individual. Scientific literacy should be taught from a very early age and this education should continue throughout one's life including lifelong learning of adults. The second part of the paper highlights briefly the role of libraries in promotion of scientific literacy and popularization of science with the help of selected internet services.

Keywords: Science, scientific literacy, libraries, teaching, Internet, Web 2.0.

1 Introduction

Science plays an important role in development of society and in understanding its developmental complexities. According to Roth [1] "New scientific discoveries and technological inventions render the world increasingly complex and the sense that things are advancing, getting better, seems to be increasingly ambiguous". While scientists are in constant interaction with scientific information and are able to understand the complexities of scientific discoveries, ordinary people who are not professionally involved in science do not always understand scientific concepts that lay behind them. To improve this situation, citizens should become educated about most important scientific phenomena that surround them in order to understand how the world functions i.e. they should become scientifically literate. Scientific literacy is a prerequisite for citizens to make informed decisions and be informed consumers; globalization of society and economies requires one to understand science and technology. [2] "Science-literate individual possesses a basic vocabulary of scientific concepts and terms, knowledge of the processes of science utilized to test our models for making sense of the world, and an appreciation of the effect of science and technology on society, to a degree sufficient to participate in dealing with the increasingly large number of science-and technology-laden public policy questions we face" [3]. By being scientifically literate, members of society are able to approach critically science and scientific discovery and they are better citizens as they will be able to contribute to the development of society by implementing scientific

knowledge they possess. They will also be able to understand how scientific information has been established; under what circumstances is scientific knowledge reliable, and how agreement of knowledge is maintained. Van Eijck and Roth [4] summarized results of implementation of scientific literacy in everyday world: "In the everyday world, scientific literacy likely does not mean doing well on a test, but it means knowledgeably participating in and contributing to worldly affairs where scientific literacy is required". It has become undisputable that scientific discovery governs our lives and that we need to understand how science improves our lives and influences our decisions. In order to make citizens scientifically literate, scientific literacy should be taught from a very early age together with information literacy and education should continue later on during one's life. While schools and universities are natural environments for introducing science to students, there is another type of organization present in society actively contributing to the education process – the library. Libraries have a special position in society as physical places and as organizations that are deeply rooted in the education of citizens and in development of society. Together with the educational sector, libraries embraced information and communication technology (ICT) several decades ago and they use it to create, organize, store and use large quantities of scientific and educational material. This material is used intensively for research and education in digital format on the internet provided mostly by libraries. By teaching how to use and understand scientific materials online, libraries help students in developing a "scientific attitude of mind", a rational mode of thought with which he/she will develop a practical problem solving ability that is unique to science and essential for improving the individual's ability to cope with everyday life. Having in mind all these facts, this paper introduces an idea of use of the selected internet services to promote science and scientific literacy with the help of libraries as information intermediaries. These internet services (mostly part of the Web 2.0) are already in use in libraries worldwide facilitating promotion of library services by using marketing strategies created by libraries themselves that are adapted to include use of the internet as an excellent promotional environment.

2 Scientific Literacy

It is possible to differentiate several types of literacy called the digital-age literacy skills [5]: basic literacy, scientific literacy, economic literacy, technological literacy, visual literacy, information literacy and multicultural literacy. This paper focuses only on scientific literacy, as one of the most important literacy types in today's world oriented towards intensive use of digital scientific information resources as a basis for development of society in general. The development of a modern concept of scientific literacy can be traced back to the period after the World War II and rapid development of scientific enterprise, which initiated interest for scientific education where scientific literacy was to provide a broad understanding of science [6]. The first concept of scientific literacy appeared in 1950s and was the result of the public debate about the aims of science education in society (mostly in the US). Since then, scientific literacy became a part of many education programs around the world as science and technology continued to play even greater role in development of society.

The goal of science education was to educate the public about what scientists and engineers were doing and how it could influence one's life [4]. To understand what scientific literacy is and what are its most important functions, one should read and analyze its definitions. One of the most frequently cited authors, Miller defined civic scientific literacy as "(...) the level of understanding of science and technology needed to function as citizens in a modern industrial society" [7]. Similarly to Miller's document the National Science Education Standards focused on "(...) knowledge and understanding of the scientific concepts and processes required for personal decision-making, participation in civic and cultural affairs, and economic productivity". A scientifically literate person "(...) can ask, find, or determine answers to questions derived from curiosity about everyday experiences. It means that a person has the ability to describe, explain, and predict natural phenomena. Scientific literacy entails being able to read with understanding articles about science in the popular press and to engage in social conversation about the validity of the conclusions. Scientific literacy also implies that a person can identify scientific issues underlying national and local decisions and express positions that are scientifically and technologically informed. A literate citizen should be able to evaluate the quality of scientific information on the basis of its source and the methods used to generate it. Scientific literacy also implies the capacity to pose and evaluate arguments based on evidence and to apply conclusions from such arguments appropriately" [8]. Van Eijck and Roth [4], offered a rather broad definition of scientific literacy: it "(...) means knowledgeably participating in and contributing to worldly affairs where scientific literacy is required". For Organisation for Economic Co-operation and Development (OECD) [9], scientific literacy is "The capacity to use scientific knowledge, to identify questions and to draw evidence-based conclusions in order to understand and help make decisions about the natural world and the changes made to it through human activity." Finally, Norris and Phillips [10], summed up the meaning of scientific literacy by offering the following points that construct the concept of scientific literacy: (a) Knowledge of the substantive content of science and the ability to distinguish from non-science; (b) Understanding science and its applications; (c) Knowledge of what counts as science; (d) Independence in learning science; (e) Ability to think scientifically; (f) Ability to use scientific knowledge in problem solving; (g) Knowledge needed for intelligent participation in science-based issues; (h) Understanding the nature of science, including its relationship with culture; (i) Appreciation of and comfort with science, including its wonder and curiosity; (j) Knowledge of the risks and benefits of science; and (k) Ability to think critically about science and to deal with scientific expertise.

3 Libraries and Scientific Literacy

For centuries libraries have had rich experience in providing access to various information resources that expands information literacy and other types of literacy such as scientific literacy. Libraries and librarians are actively involved in the teaching process on all levels of education in their own premises as well as in schools and at universities and it has become customary to see librarians teaching different information literacy related skills including scientific literacy. As a result "(...) some

librarians are now spending almost as much time in the classroom as full time discipline-focused faculty at the same institution” [11]. They introduce scientific material to students, teachers (and scientists) and offer them access to scientific material they own or to which they offer access on the Internet as well as expertise in knowledge organization and knowledge use; they organize lectures and workshops and provide space for promotion of new scientific discoveries; they participate in scientific projects, they participate in creation of academic curricula etc. To enhance learning about science (and other areas of human endeavor) educational sector and libraries have embraced ICT which resulted in intensified use of ICT itself in the learning process in schools, at universities and in libraries as well as in increased use of digital material in libraries as digital (online) culture expanded rapidly. Libraries help students in training powers of observation, providing an ability to see patterns in the plethora of data that confront us in everyday life [12]. They also help students to use and understand scientific materials online thus developing a "scientific attitude of mind". In addition, libraries employ social marketing skills to influence social behaviors of students and other library users in promotion of acquisition of scientific literacy for the benefit of the general society. Since libraries are service oriented organizations that work for the betterment of society, the task of presentation or promotion of scientific literacy are natural to them. To facilitate access to scientific material, libraries use social media i.e. selected Web 2.0 tools. The following part of the paper will present a selection of the Web 2.0 tools that could be employed for this purpose including real world examples of use of these tools in promotion of science.

4 Promoting Science and Scientific Literacy with Support of the Web 2.0 Internet Services

The internet is currently the fastest medium used for dissemination of all kinds of information. Scientific content is also available online in the form of journal articles, newspaper articles, conference papers, books, texts in encyclopedias, in the form of a text on personal Web pages, on portals, wikis, in blogs, tweets on social networks etc. In contrast to traditional channels of scientific communication, the internet "(...) provides virtually unlimited space, it can allow scientists to publish their lab notebooks and different methods attempted as well as the data that was finally obtained, meaning readers can understand not only the results but also the exploratory processes that led to these results" [13]. Scientists themselves and other categories of users of the internet can access available scientific material by using some of the most popular internet services. Due to the space constraints, the following part of the paper will present overview of selected internet services that could be used (and are used) for dissemination of scientific information which are used in libraries and elsewhere.

4.1 Social Networks

A social network is a Web application that is used (among other purposes) for interpersonal communication between scientists working together on some important

projects and for promotion of scientific discoveries to the wider audience. Social networks are popular among younger generations of the internet users who are already accustomed to this type of internet service intended for fast and mass communication. Scientists in cooperation with educators and librarians could work together and use social networks for promotion of science by creating Web pages and profiles on popular social networks dedicated to scientific phenomena or recent scientific discoveries. Students at universities participate in communication on social networks with lots of enthusiasm and they need no additional knowledge for introduction to this type of the internet service. Other people not accustomed to social networks would need an introduction to use of social networks to become fluent in their use. The downside of the use of social networks for promotion of scientific content is the fact users of social networks profiles are outnumbering scientists, professors and librarians and this might lead to work fatigue and giving up active participation in communicating scientific knowledge to interested users. Examples of use of social networks include ResearchGate at <http://www.researchgate.net/>, SciVal at <http://info.scival.com/>, BioMed Experts at <http://www.biomedexperts.com/>, VIVO at <http://vivoweb.org/>, Carnets2 at <http://carnets.parisdescartes.fr/>, Academia.edu at <http://academia.edu/>, Epernicus at <https://www.epernicus.com/>, Unisciel at <http://www.unisciel.fr/> etc.

4.2 Wiki

Wiki is "(...) software that allows users to collectively create and edit Web pages using a common Web browser" [14]. Users exploit wikis to learn knowledge organization principles, elaborate their scientific discoveries, and properly attribute their own ideas and ideas of other people they used in their research projects. Wikis are easy to start and to maintain, since there are Web sites that allow creation of wikis free of charge and no knowledge of HTML is necessary. Such Web sites take care of the technical side of the wiki software engine, while students and professors focus on research projects. Scientific wikis are popular in dissemination of scientific knowledge and they are more accurate than public wikis because they have higher barriers to editing than public wikis. Examples of use of Wiki include Sykes NMR Wiki at http://www.bionmr.ualberta.ca/wiki/index.php/Main_Page, SciMate at http://www.sci-mate.org/wiki/index.php/Main_Page, Scholaerpedia at http://www.scholarpedia.org/article/Main_Page, Scientific Volume Imaging at <http://www.svi.nl/HomePage>, WikiofScience at <http://wikiofscience.wikidot.com/>, Proteopedia at http://proteopedia.org/wiki/index.php/Main_Page etc.

4.3 Blog

Science is also popularized in blogs on the internet especially among students. "Blogs allow people to express their opinions and post comments on specific subjects" [14]. Blogs are used to help users learn high-level science content and develop the academic language skills necessary to effectively communicate science concepts and allow them to learn and to discuss concepts using scientific terms and expressions.

[15] "Blogs expand instructional time by providing professors with a user-friendly online format to reinforce strategies, introduce new topics and concepts, review important class points, review for tests, and provide enrichment" [15]. The very nature of blogs is not only to list chronologically one's ideas, but they are designed to accept user comments to encourage and facilitate exchange of ideas. Anyone can start a blog and there are many Web sites that will allow anyone to start a blog free of charge. The internet offers many professional science blogs created by learned societies and famous scientists, which guarantee the quality of the published content/material. Keeping a blog up to date is a very serious task which can take a lot of time, so creators of blogs used in the learning process must be aware of this and other shortcomings of blogs. Blogs use RSS for notification about the appearance of newly published content on a blog, and that can be also used as a tool for dissemination of scientific information. Examples of use of blogs include ScienceBlogs at <http://scienceblogs.com/>, Scientific American Blog Network at blogs.scientificamerican.com/, Science 2.0 at <http://www.science20.com/>, Science Blog at <http://scienceblog.com/>, SciBlogs at <http://sciblogs.co.nz/>, nature.com blogs at <http://blogs.nature.com>, Science Update blog: Cancer Research UK at <http://scienceblog.cancerresearchuk.org>, Sciene Blogs at <http://scienceblogs.de/> etc.

4.4 Web Portals

Web portals are aggregate points on the Web where users can access different information resources. Science has accepted portals as important internet services and as a result, the internet is full of different science related Web portals. Web portals are ubiquitous access points to scientific news as well as to full text scientific documents. Quality of the content depends on the quality of professional engagement of authors and editors. A main advantage of Web portals is that they are used easily and do not require additional knowledge for successful access to scientific content on the portal. Anyone with a basic knowledge of use of the internet can access science portals and use different content and media formats offered in the portal. In addition to being an aggregate point of information, portals offer updated information from different scientific disciplines thus helping students to stay current with the new scientific discoveries. Examples of use of blogs include Cardiosource at <http://www.cardiosource.org/>, Chemweb at <http://www.chemweb.com/>, MIT CogNet at <http://cognet.mit.edu/>, MD Consult at <http://www.mdconsult.com/>, Science.gov at <http://www.science.gov/>, Physicsworld at <http://physicsworld.com/>, Discovery at <http://dsc.discovery.com/> etc.

5 Conclusion

Today's science is less oriented to the establishment of new theories and laws. Instead it is oriented to the functional aspects of science/technology, human welfare, economic development, social progress, and the quality of life [16]. To understand its concepts, citizens must be scientifically literate. To help them become better educated

about important scientific concepts that drive their lives, citizens should start their science education as early as possible and continue their education throughout their adult life. Libraries can help different categories of people get acquainted with scientific research output. Libraries have a special position in society and are deeply rooted in development of society, and they are well equipped to provide access to scientific knowledge. They use Web 2.0 internet services for promotion of their services and they could use the same tools for promotion of scientific content to which they provide access. This would help students and other categories of library users to become scientifically literate citizens of the global society.

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Strengthening Information Literacy Competencies through Incorporating Personal Information Management Skills

Shaheen Majid¹, Yun-Ke Chang¹, Schubert Foo¹, Intan Azura Mokhtar²,
Yin-Leng Theng¹, and Xue Zhang¹

¹ Nanyang Technological University, Singapore
{asmajid, YKCHANG, sfoo, TYLTheng}@ntu.edu.sg,
ZH0002UE@e.ntu.edu.sg

² National Institute of Education, Singapore
intanazura.mokhtar@nie.edu.sg

Abstract. Information Literacy (IL) and Personal Information Management (PIM) are two closely related and overlapping concepts. However, most of the existing IL models and standards do not put adequate emphasis on relevant PIM skills. This paper provides an overview of different PIM techniques and discusses their relationship with IL competencies. Proper integration of PIM techniques and tools into IL skills is likely to further strengthen competency level of an information literate person, resulting in saving time, effort and resources. This integration can also help overcome the problems of information overload and information fragmentation. This paper argues that information literacy training programs need to expand their scope by incorporating appropriate PIM skills to provide a more comprehensive skill set to their information users.

Keywords: Information literacy, personal information management, information overload, information fragmentation, IL training.

1 Introduction

Various information literacy (IL) models and standards have been developed by different agencies to provide a comprehensive framework for IL education. Although many of these standards are highly similar with overlapping scope and coverage, they provide certain unique perspectives and interpretations of IL activities. A review of existing IL standards indicates a gap or inadequate emphasis on the management of gathered information. For example, the *Information Literacy Competency Standards for Higher Education* developed by the Association of College and Research Libraries (ACRL) covers skills related to students' ability to identify their information needs, access, evaluate, synthesize, and ethical use of the gathered information [1]. Although it mentions a skill to 'incorporate selected information into one's knowledge base', its actual emphasis is on information summarization, synthesis, and repackaging. Similarly, in the *Seven Pillars of Information Skills*, proposed by the UK Standing

Committee for National and Universities Libraries (SCONUL), one of the pillars is on 'manage' information [2]. Once again, this pillar does not actually cover the proper management of the collected information rather its emphasis is on the ethical use of information, use of bibliographic tools, and social responsibility to help others with the needed information.

The emergence and popularity of electronic information sources has empowered information users to easily identify, select, retrieve and download information from multiple sources. However, in the absence of appropriate skills, the management of retrieved documents can become a nightmare for these users. That is why, in addition to standard IL skills, an information literate individual should be in a position to effectively undertake certain PIM related activities. It is because 'information literacy' and 'personal information management' are two closely related and overlapping concepts and in the absence of one the other cannot achieve its full benefits.

The term personal information management was first used in 1980s in the midst of a general excitement over the potential of personal computers to greatly enhance human ability to process and manage personal information [2]. The need for PIM became more pressing due to inability of individuals to accurately recall the huge number of information pieces they have previously seen, used or stored. In the absence of adequate PIM skills, people are unlikely to find the needed information in timely manner to meet their immediate information needs. It is also likely that even the found information could be either insufficient or too late to use. In a worst case scenario, certain useful information may be lost forever.

2 What Is Personal Information Management?

While there are several definitions of personal information management (PIM), they are quite similar and overlapping. The Association for Computing Machinery (2012) defines PIM as "the practice and study of the activities people perform to acquire, organize, maintain, and retrieve information for everyday use" [4]. Jones [5] defines PIM as a set of activities people perform to acquire or create, organize, maintain, retrieve, use and distribute the information needed to meet life's many goals and to fulfill life's many roles and responsibilities.

People exhibit different PIM practices and behavior based on several factors such as personality traits, education level, IT skills and familiarity with PIM tools, type and frequently undertaken tasks, etc. Similarly, people use different PIM strategies to determine what information to keep in their personal information space, how to organize it for easy re-finding, and how to use it to complete an information task. In more general terms, PIM is a personal strategy to get the information (acquire/create), maintain the information (organize/store/manage privacy and security), and use it [5].

Personal information may be available in various forms and formats, from highly formal documents to scraps, therefore, their organization and retrieval is likely to vary considerably. Some examples of personal information could be: personal notes, downloaded documents, address books, task lists, important dates, reminders, email messages, archived information objects, faxes, RSS feeds, references such as bookmarks of websites and many more.

3 Characteristics of PIM

Personal information management is not a new concept. However, it started receiving more attention when technology enabled the move from paper-based documents to electronic documents, and then from desktop to an array of digital storage devices. Before the advent of the personal computer, paper and file was the major method of storing, organizing and retrieving information. However, due to cheap and easily accessible digital storage, people now continue storing huge amount of information which often cannot be found later due to limitations of human memory. That is why; instead of depending too much on human memory, a well-organized personal information space can help effective information retrieval.

Jones [3] suggests three main areas of PIM activities, which are ‘finding’, ‘keeping’ and ‘meta-level’ activities. He explains that such activities are important to establish, use and properly maintain personal information space for future information retrieval and use.

3.1 Finding Activities

These activities are performed for seeking the needed information by using previously collected and stored information or acquiring completely new information. Some activities involved at this stage are searching, browsing and asking. For finding information from our storage, we need to know what information is already available and where; how to identify/search and locate it, and finally bring together the relevant information scattered across different places. This is called the recollection process and it is relatively difficult to ensure that no information items are missed.

3.2 Keeping Activities

Keeping activities include the decisions and actions people may undertake on encountering information [5]. Though it is not feasible to control everything in our personal information space, PIM makes it possible to manage it to some extent. On encountering an information item, we need to decide how to deal with it. When the gathered information is useful in a current situation, we are likely to consume it immediately. However, for the information which could be potentially useful in the future but cannot be currently consumed, we are likely to consider certain information ‘keeping’ activities. At this stage, we are also likely to compare the effort needed to store it now compared to the repercussions if it is not stored but needed in the future. Some other factors we need to consider are the best ways to store it for future re-finding, location/device selection, the reasons for keeping it, expected useful life of the stored information, and its other attributes. Thus, keeping is more than just saving a piece of information. It is about how to properly organize it for future retrieval.

The information organization approaches used by individuals can broadly be categorized into ‘filers’ and ‘pilers’ [6]. The ‘filers’ use a more structured approach for organizing their documents based on certain attributes (e.g. documents related to a particular activity/task, subject coverage, format, and creation date). Usually ‘filers’

can retrieve the stored documents with less time and effort. Pilers, on the other hand, keep piling up documents without using any schema or structure. Mostly retrieval of documents is based on recall and likely to result in delays or even loss of some useful information. A person who mostly exhibits the ‘filers’ behavior can be categorized as a ‘neat’ person while a person exercising ‘piler’ behavior can be considered a ‘messy’ person. Whittaker and Sidner [7] observed a similar behavior for managing emails. They categorized email management behavior of people into ‘frequent filers’ and ‘no filers’ which are equivalent to ‘filers’ and ‘pilars’. In addition, they proposed a third category, the ‘spring cleaners’, a behavior which can also be applied on other e-documents. The spring cleaners do not use a filing system all the time but periodically attempt to organize information items based on certain attributes.

3.3 ‘Meta-level’ Activities

Among the PIM activities, ‘meta-level’ activities have a more direct relationship with IL skills. It is vital that a schema or structure should be developed for storing information, which will make the whole personal information space more neat and orderly. It will also allow integration of PIM tools for information organization and its future re-finding. The meta-level activities include information tasks such as ‘organizing and maintaining’, ‘measuring and evaluating’, ‘managing information inflow’ and ‘making sense’ [5].

An information literate person needs to make a set of decisions for organizing and maintaining information, including organizing, categorizing and labelling documents as well as activities like renaming documents, moving to different folders/devices, deleting, backing-up, and archiving. It is also desirable to periodically review the current information management practices and consider if any adjustments are necessary. The sense-making process helps a person to review information items that are more relevant in meeting the information needs as well as identify gaps in the existing information acquisition. The information inflow activities can help regularly collect new information through different alerting services including RSS feeds.

4 Consequences of Lacking PIM Skills

Inadequate integration of PIM competencies with the standard IL skills may result in certain problems such as the waste of time, effort and energy of information users. Due to the fast pace of life, many individuals do not attach high priority to information management activities and just keep piling information in different locations, formats and devices, resulting in information fragmentation and overload. Users these days do not restrict their use of computer to just one machine. They may use a desktop computer at work or school, a laptop at home, a smart phone and/or tablet when on the move. The use of multiple devices for finding, keeping and organizing information may leads to information fragmentation [8]. Even within the same device, information may be scattered into different files, folders, and incompatible application software. This fragmentation may result in the waste of time

and effort in locating the needed information from multiple locations or devices. Information users need to make efforts and spend time to synchronize their information stored in various devices. However, only a few users perform this synchronization due to lack of time or necessary skills.

Another problem associated with the lack of PIM skills is information overload. This problem is further aggravated due to easy access to tremendous amounts of information through multiple devices. Each new technology is making it further easier and less costly to produce, acquire and disseminate information, adding to the existing information overload. Information overload occurs when users do not have enough time to read, understand, and utilize the available information. Information overload can even cause ‘information anxiety’, which may result in frustration, hypertension, distraction, confusion, helplessness, irritation, and annoyance.

5 PIM Tools and Information Literacy

Where IT is responsible for creating problems of information overload and fragmentation, it provides a gamut of PIM tools that an information literate person can use to properly manage, organize and recall the stored information. In addition to certain general purpose tools, some specialized PIM tools are available to handle different information types and formats (Flicker, Outlook, and YouTube). Similarly, one possible solution to overcome the problem of information fragmentation is to store information online (e.g. Cloud, Dropbox).

While working on an information task, a person is also likely to generate considerable amount of ‘information scraps’. Information scraps can be ideas, draft notes, reminders on post-it notes, small pieces of paper or email messages sent to ourselves [9]. Besides the mainstream PIM tools, there are certain tools that can also help manage information scraps, such as *List-it* (from Firefox) and *Microsoft OneNote* can be regarded as the digital equivalent of post-it notes. *Evernote* can manage notes, electronic documents, images, web clippings and videos. Tools like Google’s *Quick Add* functions like a calendar to record event, contact information and to-do reminders and has some similarity to event schedulers. However, a sharp increase in PIM tools, particularly single-application tools, has also contributed to the problem of information fragmentation.

6 Integration of PIM and IL Skills

From the above discussion, it is obvious that some of the PIM activities have a direct relationship with IL skills. This section will summarize and map PIM activities with standard IL skills (Table 1). For the first IL activity, a careful review of personal information space will help better understand different dimensions of the task in hand. In addition, it will be useful in identifying information gap and type of new information required. An exact definition of new/revised information needs will help avoid duplicate information gathering thus resulting in saving of time and effort.

Information in the personal space may be available in multiple formats and scattered across many devices. An information literate person needs to know how to find the needed information from his collection. An information literate person is also likely to avoid information overload by not collecting unnecessary information.

Table 1. PIM activities relevant to information literacy

	IL Skills (Big6)	PIM Activities/skills
1	Defining information needs/task	<ul style="list-style-type: none"> • Consult personal information space for documents relevant to the task in hand. • Use existing information to understand different dimensions of the task. • Determine the need for new information.
2	Selecting information sources	<ul style="list-style-type: none"> • Identify and select information from different folders/devices from the personal information space. • Identify and select appropriate information sources for new information seeking. • Avoid creating information overload.
3	Seeking and evaluating information from sources	<ul style="list-style-type: none"> • Finding: Retrieve new information as well as from the personal information space. • Keeping: Decide what information to consume immediately. • Decide what information to keep for its re-finding and later use – storage devices, folders, formats, etc. • Meta-level activities: <ul style="list-style-type: none"> – Organizing: Categorizing and labeling – Maintaining: Renaming, moving to different folders/devices, deleting, backing-up, and archiving. – Evaluating: Review privacy and security issues; review the current information seeking and management strategies and if any adjustments needed. – Sense Making: Identify sources providing more relevant information and identify potential gaps in information seeking. – Information Flows: Identify alerting services to receive notifications about new information on the topic. • Prefer ‘filing’ over ‘piling’ activities for information keeping. • Avoid information fragmentation
4	Using Information	<ul style="list-style-type: none"> • Repackaging of new information with existing information from the personal space.
5	Information Synthesis	-
6	Evaluation	<ul style="list-style-type: none"> • Identify information sources that provided more relevant and reliable information for their possible future use. • Re-organization: Re-categorizing and labeling; renaming of files and folders; moving items to different folders/devices; deleting unwanted files/folders. • Archiving of used and un-used materials for possible future use. Decide where to archive and how long. • On-going monitoring of new information to keep existing information up-to-date for future similar projects.

An understanding of the basic PIM concepts of ‘finding’, ‘keeping’ and ‘meta-level’ activities is likely to help a person to successfully complete an information task in hand. It is equally important that an information literature person should know how to handle the used and unused information after completing a project. Some information re-organization activities will be useful to decide what and how to maintain gathered information for possible future use.

7 Conclusion

A closer examination of IL skills revealed that some of the PIM concepts and techniques are well-grounded in IL activities. A thoughtful integration of IL skills with appropriate PIM techniques is likely to save time, money, energy and efforts of information users. An incorporation of selected PIM techniques and tools into IL training can significantly improve its impact and benefits. It is, therefore, desirable that libraries and other stakeholders should play an active role by expanding the scope of their IL training programs by including certain PIM techniques, particularly dealing with information organization and management. This way we can strengthen the existing IL standards as well as empower information literate individuals with more skills to effectively complete their information tasks.

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Information Literacy and International Capacity Development Initiatives in Life Sciences: AGORA, OARE, HINARI, ARDI (Research4Life - R4L)

Tomaz Bartol

University of Ljubljana, Biotechnical Faculty, SI 1000 Ljubljana, Slovenia
tomaz.bartol@bf.uni-lj.si

Abstract. AGORA/FAO (2003), OARE/UNEP (2006), HINARI/WHO (2003) and ARDI/WIPO (2009), commonly referred to as Research4Life (R4L), are associated global initiatives in the life sciences (agriculture, food, nutrition, medicine, health, environment) founded with the purpose of bridging the digital divide by providing less developed countries with access to high quality scientific information (e-journals, databases), and offering training for this purpose. They are coordinated by UN-agencies, international organizations and associations, and private partners (publishers). The paper reviews past development, identifies some principal stakeholders with special emphasis on capacity development through information literacy and related competencies, along with the role of libraries. It highlights the principles and the structure of courses and training materials, and presents some activities in selected countries which are eligible for assistance through the initiatives.

Keywords: Information literacy, capacity development, digital divide, international cooperation, training, knowledge transfer, research, technology, agriculture, medicine, environmental sciences, developing countries.

1 Introduction

HINARI, AGORA, OARE and ARDI are associated global public-private initiatives founded with the objective of assisting less developed countries in accessing principal international resources of scientific information in the life sciences, aimed at researchers, academics, librarians, and other participants in the transfer of local/global knowledge, research and development. AGORA (Access to Global Online Research in Agriculture) supports access to food, agriculture, human nutrition, and related information. HINARI (Health InterNetwork Access to Research Initiative) facilitates access to biomedical/health information. OARE (Online Access to Research in the Environment) is dedicated to environmental issues. These three unique sister programs were later joined by ARDI (Access to Research for Development and Innovation), and are now referred to under a collective name Research4Life (R4L). Implementation of the initiatives is usually accompanied by capacity development missions, such as information literacy (IL) courses, library workshops and similar ICT-related training programs.

The paper reviews past development with strong reference to training, the role of UN agencies, international organizations/societies, supporting educational institutions, international publishers and other stakeholders. It assesses the initiatives through capacity development and IL-related courses (e.g. retrieval/search skills) and the role of libraries and information professionals through 'training the trainers' scheme. It highlights the principles and the structure of training materials, and presents some activities in selected countries which are eligible for assistance through the initiatives.

2 Development of the Initiatives

In January 2002, HINARI was launched in order to offer health and medical institutions in 67 developing countries free access to a large collection of authoritative international information materials, to be joined later that year by an additional 41 countries which could access the journals at very low prices. The initiative has evolved under the umbrella of the Health InterNetwork, a WHO-led (World Health Organization) partnership initiated by the United Nations (UN) Secretary General as part of his Millennium Agenda to narrow the digital divide [1]. Similarly, in October 2003 another UN-sponsored initiative, AGORA, was introduced, coordinated by FAO (Food and Agriculture Organization of the UN), following the previous success of TEEAL (The Essential Electronic Agricultural Library), a CD-based collection of scientific journals available in low-income countries [2]. In October 2006, OARE was initiated, coordinated by the UNEP (United Nations Environment Programme). ARDI (Access to Research for Development and Innovation) was launched in July 2009, by WIPO (World Intellectual Property Organization) and partners, based on the models of AGORA, HINARI and OARE. It provides access to science/technology journals and inclusion of patent databases through ASPI (Access to Specialized Patent Information) [3]. These related programs have gradually become known by a joint name Research4Life or R4L (Research for Life) and, by 2009, offered access to as many as 7500 high-quality journal titles and many specialized databases. The initiatives benefited greatly from the advent of the WWW which removed the costs of requests for free subscriptions to paper journals [4]. The underlying technical architecture enables a unique intersection between developing country networks and publisher access systems, through adapting to the evolving systems of authentication [5]. Results of the R4L User Experience surveys and interviews were presented extensively in 2011 by Gaible, et al [6].

The continuous strong support for R4L is pledged by leading publishers such as Elsevier as one of the founders of the initiatives [7]. However, inadequate ICT infrastructure and deficiency of trained library staff frequently present a real challenge in many countries, especially in Africa where most registered institutions are located [8]. It was thus soon clear that mere access to online resources would not be sufficient. Burton [9] quotes Sue Silver and Kimberley Parker who stress that researchers might simply not know how to search for information or even know that certain resources exist, and emphasize a strong need for training.

3 Structure and Partners

Several criteria, such as UN Least Developed Country List, total Gross National Income (GNI) or Human Development Index (HDI) determine if a country is eligible for free-access (Group A) or low cost or fee-access (Group B) to R4L-linked resources. In 2013, there were some 78 Countries, areas and territories in Group A, and 39 in Group B [10]. Public and private partners are involved. The more important partners are *Publishers* and the so called *Champions*. Altogether, more than 150 different publishers participate. There are some 20 champions which are represented by different UN agencies (e.g. FAO, WHO, UNEP, WIPO, UNICEF, World Bank), universities (Cornell, Yale), corporations (Microsoft), foundations, libraries, etc.

Table 1. Research4Life partners and supporting institutions

HINARI / WHO (2002)	
Publishers	167 publishers (Adis - a Wolters Kluwer business ... World Health Organization)
	4 founding partners (Elsevier Science; John Wiley & Sons; Lippincott, Williams & Wilkins; Springer)
Societies	950 societies (Académie des Sciences de France ... Zoological Society of Japan)
AGORA / FAO (2003)	
Publishers	60 Publishers (Adis - a Wolters Kluwer business ... University of Toronto Press)
	6 Founding partners (Elsevier Science; John Wiley & Sons; Lippincott, Williams & Wilkins; Nature Publishing Group; Oxford University Press; Springer)
Societies	180 Societies (Acad. of Legal Studies in Business ... Zool. Society of Southern Africa)
OARE / UNEP (2006)	
Publishers	59 publishers (American Anthropological Association ... Worldwatch Institute)
	32 founding partners (American Assoc. for the Advancement of Science ... Univ. of Chicago Press)
Societies	543 Societies (Académie des Sciences de France ... Zoological Society of London)
ARDI / WIPO (2009)	
Publishers	17 publishers (American Assoc. for the Advancement of Science ... The Comp. of Biolog.)

An important component in the partnership are information *Services*, such as Swets Information Services, Serials Solutions, and Ex Libris. Also, hundreds of different *Societies* are involved. Table 1 shows the first and the last (alphabetically) publisher and society participating in each respective initiative. The funding partners are also highlighted. The involvement of funding partners greatly increased by 2006 when OARE was launched. The structure of ARDI is more limited as it focuses chiefly on intellectual property.

4 Information Literacy and Capacity Development

Since the very beginning, the initiatives placed strong emphasis on information literacy and related competencies. Several highlights can be detected in the papers dedicated to the initiatives, for example user-education programs, the role of libraries/library associations in promoting IL, developing publishing/writing competencies, etc. The expression *information literacy* is used on most occasions, however, when some other related concepts are also employed, such as computer- or ICT-literacy, search/retrieval skills/competencies, information fluency, library skills etc. Strong importance is placed on 'training the trainers', especially librarians and information specialists. Sometimes, the libraries are presented as the only units with e-connectivity in less developed environments and are featured as focal points and catalysts for IL and capacity development. This has raised the profile of libraries in many places and provided an excellent opportunity for placing IL courses into the curriculum. Some selected topics which are used in IL courses (through the available R4L materials) are presented in Table 2.

It was soon clear that without technology transfer and capacity building the initiatives would not offer permanent answers [11]. The number of scholarly resources was increasing, so the need to improve student and staff skills would soon become critical [12]. Training (including general concepts in literature searching) was thus rightly considered as the second of the two essential components (the first being access to resources) in one of the very first articles dedicated to the initiatives published by Aronson in 2002 [1], who addressed the training-for-trainers workshop on malaria research in Africa. Some other IL-related aspects of the initiatives, for example developing publishing competencies, were also highlighted very early [13]. Teaching IL through AGORA, HINARI, and OARE was conducted in Uganda [14] and Nigeria [15] where emphasis was placed on search skills (search terms, limits, Boolean logic). Considerable progress in information competencies in sub-Saharan Africa was soon evident, also through AGORA- and HINARI-related training, however, the need for trained library staff was becoming ever more pressing [16]. This need was also noted in Kenya [17] or Bhutan [18]. In June 2010 a special HINARI "Train the Trainers" course was conducted with the aim of giving the participants the knowledge to train users and conduct workshops [19]. AGORA-related IL training was also conducted in eligible countries of the Central and Eastern Europe and the regions of the Caucasus and Central Asia (Ukraine, Azerbaijan, Georgia, Uzbekistan in 2005, Moldova and Ukraine in 2008, and Armenia in 2009). The training also involved a strong train-the- trainers (information professionals and librarians) component. In this region, IL was also promoted through the AgroWeb network which is an important regional ICT initiative linking information centers and information specialists [20].

The initiatives improved information literacy, enhanced the capacity of libraries [8], [21], and promoted the integration of IL-courses into the curriculum [22]. And yet, the R4L programs have sometimes not been sufficiently acknowledged [23]. Too many researchers still do not take the advantage of IL training through the initiatives [24] so, needlessly, poor information literacy remains a challenge in many places, even in 2012 [25]. Much work thus still remains to be done.

4.1 Overview of the More Important Elements Tackling IL Issues

Support for IL-related training is one of the most important components of R4L [10]. Training materials can be found on the web pages linked to the respective initiatives. Due to the limited space we identify only some selected utilities which are especially relevant in terms of IL. Typically, some modules are conceived as ‘train the trainers’ courses, going beyond basic IL training, aiming at higher levels of capacity development and information competencies by including technical, educational, as well as ethical (copyrights and intellectual property) and organizational dimensions. Courses include presentations, group discussions, hands-on practice etc. Table 2 reviews some principal elements in the R4L initiatives which involve IL-related competencies. Some are initiative-specific such as specialized databases dedicated to a particular discipline. Scopus (global bibliographic and citation database) is included in all initiatives.

Table 2. Principal elements involving training for IL skills in the R4L

Major subject	Content
Authentication	Login; ID (user names/passwords); protocols; free vs. pay-per-view
Bibliogr. elements	Formats; secondary/primary/fulltext sources; titles, abstracts, keywords
Databases	CAB Abstracts, PubMed (Medline), Cambridge Scientific Abstracts (CSA), Environment Index (EBSCO), Scopus
Search & Browsing techniques	Strategies/syntax; search criteria; Boolean logic/truncation/phrases; key concepts; basic/advanced search alternatives; search (wizard) boxes; retrieval through specific fields (years, titles, languages); refining results (checking boxes, search limits)
Downloading	Browsing by journal title A-Z lists, classification; subject categories
WWW search	Extraction of information; chapters; articles; fulltext (html/pdf)
Copyrights	Google vs. Google Scholar (Boolean logic on the WWW)
Authorship skills	Etiquette; institutional policies; intellectual property; allowed downloading; using approved passwords; dissemination of materials
	Structured scientific writing; composition of a paper; styles; plagiarism; citations/reference management; submission/peer review

AGORA training materials offer exercises, handouts and presentations. Separate *Exercises* (.pdf and .doc) are dedicated to working with browsers, hardware and software requirements, electronic libraries, search strategies, bibliographic databases, and publishers’ website features. *Handouts* for facilitators, based on Q&A principles, are also available. Eleven separate *Presentations* (.ppt) are dedicated to different aspects, including the ‘Tips for Trainers’.

HINARI materials are organized similarly. There are eight *Training modules* with strong emphasis on ‘train the trainers’. Different IL skills are tackled. Some particular emphasis is placed on reference management software (EndNoteWeb, Zotero, Mendeley). Separate *Training tools* and *Presentations* are available dedicated to different aspects of HINARI utilities. An important emphasis is placed on *Authorship skills* which are organized as several modules dedicated to the effective scientific writing.

OARE offers three *Basic training packages* involving similar IL content as the other initiatives. Some special emphasis is placed on information systems such as

Environmental Science and Pollution Management (CSA) and Environment Index (EBSCO). OARE and AGORA provide links to *Authorship skills* teaching modules through HINARI. The materials also offer concise *Short courses*.

5 Discussion and Conclusions

Researchers are frequently not aware of the existence of information resources or/and are unable to use them. Capacity development and IL training thus represent an indispensable element in the R4L initiatives, empowering experts in less developed countries to find informed answers themselves. These initiatives should not be confused with 'open-access'. The R4L is only available through a strict authentication system (passwords) and 'eligibility' criteria based on agreements between the participating partners. The initiatives serve as an excellent platform (usually the only one) for IL training by way of authoritative databases and leading international journals. This singular opportunity is not even available in many research institutions in developed countries which depend on expensive subscriptions.

Several limitations still hamper training programs, such as technical problems (the lack of computers/connectivity) and the lack of trained library staff. The first issue is gradually becoming less acute by the increasing availability of ICT technologies. The second, however, is more pressing as it is contingent on human resources. That is why the R4L initiatives place such a strong importance on 'training of trainers', including librarians/information specialists. The role of libraries is thus enhanced, enabling inclusion of IL programs in regular curricula. R4L-related capacity development and training programs along with the available materials include some of the most typical elements of the Information Literacy Competency Standards for Higher Education by ALA [26]. An opportunity for synergy is here quite obvious.

Excellent information tools are now also available in less developed countries. What still lacks is awareness thereof and usage skills. Much IL training is thus still needed. These initiatives represent a unique international collaborative endeavor in empowering individuals and institutions to face challenges in fighting hunger and diseases, and enhance local, regional and, very importantly, global knowledge through a project that has, quite appropriately, been termed Research for Life (R4L).

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A Research Based Framework for Developing Information Literacy Projects

Angela Repanovici¹, Diana Cotoros¹, and Ane Landoy²

¹ Transilvania University of Brasov, Brasov, Romania
{arepanovici, dcotoros}@unitbv.ro

² Bergen University, Bergen, Norway
Ane.Landoy@ub.uib.no

Abstract. This paper presents a model for the evaluation of users' needs adapted to the conditions of a developing country that has access to traditional literature and great potential for exploiting available sources on Internet, but does not yet have documentary or bibliographic database access.

Keywords: Information literacy, international projects, users' needs, Moldova, Norway, Romania.

1 Introduction

In the information and knowledge society, information literacy becomes a part of the professional culture, as the integration of the populace in the new society, with social cohesion, inequity exclusion concerning the access to information depend on it. Within educational institutions and libraries, people are aware of the need of training in information literacy [1]. The level of information literacy determines economic, social, professional status of the specialist of tomorrow. In order to have up-to-date specialists, skilled and able to be a part of the European educational area, programs for information literacy training, designed for teaching at any level must be initiated [2]. The development of a training program in information literacy is based upon various descriptive small scale studies regarding the students' methods for information-seeking [3]. There are several ways of approaching this research. Some have looked at the students' ability to use the Web, [4-5]. Others have described the users' behaviour in the process of search for information [6]. Some studies, oriented towards the development of training programs have special attention to embedding search strategies in Web space [7]. Most studies concentrate on research methods, information sources and the way of perceiving and using the Web-accessible informational sources [8]. Several studies show that marketing quality research concerning students' attitude and preferences about research sources is a successful tool in quantifying the services offered by the library, and also relevant in measuring the quality of students' training. Koehler and Swanson [9] have a special expertise in international studies. They used initial tests for students' evaluation and tests after training in order to quantify the effects of training in information literacy. Similarly,

Knight [10] used pre- and post- tests in order to improve each question related to the research skills in a library. At the moment, many authors use standard questionnaires. Cameron *et al.* note that “*there is a need for reliable and valid data on student learning outcomes*” [11].

Most of the standard questionnaires are developed as tests regarding general knowledge in information literacy.

2 Research Development

Within the project “Development of new informational services for economics high education in Moldavia”, financed by EURASIA foundation, in partnership between the Economic Studies Academy (ASEM) and University of Bergen libraries, the survey “*Improvement in Information Literacy for the users of Scientific Library of the Economic Studies Academy of Moldavia*” was performed during January-March 2013. The goal of this study was to identify the role of the library in developing the skills in information literacy of students, teaching staff, researchers and studying the education requirements of users in the new informational context.

Three working hypotheses were established:

- Competencies level in the field of information use of the ASEM students is low.
- Users’ training has a significant impact on the students’ academic success.
- Including “Information Literacy” subjects in the curricula contributes to improvement of education quality.

1004 respondents out of 11.909 from 6 faculties took the survey. The online questionnaire Survey-Monkey was used as a research tool. This survey revealed the knowledge level in information literacy of different users segments, and suggests ways of improving the training process of future specialists, based on the information literacy curriculum that will be developed following this research. It also offers us important information in order to identify the aspects requiring highest attention for changing the training activities of the users. The research results will be the basis of a development program in information literacy, with the objective of improving the quality of the economics higher education in Moldavia.

3 Sample Structure

Sampling was accomplished, the target group being undergraduate students, master students, Ph.D. students and post doctoral researchers. It included respondents at all training levels. We notice that the smallest percentage weight is for the fourth year of study. This small percentage is explained by the fact that the fourth year of study is only for the “Law” specialization. The third year, represented by 5.18%, were working at their bachelor practice in economic enterprises from Moldavia at the time of the survey, and thus were not in the academy.

Respondents are presented in equal proportions according to the number of students enrolled for different specialties. Totally, 11909 students are training at ASEM, including: bachelor - 7463, distance learning - 3393, master - 976, Ph.D. - 38¹.

The specializations Business and Administration, Accounting, Finances and Banks are most represented in the sample according to the number of students' trained within these. There also are new specializations represented with small groups of students, such as for example "Informational security", which explains their poor presence in the survey. The gender composition of the sample is the following: female – 69.83%; male – 30.17%, which corresponds to the real gender proportion of the students enrolled in these faculties (females – 7000; males – 3500)

The respondents were given an online questionnaire with 12 questions, including: closed questions, half-closed, scale type questions and semantic differentials. The questionnaire was in the Moldovan language.

For the question "*Which is the knowledge level on a scale from 0 to 3, 0 – minimum, 3 - maximum, you have about...*" we got the following answers:

Assessment of electronic information sources (update, informational content, text organization, accessibility, trustworthiness, manner of navigation, advertisement messages, goals etc.) – the average weighted score of all answers to this question is 2.89. It is a good result but there are approximately 5% of the respondents who indicate that their knowledge in assessing the information sources is at 0 level. This fact confirms the different levels of skills in information literacy for different users' categories.

Information search tools (OPAC, references, and databases.) – the average score is 2.74. Thus, the information users, participants in the survey, evaluated their knowledge about information search tools at a high level. But in the observation process we noticed that the knowledge is limited to Internet tools and not enough is on a quality search of information.

Information search strategies (keywords, logic operators, and thesauri) – average score is 2.90. This high number proves the respondents trust in their knowledge and skills, which confirms our assumptions regarding the Internet as the main tool of looking for information.

Ethical use of information (citations, references, plagiarism, copyright and intellectual property) – average score is 2.78. The respondents evaluated their knowledge regarding ethical use of information highly but in spite of this, they referred more to subjects like "copyright" and "plagiarism" (ASEM had a campaign for fighting plagiarism in 2012, for 6 months). At the same time, knowing the citation rules, creating references lists and presenting the references, as well as the profound understanding of copyright fundamentals is much lower for the students in years I - III, by comparison to the ones in master and Ph.D. studies (Table 1).

The answers to this question revealed that users indicate a quite high score for their knowledge in the information literacy area. However, the results we obtained are based on the subjective assumptions of the users and may be different from the objective assessment of knowledge by testing or other examination forms.

¹ <http://ase.md/files/rapoarte/raport2011-2012.pdf>

Table 1. Average scores for answers regarding informational skills

Assessment of information sources	2.89
Search tools	2.74
Information search strategies	2.90
Ethical use of information	2.78

The answers to the question “Which is the knowledge level on a scale from 0 to 3, 0 - minimum, 3 - maximum, you have about...” were: *Open-access to scientific information* – average score is 2.61. It is a high enough score, indicating the students’ knowledge regarding the international Open Access movement. This can be explained by the promotion and advocacy campaign of Open Access in ASEM, during June - November 2012. However, some users understand OA to mean “free access to libraries’ collections”. These users’ knowledge requires adjustment from library staff.

Institutional digital repositories – average weighed score indicated is 2.21. Over 60% of the respondents indicated a score between 0 and 1. This result suggests that there is insufficient knowledge of users about institutional digital repositories. It can be explained by the lack of this innovation service in the country’s scientific libraries. Even the librarians know this technology only at conceptual level. This innovative direction in libraries’ activity requires further development in Moldavia, including implementation, promotion and efficient use of advanced technologies for all users’ categories of university libraries.

Digital collections in university library – average score is 2.36. Respondents who participated in the survey demonstrated insufficient knowledge of university digital collections. This can be explained by the traditional perception of library as a printed publications collections; the digital collection in libraries is still in a development process; with lack of creation and use regulations; and insufficient promotion of digital collection within users.

Digital libraries – average score is 2.49. Respondents have knowledge concerning this informational resource, due to their popularity in Internet network and characterised by availability and search ease (Table 2).

Answering the question “In case your knowledge level is high we ask you to indicate the information sources...”, respondents chose the following of the proposed options (Table 3).

Table 2. Responses distribution regarding information systems

Open access to scientific information	2.61
Institutional digital repositories	2.21
Digital collections in library	2.36
Digital libraries	2.49

Table 3. Respondents choice concerning information sources (%)

Faculty courses	61.1
Master courses	20.2
Trainer’s instruction	10.6
Conference presentations	15.4
Individual study	65.6
Discussion groups	25.6

Thus, we may conclude that the biggest group of the respondents consider that their knowledge level is due to individual study – 65.63%, and faculty lectures – 61.07%. An important moment in improving the information literacy courses would be the implementation of some new forms of on-line individual learning.

The question „Which of the elements in the list below presents the highest interest for you? (please indicate 3 subjects)” allowed the respondents to identify the interest areas for those who wish to improve their knowledge in information literacy (Table 4).

Table 4. Respondents answers concerning interest areas (%)

Institutional digital repositories	45.2
Digital collections in library	45.7
Intellectual property and copyright	29.2
Assessment of information sources	41.8
Information search tools	46.8
Information search strategies	48.4

Most of the respondents are interested in *information search strategies* – 48.42% and in *search information tools* – 46.78%. Also they are interested in *digital collections in university library* – 45.66%; *institutional digital repositories and Open Access to Scientific Information* – 45.15%. Intellectual property and copyright are interesting for just 29.21 % of the users of Scientific Libraries at ASEM. This is explained by the weak interest towards the aspects related to intellectual property among students. However, these topics are more popular among master and Ph.D students, who perceive the importance of intellectual property more economically than morally or spiritually. It is obvious now, during the technological progress and Internet development that the issues of the international copyright has become more important. For as long as intellectual property is not promoted to young people in Moldavia, they are not motivated to study these problems. Control question “Which is the knowledge level of the presented concepts on a scale form 0 to 3(0 – lack of knowledge, 3 - maximum)” allowed us to establish the consumers’ knowledge about the following concepts (Table 5).

The highest appreciation of their own knowledge was nominated by the respondents in relation to *Information search tools* (score 2.83) and for *Information search strategies* – (score 2.69). This is confirmed also by the answers to questions no. 4-5 (Fig. 4 and 5). The respondents know least about the concept *digital collections in library* – average being 2.34. Question “What if such lectures were introduced in your library, do you think consumers would be interested?” brought up the following opinion of the respondents: *yes* – responded 89.12%; *no* – 10.88%. Thus, the real image of the respondents’ interest in organizing the Information literacy course was described.

The responses to the question “If information literacy courses are organized, which of the following concepts should be presented?”, delivered the following situation:

Most respondents wish that the following subjects to be studied within the “Information Literacy” course,: *institutional digital repositories, Open Access to*

scientific information – 42.08%; *information search strategies* – 40.88%. The respondents consider the subjects: *electronic information sources assessment* – 27.05%; *information integration in educational products* – 26.55% less important. These respondents' requirements should be considered in the curriculum's creation and the course content of information literacy.

Table 5. Average score of answers concerning the presented concepts

Institutional digital repositories	2.24
Digital collections in library	2.34
Intellectual property and copyright	2.46
Assessment of information sources	2.57
Information search tools	2.83
Information search strategies	2.69

The scale type question in the form of semantic differential identified the respondents' opinions regarding the importance of information literacy "*Which is your opinion regarding the importance of the Information Literacy course within ASEM?*" Most respondents think that this course is important – 53.05%; and very important – 29.27%. Thus we may conclude that the respondents are aware of the importance and necessity of improving their information skills for their self-development as future economists, to be competitive on the labor market in the Republic of Moldova.

The users' wish to participate in the training was identified by answering the following question "*In case the ASEM library would offer information literacy trainer's courses would you like to attend?*", as follows: *Yes* – 79.12%; *No* – 20.88%. Thus, the intention of attending information literacy courses was expressed by most respondents involved in the study.

These results confirm the hypotheses of the study and provide arguments for the necessity of making a significant effort to reach the competency level in information literacy which is expected in high education. Training in information literacy should be focused on the search strategies and results' integration, to suit the real needs of young people and to be organized in a close partnership between the professor and the librarian.

4 Conclusions

Earlier international research shows that libraries in institutions of higher education have played important roles in the development of students' information literacy. By testing some of the findings from earlier research in our own development project, we found the following:

1. Our survey identified the ASEM-students' lack of knowledge of information literacy. Other research has showed the optimal ways for IL-education. Thus, it is necessary to discuss the librarian's responsibilities, conditions and means to accomplish users' training. Librarians should establish the basic content in

common training programs, including training at several levels in information literacy. They must also prepare the necessary conditions in order to implement the courses in the academic curricula.

2. Implementation of an information literacy course at ASEM will help the students with successfully accomplishing the university curricula, and the students seem to be ready and willing to undertake this training.
3. From earlier research we realized the importance of an information literacy training to be integrated in the academic curriculum. The ASEM librarians can use the results from the survey on students' knowledge and perceptions to argue their case.

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Looking for Information Literacy: Syllabus Analysis for Data-Driven Curriculum Integration

Katherine Boss and Emily Drabinski

Long Island University, Brooklyn Campus, Brooklyn, New York, USA
{Katherine.Boss, Emily.Drabinski}@liu.edu

Abstract. The purpose of this syllabus analysis study was to establish a method of gathering data to strategically embed information literacy instruction within a curriculum. In this pilot study, 79 syllabi from the School of Business were evaluated for information literacy learning outcomes and library use requirements. The authors normed the rubric-based content analysis questions prior to coding to ensure reliability. At the conclusion of coding, the authors established interrater reliability using two measures: the percent agreement method and Krippendorff's alpha. The results revealed the most critical points for scalable, curriculum-integrated instruction in the School of Business: a group of 28 courses that could be targeted for in-depth instruction, and eight courses whose outcomes could be met with less time-intensive instruction focused on information access. Since the completion of the study, the authors have used the data to strategically expand instruction in the School of Business.

Keywords: Syllabus study, instruction planning, data-driven curriculum integration, information literacy.

1 Introduction

Academic year 2010-2011 was a time of drastic change at the Long Island University Brooklyn Library. The arrival of a new Dean of University Libraries coincided with the turnover of nearly a quarter of the teaching library faculty, the drafting of a regional accreditation report, an institutional acceleration of outcomes assessment requirements, and shrinking human and financial resources. In the midst of this tumult, librarians faced institutional pressure to increase information literacy instruction in upper-division courses. More than ever, public service librarians felt the need to defend information literacy as a vital part of the university's core educational mission.

Declining human resources presented a challenge to increasing instruction, so the authors determined that any program development ought to be data-driven. In other words, a clear understanding of the information literacy outcomes already being taught in the university curriculum was required. Following a review of the literature, the authors developed a syllabus study that integrated the methodology of previous

syllabus studies, many of which adopted a model established by Rambler [1]. The authors paired this established model with new research strategies arising from the field of educational outcomes assessment, including norming sessions, calculations of interrater reliability, and the use of rubrics to develop content analysis questions. The School of Business curriculum was then selected as the area of evaluation.

The results of this pilot study suggest clear targets for scalable information literacy instruction in the School of Business. The authors have used this data to start conversations with teaching faculty and begin to strategically embed information literacy instruction in this School.

2 Methodology

The first step in this syllabus study was to gather a set of artifacts. The liaison to the School of Business contacted the Chair of the School of Business to ask whether faculty would be interested in supplying the authors with a collection of syllabi. The Chair agreed to participate, and the departmental administrator emailed the authors all syllabi from academic year 2011-2012. This sample set of syllabi was comprehensive, as the School of Business requires faculty to submit copies of all course syllabi to the department chair. The authors sorted through the syllabi, removing duplicates as well as supplemental assignments and grading rubrics that were included in the set of artifacts. A total of 79 syllabi, drawn from across the undergraduate and graduate curriculum, comprised the final sample.

A set of content analysis questions were then developed to enable data collection about library use and information literacy outcomes. These questions drew both from prior syllabus studies in the literature and from the Information Literacy VALUE Rubric designed by the Association of American Colleges & Universities [2]. By associating the content analysis with this rubric, the evaluation could be usefully connected to other information literacy assessments happening at LIU Brooklyn and across the field of library science. The AAC&U rubric has five learning outcomes related to information literacy:

1. Determine the extent of information needed
2. Access the needed information
3. Evaluate information and its sources critically
4. Use information effectively to accomplish a specific purpose
5. Access and use information effectively and legally

These descriptions were used to develop an initial set of content analysis questions. In order to capture a broad sense of engagement with the library, one descriptive question was also asked: Did the syllabus direct students to the library, or mention the library as a place to find information resources? Each syllabus was searched for the presence of the word “library,” discarding those references that were superficial, (e.g., when the word “library” appeared in a URL).

Once the initial content analysis questions were designed, the authors conducted a calibration or “norming” session on the application of the rubric and content analysis

questions. Using a set of three unrelated syllabi as sample artifacts, the authors separately applied the content analysis questions to the syllabi, compared results, and discussed their individual interpretations. During this session, the authors revised and updated the content analysis questions to reflect a more concrete application of the tool. As Oakleaf [3] has discussed, this process is instrumental to the successful application of any rubric or set of content analysis questions, in order to ensure a balance between generalized wording and detailed description, and improve the internal validity of the rubric as a measurement tool. The final set of content analysis questions is shown in Table 1.

Table 1. Content analysis questions based on AAC&U VALUE Rubric

AAC&U VALUE Rubric Dimension	Content Analysis Question	Explanation
Determine the Extent of Information Needed	Q1. Does the syllabus require the student to conduct independent research?	Independent research requires a student to define an information need as well as the scope of research required. An independent research project would indicate the presence of this outcome in the course.
Access the Needed Information	Q2. Does the syllabus require the student to independently use library resources?	The access question hinged on whether the student was asked to go beyond the textbook and other assigned readings.
Evaluate Information and its Sources Critically	Q3. Does the syllabus state learning outcomes related to critical thinking?	Critical thinking skills are often present if unnamed in courses, making this a difficult outcome to evaluate. For the purposes of this study, the authors determined that the outcome needed to be named explicitly.
Use Information Effectively to Accomplish a Specific Purpose	Q4. Does the syllabus include a cumulative project requiring students to integrate multiple viewpoints or resources from across the course?	This learning outcome asks whether students are able to integrate and synthesize information to accomplish a specific goal.
Access and Use Information Ethically and Legally	Q5. Does the syllabus address academic integrity issues (e.g., plagiarism, intellectual property, the importance of correct citation)?	The presence of statements about plagiarism or cheating would indicate the importance of this outcome in a course.

Following the norming session, the authors evaluated each syllabus independently, with ratings entered into two separate spreadsheets. These spreadsheets were then compared to establish concordance between the two sets of ratings. The authors used

two measurements to calculate interrater reliability: Krippendorff's *alpha* and the percent agreement method. In both cases, the authors produced reliable ratings for Q1, Q2, Q4, and Q5, indicating that conclusions based on this data would be reliable. The interrater reliability result for Q3 using both equations was low; this led the authors to exclude this question from the analysis that follows. Only the reliable sample for each question was used for data analysis (Figure 1).

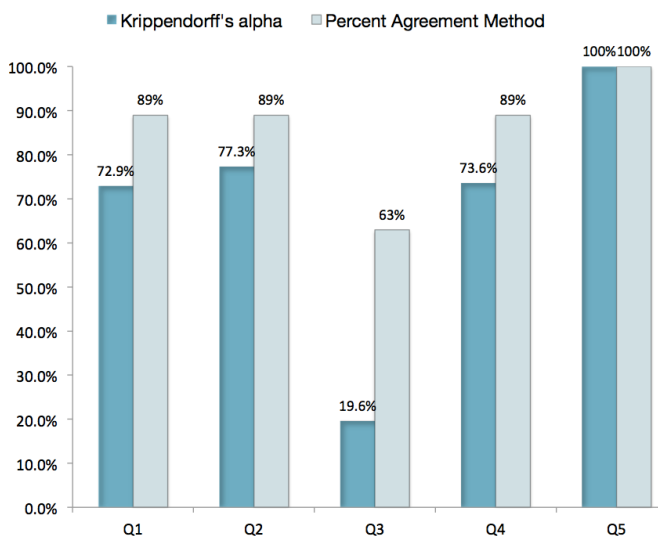


Fig. 1. Interrater reliability

3 Results

The findings usefully directed the authors to courses in the School of Business where information literacy skills are taught, and therefore where faculty would be most likely to collaborate with librarians in teaching these skills. The results of the descriptive question revealed that few syllabi, even those incorporating several information literacy outcomes, directed students to the library or to the librarians to meet their information needs. While the authors knew that the library lacked a collaborative relationship with the School of Business, the evidence showed a surprising unfamiliarity with library resources and services among the faculty. For example, one syllabus directed students to the publisher's website to access the *Journal of High Technology Management Research*. At this website suggested by the instructor, students would be prompted to pay per article. It can be assumed the instructor was unaware that the LIU Brooklyn Library subscribes to the full text of this journal in three different databases. In another case, a faculty member directed students to access United States Census data, which is freely distributed by the U.S. government, at a for-profit website: <http://www.demographicinformation.com>. At this for-profit site, access to Census data was priced in the thousands. While such examples were disheartening, they were also enlightening.

Conversely, the syllabus study also indicated that many faculty in the School of Business—like library faculty—saw information literacy skills as essential to student success. Most syllabi included mention of two or more information literacy learning outcomes. The findings from the reliable data are shown in Figure 2.

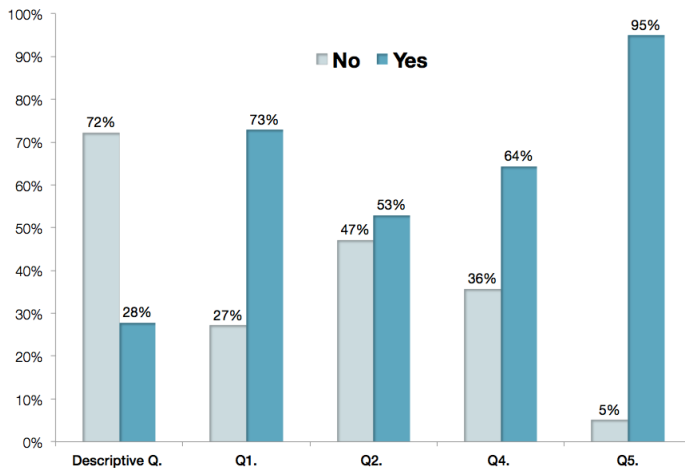


Fig. 2. Findings from the reliable data for each content analysis question

Another striking finding was that the presence of information literacy learning outcomes in the syllabus often did not coincide with any mention of the library as a place to find information. For instance, 51 of 70 syllabi (73% of the reliable sample) included an assignment or assignments that required students to develop their own research projects (Q1). Yet, only 22 of 79 (28% of the total sample), directed students to the library or librarians for this purpose (Descriptive Q). Even more discouraging, of the 22 syllabi that did note that the library could be helpful for these projects, many mentions were only in passing, or single referrals in a 15-page syllabus. For example, the weekly class calendar for one course directed students to the library to conduct a research project, cancelling class for this purpose: “LIBRARY RESEARCH PROJECT—NO CLASS.” The library has never worked with this professor to support this assignment or its related information literacy learning outcomes, rendering the library superficial in the course.

3.1 Implications for Instruction Interventions

Syllabi that contained the presence of the learning outcomes asked by Q2 and Q4 indicated courses where information literacy skills were the most sophisticated. These questions asked whether students in each course were required to independently access library resources, and also whether they were to complete an integrative assignment that synthesized information from across the course. Such an assignment requires students to use the most advanced information literacy skills: define the scope of information needed, access relevant resources, and critically evaluate and

synthesize their own thoughts with the information in their sources. These courses therefore represent an ideal opportunity for in-depth information literacy instruction. In this study, 45 of 70 syllabi (64% of the reliable sample) included a final integrative project. Of these, 28 (40%) required students to also use library resources. These courses and the faculty who teach them constitute a strategic target for instruction outreach efforts (Figure 3).

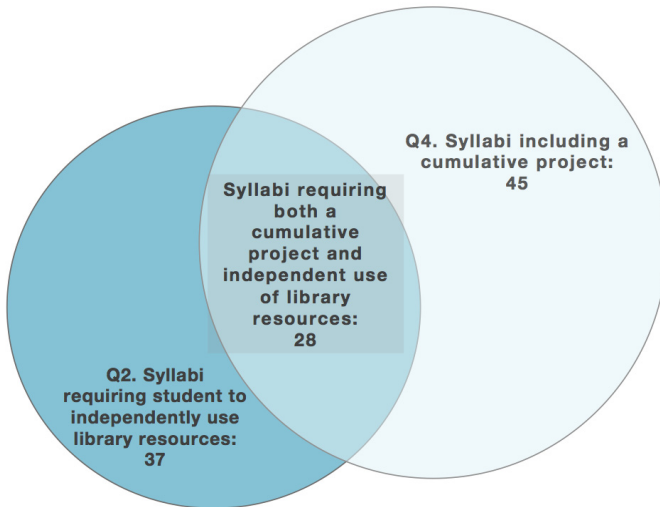


Fig. 3. Cross analysis of the data revealed the most strategic opportunities for in-depth information literacy instruction

Study results also suggested a set of courses in which students were asked to demonstrate concrete library use skills such as accessing articles in subscription journals. Thirty-seven of 70 syllabi (53% of the reliable sample) specifically required students to use materials that could only be found in libraries (Q2), particularly scholarly journals and popular sources like the *Wall Street Journal* and the *Economist* that must be accessed via the library website. Of these 37 syllabi, eight courses (11% of the reliable sample) required only these retrieval skills: students were not asked to synthesize sources in a cumulative project. In cases where information literacy learning outcomes were defined this narrowly, the authors expected that the faculty could be productively approached with tailored interventions that would directly address such course goals (Figure 4).

In sum, the syllabus study generated evidence that the authors are using to strategically expand information literacy instruction in the School of Business. The data also allows librarians to be mindful of resource limitations; information literacy instruction outreach can be confined and tailored to the faculty whose courses most clearly include relevant learning outcomes. This outreach can also include scalable approaches to instruction, as the authors saw a clear range of sophistication in the information literacy outcomes in the syllabi. Some course objectives were limited to

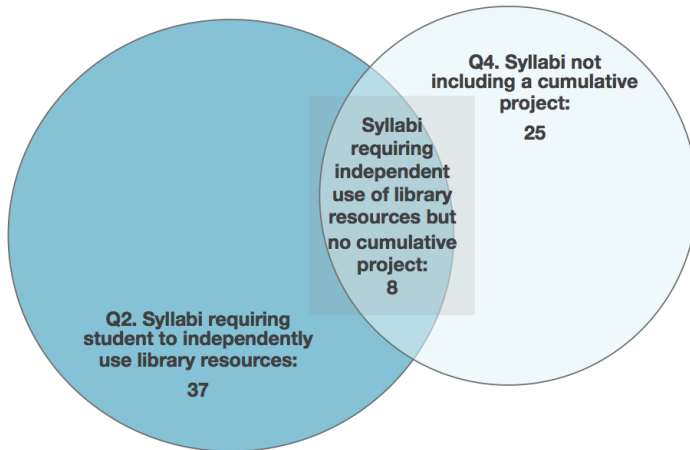


Fig. 4. Cross analysis of the data revealed courses that required information access skills

access and retrieval, while others included more research-intensive assignments requiring students to critically evaluate and synthesize information. Going forward, library faculty will use this data to develop a range of instructional interventions that can best meet these varied information literacy needs.

Beyond these concrete outcomes, the study results also make clear the value of information literacy and the services the library is poised to provide to the 62 major and minor programs that comprise the curriculum. Rather than approaching faculty and administration with the *assertion* that librarians can add value to their program, the gathered data provides *evidence* for this claim, as librarians make the case for increased resources for information literacy instruction.

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Applied Information Literacy and Learning: Curriculum Development for the Next Decade

Agneta Lantz and Christina Brage

Linköping University Library, SE-581 83 Linköping Sweden
{agneta.lantz, christina.brage}@liu.se

Abstract. In 2006 we developed and presented the first version of a model called Applied Information Literacy. The aim of the model was to embed information literacy into research and writing instruction sessions. We tested the model in our information literacy curricula for a couple of years and found it to be too linear. In addition, the information landscape has changed as various forms of social media have become strong players in students' everyday information world. Therefore there was a need for us to change and simplify our original model, which we present and discuss. According to the students it seems to work well since the new model contributes to their holistic learning resulting in better academic work.

Keywords: Information literacy education, higher education, curriculum development.

1 Introduction

In 2006 we developed and presented the first version of a model called Applied Information Literacy [1]. We had noticed that incoming students were not able to handle information effectively and that they also presented widely varying definitions of “research”. We also found that information literacy skills, writing skills, and the research process were rarely taught together and in context. The reason for us to develop the model in the first place was to integrate fundamental and advanced information literacy concepts into research and writing instruction sessions. We were convinced that we had to enable the students to develop information literacy and inquiry skills in conjunction, challenging them to construct new knowledge, new attitudes and values. Since skills for critical and analytical use of information seldom were coached by faculties or the library this often resulted in recycled information rather than cognitively processed knowledge [1].

Since we first developed our model in 2006 the information landscape has evolved and has become more complex. Students have changed their information behaviour and they think and process information differently compared to previous generations. In addition new social media that enable new ways of publishing have changed the processes involved in scholarly communication. Many definitions of information literacy were developed prior to the rise of social media and collaborative online communities; definitions that do not fully address the knowledge and skills

required to participate in new environments. Social media allows entirely new approaches to information practices as well as new user expectations that challenge traditional definitions of information literacy. Therefore we found a need to further develop our pedagogical roles in support of the goal of broad dissemination and access to information in line with the development of new social media, which has led us towards the concept of transliteracy.

Transliteracy refers to a set of literacies needed to function in the Internet age due to ubiquitous media, mobile devices and social networking. According to Thomas [2] transliteracy is defined as "the ability to read, write and interact across a range of platforms, tools and media from signing and orality through handwriting, print, TV, radio and film". Transliteracy calls for a change of perspective away from print media towards a more unifying concept that is relevant, to reading, writing, and interaction in the digital age [3]. According to the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities [4] these developments have dramatically broadened the opportunities for the dissemination of ideas, research, and scholarship. On the other hand they have also put new pressures on intellectual property rules and policies within the academy and beyond.

The challenges we face now go far beyond bibliographic and textual information to include many types of media such as video and sound, as well as social media. Students are more likely now and in the future to experience content of all kinds as digital, easily available, reusable, and shareable. They will become content creators and content users, shifting between those roles in many aspects of their work. Publishing is no longer in the hands of the specialists, and the traditional definitions of scholarly publishing are being challenged. There are growing requirements for scholarly output to have a broader impact and therefore a need to be more open for use and reuse. As we move to a wider variety of electronic formats with huge potential for data mining and reuse of content we also need to develop additional components to the information literacy curricula such as showing the students how to use copyrighted materials legally and ethically.

2 Theoretical Framework

2.1 Information Literacy Training

There has been insufficient attention given to both the nature of reflection in information literacy learning processes, and its relationship to the purposes, processes and outcomes. Many librarians conceive of and practice information literacy from a behavioural framework, characterised by teacher control and consisting of a combination of presentation and demonstration, taking students through heavily structured sequences of small steps and feedback, with progression triggered by success with the current step. A process often supported by worksheets and computer-based tasks [5]. Behavioural theories of education assume that learning is based on precise, well-defined and measurable behaviors and rules, and focuses on information sources and procedures. Librarians teach the right sources and the accurate order in which to search those sources while discouraging "wrong" approaches [5].

Hopefully this will change so that the training provision on offer will be based on a constructivist approach to learning, with emphasis placed on the learners' understanding, recognising and building upon prior knowledge, skills and expertise, as well as on experiential learning. Constructivist approaches emphasise that the prior knowledge of individual learners shape all information seeking, which is conceptualised as a recursive process, with an emphasis on strategies rather than mechanical procedures and rules. According to Kuhlthau [6] constructivism is well suited for information literacy training since students learn to think through issues that do not have prescribed responses or pre-set solutions.

2.2 Systems Thinking

Information literacy and transliteracy needs systems thinking. Systems science has the goal "to understand man and his environment as parts of interacting systems. The aim is to study this interaction from multiple perspectives, holistically. Inherent to this approach is a comprehensive historical, contemporary and futuristic outlook" [7]. Systems thinking is a way of understanding reality that emphasizes the relationships among a system's parts, rather than the parts themselves and could be described as the ability to see the big picture connecting issues, events and facts in a holistic way. In our view there is a need for systems thinking in order to develop information literacy curricula successfully. Systems thinking helps librarians, teachers and students to see information literacy related to the research and writing processes in a holistic light and to develop knowledge in higher leverage ways. Systems thinking is the process of understanding how things, regarded as systems, influence one another within a whole. In the context of information literacy it means focusing on information literacy and the research and writing processes as a holistic overall system. Through a holistic theoretical framework we are able to explain the interplay between information utilization and the different phases of the research and writing processes.

2.3 Action Research and Action Learning

According to Elliot [8] action research integrates teaching, curriculum development and evaluation, research and philosophical reflection into a unified conception of a reflective educational practice. Action research puts action at its core and seeks to create change. According to Vezzosi [9], as a method it could be seen as a dialectical interplay between practice, reflection and learning, whose main feature is the cyclical recursive. The usefulness of action research models has been proven for reflective internet searching [10-11]. The principles of action research can encourage individuals to expand their searching, reflecting and learning in a constantly changing information environment. In addition Zuber-Skerritt and Perry [12] have pointed to the effectiveness of action research related to university theses writing.

Action Learning is the approach that links the world of learning with the world of action through a reflective process within small cooperative learning groups known as 'action learning sets' [13]. Action Learning involves working on real problems, focusing on learning, and actually implementing solutions enabling individuals to

handle complex issues more effectively. It is a form of learning by doing. The process integrates research, learning and action into a single activity and develops an attitude of questioning and reflection to help individuals change in a rapidly changing world.

In the literature action learning has been used to spur innovation in learning and teaching methods by facilitating positive learning climates and outcomes in higher education. These findings have contributed to learning new knowledge and skills [14], enhancing motivation for learning [15], developing a holistic view of student tasks [16], encouraging reflection [17], and improving problem-solving skills [18].

Reflection is important to balance action and learning in the action learning process [19]. Reflection creates learning grounded in past and current experiences and makes action and learning stronger in action learning teams [20]. In action learning, focus is on the learning and investigation processes rather than on the finished product [21]. Over time this could be described as an on-going action learning spiral, which encompasses single, double and triple loop learning based on series of activity and analysis cycles. One of the strengths of action learning is the vital function of observation and reflection in drawing conclusions and generating knowledge. This makes the entire learning process grounded in spirals of reflection and continuous analysis in a dialectical interplay/relationship between theory and practice.

3 Revised Applied Information Literacy Model in Practice

Our original model from 2006 was too linear and our students didn't really understand it. We had to refine and simplify the model and the result is shown below. The new model can be described as an action research approach comprising several simultaneous processes. The action research perspective provides a systematic approach and encourages reflective decision making through the different phases of information retrieval and use, altogether forming a cyclic or spiral process of action learning with cycles within cycles of action, critical reflection and learning. The model, which conceptualises reflection at the centre of learning, helped us to develop our information literacy curricula. It has been useful both for teachers and students to arrive at a deeper understanding of the processes involved in academic research and writing.

To make students become better critical thinkers they need to develop as writers in order to break down the arguments of others when reading. We had seen that students struggle with their writing assignments, and especially with how to work with other texts. They were often unsure how to figure out what constitutes a quality or appropriate source and how to use it. In the course, Information Literacy in Theory and Practice, the aim is to prepare students for forthcoming thesis writing. During the course the students have to produce an individual exam paper in which they have to show an understanding of information literacy related to the processes of research and academic writing. To help the students understand the complex picture of the information world including new social media we start by presenting a holistic theoretical framework using the new model as a starting point. Throughout the course the students work actively in collaboration by reflecting and discussing their learning

in the context of the model. In our information literacy sessions we try to challenge the students to face the complex process of identifying their information needs and to make decisions about how to progress through the metacognitive processes with the conscious use of learning strategies, in order to interpret, select and apply information. This is an approach where the students are challenged to learn in modes beyond their comfort zone as the appropriate approach in order to develop their full potential. Students need opportunities to reflect upon, write, and talk about their research throughout the process. This helps them to share information with others and to practice the difficult tasks of summarising and synthesising. They need to organize, evaluate, and synthesize information. This should ideally translate into better academic performance.

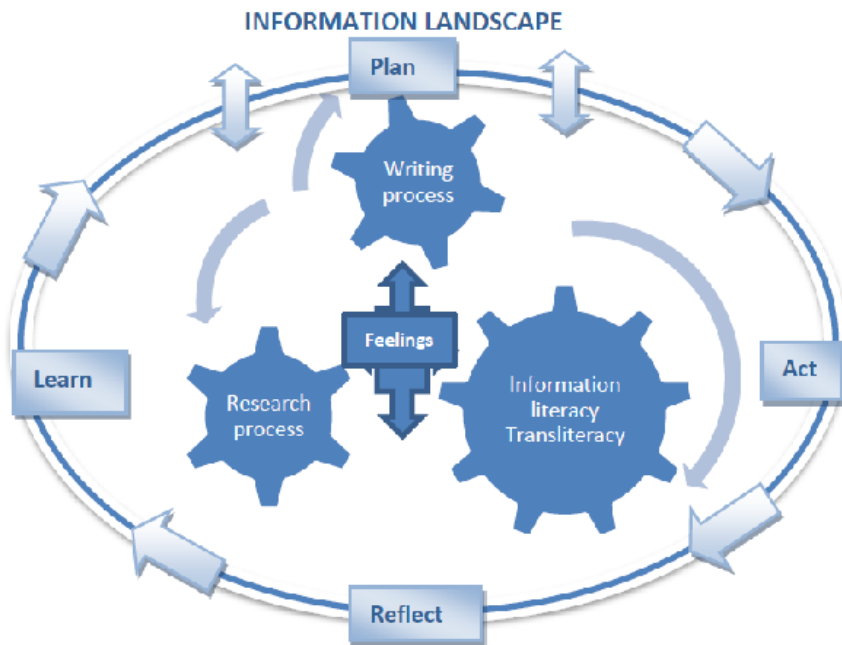


Fig. 1. Simplified applied information literacy model

By using the model we are able to move students through the logical stages of the research and writing process and also to engage them in the dialectical relationship between research and critical thinking. The students understand that the connection between research and writing is reflected in the recursive nature of both pursuits. Research is a process just as writing is a process and information literacy is a process not simply a discrete set of skills. All these processes also share the key values of critical thinking, reflection and active learning. After the introduction of the new model students understood the relationship between the research and writing processes and information literacy better.

By comparing students' exam-papers prior to and after the implementation of the revised model we found indications of improvement of critical and analytical thinking in terms of meaningful and relevant writing skills. The students were able to broaden their currently held ideas and to challenge and change their taken-for granted assumptions. Furthermore they were able to present their interpretation of the research process. In doing so they gained a deeper and more holistic understanding of their learning experience. Student research papers now show more of the qualities that you expect from an information literate thinker and writer at a university level.

4 Conclusions

From the literature it is obvious that there is a need to move towards a transliterate perspective since social media have so dramatically changed the information world. Hence we need to take all media into consideration in the development of information literacy curricula. In our opinion transliteracy should be the framework for understanding information literacy. We also need to put systems thinking in the context of the concept of information literacy for optimal learning. The revised model of applied information literacy presented in this article could be valuable in order to highlight the importance of information literacy related to the research and academic writing processes and all the feelings involved, as well as a means for the students to arrive at successive understandings throughout the learning process based on individual and collaborative reflection. Hopefully, the model of applied information literacy could have a critical role to play not only as a means of student learning but also in building the capacity of teachers and librarians, that means learning for all "in, through and as action research" [22]. The pedagogical approach of action research, action learning, systems thinking and transliteracy seem promising according to the students' course evaluations and reflective narratives.

The interim results described indicate that there is need for further investigation to confirm the usefulness of the revised model.

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Game-Based IL Instruction – A Journey of Knowledge in Four Acts

Kathrin Knautz, Lisa Orszullok, and Simone Soubusta

Heinrich-Heine-University Düsseldorf, Department of Information Science,
Universitätsstr. 1, D-40225 Düsseldorf, Germany
{Kathrin.Knautz, Lisa.Orszullok, Simone.Soubusta}@hhu.de

Abstract. Growing up in a world shaped by rapid technological development and innovations, the students of the 21st century need a new set of skills, such as critical thinking, problem solving and information literacy. New pedagogical approaches are necessary to develop these abilities in today's technology-enabled knowledge society. Based on the fact that playful learning was a successful concept for the intellectual development of humans all along and that the passion for gaming is a characteristic of the digital natives, we present an approach to game-enhanced information literacy instruction.

Keywords: Information literacy instruction, knowledge representation, digital natives, gamification, game mechanics, e-learning.

1 "Level Grinding" - Increasing Necessary Skills and Abilities

Today's society is often referred to as a knowledge-based society because knowledge increasingly forms the basis of our social and economic system. There has been a fundamental structural change from the formerly prevailing industrial society to a knowledge society. Therefore professionalized and technically skilled knowledge workers are needed to understand and apply new information infrastructures. As a result, it is necessary to impart a new set of competencies, such as information literacy, constructive interaction and critical thinking.

In transmitting the new 21st century skills it should be noted that with the advent of the knowledge society, a new generation of learners, often called 'digital natives' [1] or 'Net generation' [2], has emerged. They are growing up with the ubiquitous possibility of using new technologies like the internet, smart phones or videogames. Thus they have been immersed in technology all their lives. According to [1-2] today's students familiarity with and reliance on information and communication technology (ICT) influences their learning behavior tremendously. Through the massive interaction with new media this new generation of students is often bored of traditional teaching methods [3-4]. Therefore, former education models have to be enriched with all possibilities of the 21st century by using relevant tools, technologies and methodologies.

These findings lead to two conclusions: First, we have to impart 21st century skills like information literacy and second, the technological possibilities of the digital age

should be used to create a motivating learning environment. But how can we design such an approach in the field of education so that gaining specific knowledge goes hand in hand with a joyful experience? A deeper look at play research provides an opportunity: learning through play. Based on this, we will present an approach of game-based information literacy instruction. For this purpose, a brief look into the field of learning theory and the place of play is necessary.

2 "Fair Play" - Learning through Play

For thousands of years human beings have been learning important patterns to secure their survival through play. Of course, playing has always been a natural instinct for humans. From the moment we are born we have a desire to play. It is a fundamental way in which children acquire knowledge. It diminishes, unfortunately, as we grow older, but never disappears completely. The fact that all humans - especially all children - play, is the starting point for educational interest in play.

The first modern consideration on play in education regards play as a native drive satisfaction and an instinctive act [5-6]. The main idea of these approaches is to use the child's anthropological drive reduction for learning purposes and furthermore for preparing for the future. In this case the play is functionalized and the pedagogical intent concealed. These considerations were groundbreaking for the educational work of Friedrich Froebel [7]. Froebel was the first who presented a uniform game theoretic concept of education specifically for early childhood. In his work, Froebel made a case for the child's play. According to him, play is the highest level of child development and so of human development. Along with art and work, Froebel thought of play as a basic form of human "self-expression".

In the 19th and early 20th century a number of influential scholars developed comprehensive theories on play. Evolutionary theories of play considered the causes for play on the basis of various similarities between the behavior of children and animals. The most influential theory is the surplus energy theory of play. It goes back to the ideas of the German philosopher Friedrich von Schiller [8] and the scientific formulation of the theory by the English philosopher and sociologist Herbert Spencer [9]. It is assumed that every human expends a certain amount of energy for gaining food, shelter or a living. Children build up an excess of energy when they don't need it for these purposes. Spencer defended the view that learning has to be made enjoyable like play. Other influential scholars regard play as an undergoing of cultural stages, as a way of reliving the history of the species (recapitulation theory) [10], as a possibility to restore energy for the purpose of learning new tasks (recreation or relaxation theory) [11], or as preparation for adulthood by developing skills (pre-exercise theory or instinct-practice theory) [12].

All classical theories try to reduce the nature of play to one explanatory model. The 20th century theories on play cannot be absolved from this, either. Recent research in this field can be categorized by the specific perspective and interest of the scientists. Psychological and psychoanalytical analysis considers the role of play in personality development, learning theory, mental health and other areas. According to Freud [13],

play helps to relieve various forms of anxiety by giving children a sense of control and a competence to resolve problems that occur in their lives. In cognitive theories, play reinforces learning that has already taken place. It provides a relaxed atmosphere in which new learning is possible [14]. Sociocultural approaches provide a framework for the relation of children's development to their participation in cultural activities. Hereby, play is seen as a way to understand and learn the social roles and rules of society [15]. Phenomenological approaches focus on the nature, phenomenon, of play. The description and observation of play and of the range of different play activities and the reflection on play through the ages are the focus of these studies. The most famous phenomenological theory is probably the one of the historian and cultural theorist Huizinga [16]. In his work *homo ludens* Huizinga considers not only the importance of play in the field of learning, but the role of the play element for culture and society in their entirety.

Play and games are examined in various studies and disciplines to this day. In the media driven world of the 21th century, play is still important for the human development. Games, especially video games, are part of the social and cultural environment. Therefore, it is hardly surprising that an examination of video games and a use of game mechanics increasingly becomes a focus in education.

3 "Spawn Point" - Instrumentalization of Play and Games

With the digital age, video games in particular have done quite a lot to make playing games popular. Video games are designed with the major purpose of entertainment. The reason that people spend so much time playing games is that gaming often causes the so-called flow experience [17]. Flow is a mental state of intense concentration where work seems effortless and we reach the sweet spot between challenge and skill utilization. An outcome of this is that gamers manage to solve frustrating challenges, master difficult tactics and spend hours improving their skills at a particular game. The aim of creating a balance between challenges and skills is an ongoing process. Growing experience and skills require an increasing difficulty to avoid boredom. In order to get an optimal flow experience different and more complex challenges are needed. The hard work and concentration that people put into gaming are nothing less than astounding.

For this reason, people have been trying to emulate certain aspects of games in order to profit from some of these positive aspects. This process is called gamification and describes "the use of game mechanics in non-playing contexts" [18]. The focus here is on the use of game-based mechanics and dynamics to engage people and solve problems [19], to motivate action and drive participation [20] or to promote learning [21]. Based on these considerations, gamification does not claim to turn life into a game but to use aspects of games effectively in other areas. Table 1 shows which game mechanics increase motivation and engagement by satisfying human desires like the need to get rewards and status, achievements and competition. It can be seen that all game mechanics (e.g. points) address one primary human desire (reward), but each of them also covers other desires (status, achievement, competition, altruism).

Gamification is, for obvious reasons, already being employed in the realm of education. Game mechanics and principles from both digital and non-digital games are incorporated at all educational levels with the aim to engage and motivate students [e.g. 21-22]. There is also high interest in using this pedagogical strategy in the field of information literacy instruction [23]. University libraries make use of gamification and game-based learning in order to teach students how to do research, evaluate information and apply knowledge to new situations or create new knowledge [24]. In this way, traditional instructional (library and classroom) offerings are enhanced and meet the demands of the new generation.

Table 1. Interaction of basic human desires and game mechanics. The "x" signifies the primary desire a particular game mechanic fulfills, and the "•" indicates other affected areas (Source: Bunchball, 2010, p. 9)

Game Mechanics	Human Desires					
	Reward	Status	Achievement	Self Expression	Competition	Altruism
Points	x	•	•		•	•
Levels		x	•		•	
Challenges	•	•	x	•	•	•
Virtual Goods	•	•	•	x	•	
Leaderboards		•	•		x	•
Gifting & Charity		•	•		•	x

To sum these findings up, we have a new generation of students, who have grown up in an environment dominated by technology (see 1). These students have a wide range of social activities, a finely structured social network and enjoy working in teams. Because of their massive interaction with new media students get easily bored by the traditional teaching methods. A look inside the field of game studies and learning theory shows that effective learning is firmly connected with playing (see 2). Play has determined life from time immemorial and is a successful concept for the intellectual development of humans. However, traditional educational concepts relegate playing to the leisure time of students. Using game mechanics in the context of education offers new possibilities (see 3). Together with today's children's and student's preference for computer games, gamification seems to be a playful and entertaining method to make learning more efficient and more successful. The following project shows how such game-based processes can be used to promote learning motivation and provide information literacy as one of the key skills for 21st century.

4 "Let the Games Begin"- Game-Enhanced IL Instruction

The main topics of the university module on knowledge representation are retrieval strategies (efficient and effective access to information), selection and organization of information (critical and competent evaluation), and knowledge generation (accurate

and creative use of information). The target group consists of undergraduate students. In its original form the module consists of a lecture and a tutorial, which repeats the contents of the lecture. Furthermore, the methods and skills in the area of information literacy are deepened at home. In order to engage today's students in the area of information literacy, the tutorial was fundamentally restructured as a game-based practical lab and an online platform was added. The lecture, consisting of 22 chapters on information literacy, continues to exist as before.

The project (called *Legend of Zyren*) has three main objectives: imparting information literacy as one of the key skills of the 21st century, using innovative teaching methods and technological resources and creating a motivating learning environment. The restructuring of the tutorial was implemented by a master degree course on information science. The creation of an interesting and exciting story and the integration of tasks on information literacy in this story were fundamental points. In order to offer the students enough room to develop their own ideas, we provided only a little information concerning the basic outline of the different parts of the story. This ensured a very dynamic and spontaneous design process. To plan such a project effectively with students, we used a combination of the storyboard concept as shown in [25] and classic storyboarding as a creative technique. Storyboards are an approach to anticipate, plan and control didactic designs in educational environments. The idea of representing, processing and refining didactic knowledge through simplicity, clarity and visual appearance is an important factor. The need for this arises from the fact that all content of the course has been implemented not only as an e-learning platform, but additionally with the help of game mechanics and an epic story. Restructuring the former seminar resulted in a two part learning system:

- an online platform where the majority of the game takes place and where students solve exercises (*quests*) or embark on adventures and
- a practical lab where questions are answered, the material is reinforced and where students can solve some tasks in groups (*guilds*), thus making the lab part of the game.

The whole story takes place in four acts, each comprising four main *quest lines* (associated quests) and four side quest lines for the given 22 topics of the lecture. The main quest lines are linear and obligatory for students to complete. Additionally, there is the opportunity to solve more tasks in side quest lines. All quests improve information literacy skills. Students have to apply their theoretical knowledge on information literacy by identifying, locating, evaluating and using information in the context of the problems depicted in the story and the quests.

In the beginning, students choose an avatar from four races (elves, goblins, orcs or humans) to level up on the online platform. Reaching level 11 is required to pass the course, higher levels grant an additional bonus. However, the effort and work required to reach level 14 doubles in comparison to the requirements for level 11. A higher level can be reached by earning experience points. Those are gained for every successfully solved quest and inform the students as well as the teacher about current rank, status and abilities. Successfully achieved experience points give students a feeling of having done something right instead of being punished by deduction of points for wrong answers (like it is done in an exam). They are an immediate motivational game mechanic. The accumulation of points can serve as positive

reinforcement to motivate students to initiate further tasks. An analysis of point distribution and task status allows teachers to detect knowledge deficits of students and retarget problematic topics. Furthermore, high-achieving students benefit from special and more difficult tasks in side quests. Another implemented possibility of motivating students is unlocking achievements. Achievements reward them for specific activities or reaching certain milestones. Similar to points, achievements act as positive reinforcement. However, they motivate those students who have already unlocked an achievement more than those who have not. It is thus important to award the first achievement for reaching a simple goal. In *Legend of Zyren* students get their first achievement ('*self-awareness*') by creating an account and choosing an avatar. Overall 75 achievements and meta-achievements with both visible and secret requirements are available for the students. The practical lab is used to answer questions and to review the subject matter by playing games. For each practical session we designed special quests where guilds have to battle each other. Games like Jeopardy, Jenga or Taboo have been adapted to the information literacy context. Additionally, every guild quest takes place at a specific point of the story. So before starting the game, soft music is turned on and a prolog is read aloud. In this way a stronger relation between online platform and practical lab is established.

To sum it up, the *Legend of Zyren* is a kind of text adventure which is placed on an e-learning platform. The tasks are solved online and generate an instant feedback for the student. Additionally, a practical lab deepens the knowledge by playing games.

5 "That's All Folks"- Summery and Outlook

Traditional educational concepts relegate playing to the leisure time of students. However, playing is important for intellectual development of humans. With the emergence of the digital revolution, games (in the sense of video games) undergo a renaissance. The potential of video games has also been recognized by other areas besides the entertainment industry. Nowadays, aspects of play and games increasingly pervade every part of culture and everyday life like marketing, finances, sports or education.

By restructuring a course on knowledge representation we show how information literacy can be taught with the help of game mechanics and dynamics. We have developed a next-generation learning environment based on specially structured class lectures as well as an implemented online platform. Essential elements are rewarding students for correct problem solutions and giving them a constant overview of their skills and knowledge on information literacy. Points, levels, achievements, etc. are mechanics to provide feedback on what they have achieved and to target human needs like competition or status.

The course "*game-enhanced knowledge representation*" will take place in the upcoming months and an extensive evaluation will be carried out subsequently. The use of game mechanics in the area of information literacy instruction allows us to break up rigid educational structures and provide the opportunity to make learning more interesting, to arouse curiosity and thus to successfully provide essential knowledge. It stands to reason that today's generation of students, which has grown up in an environment dominated by technology, ought to be accommodated in this way.

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Online Conversation: Information Literacy as Discourse between Peers

Geoff Walton

Faculty of Engineering and Environment, Northumbria University
Pandon Building Camden Street Newcastle upon Tyne, NE2 1XE, UK
geoff.walton@northumbria.ac.uk

Abstract. The objective of this paper is to outline a fresh approach which seeks to harness students' predilection for communication by exploiting its value as a learning tool to teach information literacy (IL). This approach was used in the first-year undergraduate core module *Research and Professional Development*. Inquiry-based learning, IL (particularly information discernment) and online peer assessment were used to create active online learning opportunities where students learnt by doing: they read, reviewed, reflected on and commented on other's work (a draft essay) via a Virtual Learning Environment. These online conversations were informed by face-to-face workshops on research skills, critical thinking, plagiarism and referencing and the Assignment Survival Kit (ASK) www.staffs.ac.uk/ask. This approach not only produced a noticeable change in student achievement, but brought together e-learning and IL to deliver a range of IL learning outcomes including information discernment.

Keywords: IL, online discourse, information behaviour, e-learning, online peer assessment.

1 Introduction

It is well documented that discourse between student and tutor and student to student is a valuable tool for fostering learning [1]. Small group work, as a particular way of enabling this, has been shown to be of great benefit in face-to-face teaching [2]. The use of peer learning within this context is also a useful pedagogical tool for promoting empowerment [3], reflection-on-action [4] and facilitating incremental deep learning [5] especially when a scaffolded approach is used where the locus of control passes from tutor to learner [6]. Online discourse has also been found to be a beneficial learning tool especially in enabling critical thinking and knowledge construction [7].

It has also been long argued that information literacy is an essential part of learning [8-11] and should be embedded in Higher Education programmes as a matter of course. Originally the provenance of Higher Education, studies are emerging which show the impact of information literacy beyond this domain (e.g., [12]). There are many definitions and models of information literacy; this paper uses the empirically grounded definition developed by Walton & Cleland [13] and the definition of

information discernment or digital judgment, devised by Walton & Hepworth [14]. Walton & Cleland note that by completing a task in a given context (which frames student's roles and norms, e.g. a student required to complete an assignment) leads to interaction with sources (e.g. databases, e-journals, books, e-books, peers, tutors and other individuals) and the interplay of an individual's behavioural, cognitive, metacognitive and affective states. In turn this determines the level of new knowledge learnt (or produced or both) and degree of changed behaviour (i.e. level of information literacy) exhibited.

The notion of information discernment further articulates the theory [14, p. 55]:

Successful evaluation of information (or information discernment) is the ability to use higher order thinking skills in order to make sound and complex judgements regarding a range of text-based materials.

The teaching team (itself a collaboration between librarian and lecturer) combined these approaches of discourse (via online peer assessment) and information literacy within the first-year undergraduate core module *Research and Professional Development in Sport & Exercise Science* to test whether these techniques could enhance learning as claimed in the literature. The combination was realized by using inquiry-based learning (where students answer a set question, in this case: the deliberately open-ended question, *What defines success in sport?*), combined with IL (particularly information discernment) and e-learning (online peer assessment) to create active online learning opportunities where students learned by doing: they read, reviewed, reflected and commented on each other's work (a draft essay). These activities took place over three weeks via a Virtual Learning Environment (VLE – an online system for teaching and learning which includes spaces for course materials, assignments and discussion). These online conversations (online peer assessment) were informed by face-to-face workshops (essay writing and IL - research, critical thinking, plagiarism and referencing) and the Assignment Survival Kit (ASK) www.staffs.ac.uk/ask. In short, this was a blended learning approach.

2 Methodology

This learning and teaching approach was first piloted in 2006. Qualitative and quantitative improvements in students' knowledge were noted and reported in [11] and [14]. Given the promising results from this initial study, full implementation of the online peer assessment in the core module commenced in 2007 and data was gathered from 2008 onwards - the focus of this study.

To ensure a robust set of findings and full triangulation of results a mixed methods approach was implemented. Sample online discourse data were gathered from three tutor groups from each cohort from 2008-9 to 2010-11 (n=57 - average). Assessment (n=38) and questionnaire data (n=98) were gathered in 2009. Finally, focus group data (n=6) were also gathered in 2009.

2.1 Qualitative Data

Questionnaire, Focus Group and Online Discourse. The questionnaire responses were inductively analysed through a manual form of content analysis. When adopting a content analysis approach, Gratton and Jones [15] raise the potential disadvantage of subjectivity when analysing the meanings associated with the answers provided. To minimise this, both lecturer and librarian individually went through the data before any categorisation took place and similar themes were raised. Despite these concerns, Wilkinson [16] states that content analysis is a good method to adopt when assessing open-ended questions on a large scale questionnaire because it allows data to be analysed both qualitatively and quantitatively and this was the procedure undertaken for this article. For each set of data, subject's responses were qualitatively coded and categorized. As Miles and Huberman [17, p. 9], suggest, the data had been themed into categories, 'processes, commonalities and differences' could be identified across the student cohort.

Online discourse and focus group outputs were similarly analysed and coded. For the online discourse analysis three tutor groups were used from each year. The same tutors were used each year to ensure consistency.

2.2 Quantitative Data

Assessment. Students' essays were formatively assessed by personal tutors and fed back within one week. The second phase occurred during the early part of the module where key skills in effective learning in higher education (including essay writing, research, critical thinking, information literacy, plagiarism and referencing) were taught, all focusing on the inquiry-based question already given to the students. Students then handed in an 800-word version of the same question which was formatively peer-assessed on Blackboard (Virtual Learning Environment (VLE) employed at Staffordshire University).

The third phase incorporated aspects of Staffordshire University's online Assignment Survival Kit (ASK) and concentrated on academic weeks 6-8 where the students participated in online peer assessment in their tutor group each week. Groups consisted of up to 20 students who provided reciprocal feedback on their peers work.

The fourth phase was the hand-in for summative assessment. Phase 1 and phase 4 marks were used for direct statistical comparison in the quantitative analysis.

3 Results

3.1 Qualitative

Online Discourse. The average number of online comments made per 50 minute tutorial (typical size 15 students) between 2008 and 2010 was 62 contributions per session. In total 1,672 postings were analysed. The online peer assessment conversation indicated engagement with the task as evidenced by online comments made by students as they sought to advise their peers on the quality of the information

they had used for their assignments. Comments tended to centre on the notion of 'references' and how effectively the commenter felt their fellow students had used 'references' in their essay. These comments tended to reveal students' sense of information discernment to a greater or lesser degree. To some extent they mirrored the levels of information discernment originally identified by Hepworth & Walton [11]. Lower level comments (levels 1-3) tended to happen at the beginning of the online peer assessment and the in-depth, higher order information discernment comments (level 4-5) towards the end, indicating that scaffolding [6] may be occurring in this instance.

For the *lowest (first) level of information discernment* students tended to comment (positively or negatively) on peers work in terms of quantity and with little detail:

"you could use some more references"

"good use of a number of references"

It is argued that the negative comments indicate an emergent level of discernment, showing a slightly higher order of thought than that of simply commenting positively.

For the *second level of information discernment* students commented on the variety of 'references' used in their assignment to support an argument but with no real detail:

"good reference list in alphabetical order and contains a range of references from different sources"

The *third level of information discernment* is revealed via online comments which focus on the types of information used e.g., books, journals or websites with slightly more detail revealed. The quality of information is implied but not directly revealed:

"You have included references but like a previous comment said they are all of (sic) the internet, try and use journal articles or books if you can"

At the *fourth level of information discernment* students have used specific evaluation or discernment criteria (relevance, validity, reliability, and currency). Though these are short, the use of evaluation criteria reveals emergent critical thinking:

"References are relevant and support the information presented"

"References back up argument all through essay and very up to date"

"valid references which back up your main points"

"[...] a reference from the NHS which is good as they are a reliable source"

At the *fifth and highest level of information discernment* students commented specifically on linking 'references' to content and concepts in order to support an argument with much more detail in their comments:

"You have used references to support your points, although I think you could have included a few more just to show off your understanding! It would have been nice for you to include 2 other themes also, such as the social benefits and psychological benefits to show your knowledge, and add in the negatives to give an argument!"

These comments not only show an ability to analyse the arguments in terms of balance and quality of sources put forward but also make suggestions for improvement at a conceptual level. This reaches beyond the mechanical evaluation of information and indicates an ‘ability to use higher order thinking skills in order to make sound and complex judgements’ as stated by Walton & Hepworth [14, p. 55].

Questionnaire. Questionnaire and focus group responses indicate that ‘reflection-on-action’ [4] occurred where students, through reading and digesting others’ online contributions, reflected more fully on their work which, in turn, led to incremental deep learning [5].

Despite their initial apprehension, 90 percent of students, when asked about their thoughts on the online peer assessment exercise, stated that it had been worthwhile in aiding their learning (supporting the conclusions of Walton *et al.*, [8], [9]; Hepworth and Walton [11]). One reason may be because of the scaffolded approach that took place in the three-week period enabling students became more independent in their feedback and reflection by the end of the period. Clearly scaffolding [6] became a key factor in structuring the e-learning environment, by the end of the exercise the locus of control had passed from tutor to student. Indeed, despite their initial skepticism some students seemed to change their opinion once it had been completed:

“At first I didn’t think it would be helpful but changed my mind once it began”

Two major themes became apparent; empowerment and motivation through feedback and the enhancement of their learning skills. As suggested by Leach *et al.* [3], education and assessment should be about empowering learners and the strategy adopted in this module has supported their conclusions:

“[...] A lot of feedback was provided which enabled me to progress my work to a much higher standard. Some comments were short but some very good. It would be good to use this in all our assessments. It motivates you to get the work done [...]”

Focus Group. Focus group data tended to corroborate this view, after voicing initial apprehension this participant but quickly found it empowering supporting Leach *et al.*’s view [3]:

Participant E “At first I was a bit apprehensive about it because I’d a kind of weird issue about other people looking at my work. But then once you got the introduction one done and saw people’s comments, they didn’t totally tear you apart and he [the tutor] gave criticism that did help, and gave it from an angle that maybe I wouldn’t have thought about. I have actually adapted some of the criticism [...] and changed my introduction”

3.2 Quantitative

Assessment. The comparison between formative and summative assessment indicated statistically significant improvements in grades obtained prior to and post the online

peer assessment activity ($t(1, 74) = 11.380, p < .001$). In assignment one, the mean across groups was 40.22% with a standard deviation of 6.50; for assignment two, the mean across groups was 57.92% with a standard deviation of 7.05 – an observable increase of 2 grade points across assignments indicating incremental deep learning [5].

4 Discussion

The combined qualitative and quantitative data reveals a rich picture of students successfully engaging in online peer assessment in order to become more adept critical thinkers and deep learners [5]. The scaffolded approach reveals a progression from lower to higher order thinking, and the questionnaire data demonstrates that students had reflected on their experience in a positive way via reflection-on-action [4]. The findings appear to bear out the claims of Walton *et al.* [8-9]; Pope and Walton [10]; Hepworth and Walton [11] that information literacy should be embedded into a learning context in order to be successful. However, there was clear evidence that students experienced some anxiety in this process which may have caused the lower order responses that occurred early on. Nevertheless, the combined data indicates that students overcame this barrier and achieved successful learning.

5 Conclusion

This approach produced a marked change in student achievement and brought together e-learning and information literacy to deliver a range of information literacy learning outcomes including information discernment. However, the small sample size ($n=171$ overall) indicates that caution should be exercised in generalizing these results to other subject areas and populations. Nonetheless, the large number of online postings (approximately 1,600) and the consistency of findings over the 3 years tend to support the notion that these findings have validity. It would be interesting to replicate this learning and teaching intervention in other subject areas to ascertain whether it can be transferred outside the area of Sport & Exercise Science.

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Doing Online Relearning through Information Skills (DORIS): A Mutual Shaping Perspective for Information Literacy Research and Practice

Juan D. Machin-Mastromatteo and Sirje Virkus

Tallinn University, Tallinn, Estonia
{machin, sirvir}@tlu.ee

Abstract. This paper is part of a doctoral research study about the integration of social media in a learning experience and the roles that information literacy, digital literacy, and new literacies may play in such integration. A pilot study was conducted and the final empirical study took place in April 2013. The methodological approach used is participatory action research (PAR) and following its logic as well as the results of the pilot study, the research and methodological framework labeled as ‘Doing Online Relearning through Information Skills’ (DORIS) was developed. This framework comprises a series of learning interventions, activities, and assignments. This paper provides early data analysis focusing on: a) its particular epistemological assumptions and supporting theories, b) the overall mutual shaping perspective assumed, and c) some of the possible contributions such study can offer to information literacy research and practice.

Keywords: Social media, higher education, teaching, learning, participatory action research, information literacy.

1 Introduction

This paper is framed within a doctoral research study about the integration of social media in a learning experience and the roles that information literacy, digital literacy, and new literacies may play in such integration. A pilot study was conducted and the final empirical study took place in April 2013. The methodological approach used is participatory action research (PAR) and following this approach the research and methodological framework ‘Doing Online Relearning through Information Skills’ (DORIS) was developed [1]. This framework comprises a series of learning interventions, activities, and assignments, which are structured in the following five stages: 1) Introduction: participants start by completing the diagnostic questionnaire and then the researchers gives insights into DORIS' structure, its main concepts and methods, and mediates a common understanding of these conceptual tools that are going to be used; 2) Access: deals with user practices, information needs, location and selection, accessibility issues; 3) Use: its topics are, issues of social media, content curation, creation of social media sites, tool integration; 4) Evaluation: deals with the

use of social media in organizations and the evaluation of social media sites; and 5) Wrap-up: includes final reflections together with the completion of questionnaires and interviews. This research is guided by the following main research question: What significant issues, challenges and opportunities emerge when social media are integrated into learning environments in higher education? Sub-questions to this study are: a) How do students' experience learning when they are engaged in a learning activity that integrates social media? b) In what ways are students' engagement dependent upon their literacies? c) In what ways do learning, literacies and social media mutually shape each other?

As stated before, the methodological approach taken in this research is Participatory Action Research (PAR) and the data collection methods are: a diagnostic questionnaire at the beginning of the study, and a second questionnaire and semi-structured interviews at the end. Other data collection instruments were taken into account for the data analysis by using content analysis. These instruments were a blog, which was used as a content and interaction hub, thus collecting all learning materials and the forums used, which contains messages from the participants that were analyzed as well. Also important for data analysis were the participants' assignments, which correspond to the stages 2, 3 and 4 of the framework mentioned above.

2 Epistemological Assumptions, Main Concepts, and Theories

The epistemological assumptions of this study are that knowledge is created through socialization [2-3] and can be discovered [4], as people possess tacit knowledge [5]. Moreover, following PAR, teachers and practitioners are capable of generating personal theories by systematically studying their own practice [6]. The most important concepts used in this study are information literacy [7-9], digital literacy [10-11], and new literacies [12-14]. The importance to make this distinction rather than adopting a multiliteracies approach lies in the fact that in an exploratory study data needs to be gathered on the challenges posed to the participants by different kinds of skills. For example, there could be participants who may be information literates, but have problems with the technologies used. In this case there is bound to be a difference in their level of engagement and success in participating in DORIS. The opposite case may happen; so called 'digital natives' can have problems seeking or evaluating information (information literacy skills), and consequently there will be a different kind of engagement and success for these participants. Furthermore, both kinds of participants might have challenges associated with new literacies. Throughout this research and thus this article, when the term literacies (in plural) is used, it intends to contain the three concepts provided above: information literacy, digital literacy, and new literacies. The main theories supporting this research are: constructivist, blended, and problem based learning; the three dimensions of learning, are cognitive, social, and emotional [15]; and as well the theory of affinity spaces [16] is addressed. These theories provide useful analytical lenses for analyzing and discussing the data gathered.

3 The Mutual Shaping of Learning, Literacies, and Social Media

Within this research, learning, literacies, and social media are conceived as elements that mutually shape one another. This is called a mutual shaping perspective, which is opposed to the perspective of 'technological determinism'. It allows one to gain a better understanding about how technology might affect the practices of its users and at the same time gives a glimpse on how these practices may affect the way technology is used or implemented into teaching/learning contexts. Moreover, the use of social media can influence the way a learning experience is planned and the characteristics of a learning experience may change the way the educator plans the experience or uses this technology. When analyzing the data derived from this study, it is important to keep in mind that during the study the researcher familiarized the participants with the concepts of literacies and the three dimensions of learning and then mediated a common understanding of these concepts. This was done in order to give them a deeper understanding of the research objectives and main concepts so that they could reflect on their own learning experiences by using these conceptual tools [17].

In order to provide some early data analysis and remain within the space constraints of this article, the focus of the following analysis is narrowed to the participants' perspectives on the mutual shaping relationship of literacies, learning, and social media that happened during DORIS. The data included here is drawn from the final study, which was conducted with a group of 7 participating students of different disciplines and ages that were enrolled on a bachelor-level information literacy course. The number of data analysis instruments can be summarized as 7 diagnostic questionnaires, 21 assignments, around 95 forum messages, 7 follow up questionnaires, and 7 interviews, with an average time 40 minutes. Although it would seem that there were a small amount of participants, in this particular type of study, this amount of data collection instruments are added to the ones collected in the pilot study, which will feature prominently on the data analysis of the final work. This kind of research involves cyclical processes (e.g. pilot and final study) and the richness of the methods and the amount of data collection instruments that were used compensate for the small amount of participants. Even though the following section of data analysis is the first part of the results of the final study that have been made public, this is one of the most important parts of this research and the findings in relation to all the research questions will converge on this area.

All the participants agreed that learning, literacies, and social media were elements that mutually shaped one another during the study, thus partly confirming one of the main hypotheses of this research. When asked if these elements can mutually shape one another, one participant stated "yes, because today everything can be related, through social media you can make a topic of interest known. In fact, in this module we have demonstrated it, in this learning experience we have been demonstrating it." This remark, allows us to make two inferences. Firstly, participants confirm that they can take whatever they want to learn using any of the learning materials in the ways they wish, and bring any related topics to the forums, but not alter the main structure

of the learning intervention (which was slightly changed after their early feedback, but that is a matter to discuss in the full thesis). This is something that has been a concern because the role of the participants is somewhat limited. However, the participants have made statements like the cited above: "we have been demonstrating it". If we go a little bit further with what content analysis allows us, regarding a matter of discourse, these types of claims indicate some kind of pertinence from the participants toward the study. Secondly, the part of the affirmation cited above that reads "today everything can be related, through social media you can make a topic of interest known", allows us to further support the claim made in the conclusion section below: DORIS can be integrated in other learning experiences dealing with other topics. It is possible to use this structure together with the mediation of social media for other topics. This will be further examined with the rest of the data gathered.

One participant could see that this relationship happens "if you can make someone literate, through social media, over different topics, even if teacher and student are separated physically." It can be inferred from the way this study was set up, that it allowed developing literacies regardless of the means, technology used, and the geographical separation between researcher and participants. Another participant claimed that "they [literacies, learning, social media] are all part of a process", pointing out the structured and systematic qualities of the learning experience, which allowed this mutual shaping relationship to emerge. Adding to this, the response of another participant argued, "they are mutually shaped because through one of them you can reach the other ones".

Another participant reflected on using their information literacy skills: the ethical use of information and the determination of information validity, stating, "young people have to learn that to be able to post everything is not an invitation to publish anything. I believe they have to learn what is publishable what is not, as well as knowing to differentiate what is valid information and what is garbage. Information competencies are for this."

4 Conclusion

There is still a long way to in order to complete this research. The data shown in this article is a small fraction of the richness and depth of the data collected. Moreover, as the answers of the students who participated in this study are important in empirically determining exactly how this mutual shaping relationship between literacies, learning and social media occurs, there are different 'living dialectics' [18] that will play a role in the final data analysis. Firstly, there is of course the dialectics between the empirically researched and the related literature; then the contraposition of participants' perspectives from both the students who participated in the pilot as well as in the final study, because one of the methodological precepts of PAR that has been adopted is that it is "a cyclical process of exploration, knowledge construction, and action at different moments throughout the research process"[19], which could potentially be repeated *ad infinitum*. Finally, there is the tension between the pilot and the final studies from the perspective of the research, which is a part of the analysis as

well, in order to be able to achieve a reflection on the researcher's own practice, and thus generating a personal and systematic theory [6].

Because this is ongoing PhD research, the remaining conclusion of this article is some of the possible contributions that such study can offer to information literacy research and practice. Thus, different researchers, librarians, teachers, and related professionals can use its elements to enrich their social investigations, information literacy programs, and their pedagogies. Some elements from this study worth considering by practitioners are the three dimensions of learning and the concept of affinity spaces. Moreover, other elements of interest might be the epistemological assumptions, PAR methodology and DORIS as a research framework that provides a structure and an example of instructional design based on learning objectives, theoretical presentations, examples, learning activities, and supporting reading materials (not reproduced in this article for space constraints). DORIS allows differentiating literacies (information literacy, digital literacy, and new literacies) skills that the participants of this study can be using or enhancing at each of the research stages. During research, the roles that literacies play in this type of learning experience are expected to emerge. DORIS is proposed as an effective way to organize learning interventions through an information skills structure. This model has been grounded on research and inquiry learning pedagogies as well as in PAR and constructivist learning, which can be a blended one. Practitioners may adapt this research framework to develop learning interventions with the objective of learning and researching with and about social media or other technology mediated learning environments. It can be adapted to facilitate information literacy programs and teach some subjects by going through the aspects of access, use and evaluation of the information related to the topic. It can be a useful framework for scaffolding learning by going through the different information skills that are needed to research and manage the information, resources or devices related to different disciplines.

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Investigating the Use of ACRL Standards in Instruction Programs

Kristine N. Stewart and John M. Budd

School of Information Science & Learning Technologies,
University of Missouri, Columbia, Missouri, USA
kns5gd@mail.missouri.edu, BuddJ@missouri.edu

Abstract. A premise underlying the ACRL standards is that these provide guidelines for the measures of accountability of library and information literacy instruction [2]. This study investigates the incorporation of the ACRL standards into instruction and focuses more specifically on the use of these standards in credit-bearing, semester long information literacy courses. A survey instrument was used to conduct this research. A link to the online survey was posted to the ILI-L (Information Literacy Instruction Discussion) listserv, which currently has 4993 subscribers worldwide. The 117 instructors who responded to the survey came from academic libraries and academic institutions, almost half of which (47%) from institutions with student populations below 5,000. The results of this study indicated that respondents largely (83%) agree with the definition of information literacy as expressed in the standards.

Keywords: Accountability, ACRL standards, survey, information literacy instruction.

1 Introduction

Information literacy (IL) is, of course, a vital service provided by academic libraries. A principle guide that librarians turn to when designing and offering courses or sessions is the ACRL Information Literacy Competency Standards for Higher Education [2]. The development of the Standards grew from an ACRL Presidential Committee that reported in 1989. In the report's conclusion the drafters of the report stated:

The one common ingredient in all of these concerns is an awareness of the rapidly changing requirements for a productive, healthy, and satisfying life. To respond effectively to an ever-changing environment, people need more than just a knowledge base, they also need techniques for exploring it, connecting it to other knowledge bases, and making practical use of it. In other words, the landscape upon which we used to stand has been transformed, and we are being forced to establish a new foundation called information literacy. Now knowledge-not minerals or agricultural products or manufactured goods-is this country's most

precious commodity, and people who are information literate---who know how to acquire knowledge and use it---are America's most valuable resources [1].

The Standards are as extensive as could be drafted at the time, and include standards, performance indicators, and outcomes. The five Standards are:

Standard 1. The information literate student determines the nature and extent of the information needed.

Standard 2. The information literate student accesses needed information effectively and efficiently.

Standard 3. The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.

Standard 4. The information literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose.

Standard 5. The information literate student understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally [2].

These Standards form the basis of the present study; the aim here is to determine the extent to which and manner in which the Standards inform the actions of libraries and libraries as they offer information literacy session and programs.

2 Literature Review

This will be a very selective review of the literature, focusing as much as possible on the Standards. The ACRL Standards expand on the definition of information literacy and what it means for an individual to be information literate:

Information literacy forms the basis for lifelong learning. It is common to all disciplines, to all learning environments, and to all levels of education. It enables learners to master content and extend their investigations, become more self-directed, and assume greater control over their own learning.

That said, the Standards may be applied selectively or unevenly in libraries. For example, Hrycaj [9] reviewed syllabi of credit-bearing syllabi that are accessible online. He found that the subject matter of Standard 2 is most commonly covered in the courses and the evaluative component of Standard 3 is a frequent portion of the courses. The least frequent element of the courses is the purposive use of information (Standard 4). An even more fundamental challenge faces librarians who attempt to engage in instruction. As Hearn [8] observes, "The academic librarian as teacher is not a universally accepted concept by faculty and administration" (p. 226). It may be

that at least some of the teaching faculty are plagued by a perception that the library and the work of the librarians is passive; it may be viewed as potential, but not actively invested in students' learning and everyone's inquiry.

The Standards are obviously intended to be as applicable as possible, but colleges and universities differ greatly; a liberal arts college in which students must be engaged in their own learning may have a different expectation of its library than will a large research university with tens of thousands of students. This is said, not to privilege one kind of institution over another, but to recognize differences [2]. Further, there are differences to consider within each institution.

A question that arises more than once asks to what extent should librarians insinuate themselves into the teaching and learning dynamic of particular subject areas. For example, how deeply should a subject specialist who is also instructing students in a given course be engaging the students in the subject matter of the course? Some, including Fister, Hutchens, and MacPherson [5], believe,

The main goal is to hand over ownership of information literacy to the faculty... The librarians will help—as they have for decades—but the faculty are the ones who will work most closely with students on the whole process of learning (p. 208).

In other words, the question rests on a determination if information literacy is a generic or a specific instructional action. Standard 4 obliquely addresses the question and implies that librarians *should* become partners in specific instruction [6]. In addition to reports of applications of the Standards, there are some critiques. Harris [7] for example, notes that the Standards inadequately emphasize the role of communities of learners. One of the advantages he points out is the ability of students to diagnose needs collectively, rather than facing the complex task alone (p. 252). He also mentions the important axiological element of learning:

Academic librarians teaching students about research, reading, and writing in the university and how these activities are constructed and guided by the values of the academy may also wish to make connections with students' personal, professional, and educational value systems (p. 254)

Budd [3] also questions the intention of the Standards, albeit rather indirectly. According to him, a deeper understanding of learning, young college students, and the opportunities presented by formal education must be taken into account:

Each individual exists within a lifeworld; that lifeworld is expandable, though, as each of us accumulates experiences, becomes conscious of a wider and deeper array of concepts, becomes accustomed to logic as an evaluative mechanism, and reflects on what others say. Education is a formal way to expand one's lifeworld. Education has an additional objective-to instill in students a desire to understand not just what exists, but also how it exists (that is, its being) (p. 323).

3 The Present Study

There is a need for investigation of the incorporation of the Standards in instruction practice. This study investigates the incorporation of the ACRL standards into instruction and focuses more specifically on the use of these standards in credit-bearing, semester-long information literacy courses. A survey instrument was used to conduct this research. A link to the online survey was posted to the ILI-L (Information Literacy Instruction Discussion) listserv, which currently has 4993 subscribers worldwide; 117 instructors responded to the survey. The purpose of the survey was to discover how many libraries incorporate the ACRL standards into their courses as well as to allow respondents to indicate where and how they depart from the standards as written. Additionally, the respondents were asked questions regarding specifics of their incorporation of the standards.

Table 1. Incorporation of the ACRL Standards into instruction

	Yes	No
Does your library offer information literacy sessions within courses in various academic departments (exclusive of library tours) (102)	94	8
Does your library have a semester-long course (offered for credit) on information literacy? (103)	47	56
Do you follow the ACRL Competency Standards for Higher Education in spirit (that is, do you design the course according to the general concepts expressed in the Standards)? (25)	22	3
Do you follow the ACRL Standards more to the letter (that is, do you design the course to follow the Standards explicitly)? (25)	7	18
Do you adhere to the definition of information literacy as expressed in the Standards (pp. 2-3)? (25)	20	4
Do you think any one of the ACRL Standards is more valuable to students than the others? (24)	10	14

Respondents indicated (94) they offer information literacy sessions within academic departments (exclusive of library tours). Sixty-four percent of these participants indicated they typically offer one instructional session per course within an academic department, with 16% of the respondents offering more than three per semester. Comments by participants indicated that participants offered anywhere from 1 to 300 individual instructional sessions per semester total, although most said they offer fewer than 100.

Twenty-two participants indicated they design their course curriculum according to general concepts expressed in the standards, but only 7 admitted to following the ACRL standards explicitly in their course design. When asked what elements of the definition are omitted, one individual stated, "The concept that IL is big and complex and not just the library's job." One admitted to not examining the standards for some time and said, "What I remember is that some standards were too extreme and too

much to ask for instruction to IL, and others were far too simplistic.” Another stated, “Many in my library would have preferred if we did not focus on incorporating sources into writing. These people would also like it if we did not teach citations. This was viewed as the job of the instructor of record and writing center. Luckily, more level headed minds won the day.” The people referred to may believe that teaching faculty members have the skills and knowledge that librarians are trying to inculcate into the students.

When asked if they adhere to the definition of information literacy as expressed in the standards, 20 of 24 respondents agreed. Those that did not agree with the definition were asked what elements they omit, very few responded to this question, but what respondents did say was illuminating: “Information literacy also demands an understanding of the information environment within which students are expected to work.” Another mentioned: “We talk about where information comes from and is circulated and discuss controversies around publishing and use of information.” An element of the standards includes evaluation; that is not actually possible unless students begin to comprehend that publication does not equal truth or authority. A complete understanding of what is communicated formally requires knowledge of sources, distribution, and what can go wrong in the process.

When asked if they found one of the Standards as more valuable to students, of the ten librarians who responded, seven remarked Standard 3 is most important. Some responses were, “Critical assessment of any information source is central to information literacy.” “Most everyone can find some kind of information. True literacy comes in evaluating that information for accuracy, relevance, and effectiveness.” The respondent offers a particular definition of “literacy” that should be a matter of discussion within the profession. Another basically concurs with the previous statement: “Evaluation is the skill that is most difficult to master and the one which is the most necessary in our information-rich world.” Another librarian makes the connection to life-long learning: “It’s important for everything students do after school. Not only will they be seeking info [sic], but it will be forced on them unbidden. They have to be able to evaluate it correctly to be effective citizens and family members, as well as for their own personal safety.” Not all agree that standard three is the most important; one respondent states, “Standard 1 deals with the information need. If students can’t or doesn’t [sic] clearly articulate their information, the search process, evaluation, etc. becomes flawed.”

When asked which standard receives the most attention in class; Standards 2 and 3 are given more attention than the rest. The range of responses varied. One said, “Whether I’d like to or not, this is what faculty ask for and so I probably spend the most time showing students how to search.” Another respondent agreed: “To be frank, that’s what the course instructors want from me. Doing so opens the door for me to present the other standards.” More common answers, though, reiterate the importance of Standard 3. “Evaluating information is one of the most critical skills. Students need to be able to determine what information is appropriate for their needs. Being able to find information does little good if one cannot determine its quality.” There are those who admit to the importance of both Standards 2 and 3: “Well, it’s

between 2 and 3. But with the mechanics of search being more difficult than they ought to be (and more difficult than students realize they are), it's necessary to devote time to efficient and effective searching. But 3 is equally important, since with the flood of unmediated and mediocre sources, assessment is key."

When asked what essential outcomes of students' ability to determine the nature and extent of information are needed, evaluation once again featured prominently. "Knows how information is formally and informally produced, organized, and disseminated. Without this students cannot fully evaluate information." Librarians also integrated multiple standards into their responses, demonstrating that IL is not a single skill, nor even an aggregation of skills. It is a body of abilities and knowledge that enable students to understand and to learn. One stated that the outcome should be, "Finding and evaluating information as well as using the information in an ethical manner." Another said, "Students ability to create clear, focused research problem statements. Student understanding of nature and distinctions of the information available in the field." An ambitious objective is included in one response: "They also need to understand the nature of the entire information environment they are working in, everything from the types of resources available, to the difference between a journal article, an essay in a book and a website."

Librarians were asked what students need most to access information efficiently and effectively. The answers ran the gamut from technical skill to their desire to learn. "They need to understand the parameters of search (keywords, controlled vocabularies, hierarchical nature of information, etc.) as well as the basic and advanced features of academic databases." Moving away from the technical side, one respondent offered, they need "Critical thinking skills related to where information might be found and the ability to revise and be flexible." A different answer is given by another librarian: "If students are engaged with or passionate about his or her information need, he or she would probably be more receptive to learning how to access information more effectively and efficiently." A few respondents gave brief answers: "Good keyword and subject search skills;" "Active learning exercises;" "Buy in from the faculty;" and "Agile thinking."

When asked how the course helps students employ critical evaluation beyond the immediacy of a task, responses were, once again, quite varied. "We have incorporated assignments that require students to be creative, think critically, and solve problems." Some programs go beyond course assignments: "To try to connect the course content to real-world situations;" "My course stresses that critical evaluation and use of information will be important to them beyond the classroom, in their personal and professional lives, as well;" and "My explicit higher motivation here is to teach them how to address information critically, considering both relevance and quality. That is a life skill and a value that is essential to their post-university years."

When librarians were asked how their courses accommodate students' assignments in other courses, there were two types of responses. One is reflected in the following statement: "They learn how to use library databases to find books and journals." The other type targets the students' needs in other courses: "They can pair a major project—a literature review—with another course," or "They may use topics from

their other courses to complete assignments in this class, including their final project.” Respondents were also asked about the preparation of students to adhere to ethical requirements of information use. This question drew several comments that have a common theme: “Discussion and assignment on plagiarism and academic integrity;” “There is a full unit on the ethics of information—with exercises that have proven effective;” “We look at issues like copyright and plagiarism, as well as the concept of intellectual property. Ethical considerations are woven throughout their instruction.”

Finally, librarians were asked if they have any general comments about the Standards. As is the case with other questions, there was a commonality running through the remarks. “They are too long, too complicated, and require a summary so as to be useful.” That respondent did add, “But I greatly admire the process that created them.” Another stated, “Although very thoughtful and the result of highly intelligent inquiry, they’re overly long and detailed to be used effectively with most classroom faculty.” One criticism holds, “They are too mechanical and artificially production oriented, having little to do with how information is sought and used for purposes other than lower division college assignments.” A librarian presents a constructive comment: “The standards are good, but I sense the need for a larger framework that sees information literacy as something closer to learning a language than having a set of skills.”

4 Discussion

As evidenced by the results of this study, information literacy instructors rely on the Standards to guide their instruction; however, many stated numerous issues with the Standards as they exist now. The majority of respondents (83%) agreed with the definition of information literacy as expressed in the standards; those who indicated that they do not adhere to the definition were asked what elements they add, to which all responded they would include course content on the information landscape or the contexts in which information is used.

Although a certain level of respect for the Standards was indicated, respondents were clear as to the many limitations of the standards, many of which, included the rigidity and applicability of the Standards to actual curriculum and instruction. While we, as information literacy instructors, agree with many of the ideas and aspirations included in the Standards, they are difficult to apply to the actual development of curriculum. This is particularly true in the case of one-shot and embedded instructional sessions, the instructors of which are the majority of respondents in this study. The agenda of information literacy is not necessarily the same as that of faculty members and university administration, so while information literacy instruction has the potential to play a large role in the academic success of university students, those who work with the library to arrange such instruction may not have the ability to look past its value to a singular class session or homework assignment. This is problematic to instructors as it limits their opportunity to include actual information literacy (as opposed to library use) instruction in their curriculum.

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Teaching Information Literacy and Reading Strategies in Fourth-Grade Science Curriculum with Inquiry Learning

Lin Ching Chen

Department of E-learning Design & Management,
National Chiayi University, 85 Wenlong, Mingsuin, Taiwan
lingin@mail.ncyu.edu.tw

Abstract. The purpose of this study was to investigate the effects of inquiry-based instruction with infusion of reading strategies on students' information literacy and science learning. The instruction was designed based on the Big6 model which includes stages of task definition, information seeking strategies, location & access, use of information, synthesis, and evaluation. The study was conducted in an elementary school in Taiwan and lasted for a semester. The data was gathered through participant observations, interviews, tests, and document analysis. The results showed that information literacy and reading strategies could be integrated into science inquiry using the Big6 model. The students performed well in the stages of information seeking strategy, location and access, and in use information and synthesis; however, students' performance on task definition and reflection needed to be improved. Fourth-graders' science performance was also improved through the inquiry learning.

Keywords: Information literacy, reading strategies, science, Big6 model.

1 Introduction

The importance of reading literacy has aroused attention in recent years. In 2006, Taiwan first participated in the Progress in International Reading Literacy Study (PIRLS), led by International Evaluation Association (IEA). PIRLS was used to assess fourth-grade students' reading literacy. Taiwan was ranked 22 among 45 countries and regions in reading achievement which was below comparable Asian countries and regions such as Hong Kong and Singapore [1]. The results also showed that Taiwanese students ranked last in "reading for interest" [2]. In 2011, Taiwan participated in the PIRLS again. Although its rank improved to 9 among 49 countries and regions, students' interests in reading still ranked low [3]. For enhancing students' reading literacy, more effective instructional strategies should be designed and investigated.

Reading literacy is a part of information literacy and both should be integrated across the contexts of school curriculum through inquiry-based learning [4-9]. Thus,

the purpose of this study was to investigate the effects of inquiry-based curriculum with infusion of reading strategies on students' information literacy and science learning.

2 Literature Review

2.1 Information Literacy and Reading Strategies

Information literacy has two facets: inquiry process and scopes. The inquiry process includes abilities and attitudes to recognize, locate, organize, evaluate, use and create needed information [10]. The scope of information literacy includes library, media, and internet literacies [11]. Although with the rapid improvement of information communication technologies, literacy has gone beyond the limits of words; reading literacy is still the basis of information literacy.

Reading literacy includes both word recognition and reading comprehension. The essence of the PIRLS assessment is its focus on reading comprehension. There are four processes of comprehension in PIRLS namely:

1. focus on and retrieve explicitly stated information,
2. make straightforward inferences,
3. interpret and integrate ideas and information, and
4. examine and evaluate content, language, and textural elements [1].

Both PIRLS and library literacy highlight deep understanding of reading materials. Many studies found that rote practices of reading strategies cannot improve students' reading literacy. It should be taught across school curriculum through inquiry-based learning [5-6], [12].

2.2 Inquiry Learning

Inquiry-based learning is not a method of doing activities; rather, it is an approach to the chosen themes in which posing real questions and using a variety of sources of information are positively encouraged by teachers. During inquiry-based learning students work alone or in groups to actively discover, explore, question, understand, synthesize, and create new deep understanding, while teachers play two key roles that are very different from the instructor role in the traditional teaching situation [6], [13]. Teachers in inquiry-based learning are facilitators, who motivate students to develop the higher level thinking, and are also resource specialists who provide the needed resources for students.

2.3 Big6 Model

The Big6 model, developed by Eisenberg and Berkowitz [14], is one of the inquiry process models used for integrating information literacy into curriculum [15]. This model provides a framework for students to learn how to complete a task or make a

decision rationally. The Big6 has six stages: Task Definition, Information Seeking Strategies, Location & Access, Use of Information, Synthesis, and Evaluation.

At the beginning of the inquiry process, the scope of a problem should be defined clearly and concept mapping is an effective tool in this stage. Later, students can broadly search for information from different sources. After locating and accessing the needed information, students extract appropriate ideas. To process the information strategies such as note-taking and summarizing are required. Students then synthesize the information, draw conclusions about the problem and present their findings with proper media. Finally, students reflect on their performance by self-assessing both the product and the process.

Although the Big6 model seems to be easily implemented by learners, limited numbers of empirical studies so far have investigated the effects on students' performance in information literacy and science learning.

3 Methodology

This study investigated fourth graders' performance on science inquiry which integrated information literacy and reading strategies based on the Big6 model. The design is a mixed-methods case study using both qualitative (e.g. interviews) and quantitative (e.g. test scores) [16].

3.1 Research Site and Participants

The study was conducted in an elementary school in Taiwan. The main research site was a fourth-grade classroom which had a total of 28 students (14 boys and 14 girls). All of the students had a little inquiry experiences and were not familiar with reading strategies yet. Ms. Shen, a media specialist was responsible for teaching the information literacy instruction. Ms. Chang, the homeroom teacher, taught reading strategies in the Chinese language course. They both were the collaborative teachers in this study.

3.2 Instructional Content

The instructional content for this study was the unit of *The Aquatic Creatures* taught earlier in the semester in the science course. An inquiry-based instruction with infusion of reading strategies was taught by Ms. Shen and Ms. Chang. The inquiry theme was "*An aquarium in our classroom*" and the inquiry activities were designed according to the Big6 model [14]. Ms. Shen and Ms. Chang infused reading strategies based on the Big6 processes. Prior to the inquiry process, the two teachers selected six books about aquatic creatures which included informational and literary texts. The reading strategies increased students' basic knowledge about marine lives.

In the task definition stage, each group of students was motivated to raise investigable questions about how to design an aquarium using a concept map. In the stages of information seeking strategies and location and access, skimming and

predicting strategies were taught for quickly accessing different information sources such as newspaper, magazines, books, and web sites. In the stages of use of information and synthesis, students found and extracted needed information by summarizing and taking notes. At the end of this inquiry, students generated an aquarium proposal. Then each groups of students presented their proposals to their peers and they chose the best one by voting. Finally the whole class collaboratively designed the classroom aquarium based on the best proposal. In the evaluation stage students reviewed the whole inquiry process.

3.3 Instrument

Two instruments were used for the pretest and posttest in this study. The reading comprehension test was designed by PIRLS, titled *Antarctica: Land of Ice*. Its reliability coefficient for Taiwan was $KR-20=0.86$. The science test was composed of 27 multiple-choice questions, designed by the researcher, which measured students' recall of the learned science knowledge. Its reliability coefficient was $KR-20=0.83$.

3.4 Data Collection and Analysis

Data collected included interviews, participant observations, tests, and documents. All of the qualitative data were organized, coded, reviewed and analyzed multiple times. The quantitative test data were analyzed using a *t* test.

4 Results

4.1 Student Performance in Information Literacy

Student performance in information literacy was analyzed across the six stages of the Big6 model.

Task Definition. The students were divided into six groups to work on their aquarium projects. With the inquiry scaffolding provided by teachers and using provided resources, all of the groups were able to develop a concept map for their aquariums, which included sub-concepts of animals, plants, equipment, and special information. Half of the groups knew how to use different shapes and colors to represent sub-concepts in the concept maps. Among 28 students, 16 students were able to pose further inquiries after reading the six assigned books on aquatic creatures, such as "*How can the blind cave fish swim around if they cannot see?*" (S14 notebook), "*Why do we have to catch giant squids? They are so cute.*" (S25 notebook). The homeroom teacher, Ms. Chang asked students to practice posing different types of questions about the six books they read. Only three groups were able to pose both conceptual and factual inquiries, while the questions the other three groups raised were mostly factual ones.

Information Seeking Strategies and Location & Access. The media specialist Ms. Shen taught the fourth graders many information seeking strategies during the inquiry process. In their learning journals students listed different methods to locate needed information including books electronic dictionaries, on-line searching using Wikipedia, and interviewing experts (S4, 6 journals). A review of the final aquarium proposals of the six groups identified various information sources that were used including 32 items from books, 20 items from web sources, and 4 items from databases.

As for the locating and accessing skills, most of the students understood the structure of library books' call numbers and found the books they needed, thus demonstrating locating and accessing skills. Afterwards, in a social studies project, Ms. Chang requested the students to go to the library to find books on Chinese festivals. She reported that, "*Students recited the classification mnemonic chant when they went to the school library. For a while, they brought back many useful books about the research topic. So I think their information seeking skills are pretty good.*" (Chang interview 01/18) Ms. Shen also taught students how to browse an article by reading headings when they searched for the specific information. Of the 28 total students, 19 wrote in their learning journals that they learned skimming skills. For example, "*I will check sub-headings first, then decide to go on reading the article or not.*", "*With browsing skills, I can find quickly the information I need.*" (S17, S4 journals). However, we found that their web browsing skill was less effective than book browsing. The reason was possibly due to the distraction of hyperlinks on web pages.

Use of Information and Synthesis. The homeroom teacher Ms. Chang integrated several reading strategies in the inquiry process to help students use information effectively. They learned to identify keywords, take notes, extract the main points, and to make inferences and comparisons. According to students' interviews, they were all satisfied with the improvements they made, "*I won't write too many main points now, and I can write a summary easily.*" (S12 interview) In addition, according to the reading comprehension test, the within-subjects *t*-test was significant ($t=5.572$, $p=.00 < .05$). It showed that fourth graders' reading comprehension skills improved during the inquiry learning.

The information in the aquarium proposals written by students was succinct and concise. In addition, the media specialist, Ms. Shen invited an art teacher to teach the students how to arrange the titles, concept maps, and other information in the proposals. Based on the proposal rubrics, the best proposal reached the highest standard, "*clear title, text compatible with graphics, and good page design*" (See figure 1). On the other hand, the students needed often to be reminded to extract the needed information and make inferences; otherwise, they would still copy all of the information they found. Therefore, the media specialist expressed the opinion that, "*We should give these students more chances to practice these skills in a meaningful context. Inquiry learning is our best try.*" (Shen interview, 0701)



Fig. 1. The best proposal titled “Fish Squad”

Evaluation. The students learning journals and reflection worksheets were examined and revealed what they had achieved and where they needed to further improve their information and inquiry skills. Six students identified that having discussions with classmates was important. Four students acknowledged their lacking patience in the search processes, and in three cases information recorded was incomplete. Three students spoke too softly. Most students reported what they had learned and raised further questions in their learning journals like “*Why do megamouth sharks come to Hualien?*” (S28 journal)

However, Ms. Chang and Ms. Shen both considered students’ reflections were insufficient and less insightful. The teachers said, “*In their journals or reflection worksheets, I would like to see how students overcome their problems, not just saying typing speed or oral level.*” (Shen & Chang interview 01/25)

4.2 Student Performance in Science Knowledge

Although this study is not an experiential design, according to the science test result, the within-subjects *t*-test was significant ($t=6.162, p=.00<.05$). It showed that students acquired basic science knowledge about marine life after the inquiry-based instruction. The aquarium logs written by students indicate that they had good observation skills and cared about marine creatures. Of the 28 total students, 17 reminded the persons who would feed the fish next day not to feed the fish too much, otherwise the fish would die; 8 students advised others not to speak loudly near the aquarium, or the creatures would be scared.

5 Discussion and Conclusions

This study shows that information literacy and reading strategies can be integrated into fourth-grade science instruction using the Big6 model. Both information literacy skills and subject knowledge were enhanced. The study result is consistent with previous research [17], [12], [8]. As for performance in the task definition stage, only

half of the students posed higher-order questions. Callison [18] and Wilhelm [9] suggest that the first step in inquiry is stating focused, insightful, and higher-ordered questions. Therefore, the children should be encouraged to pose more sophisticated questions that call for higher-level thinking.

This study also verifies prior research findings that inquiry learning provides a meaningful context for students to enjoy reading and to practice reading strategies [6], [17]. However, to internalize these strategies, the instructors need to offer students more opportunities to practice the skills across different disciplines.

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How Do Students' Social Identities and Study Approaches Play Out in Collaborative Source-Based Writing Assignments?

Jannica Heinström¹ and Eero Sormunen²

¹ Research Collegium, 33014 University of Tampere, Tampere, Finland
jheinstr@abo.fi

² School of Information Sciences, 33014 University of Tampere, Finland
eero.sormunen@uta.fi

Abstract. This study investigated how students' social identity and approach to studying influence their general attitude towards group work and their way of working in a particular collaborative source-based writing assignment. The respondents were 53 upper secondary school students who filled out a survey about their social identity, approach to studying, general group work attitude and ways to work on an assignment. The findings showed that students' social identity (popular, lonely, leader, follower) and their approach to studying (deep, surface, strategic) played out both in their general group work attitude and their work in the collaborative source-based writing assignment, but not always in a matching way. The findings underline the importance of acknowledging students' positioning towards both social and learning dynamics in collaborative work.

Keywords: Students, collaboration, social identity, approach to studying.

1 Introduction

Collaborative learning has been presented as a pedagogical approach with high potential to deepen the learning process [1]. Discussion and mutual sharing of ideas can pave the way for a more nuanced understanding of a subject matter [2]. These benefits have been noted in information literacy education, which often takes place through group work assignments [see e.g. 3-6]. For example, the Guided Inquiry framework for information literacy instruction includes group work in the form of inquiry circles [7].

Collaborative learning is generally more demanding than conventional and more structured learning processes due to the social and emotional elements of collaboration. Socio-emotional factors are essential in creating a milieu of genuine communication and interaction, which in turn is the foundation for co-construction of knowledge [8]. In order for group members to actively participate they therefore need both social motivation and meta-cognitive competence [9].

There are a wide variety in attitudes towards group work among students [9]. Little however is known about how students' general positioning towards social interaction and learning influences their attitudes and behavior in groups. We wanted to address this research gap by investigating how students' social identity and approach to studying influence their general attitude towards group work, and their way of working in a particular collaborative source-based writing assignment.

2 Research Questions

1. Do students' social identities and approaches to studying influence their general attitudes towards group work, and if so, how?
2. Do students' social identities and approaches to studying influence their ways to work in collaborative source-based assignments, and if so, how?

3 Method

Data was collected from two eight-week courses in an upper secondary school in Tampere, Finland. Thirty students divided into ten groups completed a course in Finnish literature and a further twenty-eight students divided into seven groups completed a course in history. The students were asked to collaboratively write an article according to Wikipedia standards.

This paper will focus on data collected from two surveys. The first survey that the students filled in at the beginning of the course included items which measured approach to studying and general attitude towards group work. The second survey that the students filled in at the end of the course included items which measured social identity, group-work experience in this particular assignment, and ways to work on the assignment. A total of fifty-three students answered these questions.

Approaches to studying were explored by the OPPI test [10]. OPPI measures a deep, surface and strategic approach to studying by four items each. Students with a deep approach have an intrinsic motivation to learn and relate new information to their previous understanding of a topic. Students with a surface approach have an extrinsic study motivation, and often study by rote learning. Strategic students are organized and efficient, and above all strive for achievement [11]. The reliability of the scales was explored by Cronbach alpha, giving the following results: deep approach (.66), surface approach (.73) and strategic approach (.75).

Social identity was measured by parts of an adolescent personal identity scale [12]. Six items measured social relations and roles, five items measured social self-confidence and two items social assertiveness. An explorative factor analysis (to be reported elsewhere) was conducted to investigate whether students' answers on the identity items grouped together. The analysis resulted in four social identity factors: popular, lonely, leader and follower. Typical for students with a *popular* identity was to feel socially confident and appreciated. They trusted that others enjoyed their company and listened to their opinions. Those with a *lonely* identity did not have any good friends. They felt lonely and not heard by others. Those with a *leader* identity

often took on a leading role among their friends. They were outspoken and did not hesitate to express their opinions. Those with a *follower* identity liked to follow instructions and preferred that others made decisions on their behalf. They felt anxious if they did not blend in.

4 Results

The relationship between social identity, approaches to studying and group-work attitudes was tested by correlation analysis (Table 1).

Table 1. Social identity, approaches to studying and group-work attitudes

Group-work attitude	Popular	Lonely	Leader	Follower	Surface	Deep	Strategic
Assigning specific tasks to group members makes group-work productive.		-.32*		.44**		.44**	.39**
Group-work generates many good ideas.	.51**		.36*	.36*			.35*
Group-work is more fun than studying alone.			.33*				.55**
I learn more efficiently by myself than in a group.		.35*		-.40*			
Traditional teacher-focused education is more efficient than group-work.						.30*	
In order to learn it is important that the group works closely together.							.29*
I often get help from other group members.				.46**			.39**
I like group-work.	.31*			.34*			.39**
In group work one often ends up doing also the work of others.							
I am happy to take on the role of the leader in a group-work context.	.36*		.55**				.39**
Group-work is a way of study that fits me.	.39*	-.32*					.46**
Group discussions are often a useless waste of time.							

* $<.05$, ** $<.01$.

Only significant correlations are shown in the table.

Table 1 shows that those with an identity of being *popular* liked group-work, were happy to lead groups and appreciated the richness of ideas that developed through interaction. Those with a *lonely* identity did not think that group work was productive. Instead they felt that they learnt more efficiently on their own. Those with a *leader* identity enjoyed group work, liked to take charge, and thought that group-work generates many good ideas. Those with a *follower* identity enjoyed group work. They often got help from team members and learnt more in groups than on their own.

Those with a *deep* study approach thought that traditional teacher-focused education is more efficient for learning than group-work, although sharing tasks among group members could make groups efficient. Those with a *strategic* study approach enjoyed group work. They regarded it as important that the group worked closely together to generate good ideas. Strategic student were happy to lead groups and felt that they often got help from team members.

The relationship between social identity, approaches to studying and group-work experience in the source-based writing assignment was tested by correlation analysis (Table 2).

Table 2. Social identity, approaches to studying and group-work experiences

Group-work experience	Popular	Lonely	Leader	Follower	Surface	Deep	Strategic
The group came up with good ideas.	.40*						
The group work experience was positive.			.27*				
I worked closely together with one of the team members.						.32*	

* $<.05$, ** $<.01$

The table only shows statements which correlated significantly with one of the independent variables (3 out of a total of 11 statements in the questionnaire).

Table 2 shows that students with a *popular* identity thought that the group had come up with good ideas. Those with a *leader* identity had a positive group-work experience, while those with a *deep* study approach had worked closely together with a team member.

The relationship between social identity, approaches to studying and ways to work in the assignment was tested by correlation analysis (table 3). The results in Table 3 show that there was a relationship between having an identity as being *popular*, and trying to understand the content of sources. There were also connections between a *leader* identity and writing and discussing with the team. A leader identity correlated negatively with reading and working with sources. *Followers* asked others such as their parents to comment on their work. *Surface* students continued to look for sources as they wrote their texts. *Deep* students worked closely with sources, making notes and trying to understand their content. *Strategic* students turned to teachers to discuss the material and get comments on their texts. Subsequently they corrected their texts based on these comments.

Table 3. Social identity, approaches to studying and ways to work on the assignment

Ways to work on the assignment	Popular	Lonely	Leader	Follower	Surface	Deep	Strategic
I asked the teacher to comment on my text.							.37*
I wrote the text together with my team.			.30*				
I read the sources and discussed about them in the group.			.29*				
I corrected my text based on comments.							.33*
I read the material and discussed about it with the teacher.							.42*
I read the sources and underlined/marked interesting parts.			-.28*				
I continued to look for sources while I was writing.					.37*		
I asked others (e.g. parents) for comments.				.27*		.31*	
I read the sources and made notes.			-.30*			.31*	
I wrote at the same time as I checked my notes.						.50*	
I read the sources and tried to understand their content.	.30*					.30*	
I know the topic from before and wrote based on that prior knowledge.						-.30*	

* $<.05$, ** $<.01$.

Table 3 only shows statements which correlated significantly with one of the independent variables (12 out of a total of 18 statements in the questionnaire).

5 Discussion

Students' social identity (popular, lonely, leader, follower) and their approach to studying (deep, surface, strategic) played out more strongly in their general group work attitude than in their experiences in this particular group work assignment.

Students with a popular identity in general enjoyed group work and appreciated the generation of ideas that often resulted. In this particular assignment they had also felt that the group came up with good ideas. Popular students are socially confident and trust that others value their opinions, which may explain their enjoyment of group

discussions. Students with a lonely identity had no friends and often felt that they were not being heard. They preferred individual study over group work in their general attitude, but this mindset did not manifest in this particular assignment. Leaders reported more social interaction, such as discussing and writing with their team, perhaps since they dared to speak out and liked to debate. Interestingly leaders were not active in their independent work with sources, which suggests that leaders were mainly engaged in group efforts. Followers in general liked group work for the potential for help it provided. However, they reported that they did not get support from their team-mates in this particular assignment, so they turned to their parents for help instead. The followers thus seemed to find it challenging to take responsibility for their own work.

Deep learners in general preferred traditional study formats and a clear division of tasks during team-work. In this particular project they had worked closely with a team member as well as individually with sources. Like the followers, they had also communicated outside the group, asking others (parents) to comment on their texts. Students with a deep approach strived foremost for a personal understanding of the subject matter, which may explain why they discussed with parents and peers.

Students with a strategic approach had a positive attitude towards group work as a study format. They had, however, ended up working individually in this particular project, and turned to their teacher for discussion of sources and comments on their texts. Strategic students are achievement-oriented, and may therefore turn to teachers to ensure that their assignment proceed as expected.

Students with a surface approach continued to look for sources while they were writing. There was no indication that they attempted to read to understand or actively interact within or outside the team. Typical behaviour for surface students is to mechanically comply with task demands without any personal engagement.

Students' attitudes towards group work seemed guided both by social and learning related elements of collaboration. In findings reported elsewhere [13] it was found that very few of the student groups worked closely together. The students' personal inclination therefore did not always match their actual work in this particular assignment, which may rather have been due to contextual elements. Some trends were nevertheless found in the ways that students' identity and study approach influenced their general attitudes as well as their work in this particular assignment. Social confidence, for instance, was related to a general enjoyment of discussion and active interaction with the group both generally and also in this assignment. Dependence on others was linked to a general appreciation of group work for its potential for support and also for seeking out help in this project. Students' study approaches played out in preferences and behaviors where students tried to make the most of any learning environment in order to reach their goals, which could either be an increased understanding of the subject (as for deep students) or achievement (as for strategic ones). The findings therefore underline the importance of acknowledging students' positioning towards both social and learning dynamics within collaborative work.

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Can Social Tagging Assist Information Literacy Practices in Academic Libraries?

Munirah Abdulhadi, Paul Clough, and Barbara Sen

Information School, University of Sheffield, Sheffield, UK
m.abdulhadi@live.com, {p.d.clough,b.a.sen}@sheffield.ac.uk

Abstract. This paper explores the relationship between Information Literacy (IL) and the features of Social Tagging Systems (STS). We identify which of the underlying functionalities of STS can assist the IL skills of users with respect to retrieving, managing and sharing information in academic libraries. The study develops a conceptual framework that combines STS functions with IL skills, adapted from SCONUL's Seven Pillars. A mixed-methods approach was used, employing questionnaires and semi-structured interviews. Forty-six students, from Kuwait and the UK, participated in the study. The findings indicate that 76% of the students perceive STS functions as helpful and important with regard to library catalogue usage. The findings confirm a clear relationship between STS and IL and suggest that STS should be considered for the future development of academic library services.

Keywords: Social tagging, information literacy, academic libraries.

1 Introduction

The popularity of Web 2.0 technologies has changed the way in which people interact with information on the web. This has encouraged academic libraries to add new technological functions to their catalogue services, bringing exciting and challenging opportunities to libraries related to the development of their services [1]. Information Literacy (IL) instruction and practices should be aligned with emerging technologies to build more information literate communities. Hence, investigating the relationship between new social technologies and IL is a valuable research avenue [2], particularly since the new social tools open up alternative ways to reach the end users. This could effectively assist the skills required to be information literate in terms of how individuals “gather, use, manage, and create information and data” [3].

This paper addresses an area of research that has not been previously explored: the relationship between information literacy and Social Tagging Systems (STS). The aim is to investigate the value of STS as a means of supporting IL skill development in academic libraries. The objectives of this paper are: (1) to discover the underlying benefits of STS features that can assist users with retrieving, managing and sharing information; (2) to explore the views of students on how they would assign tags to describe information resources, and how using other tag-related functions might assist

their IL practices; and (3) to develop a conceptual framework that encapsulates STS functions and IL skills, adapted from SCONUL's Seven Pillars of IL [3].

2 Related Work

Social tagging allows users to describe information resources by freely assigning keywords or 'tags' to them [4]. Employing users' tags through various functions can provide flexible ways of using information. This has produced new methods to support users with finding, collecting, storing, organizing and sharing information [5]. Studies show that tags can reflect the vocabulary of users when they describe resources, provide direct feedback on a cluster of tags attached to the same resource, and help users to find unexpected information through browsing tags [6]. Tags can also support users in achieving goals, such as personal information retrieval, sharing information and attracting others, as well as acting as a search aid [7]. Different motivations can encourage people to use STS, including future retrieval, contribution and sharing, attracting attention, self-presentation, opinion expression, task organization, and social signaling [8].

Students often use tags, not for research or information organization, but for social and communication purposes [9]. However, educators could benefit from their unfamiliarity with the use of tagging for learning purposes [9] by creating a system that meets their needs, particularly because tags can offer opportunities to reflect on their practice of the skills required in order to become information literate, in terms of building their awareness of how to gather, use, manage and create information [3]. Overall, tagging tools provide a valuable combination of personal tagging, resulting in more sufficient social navigation [10]. It is clear that STS may be run in parallel in a library setting to enhance library services, as a way of supporting students' IL skills practice when using the library catalogue.

3 Proposed Conceptual Framework

Based on the results of our research, we developed a conceptual framework (Figure 1) that links the features of STS to IL [12], to demonstrate the possible practical support of tagging functionalities to IL skills. The STS features are categorized into: (1) *posting*, which is the process of adding tags to describe the resource; (2) *searching*, which is the ability to search tags with other descriptions (e.g. title, URL, etc.) or limit a search to tags only; (3) *browsing*, which is "the ability to re-orient the view by clicking on tags or user names, to navigate the aggregated bookmark collection" [11]; (4) *managing*, which refers to the basic tag management functions, such as editing and saving tags; and (5) *sharing*, which refers to the ability to share tagged items with others, create groups of users and resources, and import/export items. These categories emerged from a comparative analysis of the features of six social bookmarking sites (Delicious, CiteUlike, Diigo, Connotea¹, Folkd, and Jumptags), and five Library/Museum2.0

¹ Connotea website (no longer available).

tagging services (WorldCat, Penntags, LibraryThing, Goodreads, and Steve tagger). The functions of the STS categories were linked more closely to the library setting, employing the core model of SCONUL’s (Society of College, National and University Libraries) Seven Pillars of IL. This consists of seven information activities: identify, scope, plan, gather, evaluate, manage and present. These can be used to map across to other frameworks and are “adopted by librarians and teachers around the world as a means of helping them to deliver information skills to their learners” [4].

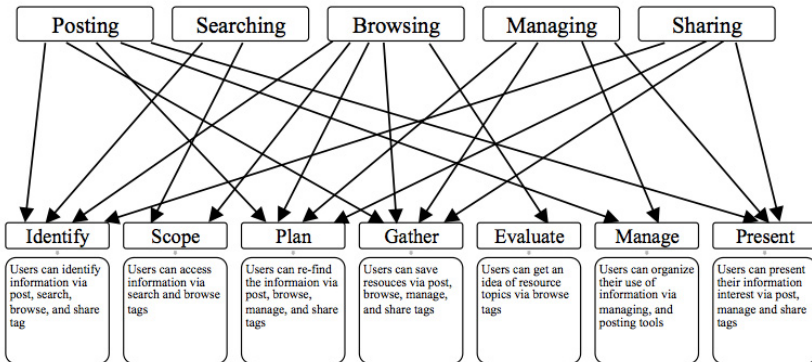


Fig. 1. Relationships between the functionalities of social tagging systems and IL

4 Methodology

A convenience sampling approach was used to reach participants in this study, who were university students (undergraduates and postgraduates), bilingual in Arabic and English. Participants were from three universities, two in Kuwait (Kuwait University and the Gulf University for Science and Technology) and one in the UK (University of Sheffield). The participants also took part in an interactive tagging experiment to expose them to a current social tagging system (Delicious), in which they had to complete the following tagging task: add at least five tags to six Arabic and English academic articles using Delicious. Participants who agreed to take part in the study were provided with an information sheet and consent form before the data collection process began and ethical approval was gained from the University of Sheffield.

A mixed-methods approach was used that included a questionnaire and semi-structured interviews. The questionnaire was used to provide quantitative or numeric descriptions of the population under study [13]; whereas semi-structured interviews were used to explore their views and opinions in-depth. Combining both methods provides a more effective means of gathering data and can improve the quality of the research [14]. The questionnaire contained closed-class questions, some of which used a 1-5 point Likert scale, as well as open-class questions. The questionnaire was divided into a pre-task section to collect demographic data (e.g. age, gender, year of study, major); and a post-task section to gather information about social tagging

systems (e.g. ease of use, tagging motivation, usefulness, future use). Follow-up semi-structured interviews were conducted after the tagging task to investigate in-depth the students' views on how tags were assigned to describe information and also on how using other tag-related functions (e.g. searching and browsing) might support the students in finding information. The interviews also aimed to explore the overall perceptions of students regarding their library catalogue usage, and IL skills practice and training. The questionnaire data were examined using descriptive data analysis, while the interview data were studied using a qualitative thematic approach focusing on STS functions and the seven pillars of IL. Subsequently, all of the collected data were linked to discover the relationships between the functionalities of STS and IL.

5 Findings

5.1 Questionnaire Results

A total of 46 students participated in the study, 18 male and 28 female. Fourteen students were from the University of Sheffield, 18 from Kuwait University, and 14 from the Gulf University for Science and Technology. Thirty students were aged 18-20 years old, eight were aged 21-23, two were aged 24-26, and four were aged 26 or older. 26.1% of the students were in their third year of undergraduate study, 21.7% in their second year, 19.6% in their first year, and only 15.2% in their fourth year. The remaining 17.4% were postgraduates. The students were from different domains, including Business, Computer Science, Engineering, English, Social Sciences, Medical Science, Law and Education.

The results about their perceptions of social tagging showed that 84.8% of the students found social tagging systems were considered easy to use, 76% stated that tagging would be helpful when using the library catalogue in their local institution, and 57.8% showed an interest in using tagging features in the future. Students' motivations [8] regarding the use of STS varied; the highest percentage (67%) of the students would use tagging functions for future retrieval, followed by task organization (54%), then sharing (42.3%). They seemed to be less interested in using tagging to attract attention, social signalling, opinion expression and self-presentation. Results indicated the majority of the students (76.1%) considered adding social tagging to current library services as important and helpful, while 82.6% would recommend social tagging tools to others.

5.2 Interview Results

The results from the interviews highlighted the different opinions amongst the participants regarding library catalogue usage. We noticed differences between the postgraduates and undergraduates. The majority of postgraduates indicated that they were aware of the various services available from the library and visited it on a daily or weekly basis. This seems to be linked to their awareness of IL skills; especially since many had attended IL sessions provided by their library or had used online IL learning materials. Many of the undergraduates, on the other hand, seemed unfamiliar with, and

rarely used, library catalogue services. The students provided several explanations for this: they felt they did not need to use it much; the library catalogue system was considered complicated or difficult to use; and the system was felt to have outdated features. This appeared to affect their usage negatively, as they mostly referred to using Google to find information, due to its simplicity, and would only use basic search services provided by the library to locate the books required for their coursework. Additionally, some had learned IL skills as a part of their coursework requirements. In order to provide a clear explanation of the value of STS in supporting IL skills, the results were mapped to the conceptual framework (Figure 1) as follows:

- *Posting* functions: almost half of the students found posting tags useful for organizing and saving information, for resources that they intend to use: “*I can group the relevant articles under one tag*” (P29), “*I can also organize my information (...) I might tag an article with my class name*” (P5), “*the Arabic ones I wrote Arabic as a tag*” (P3). Additionally, a few students stated that creating appropriate tags would encourage them to think deeply about the topic, which helps them to list the core ideas and aid the identification of keywords for future searches: “*I think it is also useful to add tags for the topics I found useful and might need in the future or to search for them again*” (P2). These views can support identifying, planning, gathering, managing and presenting skills.
- *Searching* functions: these were largely ignored, with few students recognizing these as useful. However, searching for tags can obviously support identification and scope skills: “*Searching for tags is also useful, especially if I can search for two or more tags together*” (P4), “*People can search and find useful things through the tags*” (P10).
- *Browsing* functions: many students perceived associating tags with resources as beneficial for obtaining an overview of a topic: “*It would be helpful to look at others tags in general to get an overview of the information I am looking for*” (P7). It also supports identifying keywords in order to search for related information: “*Looking at tags would be useful to discover synonyms that can help me to identify keywords to search for more information*” (P28). Moreover, browsing the tags of other users was considered useful, especially among students who share similar interests or are course-mates: “*I can look at mine and my friends’ tags to find resources, especially if they are in my class*” (P13). Thus, browsing can support identification, scope, planning, and gathering, and evaluation skills.
- *Managing* functions: these received less attention with regard to their usefulness; some students would group and edit their tags from time to time: “*Tagging is like putting information in folders; this will help to organize the things I found*” (P31). This can obviously support planning, gathering, and managing skills.
- *Sharing* functions: this was appreciated as highly important. Most of the students would set their tags to public in order to exchange knowledge with others, and assist group projects: “*It will be also useful for the group’s coursework to share resources (...) with a feature like tagging, sharing will be much easier*” (P23), as well as share resources between individuals, “*Let’s say I take a module that my*

friends had already completed. I will go and check their tags to find the relevant information” (P9). “I can contact and know people based at my own library and other libraries, both socially and educationally” (P18). These views support identification, planning, gathering, and presenting skills.

Overall, the students’ opinions show that adding social tagging functionalities to the library catalogue would be valuable and could support their use of information, particularly because they are easy to use, and can save them time when searching for information. Further, a number of students stated that tagging would encourage them to use the library catalogue more often to find information, instead of searching the web for it.

6 Discussion and Conclusions

To assess the utility of social tagging in supporting IL for academic purposes, we investigated the views of students, using both qualitative and quantitative methods. The results confirm the relationship between STS and IL skills (see Figure 1). Generally, the results show that some functions appear to be more beneficial than others, while some overlap across the STS functions in supporting the generic skills of IL from SCOUNL [3]; obviously, because the nature of IL skills practice is often closely linked [3].

In the developed framework, *posting* was linked to identifying, planning, gathering, managing and presenting IL skills. The links were confirmed by the views of students who saw tags as helpful for organizing, saving, and re-finding information. *Searching* functions were linked to identification and scope skills. The students perceived tags as a useful additional tool for discovering information or re-locating previously found resources by searching previously saved tags. Earlier studies also identified searchable tags as a popular feature [8]. Yet, the benefit was not fully recognized by the participants, mostly because they were not actually using social tagging on a regular basis. *Browsing* functions were linked to supporting identification, scope, gathering, evaluation, and managing skills. Based on the views of students, public tags were perceived as useful in providing an overview of the resource topic more quickly, and helped to identify possible keywords that aid the search for more relevant information, while browsing previously saved tags was also found to be a useful shortcut for the history of information searched. This is supported by previous studies, which found them a very effective and core function of STS [15], although other studies show that personal retrieval is equally effective [8]. *Managing* functions were linked to gathering, managing, and planning skills, since the students found tagging functions helpful in organizing information. *Sharing* functions were seen to assist gathering, planning, identification, and presenting skills. These were highly acknowledged by all of the students, who stated that they could share useful information with each other either as individuals or groups, which was also found to be an important feature of tagging in earlier studies [8].

Providing a conceptual framework that relates STS functions to an existing IL framework will help to ensure that the functions introduced into library systems are able to assist the underlying IL skills of students. This support will help people to

become more information literate in an ever-changing information environment. Social tagging should be one of the emerging technologies that academic libraries consider as part of their future services, especially since 57% of the students showed an interest in using tagging features when using the library catalogue. Instructions on how to use tags might be introduced to students within IL skills sessions, or via online tutorials for better tags use to support different information activities. We plan to carry out future studies to investigate how users use tags to describe resources in different languages and evaluate their usefulness as a discovery tool.

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Academic Strategic Documents as a Framework for Good Information Literacy Programs: Case Study of Law Faculties in the Republic of Croatia

Dejana Golenko¹, Polona Vilar², and Ivanka Stričević³

¹ Faculty of Law University of Rijeka, Rijeka, Croatia
dejana@pravri.hr

² Department of Library and Information Science and Book Studies Faculty of Arts,
University of Ljubljana, Ljubljana, Slovenia
polona.vilar@ff.uni-lj.si

³ Department of Information Sciences, University of Zadar, Zadar, Croatia
istricev@unizd.hr

Abstract. This study investigates the representation of IL within the educational environment of the institutions at the formal level, i.e. in strategic documents of four Croatian Law Faculties, by using the method of content analysis, in order to identify possible activities and methods that offer opportunities for collaboration of librarians and teachers in teaching. In addition, this study will serve to set guidelines for future research and understanding of the wider context of IL in the field of law, and as an aid in the design of IL programs for law students conducted by faculties' libraries.

Keywords: Information literacy, academic institutions, strategic documents, law faculties, Republic of Croatia.

1 Introduction

Contemporary theories of education and the Bologna process emphasize the active participation of students in learning process as well as the important role of information sources in education because of constant and rapid development of information and communication technologies and changes in academic education [1].

Such an environment sets to the fore the need to develop the IL skills of students. Today's student needs not only to search for information, but also learn how to evaluate it, find it, assess it, and use it efficiently while also developing his critical thinking skills, not only through his academic studies, but also through his lifelong education. In order to keep track of the technical and educational advancements mentioned above, libraries at universities must evolve from their traditional role to modern information centres with access to different sources of information [2]. Information literacy programs have become a necessary part of every higher education library's work because the competencies and skills encompassed by IL programs become a precondition for successful learning [3]. IL within the field of law

includes a large number of specific aspects. It is required from law students to know: legal sources of information, to know different ways of citing legal acts, and to know the specifics of legal databases [4]. Therefore the need for development is particularly emphasized not only regarding their generic IL skills but also the contextual/specific IL skills necessary for obtaining their lifelong competencies.

2 Previous Research

Studies dealing with the inclusion of IL in higher education curriculum are numerous [5]. Bruce confirms the need for institutional policies to support IL education: *...responsibility [for IL education] must be shared within strategic partnerships, operating at various levels* [6]. Several authors emphasize that the success of the integration of libraries and IL into the curriculum of higher education institutions depends on close cooperation between librarians and teachers in the learning process [7-8]. Some of them are focused on identifying the most appropriate indicators of how IL is represented within the curriculum of a particular institution [9-10]. The concept of IL in the field of law is mostly researched by authors from Europe [11-12], Australia [13] and United States [14]. They underline the importance of collaboration with faculty librarians in the creation of the program, and that it must be based on didactic starting points. The authors emphasize the development of both the generic/general and contextual/vocational IL skills in the field of law [11-12], [14]. Given these specifics, they point out that the IL programs in the field of law should be based on practical models that stress the collaborative and integrative approach to creating a curriculum [11], [14].

3 General Presentation of Current Conditions

Although IL programs at universities have been a major impetus, there are few examples of formal programs that have been presented in the practice of higher education institutions at Croatian universities. There is no scientific literature on the concept of IL for the field of law in Croatia, so there are no recorded works on formal IL programs in law schools. Librarians of Faculty of Law University of Rijeka give great attention to education of users by organizing informal IL programs intended for students at different years of study in consultation with faculty staff in several courses (e.g. Legal Writing). Due to the informal and unsystematic education, the students in all years of study have different levels of basic IL competencies, as well as the necessary information skills in the field of law. This is the reason why some of them do not know how to use library services but also do not know the IL skills in the field law. Others know IL skills in the field of law, but do not know how to evaluate and cite sources. Given the specifics of the legal field and the needs of law students in their daily work and studying, the need for an indispensable partnership of librarians and teachers in the design and implementation of IL is evident. Librarians often are not lawyers by profession and part of the teaching staff does not demand that for the development of IL skills in the field of law. This raises the issue of understanding the very concept of IL.

4 Research Problem and Research Questions

Considering the situation described above, the IL programs should not develop in parallel or independently within the library, but the concept of IL should be integrated into the goals and learning outcomes of study activity and academic courses or programs within the field of law.

This study investigates the representation of IL within the educational environment of the institutions at the formal level, i.e. in strategic documents, in order to identify possible activities and methods that offer opportunities for collaboration of librarians and teachers in education process. Consequently, the following research questions arise: Is IL included in the strategic documents of the institutions? If so, in which documents and how is it represented? What is the institutions' attitude towards IL? What does the learning environment look like? Do institutions encourage collaboration between teachers, librarians, IT departments and bodies that decide on strategic documents?

5 Methodology

We tried to find the answers to these questions by using the method of content analysis of strategic documents at all four Croatian Law Faculties (Rijeka, Osijek, Split and Zagreb). The following documents were analyzed within each institution: 1. Statutes of Law Faculties, 2. Mission, vision and goals of Law Faculties, 3. Regulations on the quality assurance of Law Faculties, 4. Strategy for Law Faculties (Table 1). Because of the limitations of the paper we will show only one group of strategic documents, in this case we chose the strategies of law faculties. The aim is to show that this methodology can be used to establish the relationship between the institution and IL.

Documents that were available in full text on the web site of each institution were analyzed. Individual elements of the text, messages, phrases, themes, sentence, words or set of words, etc. were analyzed.

Fundamental and constitutive acts of every social institution in Croatia, including the law school is definitely the statute along with mission, vision and objectives of the strategy as strategic documents. Analysis was made given their role as the principal legal documents of each institution. The ALA - Institutional IL quotient, The Information Literacy IQ test [10], which focuses on the higher education context was used as a framework for examining the characteristics of the educational environment. The contents researched within the documents include: perception of the library in IL teaching - representation of libraries and the role of librarians in IL education, representation of IL concepts within the strategic documents, description of the educational environment incentives to develop generic and contextual IL skills at the level of expected outcomes and commitments to institutionalized collaboration between teachers, librarians and decision-making bodies about strategic documents defining the holders (teachers) responsible for IL.

Table 1. Analyzed strategic documents of law faculties

Statutes of Law Faculties	Mission, vision and goals of Law Faculties	Regulations on the quality assurance of Law Faculties	Strategy of Law Faculties
Statute of Faculty of Law University of Rijeka (PFRI) (2005, modified in 2008)	Mission, vision and goals of PFRI (2010)	Regulations on the quality assurance of PFRI (2012)	Strategy of PFRI from 2012 to 2017 (2012) [15]
Statute of Faculty of Law University of Zagreb (PFZG) (2005) [19]	Part of the Statute of PFZG (Chapters III and IV (pp. 5-6).	Regulations on the quality assurance PFZG (2012)	No Strategy on website
Statute of Faculty of Law University of Split (PFST) (2005)	Part of the Strategy of PFST	Part of the Strategy of PFST (Chapter XIV)	Development Strategy of PFST 2010 – 2015 (2009) [16]
Statute of Faculty of Law University of Osijek (PFOS) (2009)	Part of the Statute of PFOS (Article 1).	No Regulations on the quality assurance on website	No Strategy on website

6 Results

6.1 Strategy of Law Faculties

Perception of the Library in IL Teaching. At PFRI the Library is mentioned in Article 11 as a structural unit of the Faculty with the main purpose of using and providing access to information resources. Strategy of PFST has the lengthiest description of the library. Defined as a firm base for further scientific research of the faculty, including providing access to relevant legal databases, and encouraging and assisting users in selecting and using library materials and information tools sources.

Representation of IL. Although the term IL is not found in Strategy of PFRI, the need for lifelong learning is emphasized, along with the need to develop innovative competencies of students.

“Any education, including the legal education, has the purpose of acquiring knowledge, skills, attitudes and values that are necessary for the achievement of individual's working and social roles. ” [15]

Strategy of PFST is the only document where the concept of IL appears, not in direct connection with the library, but is mentioned in the context of regular Computer Science classes at the Faculty. It is stated that there is a technically well-equipped computer room that serves additional information literacy workshops that are provided in this Strategy as one of the important goals of future development.

Description of the Educational Environment. Educational environment is best described within the strategy of PFRI and PFST. Various forms of legal practice are offered, and priority tasks include distance learning and lifelong learning. At PFST the learning environment is described as very supportive. The Strategy states the

establishment of new programs that will necessarily require the introduction of new forms of teaching and increasing the library collection with new textbook literature. There are many forms of teaching methods mentioned (lectures, tutorials, seminars, expert groups, legal practice – clinical teaching, etc., understanding the methodology of scientific research, students are provided with both theoretical and practical knowledge). *"Training of teachers, students and administrative staff in using technologies and e-learning methods..."* [15]

Incentives to Develop Generic Contextual IL Skills. The most detailed descriptions of possible incentives to develop generic and contextual IL skills are given in strategies of PFRI and PFST. PFRI tries to achieve its mission through continuous training of their own teachers and associates, cooperation with similar institutions in the country and the world and through the continuous improvement of the educational process and quality management through the implementation of various programs of lifelong learning. The Strategy of PFST has the most detailed description of the development of generic and contextual IL skills at the level of expected outcomes. Numerous terms are used to stress the need for additional investment in information technology and information education of students and employees. IL programs are conducted at the Center for extracurricular activities - offering IL, methodology of drafting seminars and thesis, and approach to learning, the official EU sources. Therefore the need and importance of IL is recognized, but program leaders and the role of the librarians in the programs is not mentioned.

Commitment to Institutionalized Cooperation between Teachers, Librarians and Decision Making Bodies that Make Decisions About Programs of Study, Defining the Holders Responsible for IL. The Strategy of PFRI expresses the need for cooperation, although the holders responsible for IL are not defined. The need for education and training is also emphasized, to systematically and in an organized manner raise the relevant competencies of all employees, including their advancement, as well as the need to establish formal and informal education of administrative staff. The Strategy of PFST emphasizes the necessity of cooperation with the Center for extracurricular activities aiming at the promotion of legal education, as well as better cooperation between librarians and professors at law faculties as helping tools for improving students' motivation and achievements.

"Engaging Faculty professors and associates in the lifelong education of lawyers and notaries. Interactivity and sharing of experiences by organizing professional workshops with students, research assistants and assistants opens opportunities for additional development of teamwork at the Faculty." [16]

7 Discussion

Content analysis was conducted in order to gain insight into the indicators and processes that are the starting point for a comprehensive study on the necessary IL programs at law faculties in Croatia. We will try to answer the research questions that we set at the beginning of the paper. We conclude, based on the content analysis, that

the concept of IL is partially represented in the strategic documents of law faculties in Croatia. Although there is no definition of IL, we found numerous formulations that include supporting and developing of generic and contextual IL skills of law students that are necessary for their continuous education. The reason for this contradiction can be found in the lack of understanding of the concept of IL at some of the institutions, including the librarians and the bodies responsible for drafting strategic documents at particular institutions. Law faculties do not explicitly use the term IL as part of their strategic documents, but a number of other related terms, such as the *development of IT skills and acquisition of communication skills*, we think that institutions have recognized that the development of these skills is an essential factor that affects the learning outcomes and the skills necessary for lifelong learning.

The analyzed documents prove that the institutions are aware of the need to develop generic and contextual skills in the field of law because of the development of information technology and the emergence of new branches of law. However the documents do not emphasize the role of libraries, apart from providing information resources and purchasing legal databases. All institutions highlight the need to develop and apply different methods of teaching, such as research, legal practice, the use of legal clinics, the use of different sources of information (especially legal databases) in the learning process and application of e-learning. Institutions do not emphasize collaboration between teachers, librarians, IT departments and bodies that decide upon strategic documents (e.g. Faculty Council). The most important role of libraries is seen in providing access to information sources, especially the legal databases.

We can conclude that there is sufficient evidence for the introduction of formal IL programs at the law faculties in Croatia, and that its foundations can be found within certain strategic documents. However, the issue remains open as to why the role of librarians is not visible.

8 Conclusion

It can be said that in all of the studied strategic documents the library is interpreted as an information center that provides access to information resources for learning, research and teaching.

However, its educational role is neglected, especially as an information center where users can not only find information but also learn to evaluate and use the sources effectively. On the other hand, there are preconditions for the implementation of IL at law faculties. Numerous examples of the implementation of the lifelong learning program can be found in the extracurricular activities, separate programs for lifelong learning, or some courses, such as computer science courses. Regardless of the proper educational environment an open question remains why there is no concept of IL within the strategic documents (although there are related terms) and why the role of the librarian as a driver of the IL process is not mentioned?

Results of the content analysis of strategic documents have prompted us to open a large number of new questions for future research, and for broader and deeper understanding of the IL concept in the field of law. The conducted study has confirmed the fact that the study of the concept of IL in the field of law must be approached from

different angles by all participants in the educational process. Future research should therefore encompass a much broader context based not only on content analysis, but take into account all the participants of the educational process, from students, to teachers, institutional leadership, and librarians. In addition, this study will serve to set guidelines for future research and understanding of the wider context of IL in the field of law, and as an aid in the design of IL programs for law students conducted by faculties' libraries. The method used in this research can be used for similar research on various levels (i.e. regional) since it is applicable to any higher education context. The results will be used to set indicators for creating an educational environment that allows students to continuously and systematically acquire IL competencies.

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Approaches and Perspectives on Assessment of Information and Media Literacy Related to Formal Education

Johannes Zylka¹, Scheila Wesley Martins², and Wolfgang Müller³

¹ German Institute for International Educational Research (DIPF),
Center for International Student Assessment (ZIB CISA),
Technology-based Assessment (TBA),
Frankfurt, Germany
zylka@dipf.de

² University of Coimbra, Coimbra, Portugal
scheila@dei.uc.pt

³ University of Education Weingarten,
Media Education and Visualization Group (MeVis),
Weingarten, Germany
mueller@md-phw.de

Abstract. This article gives a short overview of national and international discourses on media and information literacy, and states that approaches for the assessment of media literacy mostly miss in including the knowledge dimension. To address this gap, results are presented here from the application of a scale for the assessment of digital media knowledge. Developed in Germany and translated to Portuguese, the scale was used to conduct a small study in Brazilian schools. The example of the concluded study is afterwards reflected upon with a view to the international discussion on the assessment of (digital) media literacy.

Keywords: Media literacy, information literacy, media competence, assessment, formal education, Brazil.

1 Introduction

The various developments related to digital media in the last decades, especially the availability and use of information and communication technologies (ICT), also resulted in a growing importance of ICT-related competencies which therefore are a basic precondition for livelihood in the modern, globalized and increasingly digitalized world [1]. A variety of studies in the past took this as a starting point for research and focused upon the availability and use of media, especially digital media [2], and partially took assumptions upon the low level of ICT-related competencies as an assured theoretical basis to develop trainings for employees, educational professionals and furthermore.

Yet, a common understanding of required skills does not exist up to now, and even in terms of used terminology there is no real agreement. Existing initiatives under terms such as information literacy, media literacy, and media competency do not only present differences in terms of terminology, but also in terms of the underlying theories and approaches [1]. As a consequence, standards related to media literacy education are mostly missing which also affects the development of assessment instruments for measuring media competencies as well as information literacy. But it's not only standards that are missing: When analyzing actual literature it becomes obvious that empirical studies analyzing media-related competencies are quite rare in general and that most of them, for instance, focus upon media use, media availability or computer self-efficacy and not upon competencies [3]. Thus, an essential dimension of the concept of competence is momentarily mostly missing in respective studies: knowledge.

2 Assessing Media and Information Literacy: A Global View

The above described developments led to a very dynamic as well as heterogeneous global discussion around terminology, dimensions, range, and context-dependence within the field of media literacy. Although there is a variety of terms applied internationally, still the best known term is media literacy. It has a long history of more than fifty years but primarily focuses on discussions around media such as newspapers and radio [4]. Since the 1980s and the emergence of Information and Communication Technology (ICT), terminology originating from the analogue media was amended by terms such as computer competencies, media literacy education [5], digital literacy [6], ICT education [7] and media education [8] and furthermore. Comparable appraisals are clear when looking to different dimensions of the terms, which are also being seen in a diverse way – not necessarily between different languages or nations but also in different (national) discourses.

Looking on this diversity of approaches and understandings, most researchers agree that the area of assessment in this context often lacks theoretical grounding. Whichever approach is taken – it will not fulfill all or even most of the requirements from different disciplines. One possible solution is to look at cognate disciplines, such as empirical educational research. Within this (more or less psychological) context, cognitive aspects are being understood as a basic principle for competencies [9] and thus, also for digital media-related competencies. But – as was noted in the introduction – approaches assessing some form of media literacy mostly miss in implying media (or ICT) related knowledge.

On this basis, we developed an instrument focusing upon procedural as well as declarative ICT knowledge, which is called ITK.basic. The ITK.basic was developed in Germany and contains 22 items given in multiple choice format (for an example item of the English version see table 1) and provided reliable results in its German version. Because of this and the necessity of an instrument allowing the assessment of media related knowledge in different languages, it was decided to translate the instruments to different languages. For now, there are English and Portuguese

versions as well as the German original. Results from the application of the Portuguese version in Brazil are shown below, results from the English version will be presented in another article.¹

3 Results of Applying the ITK.basic in Brazil

Before presenting details of the results of the study, it is common to give some information on the context of the study with a view to a better traceability.

Table 1. Example item from the English version of the ITK.basic

What is the meaning of the expression “malware“?	
<input type="checkbox"/>	It’s a synonym for computer viruses.
<input type="checkbox"/>	<i>Unwanted and user-damaging software products.</i>
<input type="checkbox"/>	Faulty software products.
<input type="checkbox"/>	It’s a software which contains all the offers from American malls.
<input type="checkbox"/>	I don’t know.

3.1 Basic Information on Application of the ITK.basic in Brazil

The questions were translated by a Brazilian researcher from English to Portuguese and afterwards applied to 59 Brazilian educational professionals from two basic public schools, including primary and middle grades. All repliers attended the bimestrial planning meeting in April, where a brief announcement was made about the survey proposal and aims before they answered and gave back their forms. The summary of some basic descriptive data of the sample is shown in table 2.

Table 2. Descriptive data from the ITK.basic applied in Brazil

	N	Female	Male	Average age	Work time average
School 1	34+1*	26	8	39.2	11.5
School 2	24	19	5	40.5	12.4
Total	59	45	13	39.7	11.7

*One participant did not indicate gender

Both schools are located in south of Brazil, the infrastructure and the staff are essentially funded by the Joinville city hall, which means that schools have been dealing with many cuts on its budget over the years. By law, to be admitted to the board all staff needs to pass a public exam, and the principal is usually a teacher who

¹ In case you are interested in the instrument or in developing a version in another language: We are happy to provide the ITK.basic for educational non-commercial contexts. Just contact one of the authors.

is nominated by the mayor. The sample consists of many different educational professionals who work in both schools: Classroom teachers of different subjects (such as Portuguese, English, Math, Science, and Humanities) which are 77 percent of the sample, and some other occupational groups such as educational officers, principals, special needs teachers, counselors, as well as a principal assistant.

The researchers experienced some methodological issues. The original scale, which was adapted for this study from the German version of the ITK.basic and which was developed to assess basic ICT knowledge of teachers, teacher trainees and teacher students, had an overall reliability of Cronbach's $\alpha = 0.84$. Data in this study shows a Cronbach's α of 0.794, which is to be classified as moderate [10] but in context of the relatively small control sample seems quite acceptable. It furthermore suggests that this version of the ITK.basic seems to work well, what is confirmed by the calculation of point-biserial correlations [11]². A Goodness-of-Fit test shows that the 1 PL Rasch model can be used. Despite the above mentioned methodological issues, which suggests reliable quality of the Portuguese version, some results related to the level of ICT-related knowledge of the probands might be interesting at this point, too. When analyzing the data it has to be remembered that this is no representative study, results therefore can hardly be generalized.

3.2 The ITK.basic in Brazil: Descriptive Results and Impressions

The analyses from the survey data focus on counting the percentage of correct and false answers. Thus, we recoded the answers from the multiple-choice format to a dichotomous (correct/wrong answer) format. Fig. 1 shows the percentage of correct answers for the respective questions, which generally are lower than in the German studies that have taken place so far [see below].

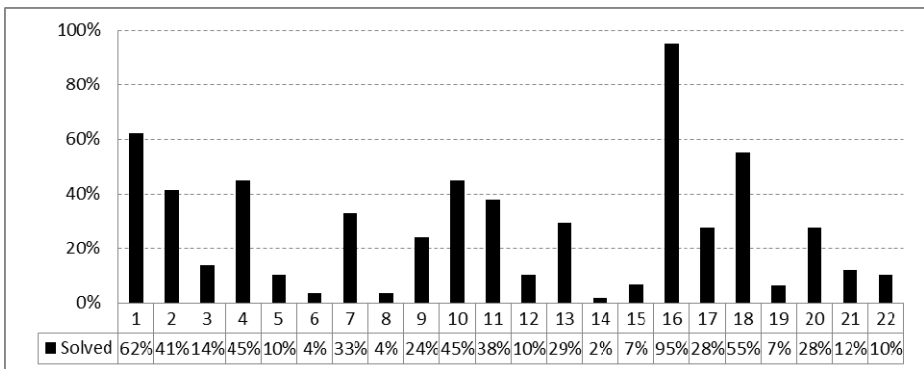


Fig. 1. Descriptive results: Percentages of correct answers to the questions 1 to 22

² Two items of the instrument didn't work as well as supposed. Additional analysis will be necessary which would lead to far in this article.

Taken the results as a complete score, they are actually quite poor, since – looking at an average score using all participants and all questions – only 27percent chose the correct answers and a large percentage (nearly half of all the participants) mostly chose the answer category *I don't know* which is also classified as *not solved*. Compared to results of a German study the participants show a significant lack of ICT-related knowledge [12]. Thus, it is supposed that the level of competencies is significantly higher in Germany – at least when comparing the two assessed samples (again: both surveys are not representative). Besides statistical results, it was interesting to observe the way repliers' reacted. The principals and many teachers wanted to discuss not only the difficulty level of the questions, but indeed the impact of the questions into their lives. From this we could draw three conclusions.

1. First, most of the participants recognized that they lack a tremendous number of skills to deal with technology, especially in those questions that required awareness and knowledge of computer components, setting rules, and functions (hardware and software). Despite that, the questions related to web technologies (such as Wikipedia and E-Mail) were those where with the highest number of correct answers.
2. Second, some of the participants questioned whether the 'basic knowledge' of ICT, as defined in the questionnaire, was suitable for Brazilians. That argument could be seen as sustained by the well-known cultural resistance against technology which in fact is an important thing to be considered: Taking the average age of involved teachers, which is about 40 years, and connecting this to a historical and cultural point of view, it becomes clear that most of them were already employed when ICT came to the educational system in the 1990's. The delay for Brazil to open its borders to modernity apparently had a negative impact on those who were born before 70's. The pace of the technological revolution was faster for them, they had to get used to so many different procedures and the price of devices was really high back then. Also some of them had experienced traumatizing economic events, like seeing people who lost their jobs when their position was extinct or they were traded for machines [13]. That made them see technology in a threatening way and developed a cultural resistance to deep engagement with computers and gadgets.
3. Third, almost all of the younger teachers, which means those who were younger than 40 years old, confess they did not have problems using technology on a daily bases, but they also confess they did not know much about using ICT technology as a pedagogic tool. That was a complaint from the senior teachers too, which let them conclude that the Brazilian educational system, the universities and the governmental qualification programs must be rethought and more or less completely redesigned.

These results shall be sufficient at this point since this article has a focus on problematic issues of the assessment of (digital) media literacy. Nevertheless, it shows an outline of impressions from using a questionnaire for the assessment of teacher's knowledge in the area of digital media. Hence, the following section will sum up these with a view to the general discussions on the assessment on media literacy.

4 Conclusions and Perspectives

The conclusion will be divided in two parts – one reflecting the present study and one analyzing this with a view to the international discussion around assessment of media literacy. The study represents one of a large number of approaches trying to get a view into media literacy (in this case: of teachers or persons from the field of formal education from Brazil). Although it used an objective, reliable and valid instrument for the assessment, there are remaining questions. One of those – which was also mentioned by the test persons – is, whether it is methodologically possible to just translate the chosen questions from German into Portuguese and use them without changing their content. Of course this is a general problem of large scale studies aimed at international assessments and can be answered from a content-based viewpoint: Literacy related to digital media should be somehow comparable between different countries, although it might differ in detail. Similar argumentations are being used in studies such as PISA or TIMSS, where internationally valid constructs are assessed.

Another aspect is that this study just asks for ICT specific knowledge. It therefore just pictures one dimension of the (ICT) literacy concept which might be an important one but, nevertheless, cannot be taken without further information. While this study was carried out to prove the quality of the ITK.basic scale in its Portuguese version, the scale is supposed to be used in combination with other scales asking for more motivational (e.g., ICT-related self-efficacy) and behavioral facets (e.g., use of ICT in various contexts). Hence, what comes with the use of multiple scales is the necessity for an adequate time frame for answering all the questions, which is a critical point inside as well as outside of formal education systems.

Coming to the use of the ITK.basic in Brazil, the organizers found it impressive to see the effort of this community of educational professionals as they cope with their new professional needs [13-14]. They became aware of the difficulties and the challenges regarding the ICT knowledge, even if most of them are afraid of the literacy they must still develop. There are a lot of internal problems in school, besides the qualification in digital literacy itself, but they also became excited to look for solutions [14-15]. This made the principals involved ask for a copy of the ITK.basic scale, because they intend to set a task group to work and find clues regarding digital literacy and what the teachers need to use technology as a pedagogic tool instead of giving them just computer training. They want the findings brought to local educational authorities to help solicit suggestions and options for the training courses which will be going on during the winter. In particular, this study contributes to the understanding of an actual media literacy taxonomy in the involved schools as well as giving researchers clues about the historical and cultural aspects that have influenced some countries that share common characteristics.

This article highlights problematic issues when assessing media and information literacy through the example of a small study conducted in Brazil. This, as well as many other approaches, has no common theoretical basis for its assessments, which is strongly needed to promote national and international research projects. However, some promising projects grew up over the last year, which partially integrated some of the mentioned aspects [e.g., 16-17].

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Theory of Action and Information Literacy: Critical Assessment towards Effective Practice

Paulette A. Kerr

University of the West Indies, Mona, Kingston 7, Jamaica
paulette.kerr@uwimona.edu.jm

Abstract. *Theory of action* framework as developed by Argyris and Schön [1] was employed to critically analyse the practice of information literacy in 11 academic libraries in the US. In theory of action, contrasting theories are explicated, namely *espoused theories and theories-in-use* and congruence between theories is a basis for effective practice. In the study, espoused theories of action were examined by investigating conceptions and beliefs of information literacy as seen in varied policy documents of libraries recognized by the academic library community for exemplary instruction resources. Theories-in-use were identified by analyzing practice via 150 online tutorials developed and utilized by these libraries. Comparative, thematic analysis revealed varying levels of congruence between theories. Espoused theories coalesced around themes of knowledge creation and lifelong learning while theories-in-use emphasized engagement with information sources. The paper distills select methodologies and findings and illustrates the usefulness of theory of action for investigating information literacy practice.

Keywords: Information literacy, theory of action, espoused theories, theories-in-use.

1 Introduction

Kuhn [2] posits that professional practice is underpinned and shaped by a received set of beliefs, values and models. This shared paradigm according to Kuhn is reflected in the language of practice. Todd [3] reiterates this when he says practice provides the opportunity to test principles and theories. However in trying to understand what guides and underpins the practice of information literacy in academic institutions, there was a dilemma. The challenge is that while information literacy had its beginnings in academic environments, with an established, accepted understanding, multiple, shifting and sometimes competing perspectives and conceptions which have emerged from varying empirical and conceptual contexts, constitute a set of beliefs and values, and these differences in conceptions may predict varying approaches to professional practice [4]. Definitions of the concept range from being equipped with discrete generic skills, constructing knowledge, critical thinking, enabling lifelong learning, a process of knowing, a process of acquiring new meaning and understanding, enabling the effective utilization of information for a purpose, and a

complex of set of ways of experiencing information (as cited in [4]). These definitions appear to be rooted in broad theoretical and conceptual traditions including a behaviorist framework, a constructivist, knowledge building approach, a process approach and a relational understanding. *How do these multiple understandings guide the practice of information literacy education?* Bruce [5] Elmborg [6] Limberg [7] Lupton, [8] and Todd [9] are some of the writers who posit that different understandings of information literacy will result in different teaching/learning approaches. While there is a growing body of research that has explored different dimensions of information literacy practice, there is little on how professional practice in academic libraries is linked to these varying beliefs and conceptions.

Kane, Sandretto and Heath [10] argue however that research seeking to understand communities of practice should examine *both* beliefs and representations of practice since practice in disciplines and professions is grounded in conceptions and assumptions. Without this kind of examination which includes observation of what constitutes practice, the authors posit that there is a danger of telling only half the story.

This paper distils findings from a larger study [4] which investigated both conceptions and representations of practice of information literacy in academic libraries through the lens of theory of action. Theory of action allowed for a critical assessment of espoused beliefs and action of information literacy.

2 Conceptual Framework: Theory of Action

Theory of action as developed by Argyris and Schön [1] is a framework for explaining professional practice in various organizations and communities of practice. The authors describe theories of action as explanations arising from unconsciously or consciously held beliefs, values, theories, concepts, rules policies, norms or skills which are utilized to describe or predict action. The term ‘theories’ is used not in the sense of physical theories or general principles, but as “vehicles for explanation, prediction or control” [1]. Houchens and Keedy [11] contend that all humans whether they are conscious of it or not, operate according to theories to explain their experience, predict future events and control outcomes in various situations.

2.1 Theories of Action: Espoused Theories and Theories-in-Use

Theory of action is further explicated via contrasting theories of action, namely *espoused theories and theories-in-use*. Argyris and Schön explain that when someone is asked about their behavior in a particular situation, the person usually responds with an espoused theory of action for that situation [1]. This theory involves intentions and is communicated to others. However, what determines people’s actions are their theories-in-use. Argyris, Putnam and Smith further clarify that “espoused theories are those that an individual claims to follow. Theories-in-use are those than can be inferred from action” [12].

Argyris and Schön [1] conclude that persons should not simply be asked about their theories-in-use. Theories in use must be *inferred* from an examination of *behavior* and *representations of action*. Theory of action therefore provides a detailed framework for explaining relationships between what can be observed in people's actions and their beliefs about those actions.

Initial research by Argyris and Schön employed the use of case studies in a range of educational settings to test effectiveness of theories-in use as well as the relationship between espoused theories and theories-in-use. Findings emerging from the research conducted suggested among other things that "...most of the inferences about participants' theories-in-use run counter to their espoused theories" [1].

3 Assessing Communities of Practice with Theory of Action Framework

Theory of action provides a sound theoretical and methodological framework for deep interrogation of tools of practice in relation to orientations and intentions which guide this practice. Argyris and Schön's framework has guided research in a range of disciplines and professional fields [1]. The pervasive themes in these studies relate to what constitutes effective practice as well the dilemmas and tensions between philosophy or guiding principles and professional practice.

A landmark detailed meta-analysis by Kane, Sandretto and Heath [10] critically reviewed over 50 research studies on *teaching beliefs* and *practices* of university academics in relation to their espoused theories and theories-in-use and conclude that *theory of action* offers an avenue to gain understanding of professional practice among teachers since it calls for examination of espoused values and observation of what constitutes practice.

Theory of action was also applied to the important issue of assessment in education in studies by Willis [13] and Orrell [14]. Research by Willis identified and presented a holistic view of learning as espoused by teachers and juxtaposed these with assessment methods used by teachers and inconsistencies were found. Willis concluded that "technicist" assessment models are at variance with the espoused theory of learning [13]. Addressing the issue of feedback on performance assessment, Orrell's comprehensive research study reports on academics' written feedback on students' papers, and compares this with the same academics' personal, practical espoused theories and practice about feedback. The author concludes that glaring contrasts between espoused beliefs and practice may have resulted from practices learnt on the job [14].

A study on reflective practice in nursing by Greenwood [15], suggests a potential inadequacy of one aspect of the theoretical framework of Argyris and Schön in evaluating practice in nursing, that of congruence and compatibility between espoused theories and theories-in-use [1]. However, according to Argyris and Schön, "there is no particular virtue in congruence alone. An espoused theory that is congruent with an otherwise inadequate theory-in-use is less valuable than an adequate espoused theory

that is incongruent with the inadequate theory-in-use, because then the incongruence can be discovered and provide a stimulus for change” [1].

The composite findings of research in these environments confirm initial findings of Argyris and Schön that critical reflection on and assessment of communities of practice should be done to identify inherent dilemmas between espoused theories and theories-in-use in professional practice [1].

4 Theory of Action and Information Literacy Practice

Theory of action is ideally suitable for explaining relationships between what can be observed in people’s actions and their beliefs about those actions. The distinction between espoused theories and theories-in-use allow for framing of questions about foundational conceptions and beliefs of information literacy and how these are demonstrated in representations of professional practice.

Further, previous research studies which applied theory of action to assess communities of practice provide evidence of effective approaches for developing institutional and personal espoused theories and theories-in-use. Kane, Sandretto, and Heath’s detailed meta-analysis indicates that effective research employ the use of multiple methodologies including interviews, direct observation and document analysis to successfully gain access to espoused theories and theories-in-use [11]. An extensive study of conceptions and practice of information literacy [4] was guided by the suggested approaches and the rigorous methodology of theory of action.

In her doctoral dissertation, Kerr [4] employed Argyris and Schön’s 1974 theory of action to arrive at rich understandings of information literacy in academic institutions. The study aimed at investigating relationships between conceptions (espoused theories) and practice (theories-in-use) of information literacy in light of the seeming dilemma of varying and competing understandings of information literacy and how these impact practice.

4.1 Critically Assessing Espoused Theories and Theories-in-Use of Information Literacy

The aims of Kerr’s research [4] were achieved through a rigorous constant comparative analysis [16] of *conceptions* and *tools of practice* of information literacy in 11 academic libraries in the US. These libraries are recognized in two best practice information literacy databases [17-18] for developing exemplary instruction resources.¹ Conceptions include values, beliefs, rules, theories and definitions of information literacy expressed by academic libraries and librarians. Espoused theories of information literacy were identified by investigating predominant conceptions as expressed in 60 mission statements and other public policy documents which detail teaching goals, purpose, definitions and other foundational understandings. It was decided to use mission and

¹ At the time of selection of sources, approximately 96 institutions were represented in one database and 28 in the other.

goals statements since they typically espouse values and beliefs and are an institution's public declaration of purposes and vision of excellence [19].

Theories-in-use were identified by analyzing how information literacy is practiced via 150 online tutorials. The online tutorial has emerged as a primary and most pervasive vehicle of practice in information literacy education [4]. This widespread use suggests that these tutorials are developed to address a span of information literacy attitudes and competencies. The online tutorial is therefore an ideal representation of 'action' of information literacy. Theories-in-use relate to implicit and explicit indicators of information literacy expressed in statements, concepts, and outcomes in these tutorials. They are also reflected in theoretical frameworks adopted in tutorials, teaching learning strategies as well as specific tasks for assessing learning. Policy documents and online tutorials were accessed via web pages of the sample of libraries.

The research employed a rigorous process to arrive at understandings of relationships between espoused theories and theories-in-use of information literacy in the sample of academic libraries. This involved a comparative analytic approach at *two distinct levels of analysis*. Firstly an *institutional*, case-by-case in-depth analysis was conducted of mission documents and online tutorials of the 11 academic libraries. This involved identification, labeling, questioning and categorization of concepts in policy documents and verbatim statements in tutorials. Statements of claims were developed from concepts and themes which emerged from the questioning approach which involved an iterative process of comparing and contrasting of these themes. Secondly, *meta-claims* were then developed from comparative analysis of *institutional statements of claims*. By comparing policy language with learning objects that show information literacy in action, different relationships between espoused theories and theories-in-use were identified.

5 Espoused Theories and Theories-in-Use of Information Literacy

Varied understandings of information literacy in academic libraries emerged from the data. Themes from the document analysis indicate levels of *congruence* and *incongruence* between foundational beliefs of information literacy and one tool of practice, the online tutorial. Espoused theories of information literacy are reflected in the knowledge-based outcomes and processes seen in mission documents, are identified in the multiple definitions of information literacy and in learning outcomes and goals articulated by information literacy programs. Information literacy is conceptualized as i) *knowledge outcomes and processes including critical thinking*, ii) *knowledge creation, scholarship and intellectual habits*; iii) enabling academic success, social responsibility and lifelong learning; iv) effective and appropriate utilization of information for specific purposes; v) knowledge and skills in accessing and using information sources; vi) enabling ethical and human values and vii) most effective in collaborative disciplined-based environments [4].

Varying approaches to the practice of information literacy via online tutorials confirm that “theories-in-use are complex” and that “constructing models of theories-in-use is difficult” [1]. While tutorials give attention to multiple competencies including knowledge outcomes, and ethical values, a predominant *source approach* to information emerged in which expected competencies focused on an engagement with an assortment of information sources.

Levels of congruence were however detected between missions and aspects of practice as deliberate attempts were made in some programmes to realize the goals and objectives of information literacy programs via tutorials. Critical thinking outcomes were addressed in tutorials via evaluation of sources, and the espoused value of curriculum integration was realized in three programmes via tutorials constructed to realize this aim.

Major gaps were identified however between espoused theories and theories-in-use, between missions, values and goals of academic libraries and practice. There was greater emphasis on *procedural techniques* than on building conceptual understandings and knowledge creation that is espoused. A ‘*find it*’ theme emerged and critical thinking competencies were not developed beyond evaluation techniques. What Argyris and Schön [1] refer to as single loop learning in which there is a focus on techniques was observed.

6 Discussion

Public testing and interrogation of theories-in-use in relation to espoused theories, done primarily to address challenges and dilemmas in practice, is considered risky [1]. The findings of this research suggest that the process of evaluating information literacy education in academic libraries is indeed risky as it reveals glaring contradictions in practice while pointing to few areas of congruence. Implicit in an investigation of theories of action however, is the theory of learning [13]. Public reflection on practice is done in the interest of learning, towards bringing theories-in-use in line with espoused theories for greater effectiveness in practice. Double-loop learning [1] which involves deep reflection on tools of practice is advocated. The research suggests that such reflection and evaluation are useful for clarifying what is meant by information literacy to better align learning outcomes with espoused missions and goals.

The research is therefore presented as a model for reflecting on espoused theories of information literacy to ask whether these are appropriate to guide practice. This will involve revisiting conceptualizations, definitions and seminal values. Reflection and critical assessment may also indicate areas of instructional design and pedagogy of tools of practice towards greater effectiveness in practice.

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How Faculty in the Hague University of Applied Sciences Uses the Scoring Rubric for Information Literacy

A.A.J. (Jos) van Helvoort

The Hague University of Applied Sciences, Academy of ICT&Media,
The Hague, The Netherlands
a.a.j.vanhelvoort@hhs.nl

Abstract. The aim of this research was to gain evidence based arguments for the use of the scoring rubric for performance assessment of information literacy [1] in Dutch Universities of Applied Sciences. Faculty members from four different departments of The Hague University were interviewed on the ways in which they use the scoring rubric and their arguments for it. A fifth lecturer answered the main question by email. The topic list, which has been used as a guide for the interviews, was based on subject analysis of scholar literature on rubric use. Four of the five respondents used (parts of) the rubric for the measurement of students' performances in information use but none of them used the rubric as it is. What the faculty staff told the researcher is that the rubric helped them to improve the grading criteria for existing assignments. Only one respondent used the rubric itself, but this lecturer extended it with some new criteria on writing skills. It was also discovered that the rubric is not only used for grading but also for the development of new learning content on research skills.

Keywords: Information literacy, scoring rubrics, Higher Education, Netherlands.

1 Introduction

Information Literacy is considered as an important aim for contemporary Higher Education. Since the end of the 20th century the focus of education has shifted from teaching to active learning [2]. Students are supposed to search for and to process information themselves and to construct their own knowledge in learning environments that are characterised as resource based, problem based, and project based [3]. Despite the increase of easy to use information technologies (such as search engines, and also networked social media and mobile technologies that push information to end users) the solving of information problems in such learning environments is still an intellectual challenge with which students in Higher Education struggle [4-5].

The shift of Higher Education to active student learning has been accompanied by a strong focus on the assessment of student learning [6]. Within the context of Dutch

Higher Education the author of this paper developed a scoring rubric for performance assessment of information literacy [1]. The present paper investigates the ways in which lecturers at the The Hague University of Applied Sciences use this rubric in their educational practices. A sample with two criteria of the rubric is attached as Appendix A in the present paper. The full text of the rubric with all seven criteria is published in reference number [1].

2 Literature on Rubric Use by Academic Staff

According to Reddy and Andrade [7], most academic staff members use rubrics only for grading or summative assessments. This application of rubrics is also referred to as ‘assessment of learning outcomes’ [8] and is often opposed to ‘assessment *for* learning’ which will be explained later in this paper. Staff members who use rubrics for grading experience that these tools make the evaluation process more reliable, efficient and consistent. However, in the same paper Reddy and Andrade also conclude that teaching staff are often unwilling to study and to use rubrics [7]. Their suggestion is that “college and university teachers might be more receptive if they understand that rubrics can be used to enhance teaching and learning as well as to evaluate”.

In the context of rubrics for performance assessment of information literacy, the issues of reliable, consistent and efficient grading are addressed by Fagerheim and Shrode [9], Oakleaf [10] Perruso Brown and Kingsley [11] and Scharf et al. [12], but the other benefits of rubric use are certainly not overlooked. Those more pedagogical arguments are discussed below.

Rubric Use for Assessment for Learning. Reddy and Andrade [7] report on several research papers that suggest that the use of rubrics in the classroom for self and peer assessment leads to improved academic performance and therefore can be regarded as educational tools that foster students’ learning processes. However, they emphasise that this is particularly true when the use of the rubrics has really been part of the instruction and is not restricted to simply making it available for the students. This is confirmed by Andrade [13]. Also Megan Oakleaf emphasises the importance of discussing rubrics with the students [14]. In a previous paper [15] the author of the present paper described how a one shot workshop with the Rubric for IL motivated adult students to use the rubric for self-assessment before they sent their paper for grading.

Feedback. Scoring Rubrics are powerful tools for feedback. Megan Oakleaf believes that the feedback function is one of the main benefits of rubric use [14], and this was also one of the conclusions that the students reported in the study of Van Helvoort [15]. Feedback is particularly important in IL education because information problem solving is a complex skill [3], [12] that can best be learned by practising regularly and by receiving remarks on how to develop this skill [16].

Improvement of Instruction. While the previously mentioned research papers emphasise the positive effects of rubrics on student learning, other researchers

emphasise that they can also be used for the improvement of instruction. Lorrie Knight describes the use of a scoring rubric for an evaluation of student produced bibliographies. The analysis of these bibliographies with the rubric was used to derive proposals for improvement of library instruction and the library's tutorial [17].

Deborah Floyd et al. also report a student bibliography project. In their case a rubric with criteria for the selection of 'professional' literature was added to the course materials [18]. Their conclusion is that this improvement of the course syllabus, in combination with a library instruction session and the instructor's emphasis on using scholarly resources, had a positive impact on the quality of student bibliographies.

Megan Oakleaf's Information Literacy Instruction Assessment Cycle, grounded in the theory of 'assessment for learning', is designed to attain two different goals at the same time: the improvement of librarians' pedagogical skills as well as the improvement of students' ability to evaluate web sites [6].

Longitudinal Assessment and Comparative Studies. All previously mentioned examples of rubric use are based on individual courses. But rubrics can also be used for longitudinal research to measure the progress of students over time or to evaluate institutional programmes, for instance in the context of accreditations [19]. The research of Scharf et al. describes attempts to conduct such longitudinal research on student portfolios [12].

Green and Bowser described a comparative study between student products from two different institutes [20]. Their experience was that their rubric cannot simply be transferred from one institute to another and that it should be modified according to characteristics of the population of the institute where it will be used.

3 Study Design

In the summer and autumn of 2012 four staff members of The Hague University of Applied Sciences were interviewed on the way in which they use the Scoring Rubric for Information Literacy in their own educational practice. A fifth colleague answered this question via email. The respondents were all teaching staff members who work in five different departments (Nutrition & Dietetics, Social Educational Care, Communication, Business IT & Management and Mechanical Engineering) and were selected because they had shown interest in the scoring rubric in the past. Only one of them was familiar with the researcher himself. This colleague (a lecturer who is also head of the department) and the researcher work in the same faculty but in different departments. The topics which were discussed in the interviews were derived from the literature review in the previous section of this paper.

4 Findings

The most remarkable outcome of the interviews was that only one respondent answered that the Rubric for IL is used as an instrument for summative assessment.

At Sandra's department of Business IT & Management the rubric is used in the very first semester to grade an essay. But they also aim to score students' writing skills, diagnostically, with the same assignment. For this purpose the scoring rubric has been extended with criteria for text structure, audience-adapted writing and grammar. This adapted rubric is not only used for the grading process itself but also to provide the students with feedback, additional to the comments in their Word-files.

All other interviewees reported that they did not use the scoring rubric for grading but further elaboration on the topic made clear that it is at least sometimes used to adapt existing grading criteria, for writing assignments for instance, or a bachelor thesis. Janneke's answer to this question was that her department (Social Educational Care) is still struggling with implementation of information use in their curriculum and that application of all the rubric's criteria is not yet an issue. With this remark Janneke mentioned the most often reported application of the scoring rubric for information literacy, the use of it by curriculum developers for the selection of relevant learning content. For instance Guus, the colleague who responded by email from the department of Mechanical Engineering, wrote that they use it in their department "as a background document in the Project Planning to integrate research skills in the curriculum." Mijke (department of Communication) and also Janneke added to this that these skills are often tacit knowledge for the academic staff and that the rubric had made them more aware of what they want their students to do. This also helped them to be aware of the subjects that should be taught.

Departments that use (parts of the) the scoring rubric one way or another in their grading processes (Business IT & Management, Communication, Social Educational Care and Nutrition & Dietetics) also provide the rubric or the grading criteria concerned in their manuals or in the electronic learning system Blackboard. Janneke as well as Dorien have experienced, however, that simply providing the rubric or the criteria without discussing it in a class, is not sufficient. Business IT & Management was again the only department in this research where the rubric was explicitly part of the instruction. They also use it for peer assessment. The other interviewees expect that their students use the criteria for self-assessment before sending in an assignment but there is no evidence that they actually do this.

Implementation of the rubric content for the grading processes seemed to be problematic for most of the interviewees. Janneke (Social Educational Care) doubts whether her colleagues have the rubric in mind in their daily practice. In Dorien's department of Nutrition & Dietetics the teaching staff had agreed that the rubric would be included in the manuals for the first year assignments but she recently discovered that more than half of her colleagues did not remember the rubric at all. She suggested that staff members should also be trained in the use of the rubric. Mijke, however, believed that the available time is a real constraint. But she also remarked that an actual accreditation process in her department helped her to draw her colleagues' attention to well formulated grading criteria. The only department where implementation of the rubric seemed to be really successful was again Sandra's department of Business IT & Management but it has to be said that she herself is also the manager of her team. As she expressed herself: "As the head of the department I am interested in it and that helps..."

5 Conclusions and Discussion

From the findings in the previous section it may be concluded that the Scoring Rubric for IL gained some reputation in The Hague University of Applied Sciences but that it is not used as it is. Staff members from different departments derived content from it to (re)formulate grading criteria for their own assignments. This means that they considered the individual criteria as ‘primary trait rubrics’ but that they adapted the formulations in the original rubric. The only department that used the full rubric extended it with criteria for writing skills. This outcome of the research specifies one of the conclusions in the literature review which stated that rubrics cannot be simply transferred from one institute to another [20]. Even in the case of one and the same university, departments appear to have different aims with the assignments for which (parts of) the rubric can be used.

The practice of using the rubric or some of its criteria for longitudinal assessment is not mentioned by any of the interviewees. It seems that this is also due to the fact that teaching information literacy skills is a rather new topic for all their departments.

The findings also make clear that teaching staff who wish to use (elements) of the rubric in the grading processes of their departments should pay extra attention to teaching the content in the classes and to the motivation and training of their colleagues who are supposed to use it. Janneke’s and Dorien’s remarks that “simply providing the rubric to the students is not sufficient” is confirmed by the general literature on rubric use [7]. The interviewee’s feelings of disappointment regarding the engagement of their colleagues are probably recognised by anyone who has tried to create interest in literacy in the disciplines’ curricula. It appears to be very hard to make academic staff enthusiastic about such generic skills [21]. In the case of this research it is not surprising that it is only the department of Business IT & Management where the rubric seems to be fully accepted, because in this department it was the head of department herself who was an enthusiastic advocate.

All five respondents in this research emphasised that they used the rubric for the integration of research skills in the curriculum. To understand these remarks one must realise that Universities of Applied Sciences in the Netherlands have recently made a shift from typical vocational education (with an emphasis on the education of professional practitioners) to the education of professionals who are able to carry out practice based research themselves. Grading instruments like the Scoring Rubric for IL can help those universities and their departments with their task of changing their curriculum to a research based one, not only in the context of student performance measurement and the feedback on it but also with the development of learning content.

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Appendix: Sample with Two Criteria of the Scoring Rubric for Information Literacy

Student product		<i>Professional behaviour</i>	<i>Insufficient behaviour</i>	Grade
1	Orientation	<p><input type="checkbox"/> The student product makes clear that the student did a good orientation on the topic and that he/she formulated his/her own focus on the topic or research question. This is also expressed by the fact that the student formulated one or more good research questions.</p> <p style="text-align: right;">0 very good 0 good 0 sufficient</p>	<p><input type="checkbox"/> The student product makes clear that the student used the question as it was originally formulated in the assignment or student task. The student him/herself did not further explore the question as such. An example of this behaviour is that the student did not define the core key terms and that these terms are supposed to be clear while they are at least multi-interpretable.</p> <p style="text-align: right;">0 poor 0 bad 0 very bad</p>	1-20
2	Reference list	<p><input type="checkbox"/> The student product has a reference list that is complete and the citation style is used correctly. With the reference list it is easy to identify the documents that the student used.</p> <p>Remark: the last point is more important than a correct bibliographic description in accordance with a standard citation style. However, for the score 'very good' the citation style must also be used correctly.</p> <p style="text-align: right;">0 very good 0 good 0 sufficient</p>	<p><input type="checkbox"/> There is no reference list in the student product and / or</p> <p><input type="checkbox"/> The reference list is not complete (documents that are cited in the text are not listed in the reference list) or</p> <p><input type="checkbox"/> Important bibliographic data (title, author, year of publication) are missing.</p> <p>An example that often recurs in educational practice: for internet resources only the URL is mentioned.</p> <p style="text-align: right;">0 poor 0 bad 0 very bad</p>	1-10
Score		0 very good 0 good 0 sufficient	0 poor 0 bad 0 very bad	

Designing and Implementing Web-Based Tools to Assess Information Competences of Social Science Students at Spanish Universities*

María Pinto¹, José-Antonio Gómez-Hernández², Susana Puertas¹, David Guerrero¹, Ximo Granell³, Carmen Gómez⁴, Rocío Palomares⁴, and Aurora Cuevas⁵

¹ Universidad de Granada, Granada, Spain
{mpinto, spuerta, dguerrero}@ugr.es

² Universidad de Murcia, Murcia, Spain
jgomez@um.es

³ Universitat Jaume I. Castellón, Spain
granell@uji.es

⁴ Universidad de Málaga, Málaga, Spain
{gomez, perraut}@uma.es

⁵ Universidad de Complutense, Madrid, Spain
auro.cuevas@gmail.com

Abstract. We describe the process of designing and applying four web-based tools that assess information competences, focused on Social Science students at Spanish universities. We draw on our previous experience in developing web resources, tests and tutorials for learning information skills (E-coms, Alfamedia, Alfinees, Infolitrans, IL-HUMASS). The toolkit includes: 1) a corpus of texts with a controlled degree of difficulty to be used by students when acquiring the required competences; 2) the IL-HUMASS questionnaire, which measures students' attitudes and perceptions on the importance and self-effectiveness of information competences; 3) a knowledge test, organised in four categories (information search, evaluation, processing, and communication-dissemination); and 4) assessment rubrics, designed to prove students' know-how by fulfilling a set of objective tasks. The combined application of these instruments to a sample of students of Social Science degrees allowed us to confirm the internal validity and reliability of our tools.

Keywords: Assessment, information competences, social science students, higher education, information literacy programs.

1 Introduction

The assessment of information competences is probably the most complex part of the process of teaching and learning them. It is a key element of this process, since it

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determines the way students learn, and it is also a requirement to prove the acquisition of knowledge. If this is not properly done, information literacy programs can lose their value. In Higher Education, teaching and assessing information competences might be hindered by a number of factors, such as the lack of expertise in assessment methodologies that lecturers and librarians may hold [1-2], the extracurricular, or even out of the curriculum, nature of this competence until recent times, and the scarcity of general purpose tools that simplify the process of carrying out and assessing tests.

Today, the acquisition of information competences is a requirement for all the degrees at Spanish universities, according to the framework provided by the European Higher Education Area (EHEA), and because of this, most librarians are working together with faculty, using different assessment methods.

In this context, one of the aims of the Spanish network of university libraries, REBIUN, stated in their Strategic Plan 2020 is “to incorporate computer and information competences in a progressive way to university studies as an educational strategy to develop lifelong learning capabilities”. In order to achieve this goal and the curricular implementation of these competences, it is essential to create and validate competence assessment tools. Likewise, an assessment based on a competences’ model cannot be limited to a question-answer test about concepts or to merely testing the degree of correctness in following a procedure. A socio-constructivist model of learning should be able to acknowledge the ability for solving complex information problems that may be typical within a particular social or community practice [3].

For this reason, our research aims to design a set of tools to assess information competences, which can be applied and transferable to different contexts, and which all together lead to an efficient assessment of information-related knowledge among students.

2 Instruments for Assessing Information Competences

A number of projects have been undertaken to design information competences assessment instruments since year 2000. Mainly:

- SAILS (Standardized Assessment of Information Literacy Skills, drawing on ACRL’s standards [4] and designed at Kent State University. Online test with 45-55 questions focused on assessing knowledge, rather than skills.
- Information Literacy Test (ILT). Computer-based test also based on ACRL’s guidelines. Developed by James Madison University (JMU) in collaboration with researchers from the Center for Assessment and Research Studies (CARS) and JMU libraries [5]. It differs from SAILS in the number of items (ILT is a 60-item multiple-choice test) and in that it does not assess ACRL’s guideline 4 (use information to accomplish a purpose) [6].
- iSkills. [7] Test designed at the California State University (CSU) to assess the ability to think critically in a digital environment through a range of real-world tasks. It measures abilities to navigate, understand and critically evaluate the variety of digital information available.

- ISS. Information Skills Survey. Survey designed by Australian librarians, led by Catts [8], to measure information competences among students of Education, Social Sciences and Law according to the standards of the Council of Australian University Librarians (CAUL) and the Australian and New Zealand Institute for Information Literacy (ANZIIL).
- EduDOC-CIUF questionnaire. Based on the Canadian questionnaire CREPUC (Conférence des Recteurs et des Principaux des Universités du Québec) [9]. Used in Italy, Austria, Denmark, Finland, Greece, Sweden, and Belgium, its aim is “first to determine incoming students’ information literacy skills so as to identify their needs and to provide more appropriate services, and secondly to provide university libraries with reliable data to support recommendations for the integration of information literacy courses into the university curriculum” [10].
- IL-HUMASS. Questionnaire designed to self-assess and report university students’ perceptions and expectations about their information competences, developed by Pinto [11].
- INFOLITRANS. Test for assessment and acquisition of the information competence among students of translation and interpreting university degrees. Uses an online set of questions on the information cycle that can be used in the contexts of guided learning, self-learning, and assessment of learning outcomes [12].

In Spain, REBIUN librarians working on learning support organised a conference in 2011 on “Assessing and acknowledging computer and information competences”, and another one in 2012 on the “Results of implementing computer and information competences at universities”¹. Their contents present many advances in terms of theory, organisation, and assessment of the training undertaken, but they do not describe assessment tools to evaluate students’ results. For this reason, in 2013 REBIUN is developing a model to certify the information competence through a number of tests that will be run by two agencies, ACTIC and CERTIUNI. A committee of experts has defined the information competence in university degrees and it is expected to examine and certify students who want to include this competence in their degree diploma by the end of 2013.

3 Integrated Assessment of Students’ Information Competence

Our experience in developing and using web resources and tutorials for learning information skills confirms our interest for designing and applying tools from an integrated approach that achieves a comprehensive assessment of the information competence that takes into consideration knowledge, skills, attitudes, and prior expectations. For this purpose, we have designed and implemented four key tools: 1) a corpus of documents containing a set of validated texts to assess information comprehension through a number of questions after reading them and to evaluate the

¹ IX Jornadas CRAI, Universidad de Santiago, 2011. <http://www.usc.es/es/congresos/crai/> and X Jornadas, Universidad de La Rioja, 2012. <http://biblioteca.unirioja.es/crai2012/>.

degree of acquisition of certain competences or skills; 2) a questionnaire to self-assess students' perceptions on the importance and self-effectiveness of a number of specific tasks; 3) a knowledge test to measure students' objective knowledge about their information competence; and 4) assessment rubrics to prove students' know-how in applying their information competence to solve problems. These tools will be publicly available at the website <http://www.infocompetencias.org/eval-ci/>.

3.1 Corpus of Experimentally Validated Texts

The first instrument consists of a set of texts that have been validated through an experiment to identify certain important perceptive characteristics for students and lecturers, so that they can be used successfully to measure and assess competences, skills, and comprehension.

This corpus was compiled following a peer-reviewed selection process (three experts filtered the texts selected by students) among a larger set of texts that met a number of homogeneity, quality, and seriousness criteria. Namely, the texts: a) came from an official and reliable source; b) were written in Spanish and English; c) had a brief length (around 2500 words); and d) were about a current, interesting, and easy to understand topic. A questionnaire was designed so that a sample of students could evaluate variables such as text comprehension, interest, credibility, and quality, among other. 324 students from Journalism, Audiovisual Communication, Information Science, and Psychology degrees at Malaga and Granada universities participated. An intergroup experiment design was followed and each group of students only evaluated one text. Results allowed narrowing the corpus selection to the 9 texts with the highest average scores on credibility and interest, and a good level of comprehension and quality. More specifically, the experimentally validated texts were about diverse and current topics, such as food safety, nutrition and health, environment, consumption of digital news, labour safety, crisis in education, and sexual exploitation. All the texts had a Spanish and an English version (thus ensuring their usage in different countries) and came from sources that are international organisations, such as FAO, UNESCO, the EU, and the ILO.

These texts can be used as a useful and valid educational tool in teaching and learning processes and as to assess skills, competences, and comprehension, depending on the learning objectives defined by lecturers and the characteristics of the students. Their usage and application with these purposes are guaranteed through experimentally validated indicators.

3.2 The IL-HUMASS Test

The previously described IL-HUMASS test [11] was adapted to self-assess and report perceptions on information competences. The design of the instrument followed a two-tier process. First, a positivist approach to reality, assuming an objective perspective to describe measurable properties that are independent from the observer. Secondly, an interpretative approach, assuming access to reality through social constructs such as language, consciousness, and shared meanings [13]. The final version of the IL-HUMASS test included 26 items grouped into four categories (information search,

evaluation, processing and communication/dissemination) and three self-reporting dimensions (motivation, self-efficacy and favourite source of learning). These dimensions were finally defined as follows: the importance of the competences for academic progress (motivation), the level of skill in the competences (self-efficacy), and selecting among class, library, courses, self-learning, and others as the way of learning the competences (favourite source of learning). Students are requested to indicate their assessment of the competences by marking their answer on a scale from one (low competency) to nine (excellent competency) for each of the dimensions.

The self-reporting nature of this test involves a self-assessment approach that has rarely been proposed so far and only in a limited way. It is a singular and complex diagnostic tool that will enable a better understanding of the user groups involved through a mixed analysis that includes two quantitative dimensions (motivation and self-efficacy) and one qualitative dimension (the preferred source of learning).

To validate the IL-HUMASS test it was applied to two important samples: firstly, to 2072 Social Science and Humanities students from three Spanish universities, in an attempt to gain a better understanding of their information literacy from an internal perspective [14]. Secondly, it was also recently applied to 452 first-year students of six degrees of Social Sciences' studies. Some of the key findings revealed a significant positive relationship between motivation and self-efficacy, providing an opportunity to highlight these internal information literacy dimensions as an academic and institutional issue. On the positive side of the balance, schematising and abstracting information, and writing documents, reports, and academic assignments were found to be the best assessed competences. On the other hand, the use of informal electronic sources of information, the use of database managers, and the use of bibliographic references managers presented lower assessment scores, thus suggesting a need for further training, for instance, in the form of specialised courses.

3.3 Information Competence Knowledge Test

The knowledge test was designed as an objective way of measuring knowledge about the competences as a whole, both of general and specific nature. It consists of 78 items with 4 possible answers each and follows the same categories of competences defined for IL-HUMASS, so that they can be subsequently compared. There are questions about the four categories and the 26 competences of IL-HUMASS, i.e.: information search (in printed and electronic sources, informally and in the internet, in catalogues and secondary sources, about terminology, and about search strategies), information evaluation (quality, main ideas, updated information, relevance of authors and organisations), information processing (recognising text structure, schematising and abstracting, using database and reference managers, and installing and using statistical and spreadsheet software), and communication/dissemination of information (communicating in public, communicating in other languages, writing academic documents and preparing presentations, knowing the code of ethics of academic/professional field, knowing the laws on the use of information and intellectual property, and disseminating information on the internet).

This test, in combination with IL-HUMASS, provides us with subjective and objective feedback on students' perceptions and knowledge about information competences. It was piloted on a sample of Information Science students and it showed high internal consistency indexes and that it fulfilled its objective in an efficient manner.

3.4 Information Competence Assessment Rubrics

After getting to grips with “knowing how to be” information literate and the “knowledge” of information competences, we developed a set of assessment rubrics to measure students' “know-how” in applying their competences to solve problems related to information search, evaluation, processing, and communication/dissemination. Assessment rubrics were developed for the following information competences according to an experimental design: being familiar with specialised terminology, being acquainted with information search strategies, evaluating the quality of information resources, identifying an author's idea in a text, schematising and extracting information, recognising the structure of a text, and designing academic presentations. A pilot test was applied to first-year Information Science students and some capabilities and limitations were found. They were familiar with the terminology of the analysed text, although they had difficulties to interpret it. In *being acquainted with information search strategies*, they used keywords in their searches proficiently, although they found it very hard to use diverse types of sources. In *identifying an author's idea in a text*, students scored highly when identifying the goals of the text, even though they showed more difficulties in its comprehension. The competence that caused more problems to them was *schematising and extracting information*, in particular when performing cognitive tasks for arranging ideas in order of importance and synthesising the information. Similarly, when *recognising the structure of a text*, the biggest problems were found to deal with understanding the logic behind the organisation of the text. Finally, students were best skilled when *designing academic presentations* to present their assignments.

4 Conclusions

Assessment of information competences must be able to acknowledge the ability to comprehend texts, students' information skills, their command of suitable procedures, and their capacity for knowing how to apply such know-how in an integrated manner to solve typical information-related problems. The tools presented here have been validated and can be applied to students of Social Science degrees in their early years at university.

The fact that students' learning assessment is not systematically performed in many programs at university libraries, or that lecturers do not have tools to assess these competences as part of the learning objectives of their modules, indicates that the information literacy paradigm is still in the process of being consolidated in Spain and therefore has not been firmly established among the teaching culture of our universities yet. According to the overall findings of applying the IL-HUMASS

survey and the knowledge test, it is suggested that its 26 variables should be considered as standards for assessing and measuring information competences, and closely linked with learning outcomes and, above all, with the learning programs of the degrees and faculties involved.

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Assessing Information Literacy Skills among Undergraduate Students at the Alexander Technological Educational Institute of Thessaloniki

Margarita Chatzilia¹ and Stella Sylaiou²

¹ Alexander Technological Educational Institute of Thessaloniki - Library, Sindos, Greece
hatzilia@admin.teithe.gr

² Hellenic Open University - School of Social Sciences, Patras, Greece
sylaiou@photo.topo.auth.gr

Abstract. The aim of this study is to assess IL skills among incoming students at the Alexander TEI of Thessaloniki, to: a) demonstrate the need for integrating IL programs into the academic departments' curriculum, b) recommend improvements for IL programs, according to the students' IL skills c) propose a methodological framework for assessing IL skills.

Keywords: Information literacy, Alexander Technological Educational Institute of Thessaloniki, Greece, ATEI of Thessaloniki Library, IL assessment, IL skills.

1 Introduction

As academic libraries design and implement Information Literacy (IL) programs, it is becoming essential to determine the status of students' IL skills, so as to meet efficiently their educational and academic needs with the implementation of user centered IL programs. Therefore the development of a specific assessment methodology will help librarians employ structured and measurable assessment for IL students' competence. The purpose was to develop a specific methodological framework to start mapping IL Skills among student population at the Alexander Technological Educational Institute (ATEI) of Thessaloniki, Greece. This framework can also be adopted by other libraries for the assessment of their students' IL skills in order to gain a better understanding of their IL strengths and weaknesses.

The review of the literature provided examples of assessing IL skills of students (for example: Chatzilia Garoufallou Mole Vafeiadis, Dunn, Fain, Burkhardt) and of measuring their self-efficacy (for example: Kurbanoglu, Kurbanoglu Akkoyunlu and Umay). Examples of integration of IL into the curriculum (D'Angelo Maid, Price Becker, Clark Collins) and of IL in social media (Carpan, Belanger Bliquez Mondal, Wan) were also considered. The aim was to assess IL skills among incoming first-year students at ATEI of Thessaloniki. The objectives were to assess skills [1] for: (1) Defining the Information Need (Formulation of research topic, definition of keywords, Document types, Source types), (2) Formulating a Search Strategy (Boolean Operators, Search Tools, Internet Search Tools) (3) Evaluating Information

(Evaluation Criteria for Print and Internet Sources) (4) Developing a Research Paper (Types of Research Papers, Presentation Skills) (5) Legal and Ethical Use of Information (Copyright Issues, Reading Citations, Using Bibliographic Styles, Referencing and Developing Reference Lists)

The expected outcomes were to: (a) Demonstrate the need for the integration of IL programs into the academic departments' curricula (b) Provide recommendations for improving IL programs, according to the students' IL skills as those were determined. - (b1) existing Library IL seminars and (b2) web-based IL program "Orion"¹. (c) Propose a specific methodological framework for assessing IL skills of incoming students in other universities.

2 Methodology

A methodological approach was designed according to the ACRL IL Competency Standards [2] and implemented, in order to create a specific framework for assessing IL Skills of students in other Universities. Five (5) specific themes were formed according to the five IL criteria from ACRL. Eleven (11) variables were formed under the 5 themes, in order to describe the Information Literate student. The questions of the questionnaire used for the study were formed according to the 11 variables.

Table 1. Methodological framework

Themes	Variables	Questions
1. Defining Information Need	1.1.Information Sources	9, 30
	1.2.Types of Information	10, 11, 30
2. Formulating Search Strategy	2.1 Search Strategy	12, 30
	2.2. Search Tools	13, 14, 15, 30
	2.3 Internet Search Tools	16, 17,18,19, 30
3 .Evaluating Information	3.1 Internet Sources	20, 21, 23, 30
	3.2. Books	22
4 .Developing Research Paper	4.1 Developing a Research Paper	24, 25, 29, 30
5. Legal & Ethical Use of Information	5.1. Copyright Issues	26, 30
	5.2. Bibliographic Citations	27
	5.3. Bibliographic Styles	28, 30

Questions 1-3 collected demographic data of the participants and questions 4-8 collected data regarding use of the Internet.

Total ATEI student population for the academic year 2012-2013 is 22.494. The number of Incoming First Year Students (FYS) registered is 3.055. A sample of 147 FYS was used with confidence level 95% and confidence interval 7 and 89. The target population was FYS, since IL skills and needs alter from FYS to seniors [3-4]. Five (5) Academic Departments out of the five (5) Schools of ATEI were represented (about 30 students of each Academic Department that participated). Figure 1 describes the sampling population and the male vs. female proportion.

¹ Web based IL program can be found in URL: <http://orion.lib.teithe.gr/>

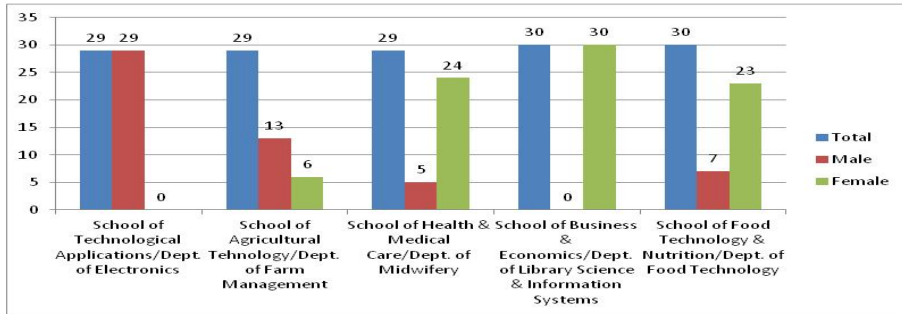


Fig. 1. Sampling population

Sampling was based on academic departments that had scheduled their FYS to attend a Library IL seminar. The age of students who participated was from 18 to 20 years old, as all students are incoming and attend their first year. The students sample in the Department of Electronics are all male, as they deal with specific and specialized subject fields, such as telecommunications, audiovisuals etc, subjects that are of interest mainly to males. On the contrary, students sample in Department of Midwifery are all female as they deal with midwifery care, pre and post-natal care etc, subject fields that are of interest mostly to female population.

Three questionnaires were designed to provide answers to the research questions.

The first questionnaire, for collecting quantitative data, was designed according to the methodological framework and answered by 147 participants before attending an IL Library seminar. Questions 1-3 collected demographic data; questions 4-8 collected data regarding the use of the Internet (frequency, browser options, reasons of use). Questions 9-29 collected data on students' IL skills, and question 30 provided data on students' IL self-efficacy [5], [6]. The pilot was tested on five (5) students – both first year and seniors- in different academic departments. The time that students needed to complete the pilot was 15 to 20 minutes. Of the 150 questionnaires distributed in total, 147 were used statistically, as three of them had missing answers.

The second questionnaire was designed to collect qualitative data gathered from 10 interviews provided by (a) members of Faculty, and (b) students, coming from the same Academic Departments. Sampling of Faculty and students was based on previous cooperation regarding IL seminars between the Library and Faculty. Interviews were scheduled by phone, took place at the campus of ATEI and lasted 20 minutes each. Questions (8 for Faculty and 4 for students) investigated views of students' deficiencies regarding the 5 themes as well as reasons for insufficient IL skills. Every member of the Faculty was asked to pick a student from class who had attended an IL Library seminar to participate in the interviews and to assess the IL seminar, in order for the Library to determine areas to improve IL seminars for the next academic year.

A third online questionnaire was designed and answered by 67 FYS, who had attended a Library IL seminar, aiming to assess IL seminars.

3 Discussion of the Results

Table 2 indicates the percentage of correct answers of participants according to the 5 themes and the 11 variables described in the methodological framework in Table 1.

Table 2. IL skills

Themes	Variables	Correct answers %
1. Defining Information Need	1.1. Information Sources	17.69
	1.2. Types of Information	11.56, 70.07
2. Formulating Search Strategy	2.1 Search Strategy	13.61
	2.2. Search Tools	69.39, 18.37, 15.65
	2.3 Internet Search Tools	11.56, 9.52, 23.81, 10.20
3. Evaluating Information	3.1 Internet Sources	82.99, 30.61, 56.46
	3.2. Books	55.78
4. Developing a Research Paper	4.1 Developing a Research Paper	38.78, 32.65, 48.98
5. Legal & Ethical Use of Information	5.1. Copyright Issues	40.14
	5.2. Bibliographic Citations	17.01
	5.3. Bibliographic Styles	9.52

In the 1st theme, students demonstrate little or no knowledge in the variables of distinguishing information sources and types of information. The 70.07% refers to a question about the Internet as a type of information. Students demonstrate a high rate in this particular question as most of them use the Internet on a daily basis and also demonstrate self-efficacy in the use of it.

In the 2nd theme, students demonstrate insufficient knowledge (13.61%) on conducting a search strategy using Boolean operators, and little knowledge on using library tools for their searches. Very low percentages of correct answers appear in the use of the OPAC (18.37%) and the Institutional Repository “Eureka!” (15.65%). Very low percentages of correct answers also appear in the use of all Internet Search Tools (Listservs, Meta search engines, Google, Google Scholar), which indicates a contradiction towards self-efficacy that students have regarding their knowledge regarding the Internet. Therefore, although students believe they are capable Internet users - according to the results drawn from this survey - they are not.

In the 3rd theme, most students answer correctly the questions under the variables of Evaluating Internet Sources (82.99%, 56.46%) and Evaluating Books (55.78%). The percentage 30.61% refers to a question about identifying a URL. Therefore, it can be assumed that although students have theoretical knowledge about evaluation criteria regarding the Internet, they do not have practical skills in applying those criteria.

In the 4th theme students demonstrate limited knowledge (38.78%) on presenting a scientific paper. They also appear to have several weaknesses on the structure (32.65%) and on the layout (48.98%) of a scientific paper. Faculty interviews also reveal students’ weaknesses in putting together and in presenting a research paper.

In the 5th theme very low percentages indicate weaknesses on Copyright issues (40.14%), and on identifying bibliographic citations (17.01%). An extremely low percentage was also noted on using a specific bibliographic style for conducting a reference list and in-text references (9.52%). Insufficient knowledge on ethical and legal use of information contains the risk of plagiarism, which is also indicated by the Faculty interviews.

The table above describes IL self-efficacy of students per ATEI School in contrast with the percentage of correct answers they provided in the questions regarding the assessment of their IL skills.

Table 3. IL Self-efficacy per school

Themes	Variables	Correct answers %	Sch.of Tech. App.	Sch.ofAgr ic. App.	Sch.of Food Tech. Nutr.	Sch.of Health Med. Care	Sch. of Bus. Adm. Finance	
Defining Information Need	Info. Sources Types of Information	17.69 11.56, 70.07		68.9%	72.4%	41.3%	56.6%	40%
Formulating Search Strategy	Search Strategy Search Tools	13.61 69.39, 18.3, 15.65	68.9%	89.6%	72.4%	93.3%	90%	
Evaluating Information	Internet Search Tools Internet Sources Books	11.56, 9.52, 23.81, 10.20 82.99, 30.6 55.78	96%	79.3%	65.5%	86.6%	83.3%	
Developing Research Paper	Developing a Research Paper	38.78, 32.65, 48.98	31%	55.1%	37.9%	36.6%	30%	
Legal & Ethical Use of Information	Copyright Bib. Citations Bib. Styles	40.14 17.01 9.52	37.9%	48.2%	31%	63.3%	50%	

It is worth noticing that in the first theme, students of all Schools believe that they are more information-literate than they are in reality, as shown from the percentage of correct answers in both variables. The 70% in Identifying types of Information refers to a question about the Internet, to which they seem to have more sufficient knowledge as the majority of them uses it on a daily basis.

In the second theme students of all Schools have higher self-efficacy in all three variables than they are in reality according to their scores. It is worth mentioning that although students think they have IL skills regarding the use of Internet tools, their extremely low percentages of correct answers (11.56%, 9.52%, 23.81%, and 10.20%), indicate exactly the opposite.

In the third theme students' self-efficacy seems to comply with their scores. Therefore, they seem to believe that they have IL skills in evaluating information in

both variables - the Internet and print resources – and their scores indicate that in the theme of evaluating information they possess more sufficient knowledge than in any other of the five (5) themes in total.

In the fourth theme students’ self-efficacy also complies with their scores. They seem to understand that they have poor knowledge on structuring and presenting a research paper and their scores indicate exactly the same.

In the fifth theme, students in the majority of Schools believe they have insufficient knowledge, which also complies with their low percentage in correct answers in all three variables. 63.3% of students of School of Health and Medical Care believe that they are information literate regarding legal and ethical use of information – a percentage bigger than that of the other Schools- due to the fact that this particular School schedules Library IL seminars for the majority of its students, and therefore, students feel they have more knowledge than they really do.

4 Recommendations

Recommendations to the ATEI Library were based on a careful review of the students’ scores and the interviews, and developed according to the expected outcomes: 1. Demonstrate the need for the integration of Library IL programs into the academic departments’ curricula [7-8]. This also complies with the qualitative data from Faculty/students’ interviews and data from the online IL assessment questionnaire, where 71% of students that attended an IL Library seminar believe that it should be integrated into their curriculum. 2. Improve Library IL programs: 2.1 Library IL seminars should: (a) take place in computer classrooms for practice with hands-on exercises. This also complies with the students’ answers from the online questionnaire, where 44% believe that having practical exercise on computers would help them get the most out of IL seminars.

Table 4. IL Seminar improvements

Recommendations for IL Seminar Improvements	Answers %	Recommendations for IL Seminar Improvements	Answers %
Pamphlets, Photocopies	14.67	More Time	5.33
Practical Exercise on Computers	44.00	Better Venue	18.67
Two Sequential Sessions	8.0	Smaller Audience	9.33

(b) Suggest hands-on exercises to themes and variables that students have insufficient or no knowledge according to their scores as indicated in Table 2. (c) Be rescheduled and emphasize specific IL needs, as those differ from FYS to seniors [9], as was also indicated by the Faculty and the online questionnaire, where 69% of students want to be re-educated on IL according to their academic IL needs. 2.2 Web-based IL program “Orion” should: (a) Include interactive exercises related to the themes and variables that students have insufficient knowledge as indicated by the results of this survey. (b) Develop and include sections about Internet search tools. (c)

Incorporate web 2.0 tools and technologies into teaching IL, in order to support learning goals and outcomes [10] and transform IL into IL 2.0. (d) Design and implement assessment plan for Library IL programs with the cooperation of Faculty and librarians [11]. 3. Develop a methodological framework (Table 1) for assessing IL which can be adopted by other libraries wishing to implement an IL assessment plan regarding their students' IL skills.

5 Future Work

Some ideas arose from the findings of this particular survey, the design and use of the methodological framework and the analysis of the results.

(1) Implement the methodological framework (a) for each one of the five (5) Schools of ATEI, in order for the findings to be subject and discipline oriented, (b) for senior students to assess IL skills and measure information competency in senior academic year. (2) Conduct a survey using pre/post tests regarding the Library's web based IL program "Orion" to compare students' scores before and after the use of it. [12-13], (3) Survey on the use of web 2.0 tools and technology in IL programs [10], [14], (4) Survey on the use of Internet tools and their integration into the Library's resources [15] compared with the traditional library tools and databases.

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Information Literacy of Public Health Students in Bordeaux, France: A Cross-Sectional Study

Beatriz Rodrigues Lopes Vincent¹, Martha Silvia Martínez-Silveira¹,
Maurício Roberto Motta Pinto da Luz¹, Evelyne Mouillet²,
and Luiz Antonio Bastos Camacho¹

¹ Fundação Oswaldo Cruz, Rio de Janeiro, Brasil

bvincent@fiocruz.br, marthas@bahia.fiocruz.br,
mauluz@ioc.fiocruz.br, luiz.camacho@ensp.fiocruz.br

² Institut de Santé Publique Épidémiologie et Développement, Bordeaux, France
evelyne.mouillet@isped.u-bordeaux2.fr

Abstract. This study builds on an earlier Information Literacy (IL) assessment of Public Health (PH) students, where graduation background was associated with IL. Here, we described the IL of PH students and investigated if the country of origin is an associated variable. A cross-sectional study with 151 PH master students attending the *Institut de Santé Publique d'Épidémiologie et de Développement* on face-to-face and distance education modalities was developed with a customized questionnaire applied during an IL course. Overall, participants (Ps=86) showed positive IL basic skills, but used less frequently the more sophisticated resources. Differences between French (55) and Foreign (31) Ps were noticed in the choice of information sources and previous learning opportunities. In addition to graduation background, the shortage of information resources and lack of expert IL tutoring in the respective countries could be associated with IL differences. Course planners of international PH programs should take these variables into consideration.

Keywords: Information literacy, public health, information seeking behavior.

1 Introduction

In the health arena, Information Literacy (IL) studies have been conducted worldwide - Americas [1], Europe [2] and Africa [3-4]. These studies applied questionnaires to investigate a variety of aspects related to users' knowledge of information resources as well as their attitudes and behaviours. The first study [1] applied the Research Readiness Self-Assessment (RRSA) Health Version on thousands of higher education students. The authors showed the lack of important competencies essential for finding and evaluating health information and suggested that the RSSA provides objective measures of IL skills. The RSSA scores varied widely among participants, even within students with equivalent education levels. In addition, they considered that individuals with more education had better IL skills than individuals with less education.

Early in 2005, a Brazilian study assessed IL using an original questionnaire applied to medical residents [5]. Four years later, we adapted this questionnaire and undertook a cross-sectional study to investigate IL among Public Health Graduate students attending the *Escola Nacional de Saude Publica Sergio Arouca, Fundação Oswaldo Cruz*, Brazil [6]. Preliminary findings suggested that age, type of training received and command of the English language were variables associated with the usage of a local proprietary full-text journal portal [7]. Following subsequent analysis, we suggested that previous under graduate area would also be associated with IL competences [11]. These earlier results led to the current study (named “Bordeaux study”), which aimed to describe the IL of PH master students (PHMS) in a French institution and investigate IL differences considering country of origin in order to better plan specific teaching strategies.

2 Methodology

A cross-sectional study accessed the IL of PHMS attending the *Institut de Santé Publique d'Épidémiologie et de Développement* (ISPED), Bordeaux, France. ISPED is a teaching and research institution welcoming French and foreign students on face-to-face (FF) and distance education (DE) modalities. In January 2011, at the beginning of the academic year, the enrolled PHMS were contacted during the course unit "*La recherche documentaire en santé publique. Méthodes, pratiques et outils*". This obligatory discipline is offered twice during the master course, at first (M1) and second (M2) years. We translated and adapted the IL questionnaire [6-7] to French and delivered it in two formats. The FF students received the printed version; DE students accessed an electronic template with a built-in database hosted at the local server. The study was open for a month, and two e-mail messages reminded students to participate. We typed the data or had it read into an Excel spreadsheet. Participants' e-mail addresses allowed us to match IL items with respective academic and demographic ones. Statistical analysis was performed with SPSS (17.0). The response rate (RR) was the ratio between the number of participants and the overall enrolled students. We conducted a descriptive study for participants (Ps) and non-participants (NPs). Academic, demographic and IL data were analysed regarding Ps' geographical origin as French (FrPs) or foreign (FoPs). The Chi-square was used to test for statistical significance of proportions and the Mann-Whitney U test to compare median age values; *p*-values smaller than 0.05 were considered significant. Options within items 7, 8 and 9 of the questionnaire were sorted by frequency and the top choices were compared.

3 Results

For the totality of PHMS (n=151), 93 (61.6%) were women, age ranging from 20-55 years, mean 28.9 (SD: 7.9), 65.3% were from France (n=98) and the foreigners were drawn from 18 different nationalities (see Table 1). For the totality, 62.3% were M1 students and 64.9% attended the FF modality. As for previous education, 73 (48.3%)

had a Bachelor degree (*licence*), 12 (7.9%) had a Master of Science degree, 47 (31.1%) were physicians, eight (5.3%) were pharmacists and seven (4.6%) were nurses. The response rate (RR) was 56.9%. Ps (n=86) were statistically similar to NPs according to all but one variable, year (M1) ($p < 0.001$). Ps were less frequently from France, less frequently on FF and more frequently enrolled in M1 than NPs.

Table 1. Demographic and academic profile regarding study participant and non-participant

	Ps n=86	NPs n=65	<i>p</i>	Total n=151
Sex			0.991	
Men	33 (38.4%)	25 (38.5%)		58 (38.4%)
Age (years)			0.104	
Median	25	28		26
Mean	28.1	29.9		28.9
Country of origin France*	55 (64.0%)	43 (67.2%)	0.681	98 (65.3%)
Year M1	67 (77.9%)	27 (41.5%)	< 0.001	94 (62.3%)
Face-to-face	55 (64.0%)	43 (66.2%)	0.779	98 (64.9%)
Graduation background			0.326	
Medicine	24 (27.9%)	23 (35.4%)		47 (31.1%)
Other	62 (72.1%)	42 (64.6%)		104 (68.9%)

*n=150

For the French Ps (FrPs) (see Table 2), age range was 21-32 years, mean 23.5 (SD: 3.2). For the Foreign Ps (FoPs), age range was 26-49 years, mean 36.3 (SD: 5.7). FrPs were mostly women, younger and under the FF modality, while FoPs were mostly men, doctors, older, and under DE modality. FoPs came from Algeria, Benin, Burkina Faso, Cameroun, Chad, Congo, Egypt, Gabon, Germany, Guiney, Haiti, Ivory Coast, Kosovo, Mali, Niger, South Africa, Spain and Syria.

Table 2. Demographic and academic profile regarding French and foreign participants

	FrPs n=55	FoPs n=31	<i>p</i>	Total n=86
Sex			< 0.001	
Men	11 (20%)	22 (71.0%)		33 (38.4%)
Women	44 (80%)	9 (29.0%)		53 (61.6%)
Age (years)			< 0.001	
Median	22	36		25
Mean	23.5	36.3		28.1
Years			0.025	
M1	47 (85.5%)	20 (64.5%)		67 (77.9%)
M2	8 (14.5%)	11 (35.5%)		19 (22.1%)
Face-to-face	48 (87.3%)	7 (22.6%)	< 0.001	55 (64.0%)
Graduation background			< 0.001	
Medicine	0	24 (77.4%)		24 (27.9%)
Other	55 (100.0%)	7 (22.6%)		62 (72.1%)
Internet access at home			0.695	
	51 (92.7%)	28 (90.3%)		79 (91.9%)

Table 3. Answers to selected questionnaire items regarding French and foreign participants

Item	Answer	FrPs n=55	FoPs n=31	<i>p</i>	Total n=86
1. Through which of the resources it is more frequent that you receive information on innovations or discoveries in your professional area?	Library or Librarians	44 (83.0%)	15 (60.0%)	0.027	78
	Documents from your own sources (for ex. Books)	34 (61.8%)	26 (96.3%)	0.001	82
	University Portal of electronic resources	38 (73.1%)	11 (45.8%)	0.021	76
3. How did you learn the techniques for database searching?	You received orientation or training from a librarian	15 (27.3%)	0	0.001	86
	You received orientation or training from a professor during an undergraduate or graduate course	25 (45.5%)	7 (22.6%)	0.035	86
4. Strategies you use when searching electronic databases	Select the «advanced search» option	53 (96.4%)	19 (63.3%)	< 0.001	85
	Use other database tools (i.e. “limits”, “field search” or “index”)	24 (43.6%)	6 (20.0%)	0.029	85
6. How often do you search in the databases?	Don't know the Cochrane Library database	41 (75.9%)	14 (45.2%)	0.004	85
7. In relation to your scientific literature search in electronic sources what are the problems you find more frequently?	Finding keyword(s) for a good search strategy	14 (77.8%)	4 (22.2%)	0.018	74
	Free full-text	22 (75.9%)	7 (24.1%)	0.005	75
8. What factors do you use to select the documents that you would like to read?	I look in details if the document is available online	18 (78.3%)	5 (21.7%)	0.006	74
9. How do you obtain the full-text of the documents selected in the databases?					

Obs1: For estimates, missing values were disregarded.

Obs2: For items 7, 8 and 9, options were sorted by frequency and top choices were compared.

Regarding IL items, 95.2% of Ps used health agencies websites and 94.1% relied on PubMed/MEDLINE bibliographic database (Item 1). 96.5% did their own information search (Item 2) and 44.2% learned on their own to interrogate the bibliographic databases (Item 3). 84.7% used the "Advanced Search" option; one third used the Medical Subject Heading (MeSH) Thesaurus (Item 4). 32.5% were satisfied with the results, even though obtaining a large number of references (Item 5). 64% used often the MEDLINE database, while 64.7% did not know the Cochrane Library database. For item 7, problems often occurred when making use of electronic resources, the top choice was "Knowing where to go for information" (n=24). For a strategy when selecting a document (Item 8), the top choice (n=29) was "The full-text document is free". As a procedure for getting the full-text document (Item 9), the top choice (n=23) was "Looking carefully whether the documents are available online".

Table 3 shows contrasting differences between FrPs and FoPs concerning the nature of the information sources used, previous learning opportunities and search strategies. None of the FoPs learned from a librarian how to retrieve the literature, and less than 25% from a professor. FoPs were less experienced with advanced search options. FrPs were less aware of the Cochrane library database and had problems when choosing adequate search terms. When selecting a document FrPs were less prone to pay for a full-text document and more prone trying to find it online.

4 Discussion

The Brazilian [6-7] and Bordeaux studies were both cross-sectional in design, but had different data collection methodologies. The questionnaire versions in Portuguese and French ended up different from each other. The questionnaire translation and adaptation to the French information context was a challenging process. Although composed by trilingual IL experts, the group was surprised by numerous cultural and context particularities. When elaborating the French version we had to deal with wording, meaning and querying differences. The lack of formal re-validation could be a limitation. Nevertheless, in the process of adaptation the experts agreed on the content validity of the questionnaire and the results supported the construct validity of IL as assessed by the questionnaire.

The Bordeaux study shares important aspects with the Brazilian one [6-7]. In the Brazilian study 321 students were enrolled, 12 foreigners. Eighty-eight responded, one from Colombia. As for the educational background, the enrolled Brazilian students came from 40 different under graduation courses; Ps came from 20 ones, including social sciences, health areas and engineering. Indeed, high-level PH programs in Brazil show a mixed student profile and, due to this heterogeneity, PH students would benefit from a core of knowledge and practices [8]. Although not stated in Minayo's work, we consider that IL skills relate to "the methodologies" promoting students' autonomy to "learn how to learn".

The RR for the Brazilian [6-7] and the Bordeaux studies were respectively 27.4% and 56.9%. Although bearing different data collection methodologies, we attributed the larger RR at the Bordeaux study to its targeted sample of students attending an on-going

IL course. Measures for quality control of data entry would have been prevented from missing/mistakes in the electronic version of the questionnaire. Although there were no sampling methods, the 86 Ps in the Bordeaux study seem to well represent the universe of the 151 enrolled students (Table 1). On the other hand, as the 31 FoPs came from 18 different nations, further discussion involving individual countries is not possible due to the diversity of the backgrounds of the group (Table 2).

Having in mind that self-reported IL skills may not correlate to actual skills as “84% of undergraduate students think favourably of their own information skills and rate them as good, very good or excellent” [1], Ps showed positive IL basic skills and used less frequently the more sophisticated resources. Ps are satisfied with the results of their searches, even if they realize the information they need comes within a large volume of inappropriate referrals. Ps expressed their inability to choose keywords, and select them from a Thesaurus, a necessary step in order to obtain quality references. This reflects the unawareness that trustworthy information does not consist in the quantity but in the relevance.

The next necessary step is to select and find the respective full-text documents. Interestingly, the study showed that their main criterion for document selection was its availability online. Differences emerged when we compared FrPs and FoPs (Table 2 and Table 3). FoPs were mostly older, males and physicians. These may explain why FoPs were more aware of the Cochrane library database, a particularly important tool for clinical practice. FrPs more frequently accessed resources like Library/Librarians and University Portals, while FoPs more frequently used private ones like books. Previous learning opportunities with librarians/professors were more frequently observed among FrPs. Their preferences for free full-text/online documents could be explained by the fact that FrPs are already used to a wealth of information and “easy to get” materials, while FoPs were still not aware or used to it.

We highlight the results for the item “How did you learn the techniques for database searching” (Table 3). In the Brazilian study [7], we compared previous learning experiences among users and non-users of the CAPES portal, a Brazilian resource of proprietary full-text journals and reference databases. In the Bordeaux study, we compared previous learning experiences among FrPs and FoPs. Whatever the tutor’s background be they librarians or professors, and be the location at a library or at a classroom, the studies showed consistent findings. It called our attention to the need of formal IL teaching.

The current literature ratifies our observations regarding access to resources, level of search skills, previous learning opportunities and language barriers. In the Tanzanian study [3], only 15% of the medical students used online library catalogues and 23% had ever consulted an electronic journal; while 60% learned by themselves. In the Sudanese study [4], 53.5% had access to full-text journal articles. We could attribute this rate to the fact that Sudan is a member of the HINARI-World Health Organization initiative [9], and hence are entitled to access a prestigious list of proprietary biomed journals. However, as 54.7% had “poor skills” [4], the higher rate of access to full-text journal articles in Sudan may not correlate with corresponding IL skills. The French study with gynaecology-obstetrics trainees [4] had 51% self-teaching, while 22% mentioned English barriers [10]. The Sudanese study [4] also

raised the language barrier issue. Brazil is a Portuguese speaking country. Although the Brazilian PHPGS passed a mandatory English admission exam, we observed language barriers associated with poor IL skills [6-7]. Language barriers may well apply to this international setting. Therefore, since we did not assess the English proficiency of the PHMS at the Bordeaux study, it is plausible that English barriers may have biased our results.

The lack of IL skills among international post-graduation students contrasts with the emerging number of academic institutions expanding their teaching horizons through online courses [3]. Apart from students' age, command of the English language and graduation background, PH course planners worldwide should consider the shortage of information resources and lack of previous expert tutoring at the students' home country as IL associated variables.

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The “Information Literacy Self-efficacy Scale” and the Medical Curriculum at Ghent University

Ann De Meulemeester

Knowledge Center Ghent, Ghent University
Ghent, Belgium
ann2.demeulemeester@ugent.be

Abstract. A study was conducted of all medical students (n=1253) in the five first years of the medical curriculum of Ghent University. The study focused on the effect of learning in a medical undergraduate curriculum, in relation to the results of information literacy self-efficacy (ILSE) beliefs and information literacy skills. All students were invited to participate in an ILSE questionnaire and a progress test of information literacy (PTIL). Mean scores of ILSE and PTIL were evaluated. Spearman correlation was used to evaluate the consistency between ILSE and PTIL. Our findings indicate that the PTIL did not further increase after the second year, while the ILSE beliefs did. This brings us to the conclusion that information literacy training should be boosted throughout the entire curriculum.

Keywords: Self-efficacy, information literacy, medical curriculum, higher education, progress test.

1 Introduction

Information literacy (IL) is defined as “a set of abilities requiring individuals to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information” [1]. IL enables learners to master content and extend their investigations, become more self-directed and get more control over their own learning. It forms the basis of lifelong learning. The learning path is common for all disciplines, learning environments and at all levels of education [1]. Information skills are essential for a successful academic track. Kılıç-Çakmak [2] indicated that many higher education institutions were launching projects to enhance the IL skills of students.

Pinto [3] defined three dimensions of educational activity: knowledge, skills and attitude. According to Bandura [4] self-efficacy (SE), or an individual’s belief in her/his own ability to succeed in a specific task, is an important influencing factor of performance. Persistence or resilience is crucial for information problem solving, self-regulated learning and lifelong learning [5]. Research [6] confirmed that training of students to strengthen their SE and their belief to have the ability to determine their performance, can facilitate valuing effort and hard work. As contended by different researchers [7-9] the context or specific domain wherein SE is evaluated is considered

to be important, as an individual can be more or less confident according to the discipline, domain or other situational differences. Qualitative research indicates that students gain a better appreciation of certain resources when they are discovered or introduced at a contextually appropriate point in their learning path. Teaching valuable use of non-medical and medical resources should therefore be introduced at relevant points in the curricula [10].

Students can become information literate only if they proactively and independently choose to pursue the opportunities that are available to them during the process of their education [2]. Consequently, education should be focused on both the development of IL skills and the attainment of a high sense of SE. Moreover Kingsley [11] advised incorporating IL training early in the curriculum, to help students develop their IL skills and SE. IL skills training should be integrated not only during the first two years of the curriculum, but also taught throughout the entire medical education, in order to enhance retention of IL and lifelong learning knowledge and skills [12].

2 Background

The purpose of this study was to investigate the relationship between the learning outcomes of IL training and SE within the medical curriculum (6 years) of Ghent University. Students starting at the medical faculty of Ghent University already passed an entrance exam for medicine. This exam is a major selection factor in the general competences of our study population. It consists of two parts: “knowledge and insight in sciences” and “acquiring and processing information”.

Training in IL skills is integrated in the curriculum and examined at the end of each semester, when the course was scheduled. The curriculum provides combined courses of lectures and practice in IL skills until the 3rd year. This combination is important to activate learning within a context. Eskola [12] researched IL in the medical curriculum by describing learning methods. For the medical curriculum, problem-based learning is essential within the educational program. Problem-based learning uses students' initiative as a driving force; they have to define the subject, formulate the questions, provide the answers and teach to or share with other students.

Storie and Campbell [10] stated in 2012 that the development of IL skills is recognized as an important aspect of medical education and the practice of evidence-based medicine. Moreover information retrieval and critical appraisal of information have become important as medical education standards require medical students and residents to possess competency in those skills. Likewise the objectives of the medical curriculum of Ghent University include goals related to IL: “Physicians should possess skills and attitudes to acquire and process adequate information. Physicians should have the knowledge, skills and attitudes concerning scientific research: this concerns primarily skills in dealing with critical findings concerning scientific research, in finding relevant scientific information, in obtaining the ability to deal with “guidelines” and in developing a critical reading culture and awareness of the possibilities and limitations of scientific research.” [13].

This research on the effect of learning in a medical undergraduate curriculum on the results of the ILSE beliefs and the IL skills is supported by the Commission of Education of the curriculum of medicine and has been approved by the Ethical Commission of the Ghent University and the University Hospital of Ghent.

3 Data Collecting Tools

All students were presented two tools, the Information Literacy Self-Efficacy (ILSE) questionnaire and the Progress Test in Information Literacy (PTIL). Students were confident they could answer without inhibitions, because all test results were made anonymous through a Trusted Third Party. In this way, the different test results can be linked anonymously at a student level and can be used for longitudinal research. SPSS statistics 21 was used to manage the data.

3.1 Information Literacy Self-efficacy Scale

Two different questionnaires were used to assess the ILSE competences. First a standardized ILSE- scale developed by Kurbanoglu, Akkoyunlu and Umay [5], composed of 7 factors and 28-items. The factors of the scale are determined as “defining the need for information”, “initiating the search strategy”, “locating and accessing the resources”, “assessing and comprehending the information”, “interpreting, synthesizing, and using the information”, “communicating the information” and “evaluating the product and process”. These skills are mandatory in a general context of IL or education. Secondly we administered a SE-questionnaire with 10 additional IL skills (basic to advanced) specific for medical sciences, as the context is considered important to evaluate SE. The personal degree of confidence is evaluated on a scale of 0–100. The SE questionnaires were both conducted in English and every question was made mandatory.

3.2 Progress Test on Information Literacy

Simultaneously, IL skills were evaluated by a PTIL. Students of medicine in Ghent are familiar with progress tests, as every year in November they have to participate to a progress test in medicine [14]. Every student from study year 1-6, has to answer the same questions. The PTIL was especially developed in the same way and consists of 30 questions measuring basic to advanced skills of IL within a medical context. Every academic year a new set of questions is set together, evaluated by the head of the curriculum and by the Ethical Commission. The questions are set up in multiple-choice form, are mandatory and prepared in Dutch, the language of education.

4 Cohort

In the academic year 2012-2013, all medical students (n=1253) from study year 1-5 at Ghent University were invited to complete the different questionnaires (response rate of 77.5%). The 6th year of the curriculum will be investigated in June 2013, after their

final clinical examination. All tests from study year 1-5, were conducted in the first two weeks of the academic year. In this way we will have results from students starting in their first week at university, as well as students ending their studies. All students were gathered in different groups, on campus, to fill in the questionnaires.

5 Results

The results for the academic year 2012-2013, presented in this paper are a part of an extensive longitudinal (2011-2014) research evaluating IL within the medical curriculum.

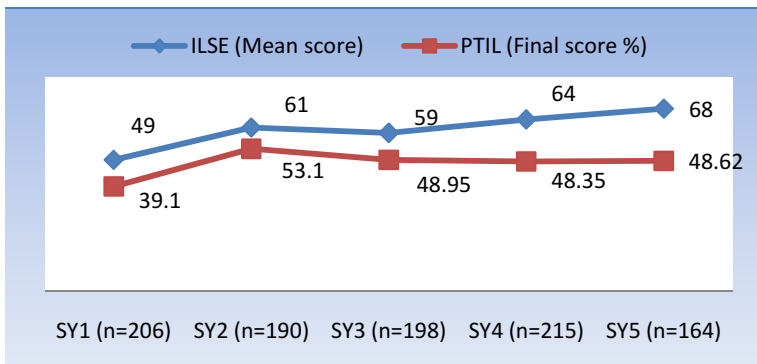


Fig. 1. Results by study year (SY) for the ILSE beliefs and the PTIL scores

We notice a low self-efficacy in year 1 which is normal as they have just started their academic career. The highest self-efficacy is in year 5.

The PTIL scores in study year 2 are the highest, which is a result of an intensive course in the first year. Students were tested about their knowledge and are still aware of their skills. After the third year the skills are less tested and we see no further growth of their knowledge in IL.

Spearman correlation (r_s) was used to evaluate the consistency between ILSE and PTIL in study year 1-5. We notice in study year 1-4 a positive and significant correlation and in study year 5 a negative and non-significant correlation ($r_s = -.104$, $p = .198$).

If we compare the scores of both tests we note in the 5th year a result we did not expect. Looking at the results of the SE mean score (68), we would suppose a much higher result of the PTIL (48.62%). Students feel confident, but the IL test results do not indicate results similar to PTIL test results.

6 Further Research

Further detailed research is required. We will need to identify why the results of the first year students are higher than expected. Is it because the students guessed the answers correctly, or is it because the students already went through the entrance

examination of "Acquiring and processing information". After every question of the PTIL, students were asked on a scale of 1 (I do not know the answer) to 5 (I am 100% sure of my answer) if they were confident about the response they gave.

Research on the level of each individual question will be the next step, as we should analyze which problems, in gaining IL skills, come forward and in which study year. This will be monitored and will be taken in account for further determination of content for the future IL courses.

The cross-sectional design of the study, results in some inter-group variability (year 5). Longitudinal follow up is needed and planned.

7 Conclusion and Discussion

The results of the students' PTIL in higher stages of the curriculum are disappointing. The test is build up as a progress test, therefore students of the 5th year should be familiar with all questions. Our finding that the PTIL scores did not further improve after the second year while ILSE beliefs did, makes us recommend that IL training should be boosted in the entire curriculum. As Eskola [12] stated, the skills should be taught throughout the entire medical education in order to enhance the retention of the knowledge and skills in IL. Students need to be instructed at the right time, when information is needed; consequently students will be motivated to learn. Integration of practice at all stages of the curriculum is necessary. Here lies the responsibility of the teachers. They need to be familiar with all aspects of IL and need to include the information resources in a structured way in their courses. IL is a responsibility of the entire faculty [15].

The results of the research are already being taken into consideration for an adaptation of the curriculum for the next academic year 2013-2014. Some parts instructed in the first year are moved to the third year and vice versa. The need to boost training is essential. Thus some important parts of the first year are going to be repeated in the third year. A manual for training in IL [16] within a medical context will be updated and republished in June 2013. The aim is to use the manual as a study framework throughout the whole curriculum. Students are getting guidelines in how to handle (locate, search, evaluate, publish...) scientific knowledge, and, moreover, medical information.

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Information Literacy Skills Assessment of Undergraduate Engineering Students

Mamoona Kousar¹ and Khalid Mahmood²

¹ Air University, Islamabad, Pakistan
librarian@mail.au.edu.pk

² Department of Library and Information Science,
University of the Punjab, Lahore, Pakistan
khalid.dlis@pu.edu.pk

Abstract. This study assessed Information Literacy (IL) skills of first year undergraduate engineering students of a Pakistani university in order to plan instruction; and to provide the university with reliable data for integration of instruction in the university curricula. Independent samples t-test and ANOVA were applied to check gender and program based differences in IL skills of students. No gender or program-based difference in IL skills of students was found. It was also revealed that students did not possess IL skills good enough to help them in their university level studies. They do not have a fair idea about methods and tools to be used to retrieve required information from various resources. This low level of IL skills shows the need for an IL program properly planned, designed and carried out in a consistent manner.

Keywords: Information literacy, Pakistan, undergraduate engineering, need assessment.

1 Introduction

Exponential growth in the production of information and fast paced developments in information and communication technology (ICT) have highlighted the importance of efficient use of information especially at the university level. To be efficient users of information students need to receive proper education for information use, which is most effectively learned through information literacy instruction (ILI) programs. To plan any such instruction program for students, first of all, it is useful to assess their current level of information literacy skills. Such assessments can be used to help to design and deliver effective ILI programs. In Pakistan any effort to directly assess information literacy level of undergraduate students has never been done. In this way it is the first effort to measure current IL skills of Pakistani students.

2 Aims and Objectives

This study was designed to address the following research questions regarding undergraduate engineering students of the Air University:

1. What is the level of these students' various information literacy skills?
2. What is the difference in students' information literacy skills based on gender and program of study?

The following research hypotheses were formulated for conducting statistical tests:

- H1: Most of the students don't have enough information skills to become good information users. (It was assumed that the participant students did not have any formal IL instruction in their secondary schools and intermediate colleges. Therefore, without a proper training, they were not expected to pass most of the test items with a 50 percent passing score. They were expected to have poor IL skills.)
- H2: There is no statistically significant difference between IL skills of students based on their gender. (The lack of IL instruction was similar in the schools and colleges for boys and girls. Therefore, no gender based difference in IL skills was expected.)
- H3: There is no statistically significant difference between IL skills of students based on their program of study. (The students with the same school background joined different engineering programs in the university. Therefore, no program based difference in IL skills was expected.)

3 Literature Review

Almost all over the world the term "Bibliographic Instructions" has been replaced by "Information Literacy". The American Library Association (ALA) recognized this term in 1989 [1] and stated that "to be information literate a person must be able to recognize when information is needed and have the ability to locate, evaluate and use effectively the needed information." In 2000 the Association of College and Research Libraries (ACRL) adopted this definition in its publication "Information literacy competency standards for higher education: Standards, performance indicators and outcomes" [2].

Literature is available on the importance of education of information users and advocating information literacy instruction. It is widely recognized that the information explosion of today requires an increasingly critical approach to information searching. Therefore, information related education is a responsibility that universities can no longer ignore. Today's student must be given tools for tomorrow's information survival. Library instruction should enable them to acquire new work procedures allowing them to become more autonomous. The work environment will undoubtedly be changed very quickly and students will need to continue learning after they complete their university education. Knowing how to find, evaluate and use information will be a major asset in their career. Pochet and Thirion state that library instruction must not be limited to simply obtaining information but the subsequent steps must be taught such as: how to understand and critically evaluate the information to ascertain whether it fills the initial need; how to

use, manage and integrate information into ones' knowledge base; and how to reformulate the information need, taking into account the new knowledge [3].

Despite all this importance given to the education of information and its place in post-secondary education, information specialists and librarians have long observed major gaps in the information skills of students. Especially those entering the university demonstrate very low level of IL skills.

Keeping in view this situation, a study was carried out in the Quebec province of Canada. The research objective was to determine whether students entering their first year undergraduate program were equipped with skills necessary to retrieve, process and evaluate information. The ACRL IL Competency Standards for Higher Education were used as the basis of this study and research skills considered essential to the success of information search process were identified. A test consisting of 20 multiple-choice questions was applied to over 3,000 students of 15 universities. The study demonstrated gaps in IL skills of students [4].

While literature is overwhelmingly focused on the importance and need of information literacy programs, lists of competencies, programs' contents and evaluation, there is paucity of actual assessment tools to measure the competencies of students. Researchers have developed some tools to measure the students' knowledge for any such program but these are either limited to a specific library system or a database or are supposed to determine effectiveness of a library instruction program already given. Such tools assess the level of effectiveness of an ongoing IL program. But at UCLA instead of assessing effectiveness of an existing IL program a study was carried out to measure IL competencies of students before participating in any such program. A survey instrument was specifically created for this study and administered to undergraduate students to measure how much skillful or knowledgeable they were [5].

In their effort to develop a standardized instrument for institutional and longitudinal measurement of IL competencies O'Connor, Radcliff and Gedeon [6] reported eight studies which used "paper and pencil" test to assess IL skills. Other examples which conducted achievement tests for this purpose include Ali, Abu-Hassan, Daud, and Jusoff [7] who used an adapted version of Mittermeyer's questionnaire to assess IL skills of engineering students in Malaysia. Rehman and Mohammad evaluated library and information skills of undergraduate students in Kuwait University [8]. Thirion and Pochet assessed IL skills of university students in the French speaking community in Belgium [9]. Swoger included multiple choice and short answer questions in his IL assessment questionnaire at SUNY Geneseo, USA [10].

In Pakistan, literature has failed to report use of any achievement test to assess IL skills of students. In a 2010 survey of the university libraries in Pakistan, Bhatti found that most of them offer ill-planned and informal user education programs without an assessment of user needs [11]. Based on some studies conducted at the University of the Punjab on the use of online databases and digital libraries Ameen and Gorman [12] inferred that the use of these resources was low for a variety of reasons. They claimed that the community was "unable to use and/or unaware of the databases and digital services available through the HEC, and this state of information and digital

illiteracy is responsible for a significant loss of resources". According to Bhatti, inadequate assessment of library users' needs and information seeking behavior was among the inhibiting factors for successful implementation of IL instruction programs in Pakistani universities [13].

4 Method

The Air University offers undergraduate programs in electrical, mechatronics, mechanical, and computer engineering. When data was collected, the second semester student population for these disciplines totaled 475. Through cluster sampling 151 (31 percent) students, making one entire section from each program, was selected. Employing a survey method and anonymity principle, a questionnaire was distributed and completed during class sessions. This technique was selected for a prompt response, and to eliminate the need for a reminder. There was a 100 percent response rate of all students who were available during class time. For data collection the instrument developed by Mittermeyer [5] was used with slight variation. A pilot study was conducted to check deficiencies, omissions, and ideas for improvements, to calculate the time required to complete the questionnaire, and to identify the level of difficulty of questionnaire for the students. Minor changes were made accordingly. Time duration to complete the questionnaire was calculated as 20 minutes. The response rate was 100 percent.

5 Results and Discussion

The first two demographic questions were about gender and participants' study program. Table 1, shows 111 (73.5 percent) were male. The program distribution shows that maximum participation was from both Electrical and Mechanical Engineering departments (26.5 percent students from each department).

Table 1. Gender and program of study wise frequency distribution of participants

Variable	n	%
<i>Gender</i>		
Male	111	73.5
Female	40	26.5
<i>Program of study</i>		
Bachelor of Computer Engineering	34	22.5
Bachelor of Electrical Engineering	40	26.5
Bachelor of Mechatronics Engineering	37	24.5
Bachelor of Mechanical Engineering	40	26.5

The next 19 questions were directly related to the assessment of IL competencies of the students. Each correct answer was assigned one mark and only 14 students (9.3 percent) got 10 marks or more. More than 60 percent students got only five or less marks. This very low level of IL knowledge leads to the acceptance of first hypothesis

(H1). This result is similar with that of the previous studies of students' level of IL skills conducted in other countries.

The questions were grouped together under five themes. Table 2 shows frequency of the correct answers. The analysis shows that the percentage of correct answers over 50 occurred only for three questions. The highest frequency for the correct answer was for a question on choosing the right search strategy to find all documents by a specific given author in a library catalog. Identification of synonyms or related terms used to represent a subject is an important component of search strategy. Better ability in this regard improves retrieval of relevant results. To determine the students' ability to correspond to the words used to describe their topic to those employed by the selected search tool a question was asked. The respondents also showed good response on it (105, 69.5 percent).

Table 2. Frequency distribution of IL related questions

Rank	Question	Theme	Frequency of correct answer	%
1	Search indexes	Search strategy	111	73.5
2	Translation into keywords	Search strategy	105	69.5
3	Significant words	Concept identification	89	58.9
4	Significant words	Concept identification	68	45.0
5	Meta search engines	Search tools	64	42.4
6	Encyclopedias	Document type	62	41.1
7	Significant words	Concept identification	57	37.7
8	Reading citations	Use of results	56	37.1
9	Bibliographies	Use of results	51	33.8
10	Periodicals	Document type	46	30.5
11	Search engines	Search tools	45	29.8
12	Boolean operator "AND"	Search strategy	36	23.8
13	Boolean operator "OR"	Search strategy	30	19.9
14	Library catalogs	Search tools	24	15.9
15	Scholarly journals	Document type	21	13.9
15	Library catalogs	Search tools	21	13.9
17	Controlled vocabulary	Search strategy	17	11.3
18	Evaluation of information on Internet	Use of results	16	10.6
19	Ethical use of information	Use of results	15	9.9

Three questions (concept identification theme) asked to examine how students select concepts in their search strategy. Are they able to distinguish between significant and non-significant terms? Also, are they able to distance themselves from the formulation used in the statement of the problem or they hold to its wording. Only one out of these three questions crossed the success rate of 50 percent.

The results show that the lowest frequency for correct answer was for a question on the ethical use of information (under 'use of results' theme). The students had little

idea about including a reference to the source of information in their own work. Only 15 (9.9 percent) respondents were able to identify the situations when they should include a reference to the source of information in their work. This poor knowledge about the ethical use of information logically results in high rate of plagiarism.

Students were also checked to see if they knew which characteristics should be used to evaluate the quality of an Internet site. Surprisingly results were not good. They were unable to identify all the enlisted characteristics necessary to evaluate the quality of an Internet site. Only 16 (10.6 percent) students provided the correct answer. Students also had very little idea about controlled vocabulary. Only 17 (11.3 percent) students were able to understand that the thesaurus should be used to identify terms.

Independent samples t-test was run on scores of the students on each theme and the total score. Table 3 reveals that second hypothesis was also accepted. It was found that IL skills of male and female were at the same level.

Table 3. Results of independent samples t-test for gender based IL skills of students

Themes	Mean		t	Sig.
	Male	Female		
Concept identification	1.32	1.68	-1.90	.060
Search strategy	2.05	1.78	1.43	.155
Document type	0.86	0.83	0.27	.787
Search tools	1.07	0.88	1.46	.141
Use of results	0.88	1.00	-0.65	.519
Total	6.20	6.15	0.11	.910

The third hypothesis was tested through one-way analysis of variance (ANOVA). The mean scores of the students from four different programs of study were different but the difference among them was not found significant. Table 4 shows no program based statistically significant difference between the IL skills of students.

Table 4. Results of one-way ANOVA for program wise IL skills of students

Programs of study	Mean	SD	F	Sig.
Bachelor of Computer Engineering	6.79	1.82	2.199	.091
Bachelor of Electrical Engineering	5.48	2.09		
Bachelor of Mechatronic Engineering	6.19	2.21		
Bachelor of Mechanical Engineering	6.38	2.81		

6 Conclusion

The results of this study indicate that the first-year students of undergraduate engineering programs lack a good understanding of information resources. They do not have a fair idea about methods and tools to be used to retrieve required information from these resources. The level of information literacy skills of these students was very low, and this needs to be improved to help them perform better in their academic pursuits. In this regard it is required to provide them information literacy instructions,

properly planned, designed and carried out in a consistent manner, which is only possible with the support of university management. Keeping in view the results of this study, it can be assumed that the students in other Pakistani universities also have insufficient IL skills. It may be verified by conducting similar studies in other settings. A national level movement for the institution of IL programs is warranted in Pakistan. The results of this study have practical implications for many stake holders such as federal and provincial governments, university authorities, the Higher Education Commission, the federal Department of Libraries, LIS researchers, LIS schools, library technology vendors and professional library associations.

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Information Literacy, Transliteracy and Information Culture Development in France: What the Teacher-Librarian Can Change

Anne Cordier¹ and Anne Lehmans²

¹ Université de Rouen-ESPE Haute Normandie, France
anne.cordier@univ-rouen.fr

² Université de Bordeaux-ESPE Aquitaine, France
anne.lehmans@espe-aquitaine.fr

Abstract. A research project on French high school pupils' information curriculum was conducted for the development of a media and information culture construction. Researchers observed, recorded and interviewed 150 pupils in groups and individually during a research activity in 3 different high-schools. The project was based on a qualitative, ethnographic methodology to observe information and pupils' transliterate practices on one hand, and the training practices of teachers-librarians on the other hand. The results show the importance of the teacher librarian's commitment to the transliteracy process.

Keywords: Transliteracy, information culture, professional training, media and information literacy, teacher-librarian, curriculum on information.

1 Introduction

Information literacy has been defined in 1989 by the ALA [1] as a set of abilities requiring individuals to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information." It is fundamentally based on a humanistic and universalistic conception of the right to be educated [2] and the project to make education a path to individual empowerment toward information as a source of power. Recently, information literacy has been completed and enlarged by the concept of transliteracy that Sue Thomas, an English scholar, defines as "the ability to read, write and interact across a range of platforms, tools and media from signing and orality through handwriting, print, TV, radio and films, to digital social networks." [3] The interest in transliteracy in research programs is focused on the universe of reading through the "big bang" [4] of the web with new media, materials, sensitive experience, social organizations, cognitive operation and formal characteristics. According to Vincent Liquete [5], the concept of transliteracy focuses the attention on the "trans" prefix: transversality of skills and abilities common to all media contexts and techniques, transformation of situations and information by personal practices and procedures, transition from personal to collective knowledge, and transgression of academic standards. It is at the crossroads

of three main fields: information, media and computer literacies, as well as a metaliteracy.

In France, in every secondary school, a teacher librarian is in charge of the education on information of all pupils and scholars. The culture of information that he/she tries to build is mainly based on a mediation process implying a certain obliteration of the professor who lets the pupils organize their own path into information within activities and tools. This means a coaching more than a teaching posture and learning in spaces that he (or she) has structured [6]. Personal, informal, intuitive, collective practices become central in this reflection, and the aim of the teacher is to create situations in which pupils can experiment with various ways of retrieving and using information in order to build knowledge. The mediation process is human (intersubjective), spatial (organization and signage of the spaces), cultural and technical [7]. Even if the teacher librarian does not usually follow a precise curriculum, he or she plays an important role in information and media literacy.

In our exploratory research project we observed a specific school situation: supervised personal projects in which groups of pupils undertook a small interdisciplinary research project on a chosen topic. Pupils aged sixteen in high schools and vocational high schools were observed during their learning processes. We have tried to characterize typical transliterate activities which are cognitively distributed and situated. Supervised personal projects mix at least two different school disciplines and involve the teacher librarian who is in charge of helping and accompanying pupils in the information research process. The project lasted 12 weeks, and pupils worked in small groups (3 to 4 pupils) or individually in the case of the vocational high school. Their final project was evaluated during an oral examination where they had to present their work and working process, and they were given a mark for their examination.

In the first part of this article, we present our scientific protocol, which is based on an “ecological” approach of capturing pupils’ information retrieval practices, and teachers’ training practices. We focused on environments and interactions. In the second part, we explain why the global effectiveness of knowledge construction in this process depends on the regime of commitment of the teacher-librarians. In a third part we consider the impact of this commitment on transliteracy practices and skills for the pupils.

2 Transliterate Practices in a Learning Context: Terms and Issues

Information literacy has been extensively examined and discussed in research projects and surveys. In a long term project, our team in France tried to take into consideration pupils in their global information related activities, inside and outside school, and to capture their working processes, uses, productions, representations, and performances. In a first step, we have followed some pupils in a school situation.

2.1 An Ecological and Interactionist Approach to Information Practices

We have chosen to consider the fundamental role of the global environment to observe information seeking and the use of practices and tools. We consider that information seeking activity is materially and socially situated [8]. We take into account “the social thickness of the forthcoming activity” [9]. We have built a research protocol which combines several qualitative methods: distant observation, individual and collective interviews and focus groups, and analysis of the traces. We have especially paid attention to all the actions taking place during the working time: reading and writing, organizing and communicating information using digital and non-digital tools and sources.

The goal of explanatory interviews is to make pupils verbalize their actions and then take part in a process. We do not ignore that describing and explaining an action which does not necessarily require conceptualizing, is difficult.

The cognitive relationship between the subject, the action and the discourse is taken into consideration. Our research protocol relies on a comprehensive recording of speaking on what is being realized as well as a description of the situation. The data records (recordings, note books, usb keys, final project presentations) have been shared among researchers.

2.2 Contexts and Research Protocol

We worked in four different contexts in order to make comparisons: two different general high schools from two geographically and socially distant fields and two vocational high schools (only one had already been visited). In these schools, we observed the pupils’ research process with methods that can be defined as focused ethnography [10]. During short term and regular visits, we sat among groups of 3 to 4 pupils and made direct observation, recorded their exchanges with a digital voice recorder, took notes and memos with an observation grid and conducted unstructured interviews with the pupils. When we noticed some changes, or important or intriguing elements in the state of action, we made the pupils explain the sense and interpretation of what they were doing. These included for example when a pupil left the group, when there was a change of activity, when a new negotiation among pupils started, when a teacher came, or when they discussed their methods, practices, or tools.

3 The Role of the Teacher Librarian in the Construction of an Information Culture

3.1 Personalization of an Institutional Arrangement

The school situations that we observed are institutional arrangements. They are designed to lead pupils to the building of competencies and knowledge. They are normative and give a specific role to the actors [11]. However, each individual has his or her own understanding and a certain freedom of action inside the framework of the arrangement. We consider the situation as one driven toward information literacy

and empowerment of the individuals by their information needs. We are also aware of the way some teacher librarians appropriated the situation to assert their position and to claim their specific responsibility based on a corpus of knowledge, using a range of aims, methods and evaluating activities, and didactic work on scientific notions in order to make them teachable to pupils.

Thus, supervised personal projects represent a challenge for the teacher librarians, among whom some have endorsed the global organization of the projects. Two opposite situations were observed. In the first one the teacher librarians endorse the whole organization and management of the projects, coordinating all the teachers and classes. They demand precise working devices: a folder has to be handed in, describing the information research process on the topics. During the work on this file, pupils are trained to regularly use the library catalog and data bases, to evaluate information, write a bibliography, and to analyze relevance and reliability of a web site. They actively participate in the evaluation of the pupils' work and the final projects. In the second situation, facing the same academic situation, the role of the teacher librarian is quite different. The organization of the classes makes the management of all groups impossible. No specific training time or resource presentation is provided. The teachers do what they can in a situation they are not able to manage. Beyond these two situations, the vocational high school offers a third model of a bicephalous management of the projects between the teacher librarian and the subject teacher. They are always present together and make two-voices directive guidance for the pupils during their working process. Pupils from the vocational high school are the most demanding and easily lost during the project.

3.2 Creation of Didactic and Pedagogic Tools

The will to progress on the building of an information culture relies on a set of didactic and pedagogic tools which are designed by the teacher librarian for the pupils. In the first situation, they are given a working agenda, meant to plan their work and regularly describe it in specific documents, and use working files to record their bibliographic researches. Some teacher librarians have become cognitive mediators. They rely on distributed cognition tools, such as the note book which is supposed to sustain reflexivity. Exploring the pupils' notebooks one can understand their ability to mobilize resources, tools and appropriate situations, and to progress and overcome obstacles. In the second situation, teacher librarians have a hard time trying to propose didactic situations. Their main way of dealing with the project is to train and help pupils individually. In the third situation, the teacher librarian has built his own evaluation criteria based on the research and use of information in the project.

Finally, in all the situations, the fundamental role of the teacher librarians as trainers is a guarantee of the individual's autonomy, and consciousness of the working and cognitive design. To reach this goal, they manage training moments dedicated to information for the pupils. The project situation induces opportunities for the teacher librarian to make pupils be aware of the information retrieving process.

4 The Impact of the Teacher Librarian's Commitment on Pupils' Transliterate Practices

4.1 Awareness of the "Art of Practice"

During our research we were able to evaluate the pupils' capability to organize their information environment, and to coordinate the work among the members of the groups. There is a direct correlation between these capabilities and the success of the projects.

Elise and Léonie, for instance, study sects and have clearly organized the work distribution. While Léonie searches for information on history and definition of the sects, Elise works on the social relation side of the project: she gets appointments with people fighting against sects who she would like to interview, organizes the communication device, uses her Gmail account to select e-mail according to their themes and their interest. In contrast, Flavien and Déborah work together but hardly talk to each other. They sometimes have a meeting to check the progress of the work and trust each other. They are quite organized and create working devices which allow them to coordinate their work according to what is requested by the teachers. Clara, Alessandrine, Malou and Pauline also work silently. They work on the plan at the beginning of the project and share the parts of it among themselves, according to their tastes and capacities. One of them was in charge of interviewing a politician. She wrote down her questions according to the aim of the research, and let all the other girls read the questions and add new ideas. She finally made a compilation and sorting of all the questions. She is also in charge of hand-writing the notebook. She asked the others what they have found and what they plan for the week.

Despite what is commonly said about youngster information behavior, they own an elaborate "art of practice" [12] and a strong consciousness of their uses and the management of their personal information system. They tend to invent ways of doing things which are not orthodox according to what they are taught, but are nonetheless efficient and explicable using thoughtful devices. We use the word *grammatization of information* to characterize the process of creative learning, construction of knowledge and information competencies which lead to information culture or *transliteracy*.

This *grammatization* appears when pupils are induced to think about their own practices and criticize them according to their social, academic and individual needs, constructing formal from informal knowledge on information, media and computers. It relies on two conditions: the existence of intuitive but nonetheless efficient information practices, commonly acquired in social situations, and the presence of a teacher librarian who induces awareness and control of these practices. When one of these conditions is lacking, the process cannot be completed. This was the case in some situations that we observed. When pupils have no or poor social experience of using media information and when the teacher librarian has few occasions to interact with them, a strong difference among pupils is observed, which creates inequality. In this case, transliteracy will mainly depend on social conditions and not on education. In the third case, while the pupils' social conditions are not favorable to transfers between personal and school information practices or between different media, the role of the teacher librarian is important to balance a lack or poverty of informal knowledge.

4.2 The Individual Information Potential

Our research on transliteracy practices shows how necessary it is to have a multidimensional education on information based on the convergence of literacies, in order for the individuals to search, use and communicate information in a critical and creative way. It is important to let the « arts of practice » emerge during teaching times, and to make bridges between different learnings and between the learnings and the practices to settle creativity on the base of a teaching program. In our research, a teacher librarian noticed the complexity and quality of a work which used several media: music, video, singing, space shiftings, dialogs. His advice to the pupils was to rely on the diverse know-how and use of various software and social networks. The teacher librarian interference helped pupils to benefit from their personal information uses and ordinary practices and to control their way of doing and behaving for an efficient information and communication approach. The pupils gave very positive feedback of the experience which made them aware of the efficiency of their own practices. They testified that they have learnt by doing the meaning of an information source, organization of data bases, creative writing and thinking.

If we add the quality of the final projects, we notice the impact of a socially situated information-based teaching program, articulated to clearly identify and define notions. Pupils have understood the notions of source, publication, use of data bases and open archives. Without the barrier of technical obstacles and reproductive methodologies, pupils become conscious of their own behavior. These competencies are necessary to develop the information potential, for the building of an information culture. They have to be included in a proactive definition of the learning process which is founded on the individual's capacity to socially adapt to information and digital environments.

5 Conclusions and Discussion

The research protocol that was chosen has been able to enhance what Michel de Certeau [12] has called individuals' "art of practice", meaning the capacity of tinkering with, and arranging adapted devices and situations, creating one's own information environment, or adopting what Jacques Perriault calls "logics of uses" [13]. It enhances the commitment of the teacher librarians to the pupils' information inquiry and knowledge construction process which has a strong effect on their autonomy in research, selection and use of information and media for their project. A real cognitive construction of knowledge on information, not only based on pragmatic skills and useful competencies, requires a positive pedagogic activity. When a precise local curriculum is applied, pupils tend to be much more creative and conscious of their own practices and competencies. When no arrangement exists, social inequalities tend to be prevalent, although social interactions among pupils have also some efficiency for sharing some competencies. The question is now to generalize the appliance of a curriculum on project based activities in order to construct a culture of information.

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National Information Literacy Survey of Primary and Secondary School Students in Singapore - A Pilot Study

Intan Azura Mokhtar¹, Yun-Ke Chang², Shaheen Majid², Schubert Foo²,
Yin-Leng Theng², and Xue Zhang³

¹ NIE2-03-60, National Institute of Education, 1 Nanyang Walk, Singapore
intanazura.mokhtar@nie.edu.sg

² Wee Kim Wee School of Communication and Information,
Nanyang Technological University, Singapore
{ykchang, asmajid, sfoo, tyltheng}@ntu.edu.sg

³ National Library Board, Singapore
zh0002ue@e.ntu.edu.sg

Abstract. The National Library Board (NLB) and Ministry of Education (MOE) in Singapore have collaborated to carry out a National Information Literacy (IL) Program for primary and secondary school students. The program involves developing a curriculum framework that can be introduced in specific school subjects where IL competencies can be nurtured. Surveys were developed to identify students' IL strengths and weaknesses and guide relevant intervention planning and implementation. IL academics from Nanyang Technological University, Singapore, were involved in formulating the proposed IL model for schools, curriculum framework, as well as in reviewing and assessing the findings of the surveys. At this point, the survey instrument has been formulated and a pilot test of the instrument has been administered to more than 70 primary school students and about 20 secondary school students. This paper shares the main analyses of the pilot survey, according to the proposed model for IL for Singapore schools.

Keywords: Singapore, primary school students, secondary school students, information literacy.

1 Introduction

Information literacy (IL) has been described as the ability to locate, access, search, evaluate and use information in different contexts [1]. In this day and age, with information being increasingly digitized, and the pervasive use of information and communication technologies (ICTs) in our daily lives, IL has become a basic competency to navigate through the deluge of information to meet our information needs for both work and leisure activities.

For students, being information literate has become a basic competency that can help them effectively sieve through and identify relevant and reliable information that they get through the Internet, television, smart phones, or friends, for school-related work or

for personal interest and development. In other words, for most of our students, IL equips them with the ability to engage with their information environment as part of both their formal and informal learning processes [2].

2 IL Policies in the Singapore Education System

Singapore is a small and relatively young island nation located in Southeast Asia, at the southern tip of Peninsula Malaysia. Despite its youth as a nation, the Singapore education system is a very dynamic sector that has evolved continuously over the years, and has been recognized as one of the most successful in the world [3-4].

IL in the Singapore school sector has also evolved since it was first introduced in 1997. For a detailed overview of the evolution of IL in Singapore schools, refer to the paper by Foo, *et al.* [5]

3 Proposed Model for IL and Competence for Singapore Schools

Academics from the Nanyang Technological University's (NTU) Information Literacy Research Cluster have developed a model for information literacy and competence that can be used as a reference for incorporating IL in the Singapore school curriculum [6]. This proposed model is the result of several years of research work – both through research studies, literature reviews and publications – in the area, as well as comparing established IL models and standards [7, 8, 9, 10]. The proposed model consists of five components of IL competencies that are shaped by three essential qualities (Figure 1).

The five components are not meant to be carried out in a linear manner, but rather, in an iterative way where an information literate student would be expected to demonstrate competency in each of these five areas. In addition to the five components, three essential qualities have been identified as being necessary in supporting the development of the five components of IL competencies. These three qualities of 'Social Responsibility', 'Collaboration', and 'Positive Attitudes', were identified based on the Character and Citizenship Education (CCE) Framework for Singapore schools [11]. 'Social Responsibility' refers to one's ability to understand and exhibit relevant moral and social aspects of behavior in the information literacy process. 'Collaboration' refers to one's ability to seek, share and create information as part of a team to achieve a common set of objectives, while 'Positive Attitudes' refers to one's ability to display an appropriate state of mind and character attributes. However, it must be recognized that the last set of qualities (i.e. Positive Attitudes) may not be easily captured through a survey or test. This set of qualities is likely to be observed or self-reported, rather than can be adequately tested to determine its presence.

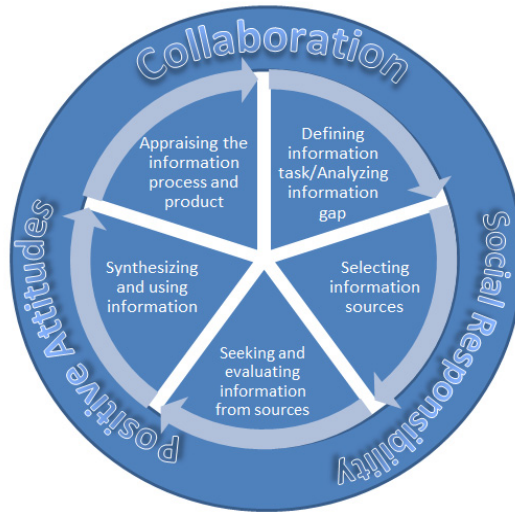


Fig. 1. I-Competent model (Source: NTU, 2013)

This model serves as a guide in designing an IL curriculum framework for Singapore schools, and in designing surveys to assess the level of IL of students in the different school grade levels.

4 Recent Emphases on IL and Problem Statement

Recently, there has been a renewed emphasis towards education policies that are rooted in IL [12] and related competencies such as 21st century competencies, critical thinking, and information and communication skills. In addition, a renewed emphasis on character and citizenship education in the school curriculum has also led to a new focus on cyber wellness and literacy that aims to promote both ‘respect for self and others’ when using technology, and ‘safe and responsible use of’ technology [13]. Hence, these are clear indications that schools in Singapore are headed towards greater information, media and technology literacy that revolves around responsible, ethical and safe use of technology and information in the cyber and print environments.

With these new emphases in the schools, it is thus timely to determine the current level of IL among students.

5 Survey Instrument and Methodology

Three different surveys were designed collaboratively between NTU and National Library Board, for students in Grade 3 (ages 8 to 9 years old), Grade 5 (ages 10 to 11 years old), and Grade 9 (ages 14 to 15 years old). There were 12 questions related to IL, 3 questions related to the essential qualities and 4 demographic-related questions for Grade 3; there were 22 questions related to IL, 3 questions related to the essential

qualities and 4 demographic-related questions for grade 5; and there were 29 questions related to IL, 6 questions related to the essential qualities and 8 demographic-related questions for Grade 9. Table 1 provides an overview of the number and types of questions for each of the grade levels.

Table 1. Overview of the number of survey questions for the different grade levels

Grade Level	Defining information task/ Analyzing information gap	Selecting information	Seeking and evaluating information from	Synthesizing and using information	Appraising the information process and	Collaboration	Social Responsibility	Positive Attitudes
Grade 3	2	4	3	3	N.A.	1	2	N.A.
Grade 5	2	9	6	5	N.A.	1	2	N.A.
Grade 9	6	10	6	6	1	1	3	2

The pilot test of the survey for Grades 3 and 5 was carried out during curriculum time in school. Students from each of the grades took about 25-30 minutes to complete the survey. A total of 42 students in Grade 3, and 35 students in Grade 5 completed the survey.

For Grade 9, a total of 22 students completed the survey as a take-home task. When enquired, the average time to complete the survey ranged between 30 and 45 minutes.

6 Demographics and Significant Findings

6.1 Grade 3 Students

For Grade 3 students ($N = 42$), it was found that 95.2% ($n = 40$) of the students had internet access from home, which shows a high probability of these students having access to online information. It was found that these students were not too sure what fiction or non-fiction books were, with only 71.4% ($n = 30$) getting the answer correct for each of the two questions that asked students to identify a book cover sample as belonging to that of a fiction or non-fiction book. It was also found that the three most difficult questions for these students were related to ‘Selecting information sources’, ‘Seeking and evaluating information from sources’, and ‘Defining information task/Analyzing information gap’.

Based on the students’ responses to the above three questions, it may be inferred that Grade 3 students may not have been taught about fiction or non-fiction books, or introduced to the different parts of a book or information source. With the ease of access to online information (as the majority of the Grade 3 students had access to the internet from home), it may be of concern that students may come to think of information as being available largely through the online realm and may not develop the propensity to look up information from print sources, nor see the importance of understanding the different components of various information sources and recognizing the purpose and importance of each.

6.2 Grade 5 Students

For Grade 5 students ($N = 35$), it was found that 97.1% ($n = 34$) of the students had internet access from home, which shows a high probability of these students having access to online information. Similar to the Grade 3 students, it was found that the Grade 5 students were not too sure what fiction or non-fiction books were, with less than 57% ($n = 19$) getting the answer correct for each of the two questions that asked students to identify a book cover sample as belonging to that of a fiction or non-fiction book. It was also found that the three most difficult questions for these students were related to 'Seeking and evaluating information from sources', and 'Synthesizing and using information'.

Based on the students' responses, it can be seen that the students were not aware how books and other materials in the library are organized according to their call numbers. Instead, the majority of students thought the materials were organized alphabetically by title (37% or $n = 13$) or by author names (40% or $n = 14$). In addition, students were not sure how they could tell the contents of a book, with only 40.0% ($n = 14$) indicating they would refer to the abstract and table of contents. The low correct responses for these two survey questions seem to indicate that the students rarely went to the library or bookstore to borrow or browse through books. Similar to the Grade 3 findings, the high internet access from home may further suggest that most of these students would do their reading from online sources and not quite often from print materials.

6.3 Grade 9 Students

For Grade 9 students ($N = 20$), it was found that 95.0% ($n = 19$) of the students had internet access from home, which shows a high probability of these students having access to online information. In addition, about 85.0% ($n = 17$) of them own a personal computer, hence, it may be inferred that the majority of these Grade 9 students had independent access to online information and may be browsing or searching through online information sources on their own. It was also found that the four most difficult questions for these students were related to 'Synthesizing and using information', 'Seeking and evaluating information from sources', and 'Selecting information sources'. From the means of the responses given, it can be seen that these Grade 9 students did not know how to cite books or other print materials (Mean = 0.20), even though they were in Grade 9 and would have done project work or resource-based assignments.

For the two questions involving the school or public librarian, it would be useful to note the mean scores for each of these two questions in light of Table 2. From here, it can be construed that these Grade 9 students did not quite consult their school or public librarians when they needed assistance in IL-related tasks such as identifying potential sources of information or to formulate search strategies, search statements or retrieve information from different sources. These students probably felt quite confident about their ability to achieve those tasks either independently or by asking their friends or classmates.

Table 2. People consulted to assist in information-literacy related tasks (N=20)

	Peers (Class-mates)	Friends	Family	Teachers	Librarians	I don't consult anyone	I don't do this task
Define the research topic & scope	13	8	2	12	-	4	-
Identify potential sources of relevant information	12	11	2	9	2	4	-
Formulate search strategy, statements & retrieve information	11	9	2	6	1	6	-
Analyze quality of retrieved information & select relevant information for use	9	4	1	6	-	11	-
Organize, compile, finalize & present answer to research topic	11	5	-	6	-	8	-
Evaluate the completed product & process of information seeking	10	7	3	9	-	5	-

7 Conclusion

The findings of this pilot study, albeit from a small group of students only, have shed some light on the information seeking, use and literacy-related characteristics that Grades 3, 5 and 9 students in Singapore schools exhibit. The pilot study has also provided interesting insights into what Singapore school students perceive of their IL competencies, what they understand about how information is organized and sought, and their perception with regard to cyber wellness and social responsibility in the online sphere. In general, the Grades 3 and 5 students have shown that they are not familiar with the types of print materials available or how print materials are organized, and were not too sure how to evaluate the information that is available or which they have obtained. For Grade 9 students, it was seen that they were generally quite familiar with the different types of print and online information sources, and they would rather depend on their personal evaluation abilities or that of their peers or classmates, than on family members, teachers or librarians. These findings are expected to help in refining the proposed IL model and curriculum framework for Singapore schools, and in designing appropriate IL intervention programs for school students.

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Strategies to Assess Web Resources Credibility: Results of a Case Study in Primary and Secondary Schools from Portugal

Ana Lúcia Terra¹ and Salvina Sá²

¹ Polytechnic Institute of Porto | CETAC.MEDIA, Porto, Portugal
anaterra@eu.ipp.pt

² Biblioteca Municipal José Régio, Vila do Conde, Portugal
salvina.sa@cm-viladoconde.pt

Abstract. In this paper, three approaches for the assessment of credibility in a web environment will be presented, namely the checklists model, the cognitive authority model and the contextual model. This theoretical framework was used to conduct a study about the assessment of web resources credibility among a sample of 195 students, from elementary and secondary schools in a municipality in Oporto district (Portugal). The practices that young people and children claim to use regarding the use of criteria for web resources selection will be presented. In addition, these results will be discussed and compared with the perceptions that these respondents have demonstrated for the use of criteria to establish or assess authorship, originality, or information resources structure. These results will be also discussed and compared with the perceptions that these respondents have demonstrated for the elements that make up each of these criteria.

Keywords: Information credibility, information evaluation, young information behavior, information literacy.

1 Web Credibility Assessment Models

According to some approaches [1-2] web information credibility should be measured considering a checklist encompassing three dimensions: message, site and sponsor. The message credibility relates to the quality of information, its timeliness, accuracy and linguistic level. The site credibility is associated with the layout and visual perception of information from the user and the level of interactivity provided. The sponsor credibility focuses on responsibility for the intellectual content, the reputation or personal experience of who sponsors/supports content. Combining these three perspectives, individuals have at their disposal an array capable of integrating the specific and complex nature of the credibility of information resources available on the web.

According to Fritch and Cromwell [3-4], web information credibility must be assessed through the lens of cognitive authority, using four filters: document, author, institution and affiliation. The validity of the document derives from factual correction, format and affiliation evinced by the URL. The competence and reliability

of the author are based on the identification of its identity and credentials. These data may serve as a starting point for a more thorough search of the identity of the author (person or institution). Overt affiliation focuses on the presence of links and obvious signs of affiliation. Covert affiliation is neither immediately visible nor detectable. For the application of these filters the authors present a set of technical tools aimed to assess the author's identity and the analysis of covert affiliation. The focus goes to the DNS (Domain Name System) and the Internet topology (structure of interconnections). For a proper implementation of this web information evaluation model, it is necessary to know some basic and advanced rules about web addresses syntax. This prerequisite may constitute a limitation to use this approach, since users may not be aware of the DNS rules' conditions. In addition, the Internet information may be created or published anonymously or under a false identity, and plagiarized, without evidence of this in the URL address.

These two models for assessing web information credibility promote an objective, universal and absolute approach regarding information resources attributes. However, even for Flanagan and Metzger [2], information credibility is a perceived variable, depending on each individual, and not an exclusively intrinsic property of information resource, although the formulation of judgments about the credibility can be influenced by the nature and characteristics of the information or by the source/medium that conveys it.

The contextual model [5] deepens this approach, trying to frame the information in its global environment, which is not limited to the Internet. For evaluation, this approach makes use of external information to the website, facilitating the inclusion in a broader social context to allow reasoned judgments. To achieve this aim, the contextual model develops three operations: promotion and explanation of reviewed resources, comparison and corroboration. The first operation supports the disclosure and explanation of peer-and editorially-reviewed resources available through the library's website. The comparison involves checking similarities and differences between two or more information resources. For this analysis, it is necessary to apply quality standards, including factual data but also background, context, details, controversy and bias. Comparison is presented as a nuclear cognitive process to evaluate every kind of information. Corroboration is the other cognitive process used to verify one or more different sources. The greater the number of features found on the same subject, the higher the ability to confirm or not certain data and find accurate information.

This perspective gives emphasis on individuals and on the tasks they perform to assess credibility, involving their information literacy skills regarding information evaluation. The skill to evaluate information credibility is part of all information literacy frameworks and has been subject of numerous empirical studies, focusing on different types of social groups, especially in the USA, Finland and the United Kingdom. However, in Portugal, this aspect has been little explored. The aim of this case study is to provide a better understanding of the strategies that children and young Portuguese (11-19 years) consider relevant to assess the credibility of information sources available on the web.

2 Sample and Methodology

This study was conducted in the municipality of Vila do Conde, a city of about 80,000 inhabitants in the district of Oporto, northern Portugal. It is an important industrial center, fishing port and tourist and bathing area. The school network includes 36 schools (29 schools in the 1st cycle, 5 medium and 2 high schools).

An online questionnaire was used for data collection. The questionnaire was available to students on the Internet via a link sent to school librarians, from schools that constituted the sample. It was, therefore, through the intermediation of the school librarians that students got the questionnaires. Thus, students used the school libraries desktops to access the survey which was available throughout June 2012. A questionnaire was created with 25 multiple answer questions and one open question. This questionnaire sought to identify practices that children and young people report regarding assessment of web information credibility, applying criteria such as authorship, originality, structure, actuality and comparison. In addition, it was intended to ascertain the perceptions that these respondents have shown for the elements that make up each of the stated criteria.

The sample includes five medium schools and two secondary schools with students from 8th, 9th 10th 11th and 12th school levels. Among these, 195 individuals participated in the research ($n=195$). The range of participants' age was 11 to 19 years, with a mean of 15.07 years ($SD=1,48$). Of the participants 40.5% ($n=79$) were male and 59.5% ($n=116$) were female.

Some of the survey results will be presented and analyzed in the following sections.

3 Criteria for Choosing Websites

As a starting point, the criteria used by children and young people in the choice of websites were analyzed. The respondents were asked to select two items from the following list: appealing design (colors, images, pictures, letters), ease of navigating within the website, the author is identified, information about last update, and there is music that I like.

The option of appealing design relates to aspects outside the informational content. The analysis of choosing this option allows us to understand the degree to which respondents value the aesthetic component of the presentation of information, rather than inner qualities to assess credibility of the content. The appreciation of the importance of usability of digital resources could be enhanced with the choice of the option indicating the ease of navigating within the website. Usability refers to the ease of access and use, implying the design aspects already mentioned, but also the organization of the contents. The identification of the author and authorship is closely linked to the issue of credibility but currently raises new questions because of the ease to create and/or plagiarize information through the use of ICT. The issues of information update on the Internet refer to an intrinsic characteristic of electronic resources that is volatility and ephemerality, implying a very fast loss of information value in terms of time. The ability to understand the importance of a constant "informational surveillance" could be measured by this item. The last option

Table 1. Hierarchy of criteria for choosing the website (two choices possible)

	(n195)
Ease of navigating within the website	76%
Appealing design	57%
Information about last update	39%
The author is identified	19%
There is music that I like	8%

corresponds to a choice totally misplaced, indicating the respondents' adherence to the questionnaire, identifying those who chose not to respond consistently.

In Table 1, the majority of respondents (76%) value firstly the ease of navigation within the website. The appealing design (57%) and information about the last update (39%) follows. Authorship is a relevant criterion for a minority of 19%. According to this criteria hierarchy, it appears that the sample emphasizes aspects outside the informational content since the intrinsic elements like authorship and update are relevant only to a minority.

4 Authorship

Regarding authorship, a question sought to know about respondents' self-reported behavior regarding the use of this criterion in the assessment of credibility. The other question on this criterion intended to identify level of knowledge of the sample on the elements that should be considered for evaluation of authorship.

Table 2. Criteria's self-reported applied in the verification of authorship (two choices possible)

	(n195)
Author name	62%
Author's biography	46%
Do not know	25%
Author e-mail contact	17%
I do not care	16%
Author photo	15%
I wonder to know	11%
Date of birth of the author	5%
Author contact on Facebook	4%

A minority of respondents (33%) stated to look for the identification of the author when browsing a website. Thus, 77% of the sample does not follow a traditional criterion for assessing the credibility of information, which illustrates a radical change in the understanding of information origins. Comparing respondents who answered yes to this question and those who chose the option indicating authorship as one of the criteria that influence the choice of a website, it appears there is a weak to a moderate correlation between them, because the value of Cramer's V is 0.284. It can be

concluded that only for 19% of respondents the authorship is one of the two most important criteria for choosing a website but there is a higher number (33%) that self-reported the use of this criterion when consulting a website.

Table 2 identifies the criteria that respondents consider that can be used in the verification of authorship. Despite the very low percentage that states to use authorship as a criterion for website assessment, respondents showed moderate knowledge of the elements that must be associated with its use. Indeed, 62% of the sample would use the name of the author and 46% the author's biography explaining his relationship to the subject of the website. Still, 25% say they do not know, 16% were not interested and 11% would like to know how to use authorship in website assessment.

5 Originality

The combination of technical facilities to copy and paste and the large amount of information available on the web has favored the multiplication of repeated content without the specific authorship mark of each individual. In this sense, information plagiarism appears to have a much greater intensity in the digital environment than in the traditional printed context, bringing to credibility discussion the question of messages' originality or resources' originality as a whole. The originality of the information derives from its degree of novelty. However, novelty is always derived from prior ideas/text reconfigured by each individual creator, who must identify their sources, giving them due credit. So originality can be understood within the meaning of "assemblage" [6] to understand writing in a remix culture where intertextuality and quotation are two powerful engines of creation. So to assess the originality it becomes necessary to explicitly identify the inputs used for each specific setting.

Table 3. Criteria's self-reported applied in the verification of originality (two choices possible)

	(n195)
Links to other websites where the author based writing	52%
There are indications on consulted books	47%
If there are images, they have date, title, author	33%
There are positive comments about the site elsewhere on the Internet	39%
Do not know	13%
Would like to know	8%
I do not care	8%

Under these assumptions, the respondents were required to identify their behavior when consulting a website, indicating if they sought to assess the originality of the information.

A majority of the sample, 79%, declares to assess the website information originality. Therefore, it is a relevant criterion for a much larger number of respondents than authorship. This is an interesting answer option, given the fact that we are dealing with the so called copy & paste generation.

Analyzing the self-reported criteria acceptable for use in verifying the originality (table 3), links to other websites (52%) and books consulted (47%) stand out. The

information with digital origins and the one that comes from the publishing world didn't present a significant difference, indicating an awareness that not all Internet information originates only in this environment. It is also interesting to appreciate that the respondents attend to the existence of positive comments about the website elsewhere on the Internet. This position falls within the perspective of Lankes [7] which considers the credibility dependent on conversation enhanced by digital networks and other tools where community participation defines and assesses credible information, characterized by reliability. The fact that images present date, title and author constitutes an important issue for 33% of respondents. This also highlights the importance that the sample assigns to the identification of the sources used, understanding that the originality of the information should be evaluated considering the relationships established with other resources.

6 Design

Site design represents an important element of perceived credibility and is necessary to consider that different web site genres have specific attributes, like more or less sophisticated structures, that have to be taking into account when assessing perceived credibility.

Table 4. Criteria's self-reported applied in the verification of website design (two choices possible)

	<i>n</i> 195
Information is divided into thematic blocks	68%
The text has no misspellings nor grammatical errors	56%
A search option inside the web site exist	34%
The website has a map	13%
Do not know	11%
There is movement images	7%
Would like to know	5%
Do not care	5%

In the sample, 84% of respondents claim to try to assess the structure of a website by seeing the way information is organized.

The data on table 4 indicates that the most valued criterion on assessment of website design is that information is divided into thematic blocks with 68%. Therefore, the fact that respondents find that information is structured according to the affinities of the content is a sign that it can be assigned confidence. This will also mean that if the thematic organization is visible graphically, it will allow users to orientate themselves in their information search and access process. Thus, the organizational structure of the contents must be explicit and comprehensible to the user. This is even more important because the use of a search option inside the website is only chosen by 34% of the sample. Therefore, to credibility evaluation, respondents seem to value more the characteristics of traditional information

resources, namely a good organizational structure of content, than a novel feature of digital resources, i.e. the ability to search within the site itself. It seems users prefer a feature that gives them direct access to the information they want, than to have to make a search by themselves. It should also be stressed that the sitemap option is only enjoyed by a minority of 13%.

Another interesting aspect concerns the valuation of grammatical accuracy, spelling and punctuation, as a way of gauging the credibility to 56% of respondents. Therefore, the sample does not attend only for facts on the topic. The linguistic quality is used as a way to make a judgment of credibility.

7 Concluding Remarks

It's important to highlight that in this study the answers of the respondents can be an externalization of what they consider to be socially desirable. In fact, the investigation focuses on the description of self-reported personal behavior, not having put the sample subjects before real problems, in a naturalistic environment. Some studies [2] show that there is a lack of correspondence between self-reported behaviors and observed information behaviors. However, it is still interesting and important to know self-reported behaviors seeking explanations for the differences regarding real behaviors. When self-reported behaviors correspond to attitudes which match with suitable skills assessment information, this means that the training initiatives of users should not orient themselves to the development of these skills, because individuals dominate them, but rather to understand why there is a non-use in order to create strategies to reverse this situation. The aim should be motivate users to perform something they perceive as an additional effort.

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The Teacher's Role as Facilitator of Collaborative Learning in Information Literacy Assignments

Eero Sormunen¹, Tuulikki Alamettälä¹, and Jannica Heinström²

¹University of Tampere, School of Information Sciences, Tampere, Finland
{eero.sormunen,tuulikki.alamettala}@uta.fi

²University of Tampere, Research Collegium, Tampere, Finland
jheinstr@abo.fi

Abstract. Group work assignments are commonly used in information literacy instruction in secondary schools in Finland. In this study, we analyze in detail how the design and implementation of group assignments affect students' learning experiences. Data were collected in two upper secondary school classes where the students wrote a Wikipedia or wiki article in groups of three to five members. In the literature class, students reported stronger learning experiences, while in the history class, the students reported fewer and weaker learning experiences. The findings suggest that particular activities designed by the literature teacher brought students' attention to relevant areas of learning. Her more active interventions to support the progress of student groups at different stages of the project also seemed to affect the learning experiences of students.

Keywords: Information literacy, learning assignments, group work, learning experiences, teachers.

1 Introduction

Source-based writing assignments conducted by groups of students are a common learning task used in information literacy (IL) instruction [1-2]. Guided Inquiry is the best known example of pedagogical approaches designed for IL instruction [3]. Guided Inquiry builds on and integrates the information search process (ISP) model into inquiry learning [3]. The ISP model was developed and verified in a series of empirical research projects on information behavior in learning tasks [4]. Regardless of existing models, however, the teachers giving IL instruction in school often do not apply pedagogies tailored to information literacy teaching but expect that students learn IL automatically by practicing independent searching and writing [5].

This paper reports the findings of a case study in two upper secondary school classes, where students wrote encyclopedic articles in Wikipedia style as a group assignment. The teachers of a literature class and a history class designed and implemented the assignments by applying their pedagogical expertise. Although the basic goals and ideas were same for both courses the designs of the assignment and

the teacher's way of guiding students during the process were slightly different. Our aim was to study these differences and reveal how they affected students' learning experiences.

2 Related Research

Limberg et al. [5] illustrates vividly the challenges of school teachers in information literacy instruction on the basis of several empirical studies. They argue that most teachers are aware of students' information related problems but few master concrete pedagogical means to guide students' learning. Most tend to focus on low level information literacy skills. The teacher's support seems to be critical but typically failed in three major activities: (1) formulation of research questions, (2) critical evaluation of information and (3) understanding and negotiating learning goals.

Guided Inquiry is a dedicated design framework for information literacy assignments [3]. The framework introduces specified activities for each stage of the inquiry process to help teachers in the design of the assignment and to plan interventions during the process. Typical of inquiry learning, the process starts by steps to stimulate curiosity, activating and building background knowledge, exploring interesting ideas, and identifying the viewpoint on the topic that the student wants to address. Although Guided Inquiry offers the teacher an appropriate model to solve the problems described by Limberg we lack research-based evidence to inform how instructional practices affect learning. One exception is the work by Chu and others [1] who studied primary school students' learning experiences in inquiry project-based learning units. However, they studied the effect of the learning approach as a whole and did not elaborate on different components of the approach.

3 Research Questions

How do students' learning experiences differ in collaborative source-based writing assignments in two parallel courses and how are these differences associated with the differences (1) in the design of the assignment and (2) in teachers' and students' interaction activity?

4 Data and Methods

4.1 Case Courses

Data were collected from two eight-week courses in an upper secondary school in the city of Tampere, Finland, during the spring term of 2011. Thirty students in ten groups completed a course in Finnish literature, and twenty-eight students in seven groups completed a course in Finnish history. In the literature course, the task was to write an article for the Finnish edition of Wikipedia while the history course used a dedicated school wiki as the writing forum. In both courses, the assignment was

designed to follow Wikipedia's conventions and requirements for authors. In the literature course each assignment was about a classic Finnish novel. The students were required to first read the novel and then write their own literary essay about it before the group work started. In the history course, the teacher had prepared topics dealing with Finnish history from the period of 1918 to 1939.

The assignment was introduced, written guidelines distributed, groups formed, and topics for the articles selected at the first meeting. The second meeting was a visit to the nearby city library. One 30-minute lesson was devoted to library searching and another lesson to Web searching. The librarian knew the students' topics and distributed materials from the library collection for the students. After the visit to the library, the students worked the next five (in the history course four) lessons in the computer class to search for information, to select and read sources and to write text for the articles under the teacher's supervision. In the history course a substitute teacher was supervising the class for two lessons instead of the regular teacher.

4.2 Data Collection and Analysis

Data on students' learning experiences were collected by a questionnaire at the end of the course. 53 students answered these questions (response rate = 91%). Learning experiences were measured by 11 statements on a Likert-scale from 1 (I did not learn anything about this) to 5 (I learnt very much about this).

The student groups were interviewed briefly during classroom sessions and more thoroughly at the end of the course. All interviews were recorded and transcribed. Interviews were used to collect data both on teacher and student initiated teacher/group interactions and on the use of written instruction during the project.

The teachers were interviewed before and after the course. The research assistant wrote memos instantly after lessons to record the overall course of the lesson. We also had access to all course materials including the teachers' written instructions for students and all reports and comments published in the Moodle learning environment. The data were used to compare the designs of the assignments and their implementation between the literature and history classes.

The questionnaire items regarding learning experiences were analyzed quantitatively to reveal statistically significant differences between the literature and history students. The interview transcripts were analyzed thematically to find all instances where students talked about the interactions with the teacher and about the use of written instructions. Interaction categories were derived from the data and quantified in five main activities (planning group work, planning content, searching & assessing sources, reading, writing and editing). All interview and course materials were read systematically to find all details where the designs of the assignments were different.

5 Findings

5.1 Differences in Learning Experiences

The responses to questions related to learning experiences are presented in Table 1. The students of the history group gave higher scores than literature students for

learning information seeking on the internet (L4). Yet the average score of 2.88 remained below the scale mean (3) on this item. Respectively the students of the literature class reported stronger learning experiences in citing of sources (L10: 3.25) and in Wikipedia (L11: 3.32). They also gave high scores for learning about differences between Wikipedia and other sources (L8: 3.32) but the outcome of the significance test for the difference between classes was not statistically significant although of interest for further research given the small sample sizes ($p=0.055$).

Table 1. Learning experiences on a Likert-scale from 1 (I did not learn anything about this) to 5 (I learnt very much about this). * $p<0.05$.

No	Aspect of learning	History n=28	Literature n=24	F
L1	Subject area	3.08	2.93	0.390
L2	Information seeking in the school library	1.54	1.64	0.172
L3	Information seeking in the Metso public library	3.04	2.61	2.046
L4	Information seeking on the Internet*	2.88	2.25	4.685
L5	Use of new kinds of sources	2.58	2.86	0.877
L6	Critical evaluation and comparison of sources	2.92	2.96	0.038
L7	Recognizing different viewpoints in sources	2.71	2.75	0.021
L8	Difference between Wikipedia and other sources*?	2.71	3.32	3.851
L9	Source-based writing	2.96	3.04	0.081
L10	Referring to sources*	2.71	3.25	4.962
L11	Wikipedia/wiki*	2.63	3.32	5.428

The next step was to analyze the differences in the design and implementation of the assignment to find out potential explanations for varying learning experiences. We tried to find plausible mechanisms which could explain the potential causal relationship.

5.2 Differences in Assignment Designs

The teachers shared the same negotiated idea for the assignment but they designed, introduced, and implemented it by applying their personal professional preferences and practices. The common goal of the two assignments was to improve students' information literacy competencies through source-based writing in the Wikipedia genre. Our data analysis revealed five major differences in the assignment design which might have affected students' learning experiences:

- The history teacher decided to use the school's wiki as a publishing forum instead of Wikipedia. Forte [6] reported that going public in Wikipedia increases students motivation to work hard on the assignment.
- The topics in the history class were broader than in the literature class (complex phenomena of a long historical period vs. named novel and author). Too broad topics are harmful in terms of focused searching [4], and meaningful learning [5].

- In the literature class, students wrote a personal literary essay on the novel before the group assignment started. No preliminary activities took place in the history class. Activating one's existing knowledge and developing one's own interest during the first stages of the inquiry process is typical of inquiry learning models [3].
- The literature teacher asked students to study Wikipedia articles about classic novels to learn the structure of articles and types of information presented in each section. The history teacher did not offer a genre-based model for the required text. Earlier research indicate that students get easily confused if the teacher does not give them an explicit model of the end-product [7].
- In the history class, 20% less classroom time was allocated for the assignment. It is typical for teachers to underestimate the time required for inquiry processes [5].

5.3 Differences in the Teacher/Student Group Interactions

Table 2 presents the number of teacher/group interactions per group in different activities and the number of teacher initiated interactions. The overall pattern was that there was less of both face-to-face interaction and virtual interaction between the teachers and the students in the history class. The literature teacher was also more active in initiating interactions and made interventions at all stages of the process. The history students used more written instructions.

During the lessons, the literature teacher made managing interventions (reminding of deadlines, checking students' progress), and supporting interventions (suggesting or giving sources, helping to assess information, commenting draft texts or citing, helping to code articles for Wikipedia). In the Moodle learning environment, the literature teacher commented on the texts of all groups while the history teacher made only one virtual comment.

Most questions from students related to the planning of content, finding relevant sources (history), citing and writing references, and coding for Wikipedia/wiki. The literature students asked for comments or advice from the teacher more often than the history students.

5.4 Assignment, Teacher's Interventions and Learning Experiences

In this subsection we focus on how the differences in the assignment designs and in the teachers' interventions are associated with differences in learning experiences.

Design of the Assignment. In the literature class the students studied the basics of Wikipedia as homework. They were explicitly guided to use comparable Wikipedia articles as a structural model for their own articles, and published their articles in the Finnish version of Wikipedia. These design features quite likely explain why learning experiences related to Wikipedia were high. The history teacher did not operationalize the genre in the design of the assignment.

Table 2. The average number of teacher/group interactions per group and reported uses of written instructions per group in different activities. The total number of teacher initiated interactions (the last row).

Activity	Face-to-face interactions			Virtual interactions			Use of written instructions		
	History n=12	Literature n=31	Difference	History n=1	Literature n=12	Difference	History n=11	Literature n=6	Difference
Process planning & control	0.3	0.6	-0.3	0.0	0.2	-0.2	0.4	0.2	0.2
Content planning	0.4	0.5	-0.1	0.1	0.1	0.0	0.7	0.2	0.5
Searching & assessing	0.1	0.5	-0.4	0.0	0.1	-0.1	0.1	0.2	-0.1
Reading	0.0	0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
Writing & editing	0.9	1.4	-0.5	0.0	0.8	-0.8	0.3	0.0	0.3
Total number of interactions per group	1.7	3.1	-1.4	0.1	1.2	-1.1	1.6	0.6	1.0
Teacher initiated interactions	3	17	-14	1	11	-10	0	0	0

The history students gave higher scores for learning experiences in seeking information on the internet but did not acknowledge the experience as a strong one. Searching on the internet was not an explicit and operationalized learning goal in either of the courses. It was only a part of a lesson during the visit to the public library but the history students used a lot of time for Web searching (see below).

Teacher Interventions. The literature students reported that several interactions with the teacher centered around two themes: (1) writing in the encyclopedic genre and (2) citing sources. Especially in the virtual interactions, the literature teacher actively commented on the style of writing and citing in text drafts. These interventions are a justified explanation for the stronger learning experiences. The students had to reflect on the issues which the teacher raised in her comments. In the history class, the teacher made only three interventions related to citing and none to guide encyclopedic writing.

Nearly all groups reported that the librarian gave them printed materials. The librarian knew the topics of the students' projects in advance, and she distributed key printed sources for each topic "to save students' time during their visit". The literature students found pre-selected sources useful and they did not need to search much by themselves. Most of the history students did not find the offered materials useful and the absent teacher was unable to help. Consequently the History students needed to search for information especially on the internet.

6 Discussion and Conclusion

Our findings in the two cases suggest that particular features of an assignment and the ways in which the teacher interacts with students are associated with students' learning experiences. The overall trend in the students' learning experiences was that the average scores exceeded the mean value of the scale only in a few learning areas. The highest averages were achieved in the literature class related to Wikipedia and citing. This is not a surprise since the literature teacher paid much attention to these issues. Moreover she guided students to use Wikipedia articles as a structural model and actively commented on students' texts. Further, publishing articles in Wikipedia may have boosted students' motivation (see [6]).

The above findings are in line with Limberg et al. [5] who emphasize that effective learning of information literacy practices requires that the teacher make the goals of learning explicit to students through designed activities and concentrates on guiding students' work on subject contents. Limberg's point is that information literacy practices are not enhanced if they are not fully integrated with meaningful learning of subject content.

The students gave modest or low scores for learning experiences in most listed areas. For learning in the subject area, the average scores were close to the mean of the scale for source-based writing and evaluation of sources. This suggests that students identified these areas but their learning experiences were far from convincing. In many areas related to information literacy students achieved quite low scores. The areas of concern were not operationalized similarly to Wikipedia, and citing in the assignment design.

The findings suggest that the particular design of the assignment and the ways of guiding students strengthen their learning experiences. However, it is fair to expect that a single learning unit cannot serve all learning goals in information literacy. Learning the whole range of IL practices requires that specific learning goals are cumulatively operationalized across the school's curriculum.

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What They Didn't Have: Backwards Design toward a Forward Agenda

Deborah Lang Froggatt

Simmons Graduate School of Library and Information Science
Boston, Massachusetts, USA
dfroggatt@boston.k12.ma.us

Abstract. Pragmatic research epistemology calls for a problem to be solved. As a secondary school librarian and doctoral student, this writer's observations of urban students' poor standardized test scores and their weak research dispositions inspired me to explore the impact of student learning without a school library. Elements of the theories of *information worlds* and *everyday information practices* outline their under-resourced educational contexts and weak information literacy skills. The purpose of this paper is to examine the validity and reliability of the emerging concept of *informationally underserved* (IU), and if its four-quadrant model and the associated mixed-methods procedures are appropriate. The goal is to advance student empowerment through earlier and equitable access to school library professionals and resources.

Keywords: Mixed-methods, pragmatic knowledge claims, information worlds, everyday information practices, information literacy, equitable access.

1 Introduction

Pragmatic research epistemology calls for a purpose, a problem to be solved. Inequitable access to active school library programs and information literacy skill acquisition is reality for many urban public school students; these are the *informationally underserved*. Their poor standardized test scores and weak library research dispositions prompted me to explore the “potential impacts and outcomes of not engaging in the information-transformational-formational challenge of learning through a school library” [1]. The objective of this concurrent, mixed-method exploration is to examine the impact of this inequity in order to provide a “pragmatic test of usefulness or workability” [2]. The triangulation of the “philosophies of science” or quantitative methods; with the “philosophies of interpretation, as articulated in communicative, pragmatic and hermeneutic thought” [3] and qualitative methods, were used to describe and generate the concept of and the model for the *informationally underserved*.

2 Theoretical Foundations

Current research from statewide school library impact studies suggests that students whose teaching and learning is integrated with an active school library program (ASLP), one that offers a professional librarian and adequately funded resources, outperform their peers on standardized tests [4-6]. The leadership of this research is beginning to explore urban students' ASLP access reinforcing previous findings and analyzing high achievement in standardized test writing scores, especially for disadvantaged populations [7]. However, there is little research on the opposite: Whether or not there is a relationship between children *without* ASLP access and their standardized test score performance. A pilot survey instrument was created and administered to a convenience sample of thirty-two, 9th grade students with the notion that this post-positive, quantitative methodology might be dissertation worthy. Two years later the statewide impact studies' methodology was applied. The survey data was compared with the sample's 11th grade Scholastic Aptitude Test (SAT) scores, rather than pre-8th grade test scores, a sharing "knowledge across context(s)" [1]. Unique variables included levels of ASLP access within their schools as the pre-high school experience ranges from no school library to partial access with to fulltime professionals who provide and an information literacy skill scope and sequence curriculum. Also, the use of public libraries as an information access alternative was explored. The findings were insignificant, but the test provided a foundation for further exploration.

Doctoral coursework integrated the ponderings about student access to educational resources with theoretical concepts such as of information poverty [8]. Upon exploring the theories of *information worlds* (IW)[9] and *everyday information practices* (EIP) [10] quantitative data only partially described disadvantaged learners. Students' under-resourced educational contexts and deficient information literacy skills triggered the inclusion of observations and interviews, such as examining their experiences with resource based learning (RBL) methods used for library research assignments. The leadership of the school library impact studies also calls for qualitative methodologies to explore the impact of ASLP s on specific populations, [11], but few examine students' perceptions of learning without libraries, a "culture specific truth" [2]. Describing the internal, societal and contextual information relationships of students; their classroom "library" worlds and insights about how they find and use information may enlarge the school library impact study research by describing what it means to learn without access to a library's body of literature and information. Learning with libraries contributes to a student's "stock of knowledge," [10] the foundation for fostering independent, life-long learning dispositions that contribute to critical thinking and informed decision making, attributes for participating in a democratic society [12]. Pilot interviews, with two successful high school students, described poor school library resources. However, each highlighted public library use. Their enthusiasm regarding this access suggests that public libraries are an alternative to ASLP.

3 Research Questions

The proposed, mixed-methods doctoral dissertation research fine tunes the investigation and ascertains if it is warranted; if survey and interview data gathering strategies are reliable; and if the emerging concept of *informatinally underserved* and its four-quadrant model is valid. The research questions are: Is academic performance compromised if students are without an Active School Library Program? How, if at all, do students without ASLP characterize their IW and EIP with their academic performance? Are these the right questions for employing a mixed-methodological exploration of ASLP deficiencies? Do they generate workable themes? How well does this pragmatic approach “yield different perspective(s)” and combine “interpretive-and communicative- oriented” with “logico-analytic methods?” [3]. A broader conception of students’ IW of “school” and how little access to ASLP influences their EIP may advance student empowerment through earlier and equitable access to school library professionals and resources

4 Methodology

The first of this study’s two modules employs a refined survey instrument. The convenient, non-randomized sample consists of 90-100 ninth graders who hail from Boston, where 58 out of 134 public schools have no library. Thirty-three professional librarians serve in 43% of the schools, mirroring the 37% of the nation’s urban school libraries staffed by professionals [13]. Only a few teach in pre K through grade eight schools. Standardized Massachusetts Comprehensive Assessment System (MCAS) English test results indicate that 40% of Boston’s rising 9th graders either needed improvement (27%) or failed (13%) [14]. The qualitative module tests this hypothesis:

$$\begin{aligned} \textit{Hypothesis: } H_0: \mu &= IU \\ H_a: \mu &\geq IU \end{aligned} \quad (1)$$

The null hypothesis is that the response variable, *IU* standardized test scores, stay the same as students with ASLP. μ in this case is the population mean of students scoring proficient or better on standardized tests. The alternative hypothesis is that, without ASLP, student academic performance will be less than their counterparts.

The survey instrument employs a Likert scale format in order to examine a range of school library access points including school library availability, staffing, public library access and cell phone use for research. Student standardized test scores will be compared with these access points for determining whether or not the *IU* scores significantly correlate with their lack of pre-high school library access. Data analysis will determine if there is a relationship between the 60% entering 9th graders without ASLP access prior to high school and their grade 8 standardized test scores.

The concurrent module investigates the phenomenon of those educated without libraries and their possible marginalization. An indigenous form of student assessment is an academic exhibition that requiring RBL and employing information literacy

skills. Students must independently locate and access a range of information resources in order to answer essential questions or solve problems; their new learning is demonstrated through written, visual and/or oral presentations. Many struggle; their research projects' assessment data and teacher input support this. Others appear to engage deeply with the academic content and easily pursue extracurricular interests. The thirty minute, semi-structured interviews will query students without ASLP about their conceptualization of a library's body of information and their information use within the "small world" of family, "meso world" of school and "information worlds:" situated, interrelated contexts that constantly interact and are impacted by social norms, social types, information value, information behavior and boundaries [9]. The interview questions probe a student's EIP and "information profile:" one's internal disposition and proclivities for information seeking, use and sharing [10].

The interview transcriptions and analyses will be coded in to order identify patterns and emerging themes. Threats to validity include researcher and student bias due to power relationships and racial differences. A composite information profile of the *informationally underserved* will describe students' pre-9th grade learning contexts, how they found information, and their perceptions about participating in high school RBL which demands independent information literacy skill application: Persistent and independent information access, evaluation, developing essential questions, deep reading, and connecting new ideas with and previous knowledge.

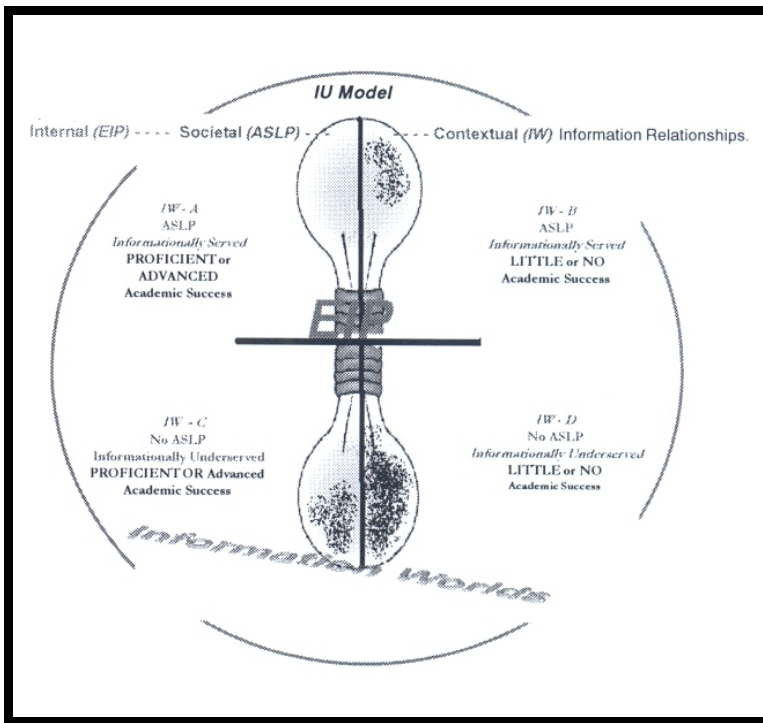


Fig. 1. Informationally Underserved Model

5 Theory of the “Informationally Underserved”

The *informationally underserved* (IU) is a child who learns without a library. The model above (Fig. 1) serves as a “spatial metaphor” [10] for the IU. The circle represents the students’ contextual information worlds (*IW*). It depicts the IU’s “meso” school world [9] including social influences such as media, politics and public library access. The light bulb represents the IU’s academic success and internal everyday information practices (*EIP*). The shading therein symbolizes student success on standardized tests. The bulb’s base symbolizes the internal, invisible EIP core where a student’s profile of information seeking, use and sharing resides. The ASLP in each quadrant represents the level of access to this critical educational resource, a component of the societal context. ASLP is depicted in four learner scenarios:

1) *IW-A* or the *informationally served*: This set of students experienced ASLP access and academic success. 2. *IW-B* or the *informationally served*: They experienced ASLP access, but have little or no academic success. The scope of this research does not include this cohort. They may have a range of other learning issues requiring different research. 3) *IW-C* or the *informationally underserved*: This set of students had little or no ASLP access yet had academic success, such as the two interviewed students referenced above. Public library use, family context, classrooms with adequate information resources may be factors. 4. *IW-D* or *informationally underserved*. They experienced little or no ASLP and have deficient academic success. The survey data results will be represented by a scatter plot where the x axis holds the students MCAS scores and the y axis holds data on pre-high school library access. If the alternative hypothesis is correct, there should be a significant number of points in the bottom right quadrant; the *informationally underserved*. When implemented, the replicable methodology and model serve to inform in order to resolve library access issues; thus, transforming the lives of young learners.

6 Conclusion

The IU research examined academic performance by analyzing standardized test scores and student characterization of their learning without libraries. Comparing student survey data with the prevalent form of student assessment furthers the school library impact study research by incorporating levels of library access. The qualitative analysis may support research that suggests that if students do not have opportunities to acquire “problem-based” learning skills then they may not have the desire to seek information for their own edification [15], compromising independent information literacy skill dispositions [13] and their “stock of knowledge” [10]. A limitation to this study is that the sample population is drawn from an urban school setting. Also, the results may be skewed because consent was garnered at parent/teacher conferences. Thus the findings cannot be generalized to other populations of students. The reliability of 9th grade survey data may be compromised due to the retrospective nature of some of the survey questions. However, high school students are capable of providing reliable data if survey questions are comprised of “contemporaneous,

factual variables” which are valid and are measured reliably [16]. Similar to the statewide impact studies, the replicability of the survey instrument supports the reliability of the methodology. Crowley suggests that pragmatic research develop interlanguages [1] such as the standardized test score methodology. Unique here the investigated variables provide student, not librarian, generated data. The synthesis of the two methodologies describes and generates the concept of and the model for the *informationally underserved*. This pragmatic approach explores student information worlds and everyday information practices and seeks relationships between student academic performance with little or no ASLP access during formative years. The theory extends research upon which educational funding decisions may rest.

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Information Literacy, a Post-2015 Education for All Goal

Isabelle Turmaine

International Association of Universities,
UNESCO House, 1, rue Miollis, 75732 Paris Cedex 15, France
i.turmaine@iau-aiu.net

Abstract. As the United Nations Education for All (EFA) is approaching its end (2015) knowing that all its goals won't be reached, it is time to propose new goals that can make a difference and offer the world real inclusive knowledge societies. This paper supports the view of the International Task Force on Teachers for EFA which proposes information literacy but through the lenses of higher education and digital literacy, and with the help of librarians.

Keywords: Education for all, access to education, digital literacy, higher education.

1 Introduction

The United Nations' Education For All initiative and its 6 objectives on early childhood, primary education, youth and skills, adult literacy, gender, and quality is coming to an end in 2015, and if progress has been made in basic education and gender parity, it is clearly known that all objectives won't be reached by that date and that millions of persons will not benefit from some kind of education [1].

Within today's - and certainly tomorrow's - knowledge-based societies - which refers to societies that are well educated and who therefore rely on the knowledge of their citizens to drive the innovation, entrepreneurship and dynamism of that society's economy (Organisation of American States¹), this is not socially, economically and individually acceptable.

Solutions are to be found. Information literacy, as proposed by the participants of the Windhoek Meeting of the International Task Force on Teachers for EFA [2] as one of the possible post-2015 EFA goals, could be one.

The aim of this paper is to advocate for this position but through the lenses of the higher education sector and the angle of digital literacy.

2 EFA, Higher Education and Technological Innovations

According to the International Association of Universities (IAU), the higher education sector is in the front line of all EFA issues. Its three missions of teaching, research

¹ Organisation of American States, Knowledge-based Society,
http://www.oas.org/en/topics/knowledge_society.asp

and community services relate to EFA. However, for the purposes of this paper, only the issues of increased access to higher education globally and the need for more teachers will be put forward. Addressing increased access and the number of teachers both have a direct financial impact, translating into higher costs for the State, the higher education institution and/or the student, yet resources from all three stakeholders cannot be extended indefinitely. These demands come at a time when technological innovations, as well as their education applications, are spreading, and seen by many as potential solutions to an increasing number of students' and teachers' training. When referring to provision of its online courses, the University of Illinois states: "As a public, land-grant university, our mission is grounded on the premises of education for all" [3].

2.1 Increasing Number of Students

The higher education sector has to provide access to a growing number of students globally. Indeed, the relative success of EFA and the evidence-based link between a critical mass of educated people and social and economic development – both at the country-level and for individuals – has led to a massification of higher education. If the trend started in the 1970s, the thrust of expansion began in 2000 (the year when the 6 EFA goals were adopted in Dakar, Senegal). Student numbers are expected to reach over 400 million by 2013 in comparison to under 100 million in 2000 [4]. Increased student bodies are a universal phenomenon. Even if most African countries still have a relatively low higher education ratio (below the 50% marker set by Trow [5] to define mass higher education of an entire age group), they have been just as affected. Faced with inadequate resources, this rising demand poses major problems for policymakers as well as for the leadership of higher education institutions [6] and, of course, for students wishing to continue their studies.

2.2 Teacher Education

In most countries, higher education trains teachers and teachers' trainers. UNESCO has evaluated that to achieve universal primary education, 1.7 million additional teachers are needed [7]. This can only be solved by training more teachers or by innovation in pedagogy. Re-training is also increasingly considered as necessary while training of teachers in conflict and post-conflict environments and learning to deal with all kinds of accessibility issues are more and more sought. Such aspects of teacher education provision are all closely linked to the EFA goals and commitments, especially in light of the growing focus on educational quality, particularly pertaining to marginalized populations and in special needs education.

2.3 Higher Education Finance

While student numbers have risen, no country has increased its State higher education budget to proportionally match growing demand. For example, in China enrollments rose by 230% in the period 1998-2003, but State funding rose by only 140% [8].

This has had and still has a direct impact on higher education institutions and higher education provision, with the necessity to find new revenue sources, increase fees (in some institutions), and the development of the private education sector, outside any quality framework. For the student, access to higher education becomes more and more a calculation that can be summarized as: where can I get the best higher education at the lowest cost?

2.4 Technological Innovations

Highlighted by many, technological innovations could well solve the need for more seats at the higher education level and reduce costs for both the higher education institution and the student.

The technological innovations that have changed and are continuously changing the education landscape can be divided into three levels: modes; supports and tools.

As far as modes are concerned, first came e-Learning, online learning provided by a university in association or not with traditional face-to-face courses (blended learning). Then appeared Open Educational Resources (OER), which allow every teacher or learner to build/complement their course/programme with pedagogical resources made available free of charge for use, re-use and adaptation. Now is the time of Massive Open Online Courses (MOOC) whereby a consortia of universities provide free (but not open) online courses in partnership or not with private companies to large numbers (millions) of students.

As far as supports are concerned, first came individual computers, then laptops, mobile phones, and now tablets.

These developments have happened in a few decades. Even if not every institution and student is providing courses/learning online: 70% of US higher education institutions reported online education was critical to their long-term strategy in 2012 [9]; Open Universities are set up in many countries worldwide; students are increasingly requesting the ability to organize their own academic path [3]; Coursera, the leading MOOC provider, claimed over 3.6 million Courserians on 23 May 2013. Indeed the student population taking courses online continues to grow.

Yet, technological innovation is costly and highly disruptive: higher education institutions must make choices regarding the technology to use. This is all the more costly and disruptive if one considers the constantly evolving nature of technology. Games and gamification, learning analytics, 3D printing and wearable technology could well frame tomorrow's higher education landscape [10].

3 Digital Literacy, the Librarian and EFA

In addition to budget and strategy issues for higher education institutions, the online provision of education has consequences on students, teachers, and professors. It has to be accepted and correctly used. A culture of online education provision and learning has to be instituted and fed. This begins with and would not exist without digital literacy. With the support of the librarian, relevant skills have to be taught, maintained and upgraded at all times and for all.

3.1 Digital Literacy

Digital literacy comprises keyboard skills; the use of capture technologies, analysis and presentation tools; general navigation/user interface skills; adaptivity, agility, confidence/exploration. It should allow for the operation of virtual and immersive worlds, and digital identities and reputation; and the use of digital technologies for reflecting, planning and making sense of learning experiences [11]. It should also address ethical and legal issues related to intellectual property and open access rights, online fact validation, and document sourcing and attribution [3].

Easy use of techniques is relatively straightforward for students, including a growing proportion of teachers/professors, who are digital natives. Yet these basic digital skills are inadequate vis-à-vis a world where online education is gaining ground and might be tomorrow's main education provider. Deeper digital literacy reflection and critical thinking are essential.

Online education is supposedly student-centered and adaptable. This implies that students can make their own choices as to where, what, when and how to study. This is something that is not innate. Consequently, it is important that students have the necessary skills to fully benefit from and succeed in their educational paths.

Today's students have to decide on their choice of higher education amongst a growing number of education providers. With online courses and the efforts made by governments in degree recognition matters, students can choose a course provided by a foreign university without moving from their home country. But they must make an informed choice in a world where bogus universities are mushrooming, rankings do not evaluate online training, and universities worldwide are launching e-marketing recruitment campaigns.

Students must learn to look for important information such as whether a degree is provided at the end of the online course or not: most MOOCs don't confer degrees at present. Students should also be taught relevant terminology, to understand that "open" does not systematically mean "free of charge," for example.

Students should learn how to organize their time and work, deal with the distractibility that mobile technologies often induces, so as not to be part of the 90% non-completion rate for online learning – and simultaneously, reduce the dropout rate. They must be informed on the topic of copyright rights, taught to analyse online available information, and respect sources in order to avoid cheating and plagiarism – the second drawback to online education.

Of course, teachers and professors have to accompany students in this and consequently must benefit from the same skills, integrate them into their day-to-day practices, and be valued for doing so. They should work on ways of retaining students, reducing distractibility and plagiarism.

3.2 The Librarian

For both the student and the teacher, the task of acquiring all the necessary digital skills is enormous and evolving nearly by the day. They will need help.

Librarians play a central role in higher education institutions, interacting with all actors: students, faculty, administrative staff, and heads of their institution. Librarians and their associations have always advocated for and worked in information literacy. They are trained to find the right information, provide training in new technologies, deal with copyright issues, and disseminate information. As such, they would be best placed to help students and teachers in gaining and upgrading their digital literacy skills.

Coping with the latest educational application of innovation technology, their commitment could take the form of the creation of a MOOC on the topic, or introduce elements of digital literacy in non-library MOOCs (edlibbs²), along with providing face-to-face and online individual/group training and information when needed.

4 Conclusion

Tomorrow's education will be increasingly, if not solely, provided online. Moreover, it will take place at anytime and anywhere. If digital literacy is not extended to everyone from a very early age and throughout life, today's higher education gap might increase instead of decrease, Education for All might never be reached and higher education courses might only originate from a handful of countries, thus repeating some kind of colonization. And online education requires information and at least minimal digital literacy. This is the reason why, the higher education sector through the International Association of Universities backs the International Task Force on Teachers for EFA's proposal that one of the next goals for EFA be information literacy.

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Rhetoric in the Finnish Higher Education Information Literacy Teaching: Analysis of the Activity Systems Found in the Finnish Academic Libraries IL-Recommendations

Juha Kämäräinen¹ and Jarmo Saarti²

¹ University of Oulu, Information Studies,
P.O. Box 8000, FI-90014 Oulu, Finland
juha.kamarainen@mail.suomi.net

² University of Eastern Finland Library, P.O.Box 1627, FI-70211 Kuopio, Finland
jarmo.saarti@uef.fi

Abstract. From the beginning of this millennium Finnish Higher Education Libraries have been undertaking a vigorous discussion about how information literacy (IL) should be taught. One aim has been to implement standardized requirements for Finnish higher education IL-tuition. This has led to several proposals for IL-tuition. The paper investigates these recommendations in order to reveal the structural dynamics of IL-background assumptions based on analysis of activity-theoretical system components and on Greimas' actant-model of narrative structures. The set of practical purposes-based criteria for theses, together with changing information environments, caused for instance by the increasing role of social media in information seeking, challenge the guidance of thesis processes as well as library services with an IL-slant. In addition, the modern working life offers its own challenges to the student and to higher education institutions. We suggest that the actant-analyses of incompatible motifs present in IL recommendations may help to develop more up-to-date inter-professional guidance practices.

Keywords: Information literacy, academic libraries, strategies, actant analysis, Finland.

1 Introduction

The concept of information literacy (IL) is associated with the growth of the information society. Today, one speaks about enlightened consumers and this infers the concept of informed citizens. There are many information skills that the modern citizen must possess. This can be seen in the proposal made by Paul Zurkowski in 1974, then the president of the Information Industry Association: he stated that during the next decade information literacy should be taught to all the American citizens. His definition of IL consisted of training the people to utilize information in their everyday work [1-2].

The academic library community adopted IL as one of its basic concepts. This coincided with the emerging digital paradigmatic change in the scientific document dissemination which resulted in an identity crisis in the library community: what is the mission of a librarian in a world that does not contain printed material? One could argue that teaching information literacy may simply sound more impressive than teaching library skills or information searching. During the 1990's and on into this millennium the discussion about IL has broadened until today it seems to have become all-encompassing.

Information literacy has been under active discussion within Finnish academic libraries from the beginning of this millennium. The first major effort in Finland took place in the University of Helsinki Undergraduate Library's project "Standardizing the management of the information literacy 2001–2003". Its aim was to translate the ARCL's Information Literacy Competency Standards for Higher Education into Finnish and these were published in 2001. The project also arranged two seminars and opened the possibility of implementing these standards into the Finnish higher education curriculum. Subsequently a project called *Information Literacy Curriculum Project 2004–2006* was launched [3] which published *Recommendation for universities to include IL competency in the new degree structures* in 2004 [4]. During the same time the Finnish libraries of the Universities of Applied Sciences (UAS) published their own recommendations [5]. During the academic year 2012 – 2013, the university libraries started to revise the recommendations.

Our paper aims to provide a close reading of the Recommendations Document in order to identify the structural dynamics of its background assumptions on IL. Our approach is based on Greimas' actantial model of narrative structures.

2 From Teaching to Coaching, from Learning to Doing – Changes in the Educational Paradigm

Finnish higher education is built on a dualistic model: the Universities have the responsibility for scientific research and offer tuition based on it; the Universities of Applied Sciences (UAS) offer tuition and conduct research and development with more practical and vocational orientations. The UAS were created out of existing institutes which had been mainly Colleges of Nursing, Commerce or Engineering. This diversity of educational cultures has required great effort to build a credible academic concept for the Finnish UAS.

One can identify at least three major trends in academic education that is changing radically the way in which universities function in the global education market. These are:

1. paradigm shifts from behaviorism towards constructivism
2. didactic movement from teaching to coaching
3. a move from local closed systems to global open digital systems

The prevalent paradigms in education have changed during the past 50 years from the behaviorist stimulus-response model towards a theory of cognitive constructivism

where the subject learns by adding new elements to his/her own knowledge base and where the process is life-long and not limited to instruction obtained in the formal education system. Teaching is now approached more as coaching; the role of the academic teacher is not to tell what to learn but to aid and help students in constructing a knowledge and skills base. This means that students spend more time on personal assignments. In other words, there has been a shift of control from the teacher to the student, who now undertakes more activities related to information searching.

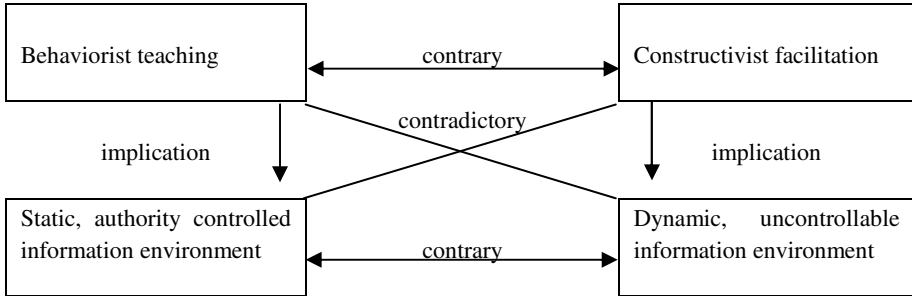


Fig. 1. Changes in the learning and information environments modeled with Greimas' Semiotic Square

The change has been assisted by developments in digital information technologies and in new ways to disseminate academic and other information. At the same time, academic education has become a global marketplace for students and academic institutions. These can be viewed as new opportunities for acquiring information and education, e.g. via open video-conferencing, social networks and open access publishing. This change is depicted in fig. 1 where one can see the movement away from a static and closed philosophy of teaching toward more open and flexible ways of learning in relation to the available information environments. This evolution has been depicted as new education pedagogy, i.e. connectivism that emphasizes the role of the modern networking technologies to the learning [6].

3 Activity Systems and Actantial Models as Analytical Tools for the IL-Recommendations

According to the Actor-network theory (ANT) no society, organization or institution can exist a priori as a given artifact or as a predetermined causal event. All societies create systems that are formed in a socio-technological process that organizes the action and the networks in each environment. Thus we can state that the better the people, ideologies and technologies involved in a process are tied together, the better they will function in order to fulfill the mission of these social constructs.

One central concept in ANT is that the technology is the main actant that creates stable collectives, thus non-human actants are at least equally important in social processes. ANT cannot be strictly defined as a theory but rather as method by which one can interpret the material and semiotic networks between the different types of actants in a social network (or in a rhizome) [7].

Information literacy does not exist as an isolated, factual or separate phenomenon or entity. Instead it possesses features related to ideologies which in turn can be seen as interrelated social constructs. Here efforts related to IL are discussed in terms of narratives as well as of activity systems. As Greimas pointed out in his actantial model based on Propp's thematization of Russian folk tales, there is a general structure to a few interrelated elements which can be found in the structure of different discourse genres. Engeström in turn has developed a systemic activity theory based on Vygotsky's and Leontjev's works.

In Greimas' actantial model, the Subject has an orientation towards achieving a goal (Object). The Object is set or indicated by the Sender and submitted to a Receiver. The Subject is supported by a Helper and hindered by an Opponent in the pursuit of the Object. It is essential to note that the actants are not to be reduced into single actors. Instead a set of interrelated connections appears between actants and between named or role-based actors. Hébert has developed the actantial model further by introducing the Observing Subject, which is the representative of the point of view adopted in a certain actantial model. By choosing a different Observing Subject, the setting and balance between actants can thus be changed considerably.

Both Greimas' actantial model and Engeström's activity system model provide relevant tools to identify and conceptualize some underlying tensions in information literacy ideologies, which are represented in the IL-recommendations.

4 Introduction and Certain Findings Concerning Finnish HE IL-Recommendations

If one wishes to apply critical approaches – like actantial or activity system models - one (at least temporarily) must reject the concept that IL possesses an inherent good value, which does not need to be justified: e.g. emphasizing the traditional library catalogue searching, can hinder fluent, flow-like integrated information finding-and-using processes that are utilized by the Internet natives. At least one must clarify one's background assumptions or make theories-in-use more explicit.

Finnish HE IL-recommendations offer a core message from a certain background to a certain audience. These assumptions or background theories are not necessarily explicit or relevant outside the information literacy framework. However, they tend to be defended and validated as a part of what can be considered as unquestionable professional competence. It is not difficult to apply for EU-funded projects or US-based commercial companies as Seekers on the Quest of the Information Literacy Holy Grail. The rhetoric of information literacy as represented in Finnish HE IL-recommendations thus needs to be subjected to a detailed analysis.

4.1 Actants Found in the Finnish IL-Recommendations

The libraries of Finnish higher education institutions approach their IL-related goals and motivations in very indirect ways. The Recommendations Document is organized into an introductory section of 5 paragraphs. The first paragraph will be used here as an example on how the argument has been built in terms of actantial relations (Table 1).

Table 1. Argumentation examples from the introductory paragraphs of Finnish HE IL Recommendations Document in terms of actantial relations

<i>Topical element in recommendations document</i>	<i>Actant</i>	<i>Relation</i>	<i>Actant</i>
1 IL will be recognized as an important skill in current society	subject: Finnish Academic Libraries	desire	object: significance of IL to be recognized
h1 [hidden element: lack of this skill causes problems]	subject: Finnish Academic Libraries	knowledge	opponent: ignorance of Libraries' expertise
2 IL is required in studying	subject: Finnish Academic Libraries	knowledge	helper: IL as tool to aid in studying
3 IL is required in research	subject: Finnish Academic Libraries	knowledge	helper: IL as tool to aid in research
h2 [hidden element: authority of scientists must be honored]	subject: Scientific Community	power	object: to define research-related competences
4 IL is required in working life	subject: Finnish Academic Libraries	knowledge	helper: IL as tool to aid in working life [practical one, outside research and studying]
h3 [hidden element: tension between different types of knowledge and knowing]	subject: Finnish Academic Libraries	knowledge /power	opponent: insufficient means to treat documents outside the bibliographic control and tacit forms of knowledge
5 one needs to be taught to achieve IL	subject: Finnish Academic Libraries	obligation /power	receiver: people not enlightened on the essence and possibilities about IL
6. one needs to be personally guided to achieve IL	subject: Finnish Academic Libraries	obligation /power	receiver: people not guided to the essence and practices of IL
h4 [hidden element: tensions between orientations toward library-organized vs. internet resources]	subject: Finnish Academic Libraries	desire/power	object: to favor library-organized resources over internet ones still maintaining a sense of conflicts between user's needs and libraries' institutional goals
7 these requirements are also valid in higher education	sender: Finnish Academic Libraries	desire	receiver: Scientific Community and HE-related policy-makers

When approaching the Recommendations Document through Actant Analysis, it appears that the concept of modality can be more productive than pure efforts to isolate actants as such. The internal dynamics of the Actantial Model is created by four modalities, i.e. universal power relations between actants: obligation (having-to), desire (wanting-to), power (being-able-to) and knowledge (knowing-how-to). [8]

The structure of the first paragraph of Recommendations Document contains seven explicit points of view. In addition, four implicit elements can be derived to support the explicit statements. Together they form a sandwich-like structure. The argument is opened and closed by the expressions of the libraries' desire. In addition to desire, the elements of knowledge, power and obligation can be found. The argument builds up from desire towards an emphasis on libraries' knowledge about requirements for IL in various sectors of society. Libraries introduce their interest in power when declaring the necessity of IL-related education. The argument is closed by a remark that higher education cannot exclude itself from these requirements. The implicit elements are also informative: the evasive and humble voice does not allow the expression of any threats. Thus the consequences of ignoring the recommendations remain hidden (h1).

Interestingly, the Recommendations Document mentions research in a way that it is separated from study and work. Research is thus placed in its own distinguished position. Libraries are trying here to provide an implicit hint to the Scientific Community that in addition to their technologies, the Scientists can benefit from better strategies in locating relevant literature. In topical element (TE) 3 Libraries are thus recommending an intervention, but soften their argument by omitting the aim to define research competence in terms of developed IL abilities.

In TE 4, the scope of IL is extended to working life (by following the Zurkowskian canon), but the unintended juxtaposition of (real) work, studying and research creates a mixed impression. After 4 it is evident that especially in working life, much of relevant information and knowledge will remain outside the library's remit. Making the h3 explicit would lead to the complex issue of who is responsible for IL-related enlightenment in (real) workplaces. In TE 5 and 6, the issues of various means and paradigms of instruction are discussed. "To teach in front" may be an issue even for librarians eager to guide (or assist) their customers.

The hidden element h4 stands for the hidden curriculum aspects around IL. The relationships and tensions between (a) "just IL", (b) promoting one's own library and the emphasis on Internet's (c) possibilities and (d) threats are ideologically loaded and sensitive areas which are subjects of on-going debate. It is a challenge to the developers of IL-related concepts, recommendations and "standards" that they do not make their views seem like indoctrination in this sense.

The final TE 7 closes the sandwich structure by reminding the policy-makers that Higher Education is not exempt from obligations posed by the ideal (and ideology) of IL. The scantily used register of desire is emphasized here. It is important to note that the validity of Information Literacy in Higher Education appears here as an issue of policies rather than as an issue of knowledge as such.

It is noteworthy that the teachers and students do not appear either as subjects or receivers but remain indirectly articulated through related activities. Whereas the

public goal of this Recommendations Document is to inform decision makers about an important concern, the hidden goal is to use as indirect and impersonal a voice as possible. The short, single page format is helpful for realising the hidden goal but not for the public goal. The makers of the Recommendations Document should explain why they chose this rhetorical strategy before publishing the final version. When the message reaches its target groups, it will be too late to try to explain unclear background assumptions: this may be a fatal error.

5 Conclusions and Recommendations

It should be noted that actantial analysis reveals structures and dynamics in the discourse from a certain viewpoint. The observing subject has been introduced to address that bias [9]. One could also analyze the rhetoric in the Finnish HE IL Recommendations from the viewpoints of students and teachers.

The major challenge in integrating IL into Finnish higher education units has been, and still is, the diversity of IL implementations within each university and other HE units. In some cases, the library has been active and made significant contributions to teaching IL, especially how best to conduct information retrieval, for students and faculty. However, there are still libraries having neither resources nor the opportunity to influence the curriculum meaning that they make little impact on IL promotion and education. Thus the aim of the Finnish university libraries has been twofold: a) to make the decision makers aware of the importance of information literacy and related information skills for students and faculty and b) to test implementations of IL with different kinds of projects. Major efforts have been expended in formulating and implementing IL strategies.

The changing information environments such as the increasing role of social media in information seeking, challenge the guidance of IL processes as well as library services. The modern working life also poses its own challenges for students and HE-institutions. The recommendations appear to be written for the library community: they do not seem to be aware of the complex actant networks of the academic world, even less of the world outside academia: the working life and the IT-world, worlds in which students already live.

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Information Literacy Course – The Perception of Students and Professors: University of Zadar Case

Dora Rubinić¹, Ivanka Stričević², and Mate Juric²

¹ University Library, University of Zadar, Zadar, Croatia
drubinic@unizd.hr

² Department of Information Sciences, University of Zadar, Zadar, Croatia
{istricev,mjuric}@unizd.hr

Abstract. Since the academic year 2011/12 University of Zadar's Department of Information Sciences and the University library have jointly organized an elective course - Information Literacy. The purpose of this research was to examine students' and professors' opinions concerning the information literacy competencies represented in the Information Literacy course curriculum, and the possibility of future collaboration between professors and librarians to help students gain information literacy competencies in the context of subject courses. Students and professors from different departments participated in the surveys and interviews. The results show that both the professors and the students are aware of the students' insufficient competencies and that the professors consider these competencies to be important. The students believe that the Information Literacy course could help them with their coursework. The professors are willing to collaborate with librarians in order to improve their own courses. It can be concluded that the Information Literacy course itself is insufficient - but can be a significant first step in developing cooperative programs of information literacy education.

Keywords: Information literacy, information literacy course, academic libraries, University of Zadar.

1 Introduction

Information literacy is most often defined as a set of abilities requiring individuals to recognize when information is needed, have the ability to access the information sources, search and locate the needed information and to evaluate and use it ethically. [1]. Information literacy assumes different levels of thinking skills which are associated with various learning outcomes. In recent interpretations of the information literacy concept the need for developing higher-order thinking skills is emphasized. It requires a cooperative learning environment [2]. Such skills are negotiation, comprising, comparing, analyses and synthesis, all of which creates new knowledge.

Many academic libraries have taken an active part in development of information literacy competencies as is demonstrated through examples of good practice in libraries that educate through individual instructional work, workshops and formal university curriculum [3]. In terms of organization, incorporating information literacy

into the curriculum can be done in several basic ways, one of which is a standalone course. Such course is offered as an elective where librarians participate in the teaching. The described form of education can be helpful to students in mastering necessary generic information literacy skills needed in the higher education environment. However the downside of this kind of information literacy education is that students learn and practice the information literacy skills outside of their specific disciplinary context. Numerous authors point out the necessity of teaching information literacy skills within disciplinary contexts, because it facilitates comprehension and gives deeper meaning to the contents [4-6]. Hence, contextualization of information literacy skills is important and it can be achieved through collaboration between librarians and professors, as the professors contextualize these skills in their classes through appropriate teaching strategies [7].

The Croatian university system underwent certain changes due to the Bologna process which promotes new methods of learning where students have more independent and responsible roles. Croatian university students' technical skills of information searching are insufficient, and intensive participation in the search process with the engagement of higher order thinking skills is necessary. At the same time university libraries around the world tend to participate in developing virtual university frameworks which require information literacy education [8].

2 Information Literacy Course at the University of Zadar

Until the academic year 2011/2012 information literacy education at the University of Zadar had been taught in the framework of librarians' individual work with students and through research methodology courses taught by the professors of various departments. There was a need to enable students to acquire the skills that will systematically help them with mastering the university curriculum. Since the academic year 2011/2012 the professors from the Department of Information Sciences and the librarians from the University library have jointly taught an Information Literacy (IL) elective course. The course is based on the ACRL Information Literacy Competency Standards [1] and is structured as a set of practical exercises in 14 teaching units taught in the course of one semester. The subjects range from library literacy (getting familiar with and using library services and resources) to information literacy. The course is an elective course for graduate and undergraduate students of all majors (excluding the Information Sciences majors). This course was originally intended for first year students only, however, due to the decision of the University Senate, whose members thought information literacy was important and that student competencies were insufficient, students of all levels are invited to take this course. Because the course is designed for students from various departments it remains on a general level - it teaches generic skills and does not encroach on individual study areas.

The importance of the IL course introduction is twofold: one is to improve students' competencies for learning to learn, and the other is to increase the visibility of the University library whose educational role is carried out through participation in the University curricula. It is the visibility of the University library's educational role in the information literacy area that is necessary so that the professors become aware

of the potential of collaboration with the librarians, and to include information literacy education in their teaching context. Such research and experiences have been present in the world for years, but in Croatia the role of academic librarians in the educational process is rarely recognized, and their role is mostly perceived within the traditional model - the librarian who acquires materials, builds the collection, organizes information sources and enables access.

Since the academic year 2011/2012, two generations totaling 53 students participated in the IL elective course. Student interest in the course was even higher but space in computer labs was a limiting factor.

3 Methodology of the Research

This study had two basic objectives. The first objective was to explore what students expected from the class and to have them self evaluate their own information literacy competencies covered in the IL course, and also to have the professors evaluate students' competencies and assess their importance. The second objective was to find out what are the professors' attitudes toward the collaboration with librarians regarding the information literacy education in their teaching context. The results of this study have a dual purpose: 1) to be used for further development of the IL elective course which should take into account the professors' perceptions of the students' information literacy needs as well as the students' own perceptions on the subject; 2) to be used for the development of other, more advanced, forms of information literacy education directed toward collaborative work of professors and librarians, in other words, toward information literacy within disciplinary context.

Research questions: 1) What do students expect from the Information Literacy course?; 2) How do students evaluate their own information literacy competencies?; 3) How do professors evaluate students' information literacy competencies and how important are these competencies for the courses they teach?; 4) How do professors perceive the elective IL course?; 5) How much and why are the professors willing to collaborate with librarians in teaching their courses?

Methods used were surveys for students and professors, and an interview for a number of professors. Students from two generations of course attendees (53 students) from the departments of social sciences and humanities, along with 20 professors from some of these departments, participated in the research. To gain further insight into the attitudes of the professors 10 out of the 20 participating professors were selected for a semi-structured interview. We interviewed the professors who are presumed to be more experienced in teaching and in curriculum development. A questionnaire was given to two generations of students during the introductory lecture (March 2012, and March 2013). For the purposes of this study we only presented the data relevant for the research questions. The survey for the professors was conducted in spring semester of the academic year 2012/13. In a Likert scale type questionnaire they were expected to evaluate the students' information literacy competencies in the areas covered by the IL course curriculum. The professors also evaluated how relevant are these competencies for the courses they teach. The student and the professor questionnaires covered the same competencies (matched items) for comparability between the two questionnaires.

The semi-structured interview that was conducted with a number of the professors (10) gave insight into their attitudes toward information literacy and their stances on the potential collaboration with the librarians in order for students to acquire the information literacy competencies within the disciplinary context.

4 Results and Discussion

4.1 Students' Expectations from the Information Literacy Course

The majority of the students enrolled in the IL course expect it to help them with coursework in their other courses – i.e. to write term papers and theses (74%), to learn how to use information resources and to be more independent while studying (68%). Students enrolled in the IL course because they felt the need to acquire knowledge and skills in researching literature, databases and the web. The results indicate that the students are aware of the need for such a course and its potential. It is possible that in the course of their past studies they encountered the situations where it would have been useful to have such skills.

4.2 Students' Information Literacy Competencies – Student and Professors Perceptions

The professors assess information literacy competencies (information searching skills, evaluation and ethical use of information) relevant to their courses (see Table 1). These assessments of importance are statistically significantly higher in comparison to student self-evaluation of their information literacy competencies. Thus, the professors expect much more than what the students believe they know. The most significant difference between the professors' perceptions of competence and the student self-assessment is evident in the category of "evaluating the validity and relevance of information sources." The professors assess these competencies as highly important (4.55), while the students answer that they have moderately high competencies (3.30). Furthermore, the students believe they use the information ethically and are able to structure their term papers, while the professors score their competencies much lower. These findings are going to be used for further development of the IL elective course – those topics that showed a big difference in the perceptions of professors and students and indicate students' uncertainty should be intensified. In the survey questionnaire the professors scored the importance of searching the databases relatively low as compared to other competencies – as a moderately important skill (3.55) (see Table 1). We can assume that this is so because it was an estimate of their existing courses, many of which do not include that specific segment. However, the interviews show that professors want database searching skills to be included in their courses in the future and are willing to collaborate with the librarians in the teaching process.

In the interview, the professors (P), while explaining which student information literacy competencies they consider to be insufficient, list poor information reading skills (P1 & P3), scientific illiteracy (P4) and lack of independence in learning (P3, P4 & P5) most often blame these insufficiencies on the fact that these competencies are not acquired in earlier stages of education (P1, P3, P4 & P5).

Table 1. Assessment of student competencies and the importance of particular competencies

Competencies	Students' self assessment of competencies	Professors' assessment of student competencies	Professors' assessment of competence importance
Using online databases	2.48	2.45	3.55
Formulating search queries	3.45	2.85	4.45
Finding the relevant information	3.51	3.05	4.60
Evaluating information sources	3.30	2.84	4.55
Structuring the term papers	4.19	3.58	4.50
Using information ethically	4.21	2.75	4.50

*Results are expressed on a scale from 1 to 5 (1 - *strongly disagree*, 5 - *strongly agree*)

Some professors associate information literacy solely with methodology courses within the principal departments. So, for example, professor P4 states: “*We teach them information literacy in the first year methodology courses, but once they pass those exams they forget it all (P4)*”. Professor P2 states that “*there is no time for information literacy because students have too little time for classes in their principal areas and they have to read their basic literature.*” This attitude clearly shows the lack of understanding of information literacy, which is seen as additional burden on students and as a set of skills that is separate from learning and study of a specific subject.

Although professors do not understand the essence of information literacy, most of them are aware of the importance of particular information literacy competencies (see Table 1) for the courses they teach. However, some admit not using the strategies that promote development of these competencies although they expect from students to have them, e.g. “*for my courses it is not important to know how to search (for information) because I give them the readings I selected as valuable although I am aware that maybe it is not the best way. For their final thesis it is important that they know how to do their research independently*” (P3). This clearly indicates that even when the professors are aware that the strategies they apply are not good, they are not aware that the students will not be able to develop the competencies without the appropriate teaching strategies. It is similar to the professor’s P6 statement who is not aware that information literacy competencies will not get developed on their own. – “*Perhaps these are the competencies that cannot be expected before the graduate level*” (P6). Professors look for reasons students lack competencies in some external circumstances – too many students (P4 & P7), time constraints in the teaching schedule (P1, P2, P4 & P7) – all of which actually show that they do not understand that the acquired information literacy competencies can facilitate learning and teaching, not hinder them.

4.3 Professors and Librarian Collaboration

The majority of interviewed professors (8 out of 10) said that before being interviewed they were not aware of the Information Literacy course or of the possibility of collaboration with the librarians which could contribute to teaching

information literacy skills in their subjects' context. At the same time almost all of them expressed interest in collaboration with the librarians. Up to that point they had not perceived the University library as a partner in education and some perceived it merely as having a “storage” function – *“I see University Library as a place that has information resources...educational services are not visible”* (P3). This illustrates how important the IL course is for the affirmation of the University library. Some professors become aware of the library’s educational role only through the IL course. Without such awareness of the educational role of librarians, the upgraded models of information literacy education based on professor and librarian collaboration are not possible.

While assessing information literacy competencies (see Table 1) most of the professors stated that they find information literacy competencies useful, and that they will continue to recommend the IL course to their students, especially to the first year students. Also, two professors stated that they have already recommended the IL course to their students (P8 & P9). As a possible form of collaboration they identified focused in-class workshops with librarians presenting topics such as searching databases. The professors themselves admit to having insufficient information literacy competencies for searching and using databases (P3, P6, P8 & P10) and that they need the librarian’s help primarily for that reason, i.e. *“I learned to do it all myself and I did not know that our library offers such service, that someone can help me with that.”* (P3) Some are of the opinion that information literacy content should be incorporated in methodology courses– *“I think that the collaboration with the librarians is needed, especially within the course Research Methods. I think five hours could be devoted to teaching information searching and other information literacy skills, customized especially for the students of Ethnology because every disciplinary area has its own peculiarities”* (P10). Only one professor pointed out the need to integrate generic information literacy skills into the subject context - *„It is important for us to know what you cover with them in the Information Literacy course so that we can build on to it”* (P5). The research findings indicate that a standalone elective course in information literacy can be a significant first step toward better cooperation between librarians and professors.

5 Conclusions

Information literacy is tied to *learning to learn* competencies; thus it is one of the important subjects that should be included in the university curriculum, because academic level studies should train the students in various disciplinary areas, and also prepare them for lifelong learning.

The results of the research conducted at the University of Zadar show that students are aware of their information needs and that they expect that the elective course in Information Literacy will help them develop the skills they identify as important. The results of this research indicate the need for more intensive teaching in online database searching, evaluating of information sources, formulating search queries and using information ethically.

Both the professors and the students are aware of the students’ insufficient competencies of information literacy. The professors considered these competencies

to be important for successful learning and relevant to their courses, but they did not expect librarians to be included in the teaching process. Before being interviewed, most of the professors were not aware of the IL course or the University library's educational role, and thus were not aware of the possibility of collaboration and partnership with the librarians in creating the students' learning environment. The results of the interviews have shown that only after getting familiar with the IL course curriculum did the professors become aware of the help they could get from the librarians, and that librarians could enrich their course curricula and teaching process. Therefore, this research has shown that the IL course is needed, not only because of the direct benefits for students, but also because it sets the stage for development of advanced models of IL education which are based on professor and librarian collaboration.

Future research should focus on comparison of survey results conducted before and after taking the course. This will provide insight into students' perception of their own progress and will help estimate the efficiency of applied strategies and IL course's improvement. At the same time these findings can be a basis for a dialog between the professors and the librarians about the most effective strategies for teaching information literacy on generic level and/or in the subject context.

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Incorporating Information Literacy in Ibero-American University Libraries: Comparative Analysis of the Information from Their Websites

Alejandro Uribe-Tirado¹ and María Pinto²

¹University of Antioquia, Colombia / University of Granada, Spain
auribe@bibliotecologia.udea.edu.co, auribe@correo.ugr.es

²University of Granada, Spain
mpinto@ugr.es, mpinto@mariapinto.es

Abstract. This paper, framed in research "*Lessons Learned in information literacy programs at universities in Ibero-America*", will show how, from the information displayed on websites of university libraries of the 22 countries that make up the Ibero-American context, it is possible to have an approximation of the incorporation, or lack thereof, of information literacy in these universities at different levels. To achieve this purpose, the method used was web content analysis, considering first, the definition of seven categories of identifying information from such websites and programs/services training that they present. Considering these categories, and particularly the structure of program/service training, which is the most common information presented on websites –four levels were established involving the incorporation of information literacy, or lack of such, in the university. These results show that the incorporation of information literacy in Ibero-America is still in its initial process; however, in some specific countries, the reality is more positive.

Keywords: Information literacy, information competencies, university libraries, Spain, Portugal, Latin-America, Ibero-America, content analysis, websites.

1 Introduction

Information literacy (IL) or training in information competencies (TIC) is a theme that has been developed at different levels, scopes, and trajectories in Ibero-America (*Spain, Portugal and Latin-America*) in the library context, especially at the university level.

As indicated in the previous texts to this paper [1-2], in the more than 25 years of adaptations in the passage of library instruction and traditional library user training up to the point of today, with the training paradigm of IL-TIC, there have been various processes of advancement and periods of development: "Pre-Initiation (1985-1994), Initiation (1995-1999), Pre-Advance (2000-2003), Advance (2004-2007) and

Pre-Positioning (2008 -), in addition to viewing the future, according to certain processes and outcomes of success, a 6th period: Positioning (2012, 2013 or 2014)".¹

Considering these processes and these general periods, a key challenge is to identify specifically how they are carried out within each university and higher education institution (HEI) and the incorporation of this formation in IL-TIC; with such identification, it will be possible to detect lessons learned and identify best practices that enable other universities/HEIs in the Ibero-American context, with appropriate adaptations, to improve and advance their training programs in information competencies.

The websites of university libraries are a source of key information to aid in such identification, especially over the past decade, as there is no doubt that this media is having an impact on the dissemination and interaction of its information-documentation services [3-4], in which training is included.

Therefore, this text is the product of the research "*Lessons learned in information literacy programs at universities in Ibero-America*,"² which collects and integrates specific developments for each of the 22 countries that make up the Ibero-American context³.

The paper thus presents an analysis of the Ibero-American case in general, considering the analysis of the universities'/HEIs' library websites, and according to the information presented, identifying levels would be found in the incorporation of IL-TIC from the perspective of an information literate university [5].

Therefore, from our perspective, considering previous research and publications [6-7] that have collected the proposals of different authors, a university/HEI or a unit within it which should lead processes and training programs in IL-TIC (System Libraries, Library, Resource Centers for Learning and Research-RCLR, etc.) that can be categorized, through generalization of the different contexts, into four categories according to the degree of incorporation: *Universities/IES: compromised / growing / initiating / unknown*. These degrees of incorporation of IL-TIC training can be synthesized and identified when analyzing the universities/HEIs' library websites considering different elements (variables).

On these variables, it is particularly concerning that program structuring can provide more account of the degree of incorporation that IL-TIC would in a university/HEI and its responsible unit, since the presence of certain courses-tutorials

¹ Ferreira (1995); Gómez Hernández (2000); Menou (2004); Rader (2002); Dudziak (2002, 2003, 2008); Gómez Hernández, Pasadas Ureña (2003); Campello (2003); Angulo Marcial (2003); Dudziak, Ferreira (2004); Vives I Gràcia (2004); Lecardelli, Schoffen (2006); Fernandez Aballi/Unesco (2007); Lau *et al* (2007); Marzal, Calzada Prado (2007); Pinto, Sales (2007); Da Rocha *et al* (2008); Area Moreira, Gros, Marzal (2008); Meneses Placeres (2009); Licea de Arenas (2009); Da Silva *et al* (2009, 2010); Pinto, Cordón and Gómez (2010) and Uribe-Tirado (2010, 2011, 2012), etc. More about the historical account of IL-TIC and full references can be found in: <http://eprints.rclis.org/handle/10760/15060#.UFNgVrKTuJ0>

² More about state-of-the-art IL-ICT in Ibero-America can be found in: <http://alfiniberoamerica.wikispaces.com>

³ References to the analysis of each country can be found in: <http://alfiniberoamerica.blogspot.com/2012/06/analisis-de-alfin-para-las-bibliotecas.html>

for viewing, indicates more easily what scope the program has (faculties, degrees, number of students, etc....), and if it works at 5, 6 or 7 competencies that have university standards of IL-TIC (depending on who has chosen to follow).

This leads to a correlation of this specific variable, which can be viewed on the websites, with the four categories of incorporation that reflect the development process of this subject. These have been recognized by international experts such as Sontag [8], and share the vision of documents and proposals such as those of Wang [9] and EMPATIC-European Union [10], which cites the Australian–New Zealand model (ANZIIL) in considering the transition from bibliographic instruction and traditional library user training to IL-TIC’s inclusion in the curriculum (Figure 1).

↑ Bibliographic Instruction User Education	↑ Information Literacy-TIC Multiliteracy	↑ Compromised	Information Literacy. Level 2 (IL2): courses from the library to train information competencies: the instrumental + lifelong learning + critical thinking; and courses / modules officially immersed specific curricula to train different academic programs, transversally and discipline in these competencies
	↑ Growing	↑ Growing	Information Literacy. Level 1 (IL1): courses from the library to train information competencies: the instrumental + lifelong learning + critical thinking
	↑ Initiating	↑ Initiating	Library user training. Level 1 (LUT1): training in general library services and some courses –very instrumental– to search for information: use of catalogs and databases, although it begins to discuss the need for change in this traditional training and work the other competencies
	↑ Unknown	↑ Unknown	Library user training. Level 2 (LUT2): only trained to use the catalog Unknown: There is no presence of any training

Fig. 1. Incorporation levels of IL-TIC in universities

2 Method

A similar method was followed in analysis of each country. First, higher-education institutions, were located on official websites which list universities, in which they had reference and/or direct access to the Universities-HEIs listings of each country and their websites.

Second, to refine and expand these lists, two international sources that enabled identification of and access to each university’s website were consulted:

- The "Webometrics Ranking of World Universities" of CCHS/CSIC: <http://www.webometrics.info/es>
- The Student Portal “El Atillo.com”:
<http://www.altillo.com/universidades/index.asp>

Table 1. Ibero-American university library websites analyzed

Country	Public HEIs	Private HEIs	Total no. of HEIs	Percentage (%)
Argentina	66	65	131	4.8
Bolivia	16	53	69	2.5
Brazil	224	241	465	17.0
Chile	21	58	79	2.9
Colombia	106	231	337	12.3
Costa Rica	19	56	75	2.7
Cuba	36	0	36	1.3
Ecuador	30	52	82	3.0
El Salvador	4	45	49	1.7
Spain	50	81	131	4.8
Guatemala	10	44	54	1.9
Honduras	12	26	38	1.4
Mexico	260	272	532	19.4
Nicaragua	33	70	103	3.8
Panama	20	37	57	2.1
Paraguay	6	53	59	2.2
Peru	36	70	106	3.9
Portugal	39	43	82	3.0
Puerto Rico	10	38	48	1.8
Dominican Rep.	2	46	48	1.8
Uruguay	14	27	41	1.5
Venezuela	67	47	114	4.2
Total	1081	1655	2736	100

This method allowed the generation of a database of each country's universities/HEIs (whether public or private) – and especially their libraries – for analysis, as well as their respective websites (URLs) (Table 1).

To carry out the analysis of these 2736 Ibero-American university libraries, we used a record card, considering the principles of content analysis [11]; the basic data were from each library and the URL, and the characteristics of the IL-TIC program were recorded, taking into account the seven variables to be evaluated – especially the structuring of the program – and finally, considering which of the four levels of incorporation of IL-TIC the institution would meet.

3 Analysis and Results

After considering the 2736 university library websites analyzed (table 1) and integrating the results of the 22 Ibero-American countries, we find the following general results regarding incorporation levels of IL-TIC (Figure 1), which account for a major part of the reality of this thematic in this context:

Table 2. Total university libraries analyzed and levels of incorporation by country

Country	IL2	IL1	UT1	UT2	Not reported
Argentina	1	9	20	40	61
Bolivia	0	0	1	12	56
Brazil	3	30	95	121	216
Chile	2	11	9	23	34
Colombia	5	11	22	37	262
Costa Rica	2	3	9	13	48
Cuba	4	8	12	4	8
Ecuador	0	0	9	10	63
El Salvador	0	1	5	16	27
Spain	10	19	29	18	55
Guatemala	0	0	2	15	37
Honduras	0	3	1	9	25
Mexico	5	15	18	34	460
Nicaragua	0	0	13	3	87
Panama	0	0	8	5	44
Paraguay	0	0	3	6	50
Peru	0	5	8	13	80
Portugal	2	5	19	11	45
Puerto Rico	3	9	8	4	24
Dominican Rep.	0	0	8	9	31
Uruguay	0	0	10	3	28
Venezuela	0	5	2	15	92
Total	37	134	311	421	1833

Table 3. Distribution by country and public or private university of most Ibero-American university libraries according to IL2 and IL1 levels (12 of the 22 countries=167 -IL 2 and IL1-)

Country	Public	Private	IL2	Public	Private	IL1	Sub-total	% among all HEIs in the country
Cuba	4	0	4	8	0	8	12	33.3
Puerto Rico	3	0	3	3	6	9	12	25.0
Spain	9	1	10	18	1	19	29	22.1
Chile	1	1	2	5	6	11	13	16.5
Portugal	1	1	2	5	0	5	7	8.5
Argentina	1	0	1	1	8	9	10	7.6
Brazil	3	0	3	25	5	30	33	7.1
Costa Rica	2	0	2	3	0	3	5	6.7
Colombia	1	4	5	4	7	11	16	4.7
Peru	0	0	0	1	4	5	5	4.7
Venezuela	0	0	0	4	1	5	5	4.4
México	5	0	5	9	6	15	20	3.8
Total	30	7	37	86	44	130	167	

4 Conclusions and Recommendations

Considering these general results, we can reach the following conclusions: Taking into account that the website information serves as initial reference information, the project found in general that of the 22 Ibero-American countries' 2736 university libraries, 1833 do not provide users with information on program/services training (67%); 421 only offer training to introduce library installations and show how to use their library catalog (15%); 311 additionally offer courses or activities related to learning how to use electronic databases (12%); and only 134 libraries incorporate training covering several or all competencies involving information literacy, including search, organization, evaluation, communication, and ethical use of information (5%). In addition, only 37 libraries offer training, which involves several or all information competencies, earning a credit-curricular recognition and evaluative value for students (1%).

That is, a total of 171 universities, and of these, 167 universities make parts of 12 of the 22 Ibero-American countries⁴.

These general and specific outcomes and findings reaffirm several recommendations made since the Declaration of Havana [12]. We want to highlight, as the final finding of this paper, the need for collaborative work by IL-TIC in the Ibero-American context to help with the following:

- Generating spaces for the continuous exchange of learning acquired in the development of training programs in different contexts
- Supporting each other in the growth and development of the formative programs
- Offering and maintaining exchange and support through the use of web resources
- Generating relevant research topics and fostering collaborative interdisciplinary and transdisciplinary work
- Performing and generating joint work for updated diagnostics on the development of training in each context.

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The Information Seeking Behaviour of Law Students at Adekunle Ajasin University, Nigeria

Doreen Yemisi Olorunfemi and B. Janneke Mostert

Department of Information Studies, University of Zululand, South Africa
KwaDlangezwa 3886
doreenolorunfemi1@gmail.com

Abstract. The aim of this paper was to investigate the information seeking behavior and ICT utilization skills of undergraduate law students from the Faculty of Law at Adekunle Ajasin University in Ondo State, Nigeria. Purposive sampling was used to select the law students. The sample size consisted of 356 law students. The findings revealed that the respondents' main reason for seeking information was to become more knowledgeable about legal issues. Most respondents favored traditional information sources and services such as textbooks, books on legal issues, and the law library. The majority preferred to use both print and electronic sources. Awareness of electronic resources was low, with most respondents unaware of their existence. The Internet was only used "when necessary", while Internet access was mainly through the use of mobile phones. The majority of the respondents had taught themselves Internet searching skills prior to attending university.

Keywords: Information seeking behavior, ICT utilization skills, law students, Adekunle Ajasin University, Nigeria.

1 Introduction

In modern society, lawyers seek legal information in order to successfully argue matters and win cases in court. In a similar way, law students seek library information sources to enable them to pass examinations, conduct research, and write their assignments and dissertations in order to graduate from university. Law students' information requirements are a critical factor in their quest for legal knowledge during their degree training program in law, and according to Reddy [1] it is comparable to humans' need for air, water, food, and shelter. These students need to be able to effectively use the law library information sources and services to achieve their educational goals and prepare for their future roles in the field of Law.

Igbeka [2] argues that information centers or libraries are the best agents to provide the information sources and services that law students need to effectively cope with the work load of their academic studies.

According to Khan and Bhatti [3], ICTs, specifically the Internet, have improved the potential for the extensive online searching for legal information sources or content by law students and legal professionals in Nigeria. Ekwelem et al. [4] studied students' use of electronic information sources at the University of Nigeria, Nsukka, in Nigeria and found that the development and availability of ICTs in libraries have increased the impact that information has on students, through the provision of massive collections of information resources, which can be easily accessed.

The introduction of electronic information resources into the university law libraries' environment have brought about rapid growth in terms of awareness and the use of resources. However, in order to effectively utilize law libraries' potential, 'time, effort and skills' are required on the side of the law students to electronically access and utilize information resources. The researcher observed that law students seem to lack these qualities at Adekunle Ajasin University, which can possibly be ascribed to a lack of information literacy among the students.

Chipeta, Jacobs and Mostert [5] stressed that students should be empowered with ICTs, and should be literate and comfortable in the use of information sources and services, which should be available in printed and electronic formats. Ray and Day [6] found that even though many students use electronic resources, some still prefer to use printed materials to compliment electronic information resources.

2 Information Sources and ICT Resources at Adekunle Ajasin University Law Library

The Adekunle Ajasin University in Akungba-Akoko in the Ondo State, Nigeria, originally known as the Obafemi Awolowo University, was first established in 1982. Currently, the university has about 10,000 students registered for degrees in five Faculties, (Arts, Education, Law, Sciences, and Social and Management Sciences). The law faculty offers a five year degree training program in law, with 356 registered law students. These students are taught using a number of methods, including teaching using law textbooks, lecture notes, group discussions, and through student participation in reading assignments normally presented and discussed in class. Lecturers expect the students to use primary, secondary, and tertiary information sources when available for class preparation and assignments. These sources are quite expensive for the law students to purchase [7], especially the law library electronic resources. Although, there are ICT resources (personal computers, Internet cafes and mobile phones) available outside the law library environment, which law students can also use to retrieve quality information for their studies. Access to the Internet and mobile phones requires the purchase of airtime at the cyber cafes sited within the environment. To buy sixty minutes airtime at the cyber cafes costs two hundred Nigerian Naira equivalents to \$1.23US dollar. Internet subscription for mobile phone for one month depends on the Internet Service Provider. However it cost between one thousand four hundred and one thousand five hundred Nigerian Naira per month, which equivalent in dollar is \$8.61 or \$9.22US dollar.

The main location for accessing research material at the Law Faculty is the law library, which has 250 readers' seats, full text access to legal information through

textbooks, law reports, law journals and an electronic library that has been established mainly for law students. The e-library is in the form of a cyber café within the law library where law students can access the Internet and search for legal information. The e-library is equipped with 16 wireless computers, while Internet access is through the university's main ICT Centre. Access to the Ebscohost law databases is provided through specific access codes to the National Universities Commission's Virtual Library (NUCVL).

This paper aimed to provide an insight into the information seeking behavior of law students at Adekunle Ajasin University and the role that Law libraries play. The paper sought to determine: what information sources are available to law students; how students retrieve information; the students' ICT utilization patterns in the information seeking process; their level of proficiency in retrieving information; and the challenges that they encountered in the information seeking process.

3 Methodology

This study gathered data using a questionnaire based on the study's objectives. The questionnaire was administered to 356 law students; 106 usable questionnaires were returned, providing a response rate of 30%. The data was analyzed using simple descriptive statistics.

4 Results of Analysis and Discussion

4.1 Ability to Effectively Search for Information

The ability to effectively use information sources and services to search for information greatly influences the utilization of the said services and sources. When asked whether they were skilled enough to effectively search for electronic information, 53% indicated that they were able effectively to search for and retrieve information. The findings revealed that the majority of the law students had attained their ICT skills by attending formal computer training at secondary school level, training themselves at home, and/or attending classes offered by private institutions in the period prior to coming to the university. Library information seeking skills were obtained by attending a formal course entitled "*The use of the library*" during their first year, or through time spent browsing the library shelves.

Those who indicated that they could not effectively search for information were asked what challenges they encountered in their search for information in the libraries. Quoting the respondents, the major challenges were: "The e-library is not fully functional or non-existent and therefore can't be utilized"; "I am not computer literate"; "The lack of current materials hampers my efforts to find information"; "Poor network connections influence my ability to use the Internet"; "Prohibition to access the electronic library in the law library"; "The sources are unorganized"; "Unavailable or unhelpful staff who are not electronic literate enough to assist"; and "The library closes too early".

These comments suggest that the library is unable to provide information resources as advanced by Igbeka [2]: “Information centers and libraries are the best agent to provide information sources and services”.

4.2 Reasons for Information Retrieval

The question aimed to establish the reasons for information seeking and to determine whether the respondents had already developed a culture of seeking and retrieving legal information for their academic studies. The results are reported in Table 1.

Table 1. Purposes for which information is sought (N= 106)

Purposes for information retrieval	n	%
To further my knowledge about legal issues	84	79
To complete assignments	75	71
To augment my lecture notes	72	68
To update myself with the latest developments on the legal front	69	65
To study the outcomes of court cases	58	55
To be able to participate in class discussions	55	52
Other	10	9

From the table, it is clear that academic matters related to their studies were important reasons for law students to search for information. The most important reason as cited by the majority (79%) was the need for information to further their knowledge about legal issues, followed by 65% who wanted to keep abreast of current developments in the legal world. This suggests that there is awareness among the students that they need to gain a broader understanding, beyond their immediate academic information needs about their chosen career. Academic matters, such as to complete their assignments (71%) and to augment their lecture notes (68%), were the most popular academic information needs. These findings suggest that the respondents were aware of the fact that information retrieval would be an important part of their future careers, and that the habit of constantly retrieving information pertaining to legal practices are paramount to their success as legal practitioners.

4.3 Information Resources Utilized for Information Retrieval

This question aimed to determine whether law students utilized library information resources and if so, how often.

Traditional information sources were mostly preferred, with textbooks (71%), books on legal issues (68%), and the law library (67%) topping the list, while Internet access via mobile phones (58%) and networked computers (48%) were less popular than expected. Low utilization of e-resources was also evident, with law databases and the digital library remaining mostly unused. This could be ascribed to the fact that although 16 computer systems were available in the law library, Internet connectivity was non-existent, prohibiting access to available databases and e-resources.

Additionally, students could not use the available resources freely (restricted access) due to the control measures put into place by the law library.

4.4 Format Preference for Information Retrieval

The majority of students worldwide display a tendency to prefer to use information in electronic format. The question that asked for their preferred mode of access tested this assumption with this set of students.

Table 2. Information sources/systems utilized (N = 106)

Information resource	Often		Seldom		Never		No Reply	
	n	%	n	%	n	%	n	%
Textbooks	75	71	8	7	1	1	22	21
Law books	72	68	13	12	0	0	21	19
Law library	71	67	19	18	2	2	14	13
Internet via mobile phone	62	58	15	14	7	7	22	21
Newspaper	60	56	19	18	4	4	23	22
Internet	48	45	29	28	1	1	28	26
Acts	45	42	24	23	7	7	30	28
Law reports	40	38	36	34	6	5	24	23
Law journals	33	31	43	40	6	6	24	23
Government publ.	22	21	36	34	15	14	33	31
Law database	14	13	24	23	32	30	36	34
Court libraries	12	11	14	13	41	39	39	37
Digital library	7	7	30	28	32	30	37	35

Table 3. Format preference for information retrieval

Format Preferred	n	%
In both print & electronic formats in the library	61	58
Printed format in the library	32	30
Electronic format from the Internet and database from outside the law library	28	26
Printed format from my personal textbooks	25	24
Electronic format in the library	14	13

The majority of the respondents preferred to retrieve information using a combination of both print and electronic sources that could be found in the law library. It was observed that in the absence of networked computers, the electronic sources in the law library that were available mainly consisted of CD-ROMs. Overall, the print format still seemed to be the most preferred format, although the lack of accessible Internet facilities probably also plays a role in the lesser preference for electronic sources.

4.5 Availability of ICTs and Digital Information Resources in the Law Library

In order to utilize information sources, awareness of their existence and the information that they can offer needs to exist. Only 42% of the respondents indicated that they were aware of the existence of ICTs and e-resources. However, the same number claimed to be unaware of ICTs and e-resources, while 16% did not answer this question. This finding indicates that ICTs and its concomitant digital information resources are not effectively marketed to the users of the law library, or alternatively that their availability is restricted.

The ICTs that were identified as being available in the law library were the Internet and one photocopier machine. The utilization of these ICTs was, however, extremely low, with only 9% indicating that they used the Internet and 3% using the photocopier machine. This finding suggests that ICTs and digital information resources and ICT usage in the law library play no important role in the academic pursuits of law students. It equally shows that having ICT facilities and digital resources available does not necessarily translate into utilization.

4.6 Ability to Search the Internet Effectively

Respondents were asked to indicate whether they used the Internet to search for information. The 95 that indicated that they searched the Internet were then asked whether they were able to effectively search for information using the Internet. The responses are illustrated in Figure 1.

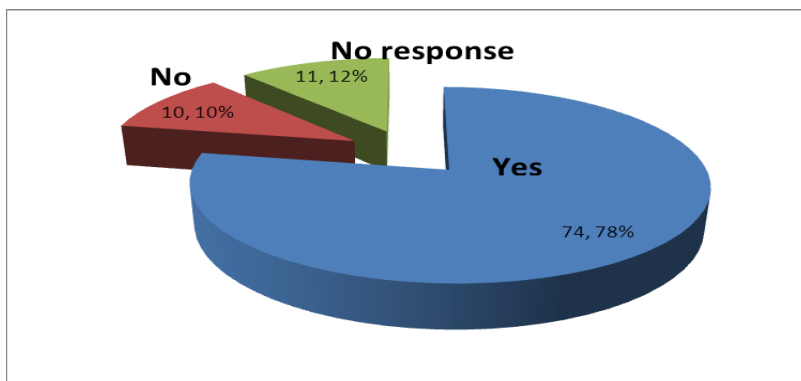


Fig. 1. Internet searching ability (N= 95)

The majority (78%) of the respondents felt that they were able to effectively search the Internet for academic information purposes. When these respondents' ICT competence was tested through observation, the result corroborated their claims in terms of their Internet searching abilities. However, 22% of the respondents did not have the necessary ICT skills to search the Internet.

When asked to indicate how they searched the Internet, the majority (75%) indicated that they searched independently, while 16% searched with the help of friends, and 5% searched with the librarian's assistance. Three percent relied entirely on the librarian to search for them.

When asked to cite the difficulties faced in using the Internet as an information retrieval tool, 43% indicated that the non-availability of digital information resources in the law library was a major problem, while 38% stated that poor network connectivity in the law library was a challenge. However, the same problem was also experienced when using their mobile phones or personal computers, both on and off campus. Power failures or interruptions that resulted in losing completed research, or the inability to access digital resources, were mentioned by 24% as a serious impediment, while 22% indicated that they felt that they were inadequately skilled to search the Internet effectively. Lack of funds to buy airtime was also mentioned as an obstacle.

4.7 Suggestions on How Challenges Can Be Addressed

The respondents were asked to offer suggestions on how to overcome the challenges. The following solutions were proffered: the government and the university's management should intervene to improve the availability of ICTs; the e-library should be made available and accessible to all students; networks need to be improved by the Internet service provider; the government should increase the electricity power supply; a stand-in generator must be supplied in case of power failures; funds must be raised by the law faculty to purchase more computers and Internet resources; and Internet access needs to be subsidized.

The last question concerned the issue of whether the utilization of ICTs in the library had changed the respondent's information seeking patterns. In this respect, 12 respondents indicated that ICT utilization had made no difference, mainly because of unavailability. One of the respondents demonstrated the feeling of this group by remarking: "*Law library ICT is a flop.*" Another 13 respondents felt that the available ICTs did make a difference. The reasons they gave included: they had improved the respondents' information seeking skills; the ICTs assisted in finding information outside the library; they could download and print information; and ICTs generally make access to information faster and more efficient.

While a large number of the respondents indicated that they used the Internet for information seeking, only a few found that the available law library ICTs made any difference to the way they searched for information. Although available ICT resources outside the law library environment, (e.g. personal computers, Internet cafes and mobile phones), appear to be helpful in retrieving information from the Internet, using the Internet is a very costly exercise for the majority of the students, which may have contributed to many respondents' view that it had not made any significant changes in how they searched for information.

5 Conclusion and Recommendations

The paper concludes that law students at the Adekunle Ajasin University are well prepared to use the law library and have the ability to utilize the electronic information resources that are available to retrieve information for their studies. However, the inaccessibility of the electronic library and lack of relevant electronic databases in the law library prevents their utilization. The lack of Internet connectivity, regular electricity power outages, and an inadequate number of computers are the basic obstacles to the successful implementation and use of the electronic library in the law library.

The paper recommends that the Ondo State Government and the university management team should provide adequate funds to upgrade the e-library with respect to purchasing more computers, improving Internet connectivity, upgrading the available broadband, assisting in subscription to law databases, and providing a constant electricity power supply by way of a standby power generator.

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Information Literacy and Autonomous Creation of Knowledge in University Students

Carmen Varela-prado, Beatriz Cebreiro, and Carmen Morante

University of Santiago de Compostela, School Organization Department,
Campus Vida, Santiago de Compostela, Spain
{carmen.varela,beatriz.cebreiro,carmen.morante}@usc.es

Abstract. We show design, framework, process and assessment of an e-learning course and program on information competences. The course was the product of a strong collaboration between teacher and library staff. This collaboration promoted the acquisition of information and technology skill, use and group working. It promoted the students acquiring an attitude of cooperation and control of their own learning. The results were achieved across three evaluation systems: quantitative, qualitative and a global satisfaction test, in which every subject took part. The evaluation process resulted in determining strong points, weak points and proposals for improvement. The exercise of joint self-appraisal and shared responsibility was promoted.

Keywords: Information competences, information literacy, constructive learning, e-learning.

1 Introduction

The knowledge-based society demands professionals and citizens with knowledge, competencies, entrepreneurial skills and capacity for self-management, for cooperation, for innovation and creativity. Hence, the new educational paradigm represented by the European Higher Education Space (EHES), requires students to acquire competencies linked to knowledge. Analysis of the current reality of the university, and in particular of the population on which it is going to act, reveals the gap between the educational and informational model and the new demands of professional life. Hence, we proposed to act to modify this reality through the design and implementation of a specific program for the acquisition of informational, technological, communication and cooperative skills. The aim was: to evaluate the impact of implementing a specific information skills development program (ISD) for the acquisition of information skills via e-learning, using an interaction-based teaching-learning methodology.

2 Socio-Educational, Technological and Library Context

The new knowledge society is regarded as a source of wealth and value in today's world economy. In the employment context, the competitiveness of workers, related

to the level of their knowledge and the added value that they are capable of generating, has risen to a very considerable degree.

Faced with this situation, the University cannot simply be a spectator in the face of the social need for adequate training for the Knowledge Society, especially if we consider the guidelines set out by the EHES, which clearly promotes the idea of a continuous learning process.

Advances in ICT which expand the possibilities of its use in educational processes prompted a substantive renewal of the processes, teaching methods and organizational forms in higher education, constituting, according to some authors, a genuine educational revolution [1]. However, such a change cannot consist solely of the mere incorporation of new technologies at the service of the traditional models of higher education. The challenge for the future lies in universities innovating not only with regard to their technology, but also their educational concepts and practices in the use of these technologies. This means changing their role within the university teaching model as a whole. Addressing this process will also mean reformulating the role and teaching practices of the teaching staff, planning and developing models of student learning which are radically different from the traditional forms, changing the organizational forms of time and space of classes, and changing the forms and strategies of tutoring. [2]

The new spaces and learning models are much more powerful and versatile, and rely on the combination of technological tools which are already consolidated and tested in the educational environment, such as platforms for training and collaboration, and the more recent addition of social software. These facilitate interaction, constituting spaces for cooperation where the students can organize their own resources, tools, tasks, discussions, ideas and opinions [3]; they are characterized by interactivity and the ability to share and disseminate materials and knowledge.

In the same way, the introduction of the concept of Information Literacy in the sphere of the university library marks a profound change in the training of users. The new resource centers for learning and research become new scenarios for promoting the acquisition of information skills.

3 The Design of the Research

Given our firm conviction that the assessment processes are fundamental in any field of work, to determine needs and establish proposals that will improve the quality of products, processes and services, we have proposed to carry out a piece of evaluative research on a program designed to act on a concrete reality, with the aim of changing and improving it. In this research project, we take as reference the assessment model of Stufflebeam and Shinkifield (1987) or CIPP model, i.e. Context, Input, Process and Product, four types of assessment which together represent a comprehensive and inclusive approach to assessment [4].

3.1 Study Problem and Research Objectives

We carried out a brief analysis of the social environment, educational, and technological factors which indicated that, both socially and in the labour market, it will

be necessary to provide training for those citizens and professionals whose CVs include the knowledge and skills to participate actively and independently in this context. This means a change in the pedagogical principles of education, and in particular in higher education, which confronts the university with new responsibilities, given the Bologna commitment and the teaching-learning model set out in the EHEA. In this context, we emphasize that the progress being made in information and communication technologies is responsible for the overwhelming flow of information occurring in all fields of knowledge, which requires the development of skills and capabilities to manage it effectively. Considering the organizational and teaching context in university classrooms, we find a reality that is not adapted to the changes in education or to the new demands of the Knowledge Society. The majority of students learn in a teaching model of knowledge transmission in which the teacher controls the information, and uses techniques which are eminently presentational. This model of teaching has been extended and perpetuated in higher education to the detriment of active, collaborative and innovative methodologies, which are less widespread. This transmissive model of information is related to a vision of scientific knowledge as something elaborate and definitive that the teacher transmits to the students, who must absorb it without questioning it [2].

However, it is important to see the technological skills with which students arrive at the university as strengths, even though they lack specific training. The new generations of young people are recognized as digital natives; they know how to use different technological tools, they are users of social networks, and the Internet is already a familiar environment. On the other hand, however, they lack specific skills to manage information properly and skills to use ICT in the learning process.

Having defined the context on which we wished to act and the reality we sought to change, we proposed to create and implement a specific program so that students could acquire informational knowledge and skills in a flexible environment using an active and collaborative methodology that would contribute to awakening their minds and develop their intellectual capital. The objectives we set ourselves were derived from all the above:

1. To investigate the impact that an information literacy program can have on the acquisition of informational skills the application.
2. To evaluate the results of developing the ISD program using a training platform and Web 2.0 tools
3. To ascertain the effect of introducing a methodology for teaching-learning based on cooperation.

3.2 Research Process

The first stage of assessment of the context, the community of students of the Faculty of Teacher Training of Lugo (USC), was addressed using two verification systems, 1) the qualitative assessment of the teaching elements and, 2) the prior analysis of students' informational skills.

Given the objectives we set ourselves, we sought to modify the reality detected into a reality more adaptable to the new demands of the knowledge society. Hence we proposed:

- a. To design a program of informational literacy capable of fulfilling the first of the proposed objectives: to measure the degree of aptitude of the students in information competencies.
- b. To evaluate and make decisions about the tools, resources and procedures for implementing the program in e-learning mode using a collaborative methodology. As a reference model, we took the competency program of the Society of College, National and University Libraries [5] , 7 competency pillars associated with the following skills: 1) Ability to recognize the need for information, 2) Ability to distinguish among a variety of approaches to meeting the recognized need for information 3) Ability to formulate search strategies, 4) Ability to locate and accede to the information, 5) Ability to compare and evaluate the information obtained from various sources, 6) Ability to organize, apply and communicate the information in an appropriate manner, 7) Ability to synthesize and build new knowledge based on the existing information, taking into account ethical and legal criteria in the use of the information

The program is called: ISD: Use and management of specialized information for two reasons, because it was a transversal program aimed at the acquisition of informational skills and because it was incorporated in the curriculum development of a particular subject.

Once the program was designed, we analyzed the tools, resources and procedures that we felt were necessary for its implementation in e-learning, using tools and methodologies that permit cooperation, which were the second and third objectives of the proposed research.

The decision to use the e-learning model was based on the possibility of generating a flexible working environment to support the continuity of learning in relation to the space and time variables, as the students who would constitute the sample studied were undertaking a period of teaching practice and were therefore dispersed in different schools.

As a virtual classroom, we selected a free software tool (Dokeos) managed by the Galicia Supercomputing Centre, which offers the Virtual Classroom Service (CESGA) to the education and research community in Galicia.

Another of the fundamental input components were the learning resources or materials:

1. The basic library: documents and references related to Informational Competency by way of a recommended bibliography to understand the subject.
2. Content: explanatory and work documents for the development of the ISD Program.
3. Tutorials: textual guides for proposing searches and learning how to evaluate information, and tutorials for the management of sources: catalogues, databases, open access databases.
4. Electronic library: organization of a series of electronic resources and links to sources of information that we consider essential, related to the ISD Program.

With regard to the procedure for developing the program, we proposed a collaborative approach previously agreed between the lecturers responsible for the

compulsory subject of the last year of the Teaching diploma: "learning difficulties and developmental disorders," and the Faculty librarian. Given the possibilities offered by the platform and the collaborative tools on the network, we brought together the elements required to achieve the third objective of the proposed research: to assess the results of using an interactive methodology, group work, leadership and the intergroup relationship for decision-making.

The instruments used for collecting information in this research will enable us to obtain the data needed to evaluate the success of the program, the redesign of strategies in the development of the process and/or to deduce the weaknesses and strengths thereof for reframing future actions:

- 1) EnIL questionnaire for initial assessment of the students' information skills. [6].
- 2) ISD questionnaire, for the final evaluation of the skills acquired during the course.
- 3) Questionnaire on student satisfaction with the ISD Program.
- 4) Final forum for joint evaluation.
- 5) The coursework diary.
- 6) The final Academic Report.

The Training Platform also has a tool that allows each student's work to be monitored, together with his/her rate of participation and collaboration when working both in groups and individually.

3.3 Planning Phase

Once the collaboration agreement between the lecturer responsible for the subject and the center's librarian was established with regard to the planning of the project and the responsibility of each, it was decided to establish, as a frame of reference, the strategic lines guiding the training structures of the project, the instruments, the overall and specific objectives, content, methodology and assessment.

3.4 Implementation Phase

The implementation process of the ISD Program took the format of a course and was conceived as a large project consisting of the preparation of a document with the contents of six thematic blocks and the corresponding bibliography. This was done by following each of the specific objectives of the ISD Program, corresponding to each of the pillars proposed through the training structure and some specific activities. All the above was oriented to obtaining the information necessary for the elaboration of the new knowledge, whose structure and content is the result of consensus among the groups corresponding to each block. One of the most important parts was the bibliographic apparatus that they presented, which was judged by how up-to-date it was, its relevance and quality. The project was materialized in a single document, prepared by all the students/participants and consisting of a set of academic reports for each of the thematic blocks, which were supervised by the lecturer with regard to the quality of the new knowledge, while the organization, coordination, advisory services and renewal of the entire process were shared between the lecturer and the librarian.

On the other hand, the students participated in the Blog, reflecting on the learning process itself, following the common thread marked by the audiovisual documents proposed. In the specific forums, discussions took place on particular topics, with the students offering suggestions on both the content and the procedures, and this space was even used to regulate participation and responsibilities in the tasks.

Table 1. Study participants/sample

Number of participants	164
Number of groups	51
Thematic Blocks	6
Left the course	3 groups
Completed the course	48 groups
Total number of students who completed	156

3.5 Evaluation of the Learning Process

The results were analyzed according to the evaluation criteria previously agreed and established. Learning of informational skills, knowledge of course content and the capacity for participation and communication developed were all evaluated.

This was the "product" phase of the CIPP model, in which we considered firstly the skills acquired and the materialization of the learning in the "Academic Report" or final document, which reflected the new knowledge resulting from an appropriate management of information in a space of shared intelligence.

The research data were analyzed on the basis of information gathered from the following instruments: initial diagnosis through the ENIL questionnaire, the learning, management capacity and cooperation which the students developed during the course, the individual data provided by the system itself and the group evaluation forms. The ISD questionnaire provides information about the final degree of learning. Moreover, it is interesting to know the level of satisfaction of all the participants; this was analysed using a questionnaire and the final forum, where there was a joint assessment of the course which turned into a self-evaluation exercise.

4 Analysis of Results

Students' *individual work* is assessed on the basis of the monitoring carried out by the system itself: participation in the classroom, time spent on the learning itinerary, tasks, links and interventions, the results of the skills and content tests.

Table 2. Overall results of individual work

Itinerary	0.868
Documents	630 consultations
Tasks	726
Links	1133
Downloads	287
Forums	428 interventions
Blog	396 interventions
Content test	100% correct answers
Final Test	50% of the students 100% correct answers

In the individual monitoring, we note that all the students have fulfilled the minimum requirements with regard to individual work, and only 6 students failed to participate in any of the spaces for expression: forums and blog. A total of 726 assignments were recorded, resulting in an average of 5 assignments per student.

The questionnaire on content consisted of 20 basic questions on the subject, and 100% of the students answered them all correctly.

With regard to the informational skills (ISD) questionnaire, also with 20 questions, 50 per cent of the students answered them all correctly, and none the rest made more than three mistakes, which were spread among different items; hence it appears that none of the questions led to confusion, was poorly phrased, or dealt with an especially complicated topic.

After evaluating the quality of the content, the whole project was recorded in a single document called "Special Educational Needs. Difficulties and Developmental Disorders"

Group Assessment, follow-up of each group took into account: the quality of the assignments, the participation, collaboration, performance, and the leadership, in addition to the quality in the presentation of the content. Out of a maximum score of 5 points, the average of the six thematic blocks was 3.07.

Evaluation of the course by the students, 50% declared themselves very satisfied, 40% satisfied and 10% dissatisfied or very dissatisfied.

Qualitative assessment, the self-assessment exercise by students and tutors was carried out in a forum created for this purpose called the *Final Forum*. In this forum, all the participants took part, giving their opinions and evaluation on the development of the course, the problems, deficiencies, expectations, learning, performing a very enriching joint evaluation exercise.

Of 90 people who spoke, only one case was against this system; in contrast, the other 89 were in favour of this type of learning methodologies.

The results obtained at the end of this experience showed that the goals that we set ourselves when we designed the research were achieved satisfactorily, as demonstrated by the results of the ISD questionnaire, the tasks carried out in the process and lastly in the final product: the *"Academic Report"*.

5 Conclusion

Based on the concept of collective intelligence, this experience was developed as an overall project in a techno-social game using an interactive methodology bringing together all the elements: people, information, spaces, resources and learning, sending the message that the best way of learning is by doing and by participating in the learning process itself. This message was the common thread of the process for the development of the program and the course. The final result translates into knowledge and competencies: competencies in information, communication, and technology. The student's autonomy in the resolution of problems and in the free expression of his or her opinion increased, just as the values of cooperation, solidarity and discipline as members of work teams were promoted, as was the interrelationship between teams. They all become transmitters and receivers in an exercise of exchanging ideas and experiences, in this way building a space of collective intelligence, the classroom 2.0.

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Library Instruction in Two Croatian Academic Libraries

Kornelija Petr Balog¹, Ljiljana Siber², and Bernardica Plaščak¹

¹ Faculty of Humanities and Social Sciences,
Josip Juraj Strossmayer University of Osijek, Osijek, Croatia
{kpetr, bplascak}@ffos.hr

² Law Faculty, Josip Juraj Strossmayer University of Osijek, Osijek, Croatia
ljsiber@pravos.hr

Abstract. The purpose of this paper is to present outcomes of library instruction focusing on student information literacy (IL) at two Croatian academic institutions: The Law Faculty and The Faculty of Humanities and Social Sciences in Osijek, Croatia. The Faculty of Humanities and Social Sciences library started with course-related IL instruction in the 2010/11 academic year. The Faculty of Law Library introduced a pilot project of course-related information literacy instruction in March 2013. In this pilot project information literacy workshops were organized for four seminar courses for students from 1st to 4th years of study (the 5th, final year, does not have seminars). These are the first academic IL instruction programs at the University J. J. Strossmayer in Osijek, and the data from these projects is reported for the first time to wider audience.

Keywords: Academic libraries, information literacy, Faculty of Law Osijek, Faculty of Humanities and Social Sciences Osijek, Croatia.

1 Introduction

In the last decade, the topic of information literacy (IL) has become extremely interesting for the LIS community. This is evidenced by the steady increase in a number of related materials and articles [1-2]. According to ALA [3] IL is a set of abilities requiring individuals to recognize when information is needed and then have the ability to locate, evaluate and use effectively the needed information. Technological advances in information storage and retrieval have created concerns for many academic librarians because college students may not be able to successfully retrieve the needed information. The introduction of electronic information retrieval methods and the explosion of information available across various media in the academic environment have created a need for library instruction programs fostering IL.

Jaqueline Delors, the chairman of the International Commission on Education for the 21st century [4], has pointed out in his report to UNESCO that the information society with its advanced technology increases access to data and facts, so education is

needed to enable everyone to gather information and then to select, arrange, manage, and use it. The report emphasizes the fact that students must have these new retrieval and management skills because, among other things, ICT technology is increasingly being used in the educational process.

Many college students today are quite experienced in searching the Internet, but the majority of them lack the critical-thinking skills and database searching proficiency necessary for successful accomplishment of their academic studies, or for their continued lifelong learning. Changes in our society are so fast that it is likely that disciplinary knowledge might change at a rapid pace making certain subject content obsolete within a relatively short period of time [5]. It is therefore vital that graduates are equipped with information skills which will ensure they remain current through continued searching in their field of interest.

In Croatia, not many papers on IL can be found. Even fewer are those that report on actual IL workshops or programs. For many Croatian libraries information literacy is a component part of their mission statements, but not many have acted upon it, and even fewer have reported about their efforts. Theoretically, the concept of IL in Croatian literature has been analysed by Špiranec, Banek Zorica and Lasić-Lazić [6-8]. The Central Medical Library in Zagreb is one of the rare libraries that has documented its IL efforts [9-10]. Hasenay and Mokriš Marendić [11] gave a short account of the IL activities in two libraries: one academic and one public. However, no matter how scarce the articles on IL programs in Croatian libraries, Croatian academic libraries are quite eager to offer IL workshops and programs to their users and this paper presents two IL initiatives from J. J. Strossmayer University in Osijek.

2 The Law Faculty Library and the Library of the Faculty of Humanities and Social Sciences

The Law Faculty Library¹ was founded in 1975. Its library collections consist of more than 33.000 catalogued books and other library materials, and close to 500 titles of foreign and domestic periodicals. The library maintains an OPAC and provides access to online databases². In the current academic year (2012/2013) the library has been catering to a user population of 2743 (2673 students and 70 staff). The library also maintains an “EU i” information centre on the European Union and its legislation.

¹ Library web pages can be viewed at <http://www.pravos.unios.hr/knjiznica/>

² The Croatian Ministry of Science, Education, and Sport ensures access to various databases for all academic institutions in Croatia. Currently, access to 38 scientific databases ranging from technical, biotechnical, natural, medical, social sciences and humanities is ensured through this subscription, but it is not unusual for an academic institution to subscribe to a database on its own. Both faculties from our paper subscribe on their own to several scientific databases.

The Library of the Faculty of Humanities and Social Sciences (FHSS Library)³ was founded in 1961⁴. The library collections consist of more than 60.000 catalogued books and other library materials, and currently the library subscribes to 125 titles of foreign and domestic periodicals. It also subscribes to several online databases not covered by the Ministry subscription. In the current academic year (2012/2013) the library has been catering to the user population of 1939 students and 173 staff.

3 IL Programs

3.1 IL Program: The Law Faculty Library

The Law Faculty Library in Osijek started a pilot-project on information literacy in the summer term of the academic year 2012/2013. The main goal of the project was to raise awareness among students (and the faculty) of the necessity of acquiring information literacy skills that they will need during their studies, but also later during their careers.

The main hypothesis was that the students who underwent the IL training would achieve better results in their seminar papers (they will choose better quality sources) than those students who did not take part in IL workshops. Seminar papers were chosen because they present a practical way of monitoring and controlling students' progress in retrieving the relevant information, their analysis and evaluation.

Instrument, Methodology and Sample. In cooperation with the administration and the faculty, during March 2013 the library offered 90-minute workshops for one seminar course per study year (from 1st -4th; the final, 5th year was exempt because they did not have seminar courses any more). A seminar group was divided into two parts: one group participated in an IL workshop (test group), and the other did not and served as a control group. The test group had 89 students; the control group had 76.

The test group consisted of 14 (15.73%) 1st year, 27 (30.33%) 2nd year, 16 (17.98%) 3rd year and 32 (35.96%) 4th year students. The four seminar courses included in the pilot were: Roman private law (1st year), Criminal law (2nd year), Administrative science (3rd year) and Administrative law (4th year).

The librarian prepared course-related materials and assignments, and each seminar group was instructed about relevant data sources (library catalogues, databases, etc.) and source evaluation, search strategies (Boolean operators), proper citing and crediting, etc. At the end of each workshop students filled out satisfaction questionnaires.

³ Library's web pages: <http://web.ffos.hr/knjiznica/>

⁴ Initially it catered to the needs of students of the Teacher Training College. In the late 70s the college became the Faculty of Education. Finally, in 2003/2004 the Faculty of Education became the Faculty of Humanities and Social Sciences. Each new name resulted in a change of structure and the type of studies offered at this institution and consequently, influenced the content of library collections.

So far, the learning outcomes of IL workshops were evaluated in two ways:

- upon completion of seminar papers students (regardless of whether they were from the test or control group) filled out the form about the sources used;
- course instructors were consulted about the perceived quality of the seminar papers.

The third planned way of outcome evaluation is citation analysis, and it is still under way.

Results. Students from our sample realized the benefit of the workshop for their IL skills. Fig. 1 shows their estimate of improved skills in searching the library catalog, databases and search strategies in general (indicated on a 5-item Likert scale, 1 being the worst, 5 the best grade). As expected, they were quite critical about their search strategies (2.30 before the workshop), but at the end of the workshop they saw the improvement (3.82).

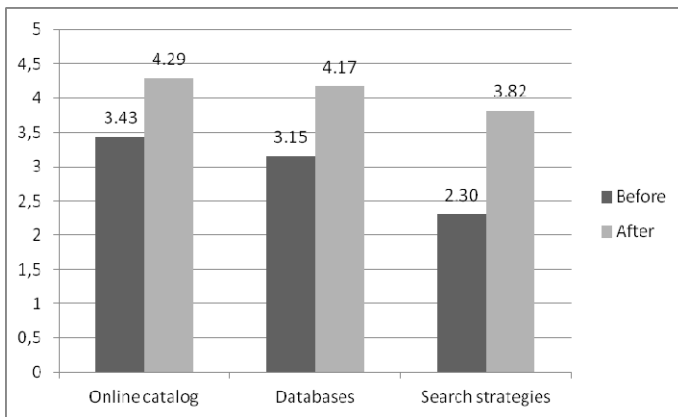


Fig. 1. Students' evaluation of their knowledge and skills before and after participation in the IL workshop

The librarian received a 'very-good' grade (5-item Likert scale, 1 being the lowest, 5 the highest grade) on all counts: communication skills (4.38), clarity (4.28), interesting examples (4.10), instructions (4.52), and the workshop in general (4.37).

Workshop participants were obviously satisfied with the knowledge and skills gained. Their satisfaction was indicated by the fact that almost all of them would recommend this workshop to their colleagues (86 students, i.e., 96.6%) Only 3 students (3.4%) would not recommend it.

When looking for information sources needed for their seminar papers, the majority of students in the test group were independent and searched on their own (49 students or 55.05%), after that they asked their teachers for advice (21 or 24%). Librarians were the least consulted (19 or 21%). The control group, on the other hand, relied heavily on the librarians (28 students or 37%); after that they also consulted their teachers (26 or 34%), and the fewest number of students performed searches on their own (22 or 29%).

3.2 IL Program: The Library of the Faculty of Humanities and Social Sciences

The FHSS Library started with IL workshops in the academic year 2010/2011⁵. Initially, they were organized for all three years of undergraduate students. It was decided to offer courses to graduate students only if the teacher of a particular course requested them.

Workshops concentrated on information retrieval through OPACs and databases. After 2010/2011 the library decided to offer workshops only to the 1st and 3rd year undergraduate students (1st year students now were instructed about library OPACs, and 3rd year students about databases). After the workshops, all the materials continued to be accessible from library's webpage⁶. In 2010/2011, 16 workshops were organized aimed at the total student population (1456 students). The next year workshops were organized only for the 1st and 3rd year of undergraduate programs, which consequently meant fewer workshops and a smaller target population. In 2011/2012 there were 9 and in 2012/2013 5 workshops. The percentage of the student population reached by the workshops ranged between 20-30% (27.82% in 2010/2011, 31.97% in 2011/2012, and 22.77% in 2012/2013).

The workshops are evaluated through exit satisfaction surveys (participants' overall satisfaction with the workshops: theory, exercises, content, lecturer's expertise) and citation analysis of students' final papers. The data from satisfaction surveys for all three academic years shows that the highest satisfaction was recorded in the initial year (mean 4.69), in 2011/12 it was somewhat lower (4.40), and for the current academic year it is 4.60.

Over 90% of workshop participants (2010/11: 93.80%; 2011/12: 94.41; 2012/13: 97.87%) think that the knowledge and skills gained at workshops will help them in their future academic career and work.

Citation analysis⁷ of students' final papers revealed a steady increase in the number of cited documents across almost all departments (only Croatian language and literature and German language and literature recorded a decrease). According to information media, printed materials were the most popular in 2011/12 (49.40%), databases in 2010/11 (37.37%), and Internet and web resources, being the least reliable sources, in 2009/10 (55.89%).

⁵ In the academic year 2009/2010 the library conducted a user satisfaction survey that contained two questions about information literacy. Results revealed that the customer satisfaction with that aspect of library service was rather low (up to then customer education was conducted on an individual level). This motivated the library to start with an organized and more formalized IL program.

⁶ Retrievable from <http://web.ffos.hr/knjiznica/?id=28>

⁷ Citation analysis, which would otherwise have been a great burden for the library, is carried out in cooperation with the Department of Information Sciences at the Faculty of Humanities and Social Sciences. Each year several graduate students perform citation analysis as a part of their obligatory pilot project in the final year of their formal studies. Citation analysis of student undergraduate final papers was carried out for academic years: 2009/10; 2010/11; 2011/12.

4 Conclusions and Discussion

This paper gives a short overview of IL activities and the efforts of two academic libraries of the J. J. Strossmayer University in Osijek, Croatia. The FHSS Library started with its IL program three years ago whereas the Law Library introduced the program in the academic year 2012/2013 in the form of a pilot-project. This is the first public presentation of these IL efforts in those two libraries.

The IL programs described here were also marked with certain difficulties and obstacles. The biggest problem for both libraries is the fact that they are understaffed and are torn between their regular everyday operations and their preparations for IL workshops. Furthermore, the FHSS Library complained about the lack of interest and motivation for IL workshops when it tried to target the teacher population. So far, in spite of all their efforts, the teacher population of the FHSS remains out of reach for the library's IL efforts.

The Law Library has only just started with this program, and it has not encountered all the problems that the FHSS Library has (for instance, they have not targeted the teacher population with their pilot-project), but it will be interesting to compare whether similar problems repeat themselves.

Citation analysis at the FHSS Library revealed progress in the quality of student undergraduate final papers. Also, it showed that students have become more critical toward the Internet sources and do not use them as heavily as they have in the past. However, the IL workshops organized at this faculty were not aimed or created primarily for that purpose, but for the general improvement of student IL. On the other hand, the Law Library organized its IL workshops for specific seminar courses, with exercises and examples tailored for the particular course. It will be interesting to compare the results of citation analysis and to find out whether the tailoring of IL educational materials for a specific content and goal has a higher correlation with the quality of student papers.

On the other hand, the first results obtained upon students' completion of their seminar papers clearly show that the students who took part in IL workshops demonstrated a higher level of independence in information retrieval than their colleagues from the control group. Teachers confirmed that the test group, in general, chose better quality sources than the control group, and suggested that the library continue with IL workshops in future. Therefore, the initial research hypothesis was confirmed.

Both libraries established a good relationship with teachers recognizing them as the key agents of the whole program. The FHSS librarians were invited to give some of the IL workshops within the regular courses, whereas the Law librarian planned the whole project around the chosen seminar courses where the teachers were involved in both the initial (motivational), and also the final phase (evaluation of the quality of the student work) of the project.

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First Year Students and the Research Process: Hearing Students' Voices

Diane VanderPol, Emily A.B. Swanson, and Amy S. Kelly

Westminster College, Giovale Library,
1840 South 1300 East, Salt Lake City, Utah 84105, USA
{dvanderpol, eswanson, akelly}@westminstercollege.edu

Abstract. Westminster College librarians interviewed first year students after they completed a research paper. The retrospective interviews were designed to elicit student narrative about the research process. Findings include a greater understanding of student use of prior knowledge in topic selection, struggles with the complexity and unfamiliarity of academic research, students' confusion around the use and citation of information, and help-seeking behaviors. By hearing student voices, librarians and faculty can collaborate to craft responsive and effective learning opportunities for the development of students' information literacy.

Keywords: First year students, research process, ethnographic study.

1 Introduction

Westminster College librarians conducted retrospective interviews with first year college students during the 2011-2012 academic year. Eleven students were asked a series of questions about their research process; their answers were coded and analyzed. The interviews were designed to help librarians and faculty develop a better understanding of student research behaviors and consequently adjust efforts to foster effective information literacy instruction.

1.1 Methods

Librarians recruited first year students from Fall and Spring sections of a basic writing and composition course, English 110. Librarians created a list of 16 broad questions that led students through the research process from start to completion. Interviewers had the freedom to explore ideas and areas introduced by the students that the pre-set questions did not address. Interviews were conducted by two interviewers and recorded. In total there were five interviewers: four librarians and one student worker. At the end of the interview, each student's research paper was collected and the student was provided with an Amazon gift card. Once transcripts were produced, they were analyzed by two coders. Once the coding was done, the researchers met and organized the identified text according to themes.

2 Findings

The sample of students was limited to first-year students. These students are just beginning to enter their fields of study, and had just completed an introduction to composition and research course, taught primarily by adjuncts, and with no set curriculum. Thus, the parameters for completing a research paper for this course vary widely. Not only are students asked to write a research paper without a disciplinary background, but they are also asked to navigate the scholarly literature in fields with which they have no experience. The findings below demonstrate the difficulties students faced in completing this task.

2.1 Topic Selection

Students tended to pick a topic that they had a connection to or a topic that they perceived as being easy. Connections to topics were emotional or were the product of the students' prior knowledge.

My mom got diagnosed with Celiac's disease and so we [family] heard about this diet, it's called the Paleolithic Diet. And we started kind of doing it, and we started getting into it. And then I heard there was a controversy over it...So I was like, well, it's something that's in my life right now. Something that I can write about and be interested in.

I was debating something with the Civil Rights movement...And then I looked at child labor. And I don't know, I found different things that were from like my hometown and cities that were already around me, and I thought it was cool to pick something that had places that I'd been.

At least three students picked their topic as a result of prior knowledge. The students indicated that the work they had done previously would be a significant help to them.

I was reading *Fast Food Nation*, and I was very taken away by how awful fast food industries are...I guess I just knew learning from school that Brazil is now the focus for a lot of cattle ranch and soy bean production. So I wanted to learn more about that, and so I basically, after I read the book, I decided that basically my topic would be on how fast food industries effect deforestation in Brazil due to cattle ranch and soybean production.

I had already done some research on [the topic] in high school, and I thought it was really interesting... I thought it might be easier already having some ideas.

The concept of ease of finding information or finding resources before picking a topic was a large factor in deciding on a topic.

I decided on ones that I could find the most information on and that I felt knowledgeable about and that I thought would be interesting to readers.

And there were a lot of documents, and like, primary documents really that related to the topic that'd be easy to find.

Finally, two students provided a completely unexpected reason for topic selection and revision: the lack of a car to get to destinations to do observations as was required by the assignment prompt. The researchers noted that many aspects of the students' personal lives may contribute to the selection of a topic, possibly even to a greater degree than the current course content or the instructor's prompt for the assignment.

While topic selection at the broadest level didn't seem to influence student success or failure with an assignment, some students' selections and their subsequent narrow view of their topic set them up for challenges in finding materials to meet the assignment criteria.

2.2 Finding Materials

Several themes emerged from examining students' reflections on their search strategies: they may struggle to contextualize a narrow topic or grapple with a too-broad topic, often based on an incomplete understanding of the information environment; they want to use library resources but often return to, or start with, Google; they don't fully understand terms like "keywords" or Boolean logic; and they rely on direction from librarians or instructors to begin a search.

More than one student attributed a lack of success in finding certain sources to the information environment rather than to their own research abilities. They didn't perceive themselves as having a deficit of knowledge or a need to develop a new skill.

I spent a lot of time trying to find something relevant to what I was writing about, and it wasn't so much a fault of the system. It was more of a "I'm looking for things that are very specific," always going to limit my results.

Yeah, the problem I have is, it's a newer debate. There's no, like, reliable resources or stuff. It's all peoples' opinion.

This last student's bibliography is indeed full of opinion and light news pieces. A quick search of the College's main interdisciplinary database, using the same keywords selected by the student, reveals dozens of in-depth and reasoned full text scholarly and trade articles on her topic. The student's limited understanding of the information environment precluded her from even seeing that there was an opportunity for learning and improvement.

Another student, describing her process, indicated the opposite problem. She struggled with finding too much information on her topic though also suggested that she was able to overcome this problem by using Google as her search tool.

Well I started looking at things. Like, the historical part was the easiest, because there are tons of history books, tons of websites [on Holocaust history], and so Google was my first choice.... I just like Google, because it's my go-to thing, I just use it. The only drawbacks I would say is that it pulls up stuff that's not really related. It's not really specific. And so you get just a ton of information. So that's why it took me a while, to kind of weed it out.

The student interviews in this study mirror the work of Asher and Duke [1], whose research suggests that students use Google and databases without fully understanding either. Asher and Duke point out that library systems are complex collections of catalogs, repositories, databases and archives, each with unique search fields and tools; this variety of information increases students' cognitive loads, and – as with other new cognitive tasks – student performance falls apart until they master the necessary techniques and knowledge.

I went back on, like EBSCO. Like the databases on there. And then also popular sources, just on Google.

I did EBSCOhost and... ProQuest. I only search Google for small stuff.

These statements demonstrate students' initial willingness to look for information in more than one place; however, their flexibility in selecting a tool often does not yield the hoped for results. Some of the students' difficulties in finding desired materials can be traced to a limited understanding of search terms, key words, Boolean operators and a lack of disciplinary knowledge about their topics. Students try to speak with authority about search terms, but don't quite manage it.

I put in 'airport security' and then in parentheses AND body scanners or AND pat downs... And then when I was looking for drug sniffing dogs, I did the double search. With Google and the quotes, to single it out.

I don't know, the search, like the searches, were kind of confusing, so. And whenever I, like, try different words and like, subjects, and there's another term for subject and then there's "keyword." And stuff like that.

Students struggle to define their information need, select the appropriate tools and construct effective search strategies. Not surprisingly, their troubles are compounded as they try to make sense of the information they have gathered and to use and acknowledge its role in their own work.

2.3 Citation and Use

In four cases, when asked about how they integrated their sources into their research, students focused mainly on citation-related or organizational mechanics. Students described a process of making materials fit the requirements of the instructor to

include a variety of source types such as primary, secondary, scholarly or popular and to fit within the structure of the paper.

[How did you use the sources?] Mostly paraphrases, and then just citing, like in-text citation. But the articles I used had a lot of charts and graphs and statistics... So I just paraphrased that. And, I don't think I used any quotes, actually. Yeah, I used quotes from, like, the interviews that I did.

[How did you integrate this source?] Not a lot of direct quotations... I didn't write it word-for-word, like what the history [was]... and you know, everyone has some basic knowledge on the Holocaust... So I used that and what my roommate knew and... I didn't do a lot of direct quotations.

[The professor] said she wanted to see at least three citations in each paragraph. Because of that's the way a paper should be. So... she had us go through and make a chart. So we had all of our ideas at the top and then our resources. And whenever you had a resource that went with an idea, I would summarize what they said in that idea. So I went through and organized my sources that way and then I would go through them and condense them in paragraphs.

Six students were able to articulate, to one degree of sophistication or another, the ways in which they incorporated their research findings and source material into their own arguments. The most common theme was the use of sources for emphasis.

Because I knew already, about the Paleolithic Diet, I just needed more information so that I could be more accurate in my statistics, or more accurate in proving a point... I used a couple of the sites to prove that the Paleolithic Diet is good though, like, scientific studies.

Well, so I'd use them [the sources] to, like, emphasize my ideas.

Several students made comments indicating both a frustration with and a lack of understanding about the use of citations in their work. Frequently they indicated that their instructors had provided little guidance beyond specifying a citation format style.

[Did you have to use a specific citation style?] ...MLA or APA, whichever we chose. She just said to do our best and then [she would] look it over and tell us our mistakes for the future.

Ninety percent of the time, I look for citations that are already on the source, that I can use, because I just figure those are right. But I don't think I've ever turned in a bibliography that didn't have a mistake in it. I don't know. Maybe that's just how bibliographies are. ...Even if a lot of it's wrong, I figure that it's close enough, that I'll just... go with it. I'm not going to get charged for plagiarism if something's not italicized, so whatever.

Despite their struggles to make sense of the academic research process, students indicated no strong inclination to seek help beyond what was offered in class.

2.4 Help

Ten of the eleven students interviewed mentioned receiving help from peers. Six of the students reported that there were structured opportunities for peer review in class. Many students, even among the six who reported structured class opportunities for peer review, also turned to family and friends. Siblings, roommates, and fellow students with majors or jobs on campus that cause them to be perceived as good reviewers were frequently consulted. When they specified, students suggested that peer-review focused on writing, flow, and organization primarily. Most students reported that they did not seek help conducting research beyond basic instruction provided in class by a librarian or teacher.

The only time I needed people to help me was not with the research but with the grammar. As soon as I put it in my own words, I needed some help with sentence flow and paragraph transitions. I went to the Writing Center... [the student consultant] read over it and helped me with some transitions. And then I had a friend who's really good at grammar and reading over stuff, and she helped me with the whole thing.

But oftentimes my brother... I'd ask his opinion on certain things... I think it was a couple times when I'd ask, if it was a paragraph, does this sound right to you? Does this seem clear?

I really didn't feel like I needed too much help finding sources. All year during class we'd been shown a bunch of different databases and search engines and stuff like that.

The narrative voices in this study's ethnographic survey, taken together with other studies of student learning and behavior, point to paths that librarians and faculty can take in helping students develop Information Literacy.

3 Conclusions

Our findings suggest that it behooves librarians and faculty to recognize the power of prior knowledge, finding ways to help students to make good use of what they know while avoiding the pitfalls of that dangerous thing, a little knowledge. Students frequently use personal connections to select a topic, and they strategize to select a topic they believe will be easy to research. They clearly evidence some development of Standard 1 outcomes of ACRL's Information Literacy Competency Standards for Higher Education [2], such as recognizing that existing information can be combined with original thought to produce new knowledge and attempting to define a realistic overall plan and timeline to acquire needed information. Other Standard 1 outcomes, such as identifying key terms to describe the information need and determining the availability of needed information, proved to be a stumbling block as students tried to find sources.

Using “search strategies” as a lens for viewing the student interviews reveals beginning information seekers who are overwhelmed by the options and could benefit from discipline-based and discrete task-based Information Literacy instruction. New tasks such as doing research, writing scholarly papers, and reading scholarly materials increase a student’s cognitive load; combine these with the disparate information-finding tools such as catalogs, databases and archives, and it’s no wonder that novice researchers and writers struggle. First year students’ narratives about search construction and tool selection rationale demonstrate their efforts to engage in academic research without a clear understanding of rules and norms. Librarians and faculty must help first year students by articulating clearly their expectations and repeatedly modeling each element of the complex processes involved in research and academic writing. Expert researchers such as librarians and faculty may need to be reminded, that the act of selecting the most appropriate information retrieval system is not intuitive and that, as the student voices tell us, trial and error may not be the most effective learning strategy for overwhelmed students.

The information literate student synthesizes the main ideas of consulted information sources and recognizes interrelationships among concepts in their process of creating new information and adding to their knowledge base. The first year students interviewed rarely spoke about interacting with or responding to the materials they found in their own writing and thought processes. This sophisticated work is at the heart of academic research and writing. Yet, typical guidance about information use focuses on artificial criteria and checklists. Students are often asked to include a specific number of sources of a particular type, such as two scholarly articles and one primary source, rather than being asked to include the most relevant and appropriate sources for the hypothesis. Faculty and librarians must take on, more directly, the work of helping students to develop their abilities to read critically, compare and synthesize information for use in their own thought and knowledge development.

Taken together, the interviews make visible that students have trouble with all aspects of undergraduate research. And, while students spoke of seeking help—especially from their peers—on issues of writing, flow and organization, they did not, for the most part, indicate a perceived need or desire for help with their *research*. Librarians heard, in the narratives, that when students invest time and energy into any stage of a research process, they are unwilling to let go of the product even if it does not meet their needs. If they experience trouble at an early stage in the process, the trouble continues to pile up. Bean [3] argues that research should be scaffolded: low-stakes research tasks gradually lead up to more sophisticated finding and implementation projects within a subject area. Not only did students not see a need for early help, they didn’t ever recognize that their lack of a workable topic or selected keywords led to difficulty finding sources, which in turn led to confusing and inadequate use of those not-always-pertinent sources. Badke [4] writes “...students think that they are more skilled than their production demonstrates, while attempting to play by the rules, though not really understanding them, and not performing up to acceptable levels” (p.4). Librarians and faculty need to find opportunities to intervene at these crucial points.

How can librarians and faculty lay the groundwork for student success in Information Literacy? They can collaborate to build assignments, courses and

curricula that integrate prior knowledge and both discipline-specific and genre-based learning. They can isolate discrete tasks of the research process for consideration and focus, and emphasize that critical reading and synthesis skills are scaffolded and developmental in nature. Finally, they can help students identify the gaps in their understanding or abilities. While the student voices in this study demonstrate deep confusion, they also show a willingness to engage in research. In response, faculty and librarians should celebrate and capitalize on students' desire to become proficient undergraduate researchers and scholars.

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Malaysian Teacher Education Institute Trainees and Information Literacy Competency

Siri Sena Baba Hamid¹ and Mohd Sharif Mohd Saad²

¹ Department of Library Science, Darulaman Teacher Education Institute, Malaysia
sirisena@ipda.edu.my

² Faculty of Information Management, Universiti Teknologi MARA, Shah Alam, Malaysia
mohdshar@salam.uitm.edu.my

Abstract. The case study attempts to discover with certainty the information literacy competencies in research process acquired by undergraduate trainees of the Malaysian Teacher Education Institute. It is a pivotal fact indicated by recent researchers that most future teachers often enter teaching without the necessary information literacy skills and knowledge in the research process. The study plans an in-depth analysis of information literacy competency problems and issues faced by full-time final year trainee teachers doing research process in the northern region. The population is segregated into science and non-science from various content-area specializations. The study included two phases of data gathering. The first phase used face to face interviews and document analysis on the purposive sampling; and second phase used questionnaires of the study population. The findings hope to give insights to stakeholders on the way to move forward in terms of needs, process and outcomes in accordance with the Malaysian National Information Literacy Agenda.

Keywords: Information literacy competency, information seeking behavior, research process model, teacher education.

1 Introduction

The 21st century opens a new paradigm for teacher education, as young trainees are required to have more sophisticated information literacy (IL) skills compared to their predecessors. Today, far more vital IL skills are projected in teaching and learning for the competent navigation, evaluation and use of information. [1]. The Educational and Behavioral Science Section (EBSS) of ALA has included these skills in their IL standards for teacher education [2]. The standards accentuate the information age teacher's major role of facilitating students' learning by inculcating skills on how to use information wisely in their lifetime [2]. Breivik and Gee [1]; and Mohd Sharif [3] profoundly indicated in their studies the importance of accessing, evaluating and applying these IL competencies. This practice was explained by the Secretary's Commission on Achieving Necessary Skills (SCANS) [4] and later by Schleicher and Rubin [5] as the fundamental research process of 21st century teachers. Despite this,

recent researchers like Gandhe [6] and Kokic [7] have found that future teachers often emerge in teaching without the necessary IL skills and knowledge of the research process.

The Malaysian Education Master Plan 2006-2010 [8] was focused on preparing these trainees for 21st century education, whereby, their role as drivers of IL in the life of young Malaysians should be installed throughout their institute curriculum training. Therefore, the institute is held responsible for stamping and evaluating them with these skills before they turn out as teachers. This study intended to investigate the trainee teachers' IL competency behaviours embedded in doing research process for their final action research project paper.

2 Background

Cognitive skills such as 'critical thinking', 'problem solving' and 'decision making' are nothing new in the teaching arena [9]. IL incorporates all of these as ways to 'learn how to learn' in pursuing new knowledge [10]. Cook and Cooper explained that IL is fundamental in doing research, whether for economic or personal success today [11]. Over the past 10 years these key characteristics are defined as the abilities of those who are 'information literate'. These are the skills that are coined in the *IL competency standards for higher education* by ACRL [12] and later mapped by the EBSS [2] for a more relevant standard for education-specific associations and organizations.

In tandem with this change, the actual distinction between IL competency behaviour among the trainee teachers has a cohesive effect on how they improve their skills further [2]. These skills must be affirmed during their training and schools' internship practices to equip them with the 21st century's teacher's basic skills [13], [14] and [2]. Understanding this importance, the ministry's teacher education curriculum offers preliminary subjects of IL in the first semester after the trainee teachers' enrolment. The curriculum later requires them to do a final project of school-based action research during the seventh semester and submit a written report during their eighth and final semester. The trainee teachers are also required to complete a pre-service practical training at local schools during the seventh semester and gather information on their research project. Therefore, this case study on their research process would enable a clear-cut cross section of IL competencies that they possess.

3 Brief Literature Review

The Ministry of Education (MoE) mission is to produce trained teachers who are competent and spirited educators through its dynamic teacher development programmes, in order to achieve world-class school education [15]. In doing so, it is highly important to see that trainee teachers have acquired a comprehensive understanding of IL skills and knowledge in the research process [5]. The Malaysian National Philosophy of Education [16] is inclined to produce citizens with special

skills, knowledgeable and competent, responsible and capable, all towards the betterment of the nation [17]. To achieve this, the country needs well informed literate teachers who understand their commitment by integrating new initiatives in an effort to improve the quality of education [18]. Based on this, the development of the Education Master Plan 2006-2010 for Malaysia was proposed, focusing on the importance of enhancement of teacher training in relation to the research process [8].

Being a most significant and costly resource in schools, teachers are central to school improvement efforts. Schleicher and Rubin imply that improving the efficiency and equity of schooling depends largely on ensuring that competent people work as teachers [5]. In the lead awareness of the Ministry's firm action regarding the importance of IL within the education sectors, the Multimedia Development Corporation (MDC) was projected. Based on these 'integration of information and communication technology'; and the guideline provided by MDC had indicated positive outcomes. Research evident in the promoting of IL Programmes assessment of high schools in the State of Selangor has shown complementary outcomes [19]. Siri Sena found that the IL Programmes indicated positive outcomes in giving IL skills to high school graduates. Contrary to this fact, how much of these skills are applied when they turn up as trainee teachers is a different matter to be proven.

In sustaining the MoE's mission, the institute aspires to produce trained graduates with life-long research skills. Complying with 'critical thinking', 'problem solving' and 'decision making' by Toffler [20] and Doyle [21], these are pivotal research skills. The MoE is aware of these prerequisite skills in the research process that is necessary for information literate trainee teachers [8]. In America this matter was shouldered by the Secretary's Commission on Achieving Necessary Skills (SCANS) [4] in seeking for 'what work is required of schools' for students to learn the research process. Despite many interests of researchers in IL competencies around the globe, few relate it to trainee teachers. Besides this, Gandhe [6], Kocic [7] and Carr [13], indicated that pre-service teachers often emerge in teaching without the necessary IL skills and knowledge that are needed to perform in schools. How much of this is true in Malaysia? The institute is seen here as a contributor in shaping how teachers promote learning for the country. It is fundamentally important to find out whether or not these trainee teachers fulfill their IL competencies for the 21st century teaching.

Basically, the EBSS standard [2] is an information literacy evaluation checklist of the basic information seeking competency behavior consisting of the ability to *access*, *evaluate* and *use information* in problem solving. SCANS [4] defined problem solving skills as the essence of the 21st century research process in the education arena. This research used the following competencies performance indicators outlined by the EBSS [2] in discovering information literate trainee teachers, in doing their research process. The indicators' outcomes are the ability to;

1. Defines needs for information
2. Articulates needs for information
3. Select strategies
4. Select tools
5. Locates information

6. Select information
7. Organize information
8. Analyses information
9. Process information
10. Synthesize information
11. Present information
12. Evaluate individual information
13. Evaluate information seeking process
14. Use and disseminate information ethically

Based on the EBSS standard [2] and the underpinning theories adapted from Breivik and Gee [1]; and Mohd Sharif [3], an Information Literacy Research Process Model in Educational Research was proposed. The model consists of six stages of IL competencies to perform a research process of accessing, evaluating and applying information in educational research.

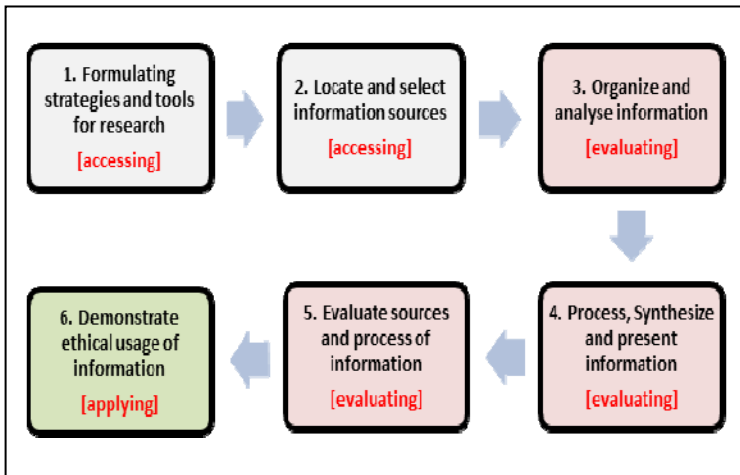


Fig. 1. Proposed Information Literacy Research Process Model in educational research

Seen here in Figure 1 are the six stages in accordance with IL standards for teacher education as mentioned by EBSS [2] to perform a research process. In order to do so, a trainee teacher must first be able to formulate strategies and tools for their research, and secondly locate and select information sources. Thirdly, trainees must be able to organise and analyse the information; fourthly, they must process, synthesize and present the information that they have gathered. Fifthly, these trainees must learn how to evaluate the sources and processes that they have used in order to bring value to their research. Finally, the last stage requires a trainee teacher to demonstrate ethical usage of information in their entire research process.

4 Research Objectives

The research aims to discover with certainty the IL competencies acquired by the final year teacher trainees of institutes in the northern region. The study attempts to understand the trainees' behaviour in accessing, evaluating and applying their needed information as indicated by Breivik and Gee [1]; and Mohd Sharif [3] in their course of teacher education.

The objectives of this research are to determine whether the trainee teachers' exhibit characteristics of IL behaviours in conducting the research process for their final project paper. The research process skills needed for the trainee teachers are based on the benchmarked outcomes of EBSS standards [2] for 21st century teacher education. The following underlines its prime objectives;

1. To analyse IL competency issues and behaviours of the trainees in accessing information for research in educational topics.
2. To examine whether the trainees exhibit IL competency characteristics in organizing, analysing and evaluating information for their action research.
3. To ascertain whether trainees demonstrate ethical usage and dissemination of information in their final project paper.
4. To analyse the differences and similarities of IL competencies among science and non-science trainees.

5 Methodology and Instruments

Designed as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context" [22] of IL in the research process among trainee teachers in their 'true setting' [23] of the five northern region campuses. The research is designed to investigate 'logical problem' or critical issues of IL competency behaviours among the final year trainee teachers in conducting the research process.

The case study employed Denzin and Lincoln [24]; Ololube and Kpolovie [25] approach of qualitative and quantitative methods in conducting scientific research in education. This study uses a face to face interview and document analysis on the purposive sample as *qualitative approach* [24] by triangulating *quantitative data* [25] from a questionnaire of study population from the five northern campuses. The questionnaires are adapted from the Network of Illinois Learning Resources in Community Colleges [26]. Since it is a case study, the research used the *exploratory, descriptive and explanatory* survey methods [27]. With reference to Saunders, Lewis and Thornhill [27] the research instrument tries to underpin inferences, interpretations, predictions and explanations for an in-depth analysis. The following *Table 1* explains the phases employed by this research.

Table 1. Phases of the case study

Phases	Methods	Time Frame
1. Qualitative Approach	i. In-depth interviews (14 purposive samples)	<i>Proposal stage</i> (6 months)
	ii. Document analysis (14 purposive samples)	<i>Final semester</i> (6 months)
2. Quantitative Approach	Survey using questionnaire to all the study populations in the five northern region campuses.	<i>Final semester</i> (6 months)

6 Conclusion

The findings will assert the paragon of excellence to which level of IL is needed in the making of the MoE's undergraduate teachers. It is hoped that the study will archetype and mould a conception of IL needed in the making of young teachers in the country. Through this study, the findings will spell out the needs, process and outcomes as standard to the MoE to specify indicators that can identify a final year trainee teachers as 'information literate' in the research process. These indicators are pivotal in accordance with the National IL Agenda for Malaysia (NILA) as pointed out by Edzan and Mohd Sharif [28] in their studies.

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Information Literacy of LIS Students at the University of Zagreb: Pros or Just Average Millennials

Ivana Hebrang Grgić and Sonja Špiranec

Department of Information and Communication Sciences,
Faculty of Humanities and Social Sciences, University of Zagreb, Zagreb, Croatia
{ihgrgic, sspiran}@ffzg.hr

Abstract. The rationale underlying information literacy in higher education refers to lifelong learning, critical thinking and problem solving. In addition to these common goals, LIS students have to be fully aware of the importance of IL as a concept, understand its relevance in contemporary societies and have to learn about main aspects of teaching IL. Regardless of whether LIS students have attained information skills and practices by studying library and information science, or whether they have been attending IL courses, the question of transferability of IL to learning situations remains open. This paper presents a sub-study that explores the transferability of IL competencies to the overall research experience of LIS students and the application of IL competencies in fulfilling course assignments. The survey of LIS students was conducted at the Department of Information and Communication Sciences, Faculty of Humanities and Social Sciences, University of Zagreb and is a part of a wider, international survey.

Keywords: Croatia, information literacy, LIS student, transferability.

1 Introduction

The information literacy (IL) movement has grown dramatically over the past quarter century. Although the concept has entered the discourse of different disciplines, domains and landscapes, there is little doubt that IL has been the most explored and analyzed in the educational sector. In the higher education sector, the emphasis in IL initiatives and curricula is on acquiring, developing and demonstrating individual skills and competencies, which will support independent lifelong learning, critical thinking and problem solving. For LIS students, however, the rationale and goals underlying IL integrated in the course of their studies is much more substantial and wider. In addition to becoming information literate themselves, LIS students have to be fully aware of the importance of IL as a concept, understand its relevance in contemporary societies and have to learn about main aspects of teaching IL. Regardless of whether LIS students have attained information skills and practices by studying library and information science, or whether they have been attending IL courses, the question of transferability of IL to learning situations remains open.

This paper presents a sub-study that explores the transferability of IL competencies to the overall research experience of LIS students and the application of IL competencies in fulfilling course assignments. The survey of LIS students was conducted at the Department of Information and Communication Sciences, Faculty of Humanities and Social Sciences, University of Zagreb as a part of a wider, international survey.

2 Literature Review

A myriad of recently conducted studies reveals vivid interest in the information behaviour of learners and students [1-5]. A quite coherent research picture emerges from millennial case studies, which suggest that millennials have developed common (though not universal) characteristics of information behaviour. The CIBER study, an often cited and key piece of research, revealed that students are not expert searchers and overestimate their abilities, spend little time looking at a lot of sources, demonstrate little effectiveness in evaluating search results, prefer natural-language searching, trust Google and have difficulties in finding library resources [3]. Complementary results were elicited by Holman [1] who concluded that millennials do not necessarily follow organized, hierarchical structures of information gathering or processing, preferring instead “hypertext” thinking where information comes from multiple sources and is pieced together through horizontal information gathering. The same study, as well as some other sites [2], [6], showed that millennial students routinely begin their searches on the Internet, primarily at a popular search engine. Similar studies suggest that students do believe library resources offer higher quality material for use in academic work, however many cannot handle library sources effectively [1], [4], [7]. Results from one more representative studies deal with how students evaluate the information they need for course-related research and what research styles they apply [6]. Findings from this study suggest students are evaluating information from the Web, but seldom ask librarians for help when they encounter evaluation issues. Furthermore, despite their reputation of being avid computer users who are fluent with new technologies, few students in the study had used a growing number of Web 2.0 applications for managing research tasks. A major finding, confirmed in other studies, demonstrated that the most difficult step of the course-related research process was getting started.

These studies reveal a relative coherent picture and clear trends in information behaviour for learning/academic purposes. Such information behaviour potentially inhibits deep learning and critical thinking; both are defined as core goals of IL in higher education.

LIS students present a very interesting case in this regard, as they are both millennials and knowledgeable about the IL concept. The present study explores the transferability of IL competencies to the overall research experience of LIS students and the application of IL competencies in fulfilling course assignments.

3 Methodology and Sample

The survey of LIS students was conducted at the Department of Information and Communication Sciences, Faculty of Humanities and Social Sciences, University of Zagreb. It is part of a wider, international survey involving 21 countries with the aim of collecting quantitative data about LIS students' research approaches, practices, and styles and comparing LIS students' IL in different countries and societies. The survey instrument was the same for all the countries – an online questionnaire with 17 questions on IL. The questionnaire is based on the Project Information Literacy (PIL) survey instrument [4], although adapted to meet the purpose of the study. The purpose of the international survey is to find out about LIS students' research experience, information behaviour and information literacy skills, as well as to correlate them with the students' status, their age, gender and GPA. On a national level, the study consists of two parts. The first one is based on the questionnaire and in the second one it is aimed to compare IL of LIS students with the data on IL of average millennials, based on the survey results and on literature. Questionnaire was sent to 498 available e-mail addresses of undergraduate and graduate students at the Department of Information and Communication Sciences, University of Zagreb. First call was sent in November 2012, and second call in December 2012. Until the end of January 2013 response rate was 40% - 199 answers, 110 of them complete. We decided to analyse only complete answers; incomplete answers will be included in the international analysis.

The first four questions in the questionnaire regard demographic information. Those questions are single choice questions. Seven questions are 5-point choice array questions, and five are 6-point choice array questions. The last question in the questionnaire is an open-ended question. Analysis shows results for all the students. For some questions, correlations for two student groups are given (undergraduate and graduate students).

4 Results

The undergraduate course LIS study (BA degree) lasts three years in Croatia, and the graduate course (MA degree) lasts another two years. 45.5% of our respondents are undergraduate students (first, second and third year) and 55.5% are graduate students (fourth and fifth year). Grade scale in Croatia is 1-5 scale, with 5 being the best grade. GPA (grade point average) is 3 for 6.7% respondents; 4 for 75.2% respondents; and 5 for 18.1% of respondents. There are 74.6% female students and 25.4% male students in the sample. Out of 110 students, 67.3% are under the age of 25.

Asked about how often they have to do each type of assignment, they put oral presentation in the first place, followed by papers that present arguments about specific issues, interpretations of texts and literature reviews. Undergraduate students more often than graduate students have to do research that results in multimedia products (e. g. web sites or video). Both groups rarely have to do historical analyses, qualitative or quantitative research. The type of assignment depends on educators, but sometimes students can decide what to do (e. g. oral presentation or a video).

When searching information for course-related assignments, the most difficult thing for all the students is to get started. It is followed by defining a topic and finding grey literature. Undergraduate students have more problems with finding up-to-date information and deciding which database to use. The easiest parts of research for all the students are finding articles in the library's databases and finding sources "out on the Web" (e. g. Google, Wikipedia...).

Asked about what is difficult when preparing for an exam, results for undergraduate and graduate students are again similar. The most difficult for all of them is how to know whether their use of a source, in certain circumstances, constitutes plagiarism or not. It is also difficult for students to re-phrase what is already well expressed in a source. Evaluating sources, knowing when to cite and how to cite is more difficult for undergraduate students. That is expected because they have less experience and are less familiar with authorship and the moral component of copyright. Taking notes and integrating different sources from research into assignments is not difficult for both student groups.

In another question, 15 resources were offered to students and they had to mark how often they use them. Table 1 shows the ranking, from the most often used (search engines) to the least used (social networking sites). Results for undergraduate and graduate groups are similar. Undergraduate students are more likely to use video sharing sites but are less likely to use research databases available through the library Web site (e. g. LISA, WoS, EBSCO, JSTOR). Graduate students are more educated to use research databases, so they use them. Grey literature (e. g. unpublished theses) is not very popular among students when doing their assignments. Maybe students are not aware that some of the grey literature is available in the library or in the faculty's institutional repository (mostly theses – diploma, master and PhD). Blogs and social networking sites are the least popular, probably because of the common opinion that those web 2.0 services are created for spending free time, not for education.

Table 1. Resources used in course-related assignments, from the most used to the less used

Rank	Resource
1	Search engines (e. g. Google, Bing, Yahoo!, Ask.com)
2	Library shelves
3	Library catalogues
4	Course readings
5	Encyclopedias (e. g. Britannica, either online or print)
6	Wikipedia
7	Personal collection (materials you already own or buy - either print or online)
8	Research databases through the library Web site (e. g. LISA, WoS, EBSCO)
9	Video sharing sites (e. g. YouTube, TeacherTube, etc.)
10	Gray literature (thesis, reports, unpublished papers, etc.)
11	Governmental Web sites
12	Online forums
13	Slide sharing sites (e. g. Slideshare)
14	Blogs
15	Social networking sites (e. g. Facebook)

The most often consulted people for providing information during course-related assignments are classmates (undergraduate students are more likely to consult them), followed by librarians and instructors. Both groups rarely consult friends or family.

What do students consider when they find resources through library? Table 2 shows the ranking, from the most important to the least important issue. For undergraduate students it is a little bit more important if their instructor mentioned the source. Existence of footnotes, references or bibliography is more important to graduate students.

There are more differences in results between undergraduate and graduate students when using web sources. Undergraduate students need more instructors' recommendations than graduate students. Connected with the answers to one of the previous questions, it can be concluded that undergraduate students have problems with recognizing intellectual ownership – it is not so important to them if the Web site gives credit for using someone else's ideas. Also, they do not check how current the site is so often as graduate students (although accuracy of the web site is important to them). All the students rarely chose web sites based on whether they are in their native language. Table 3 shows ranking of the issues that are important to all the students when using web sources, starting with the most important issue. Librarians' recommendations are not very important to students when using either printed (previous question) or web based sources.

Table 2. Importance of the issues when finding resources in the library

Rank	Issue
1	How current the source is
2	Whether an instructor mentioned the source
3	Whether you have used this source before
4	Whether it has a bibliography/reference list
5	Whether you have ever heard of this source before
6	Whether the author gives credit for using someone else's ideas (e. g. footnotes)
7	Whether it is written in your native language
8	Author's credentials (e. g. where he/she works)
9	Whether the content acknowledges different viewpoints (i. e. not biased)
10	If there are charts - whether they have vital information
11	Whether a librarian mentioned using this source
12	Who the publisher of the source is

When working on course-related assignments, the most common practice is to develop an outline for how to proceed with the assignment. The second procedure is to figure out search terms, followed by working on one's own perspectives. Students rarely write about the same topics in different assignments, and they rarely use interlibrary loan or document delivery services. Also, students do not tend to spend as little time as possible (although that practice is more usual for undergraduate students).

Table 3. Importance of the issues when finding resources on the web

Rank	Issue
1	How current the Web site is
2	Whether the Web site has links to other resources on the Web
3	Whether the Web site has bibliography/reference list
4	Whether an instructor mentioned using the Web site
5	Whether you have ever heard of the Web site before
6	Whether you have used the Web site before
7	What the URL (i. e. Web site address) is and what it may mean
8	Author's credentials (e. g. where he/she works)
9	Whether the Web site gives credit for using someone else's ideas (e. g. footnotes)
10	Whether the Web site's design tells you it's a legitimate site
11	Whether the Web site content acknowledges different viewpoints (i. e. not biased)
12	If there are charts - whether vital information is added
13	Whether it is written in your native language
14	Whether a librarian mentioned using the Web site

One question was – what tools do you use when writing assignments. The most popular are presentation-making tools, followed by spell checkers, video sharing sites, document sharing programs, digital "sticky notes" and photo sharing sites. The least popular are micro blogs and citation-making programs. This question had the highest number of “never heard about it” answers. There are also slight differences between undergraduate and graduate students – undergraduate students more often answer that they have never heard about some of the tools. Graduate students have had more opportunities to learn about, or to be introduced to, the tools during their education.

Asked what was important to them while working on a course-related assignment, students answer that the most important thing is to pass the exam. The second important thing is getting the paper finished and in third place is to learn something new. Improvement of research, analytical and writing skills is a little bit more important for graduate than for undergraduate students.

For accessing information, students almost always use laptop computers; sometimes they use desktop computers, and rarely cellphones or tablets.

For communicating with teachers, mentors or librarians they usually use e-mail (via laptop, desktop computer or cellphone) and face to face contact; they rarely make cellphone or telephone calls; they almost never communicate via social networking sites, instant messaging or texting. There are no differences in ways of communication with teachers, mentors or librarians regarding the students' status (graduate or undergraduate).

The last question was an open-ended question – do you have any comments? Only 15 answers were recorded, mostly positive comments about the questionnaire. Very interesting is one comment that says: “I will use the questions from the questionnaire to enhance my information literacy,” (graduate student). That shows that even the questionnaire itself motivated some of the respondents to think about their information literacy.

5 Discussion and Conclusion

According to a plethora of literature, either anecdotally or research-based in nature, the web has changed students' information behaviour and expectations of the research process. Studies are oriented towards profiling information behaviour patterns, since those affect learning processes. This study contributes to research findings in this area by characterizing information behaviour of LIS students, who pertaining to their field of study, are supposed to handle their information problems thoroughly and with less difficulties than the average millennial.

The most difficult thing for LIS students when preparing their exams is how to get started. This step is the most difficult for half of the surveyed students. The results of the PIL project (in the sample were over 8000 US college students from different academic disciplines, not only LIS) show that this step is the most difficult for three-fourths of US students [4]. The conclusion can be made that LIS students have less problems with getting started with their exams, but the problem is still significant.

Porter's study of research strategies of undergraduate millennials shows that most of them begin their search with Google and Wikipedia [5]. In our sample, Google is also in first place, but Wikipedia is in sixth place. LIS students are, more than average millennials, aware of the importance of credible sources, such as libraries, library catalogues and encyclopedias.

O'Brien and Symons [2] concluded that peers have the greatest impact on students' information choices (students from different disciplines were surveyed). For LIS students in our sample, peers are also the first people to be consulted for providing information during their course-related assignments, but librarians are also very important (70% of respondents consult librarians very often).

Some findings have confirmed initial assumptions about the higher efficiency of LIS students in handling study and research tasks, primarily findings referring to abilities of using library resources like catalogues, databases or citing sources. However, other results, pertaining to the research process itself (e.g. starting research) imply that LIS students, despite being exposed to the IL concept and content during their studies, partly share the same kind of difficulties as do average millennials. The overall results show that IL contents regarding information sources as such (retrieval, finding information, citing) are more easily transferable to other learning contexts and situations than abilities referring to the research process itself. Such results signal recommendations for information literacy education, which should pay more attention to the overall research process, in particular the initial part of the process, i.e. starting research.

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Information Literacy Skills of Students at Paris Descartes University

Joumana Boustany

Paris Descartes University – University Institute of Technology
DICEN – CNAM, Paris, France
jboustany@gmail.com

Abstract. This article discusses findings from a research study that evaluates the information literacy competencies of students at Paris Descartes University Institute of technology (UIT). This study was carried out to understand how the undergraduate students of this University deal with information. Findings reveal that a number of students have problems with basic information literacy skills and that the students from different disciplines have different needs.

Keywords: Information literacy skills, undergraduate students, France.

1 Introduction

In today's age of abundance of information, “a person must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information”. [1]

Have the students of University Institute of technology (UIT) at Paris Descartes “the foundation for continued growth throughout the careers of graduates, as well as in their roles as informed citizens and members of communities”? [2] By evaluating the information literacy (IL) skills and learning how the undergraduate students of this Institute deal with information, we will have a good overview of the level of French students. In fact, the UIT aims to graduate students after two years of studies based on a national curriculum. Since the year 2000, UIT has delivered bachelor degrees. To join bachelor programs students must have completed two years of studies at any university. Therefore this study will give us also an idea about the level of the students from other universities. That is why we consider this group of students to be representative of the information literacy skills of the French undergraduate students at all the stages of their studies.

Most of the surveys in France have evaluated the way students conduct their research in the primary, secondary and High schools, or how young people behave [3-4]. However, few studies have evaluated the information literacy competencies of university students [5-7].

Gaining an increased understanding on how students carry out their research will let us know if French students are well prepared to face the challenges of our information society. It will help to detect weaknesses and to identify gaps to help improve training. For this purpose, we are going to answer the following questions:

- What are the information literacy competencies of students?
- Is there any relationship between the information competencies of the students and the type of baccalaureate¹ they prepared for?
- Furthermore, is there a meaningful difference in IL skills among disciplines? Are there different requirements for different disciplines?

2 Methodology

The data was collected during the first and the beginning of the second semester 2012-2013 by using an online survey² completed by the students enrolled at the University Institute of Technology (UIT) at Paris Descartes University.

The survey is a self-assessment checklist about the students IL Skills. The self-assessment criterion was the user's perception of his/her own agreement on a Likert scale from "strongly disagree" to "strongly agree" with a "no experience" option. The "neither agree nor disagree" suggested some measure of doubt. For other questions, we used the scale from "Never" to "Almost always". In the data analysis, the "very agree" and "agree" and the "always" and "almost always" were merged as each expressed the same opinion. It was the same for the "disagreement" and to "never" or "rarely".

The demographic questions were designed to explore factors that might have an impact on information literacy skills like gender, type of Baccalaureate, and age.

The survey was conducted in the classroom for the majority of respondents. For some departments, students were in an internship and the questionnaire was sent by mail. For those students, the number of respondents was low and especially for students from the Social Careers Department.

Quantitative data were entered, coded, and analyzed using the SPSS statistical package. Descriptive statistics were used to analyze the findings. Chi-square tests of independence were used to compare the factors such as disciplines and IL competencies.

3 Results

3.1 Participants

The survey questionnaire elicited 375 completed responses. This was an overall response rate of 16.27% of the total number of students at the UIT (2305) distributed in six departments: Social Careers (CS), Business and Administration Management (GEA), Information and Communication (IC), Computing Science (INFO), Statistics

¹ In France, to access the university, students should have their baccalaureate, a national high school diploma. There is two types of baccalaureate divided into streams: the general baccalaureate (ES - economic and social studies, L - literary and S - scientific) and the technological one (Management, Industrial, etc.).

² This survey was adapted from the Project Information Literacy research survey by A. Head and M. Eisenberg. [3]

and Data Processing (STID), and Marketing Techniques (TC). Each department offers a different diploma. The rate of response from each department is illustrated below in Table 1. The highest number of respondents was from the Information and Communication Department followed by the Computing Science Department.

Table 1. Number of students by department and year of study

		CS	GEA	IC	INFO	STID	TC	Total
Total N of stud. by dep.		249	595	306	397	212	546	2305
Year of study	First year	8	21	95	32	18	3	177
	Second year	7	16	30	43	17	1	114
	Third year	2	8	30	21	1	22	84
	Total	17	45	155	96	36	26	375

47.2% of the respondents were in the first year representing 17.49% of the total number of first year students at the UIT. 30.4% of respondents were in the second year representing 12.88% of the total number of students. 22.4% of respondents were in the third year, which is 20.59% from the total number of students. Third year students, followed by the ones in the first year, were the most surveyed students. Second year students were in internship, which is why the number of participants is low.

62.4% of the participants are aged between 18-20 years (only one person was less than 18, and was counted with this group). 28.8% were between 21-23 years and less than 10% over 24. 54.7% of the respondents were female, with a predominance of girls (80%) in the Information and Communication Department. The boys were predominant (78.1%) in Computing Science. The percentage of males is also high (61.1%) for Statistics and Data Processing. For the other departments the gender difference was not so significant.

Most of the students (77.9%) at UIT come from a general baccalaureate. Few (14.7%) prepared a technological one. Very few (7.5%) has an equivalence diploma.

3.2 Starting an Assessment

The beginning of the course-related research process is rife with challenges for 53.3% of students. Only 18.9% of them do not have problems to start an assignment. There are fewer (41.9%) who have difficulty to define a topic. Only quarter of them (27.5%), find this task easy. A great number (58.9%) admit that they have difficulty in narrowing a topic. Less than quarter (18.1%) said that they do not have problems.

It is important to notice that a quarter of the students answered, “Neither agree nor disagree” for those three questions, which is significant. It is concluded that students are unsure about themselves and their competencies.

Students from different departments do not face equal challenges when they have to define the task for course-related research. Some have more difficulties to start an assessment, to define and to narrow the topic, such as the students from Business and Administration Management. For others, it is the easiest task, and that is the case for

students from the Information and Communication Department, except for the task of narrowing the topic. For this exercise, all the students are at the same level.

We expected that the number of respondents who will have difficulty to start an assignment will decrease with the level of year of study, but it was not the case. While 49.2% of the first year students had difficulty, this number increased to 57% with the second and the third year students. Maybe it is important to reconsider the curricula at UIT to help students improve their competencies.

The same observation can be made concerning the question related to defining a topic with these percentages: 38.4% for the first year, 42.1% for the second year and 48.8% for the third. The first year students have more difficulty to narrow down a topic (64.4%), comparing to the second (51.8%) and third year (57.1%). Narrowing down the topic is also problematic for 67.9% of students who prepared a technological baccalaureate and 60.6% who prepared a scientific baccalaureate.

3.3 Searching for Information

Successful information retrieval is essential for successful studies. We have focused our research efforts on how students find information.

Defining search terms is not considered difficult by 53.6% of students. Only 23.7% of them have difficulty with this step. It is the case for all years of study; students do not report improving their competencies by passing from first to second or to third year. What is difficult is elaborating the search strategy. This is the opinion of 41.1% of students. First year students have more difficulty (47.4%) than the second (25.3%) and the third year students (27.3%).

Students from different departments are not equal concerning the search for information. For Business and Administration Management students, it is difficult to come up with the search terms (46.7%) and to build a search strategy (53.3%).

Students from Social Careers are unsure about their competencies. More than half (52.9%) of them neither agree nor disagree with the assertion that “defining keywords is difficult” and more than a quarter (29.4%) do not have difficulty meeting this objective.

Students from other departments do not have problems with keywords (with a percentage varying between 53.8% and 61%) except for Business students as we saw before. However, the situation differs with building up the research strategy. Only students from Computing Science do not have difficulty, all others except Social Careers students find it hard to develop a research strategy (45.4% to 61.5%).

Students with a technological baccalaureate have more difficulty than students who prepared for a literature or scientific one.

Dealing with the resources from the library, what is remarkable is the number of students who do not have any experience with finding articles in their databases (24.8%), or figuring out where to find sources in the library (20.3%), or finding gray literature (21.6%). If we add the number of students who said that they have difficulty to find articles in database (32.8%) or to find gray literature (40.8%) to the number of students who didn't experienced this situation (24.8%), it become urgent to enhance training to access databases, especially when we know the quality of information they offer.

3.4 Resources Consulted

What is the students' preferred use of information sources for course work? Web search engines, Wikipedia, and Course reading, received a significantly higher rating than other sources. On the other hand, classical encyclopedias (6.4%), library shelves (5.3%) and library catalogs (4.8%) are seldom used. The worst scores are for gray literature and databases (2.9%) (See Fig. 1 Percentage of resources consulted). The number of years of study makes no difference in resources used. However, we noticed that the first year students consult less library catalogs (13.6%) than the third year (19%), government web sites (25.6 vs 40.5%), and the personal collection (31.8% vs 41.7%). Instead, they consult social networking (56.3 vs 63.1%). There is a possibility that in the next few years, this resource will become more important.

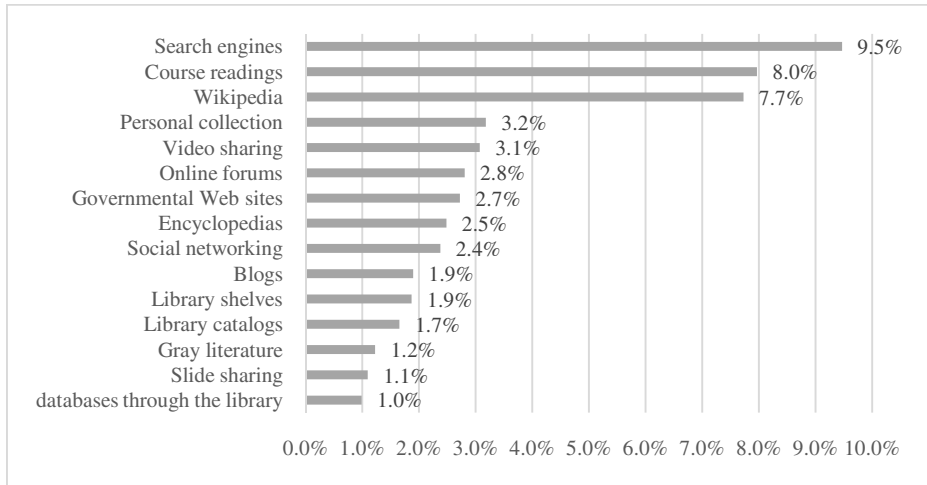


Fig. 1. Percentage of resources consulted

It is important to notice that the results concerning the use of Wikipedia by French students are corroborated by the results of A. Head who demonstrated that: “Over half of the survey respondents (52 percent) were frequent *Wikipedia* users — even if an instructor advised against it” [8].

The difference of resources used varies significantly depending on the disciplines. All the students in Business and Management consult search engines before the course readings (82.2%) and Wikipedia (66.7%). They never use slide sharing. Students at the Information and Communication Department use almost the same resources: less search engines (98%), more course readings (85.2%) and more Wikipedia (84.5%). What is surprising is the low level of use of databases (9%) when we know that this is an important requirement for the librarian students trained by this department. Students from Computing Science make use of Wikipedia (78.9%), which is the second resource by frequency. They have the highest score for the use of online forum (52.6%) and the lowest score for using the library (shelves and databases). Students from Business (61.5%) and Social Careers (58.8%), put

government sites in the third position. Students from Social Careers have the highest score of using the library catalogues (41.2%), the library database (17.6%) and the gray literature (17.6%).

There was no significant relationship between the type of baccalaureate and the resources used by students. The only remarks that could be made are about the importance of the personal collection and the use of classical encyclopedia for the literature baccalaureate.

3.5 Validation of Information on the Web

The first criterion used by French students to validate information is an up-to-date resource. As with American students, they “use a risk-averse strategy based on efficiency and predictability in order to manage and control the information available to them” [9]. That is why three-quarters of the French students prefer the resources they know or mentioned by their instructor. They also single out resources in their native language. No significant difference by discipline was observed.

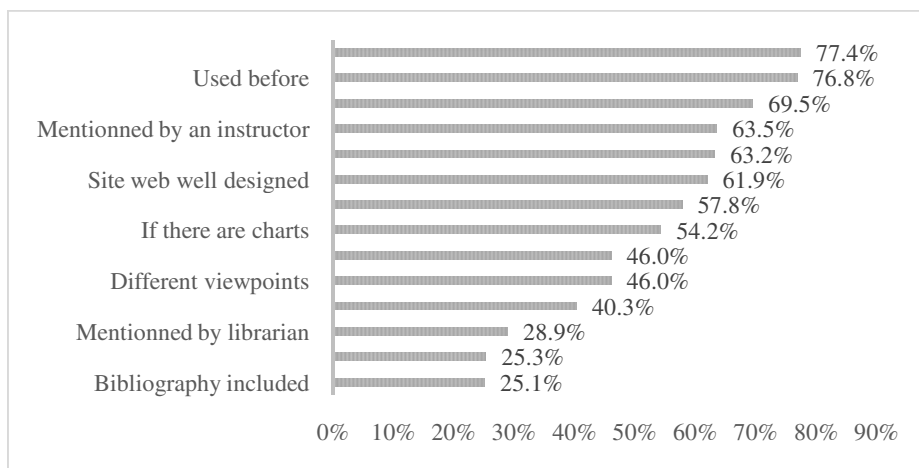


Fig. 2. Criteria for evaluating Web content

4 Findings

The information literacy skills of undergraduate students at Paris Descartes University – UIT are insufficient, as evidenced by the results of this survey. Students are lacking the skills required to effectively and efficiently complete undergraduate course work, even though the methodology of searching information has been included in the curriculum since April 1997 [10]. This appraisal implies that there are weaknesses in the proficiency of preparing students to be IL literate and measures should be adopted to enhance their IL competencies.

In some cases, like searching for information, first year students have more difficulties than others. This could be explained by the fact that students are not adequately prepared for the transition from high school to university. They pass from more to less structured to much more complex assignments and from limited to seemingly unlimited information resources.

Students coming from a technological baccalaureate have some problems with information literacy competencies, but the difference noticed with students from a scientific baccalaureate is not significant. The dissimilarity is more important with students from a literature baccalaureate.

At the beginning of this research, we took into consideration the relation between skills and gender. The results shown that there are no differences among our respondents.

Students are unaware of resources available and offered by the library and especially the databases. In their behavior, they seem to adopt an easy way out attitude. They rely heavily on search engines instead of databases. They prefer Wikipedia to the classical encyclopedia, and they choose the resource they know or have heard about.

5 Perspectives

The results of this study demonstrate that the current IL curriculum expectations are insufficient to ensure that students are acquiring the necessary skills. Information is the lifeblood of academic engagement and successes. Consequently, information literacy is of vital importance. Strong action should be taken to ensure the success of students.

It is interesting to build curriculum and design pedagogy to increase the relevance of students' learning for the digital contexts in which they live and work. However, it is important to underline that this preparation should be commenced earlier, at the high school level. This should assist students in making the transition from the secondary to university level education by helping them to become comfortable and confident when they deal with information.

To build this curriculum, an audit of Information literacy programs and practices at UIT should be a necessary action to adapt the programs to the needs of the students.

As a self-assessment, the results may not reflect the participants' true abilities and it is necessary to complete this study by renewing the survey the next year in order to confirm the findings. The study will be complemented also by a qualitative research project and with focus group research.

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Information Literacy Competences of LIS-Students in Switzerland – A Case Study

Eliane Blumer¹, Jasmin Hügi¹, Bernard Bekavac², and René Schneider¹

¹ Haute Ecole de Gestion, Geneva, Switzerland

{Eliane.Blumer,Jasmin_Hügi,Rene.Schneider}@hesge.ch

² Hochschule für Technik und Wirtschaft, Chur, Switzerland

bernard.bekavac@htwchur.ch

Abstract. This paper analyzes the information literacy competences of Swiss Library and Information Science students, in the context of the international Information Literacy Survey, supervised by the Department of Information Science at Hacettepe University of Ankara. The study has been conducted by the Department of Information Science at the University of Applied Sciences in Geneva in collaboration with the Information Science Department at the University of Applied Sciences in Chur. For this study, a very small convenience sampling method has been used. Therefore, the findings are not representative for the basic population of all LIS bachelor students in Switzerland, but refer only to the respondents.

Keywords: Information literacy, library and information science, different cultures, Switzerland.

1 Introduction

In today's information society, we experience an information deluge, not only concerning scientific content, but also concerning news or entertainment. Therefore, it is becoming increasingly important for everybody to acquire competences in information literacy. Information literacy in this context means "the ability to handle information efficiently and competently as a result of having specific expertise, and being able to structure and select data to meet requirements. It is the ability to localize, evaluate and use information." [1]

In Switzerland, the discussion about information literacy (IL) has led not only to development on a national level, such as "Strategy of the Swiss state for an Information Society in Switzerland" [2] but also on a more concrete level with the development of the Swiss Standards of Information Literacy [3].

Especially, for students in Library and Information Science (LIS) in Switzerland, information literacy competences represent essential skills for their work life, as the role of teaching information literacy is attributed to librarians. In Switzerland, there are two universities of Applied Sciences which offer bachelor's and master's degree in library and information science (LIS) and which teach many aspects of information

literacy, including search on the web, search in data bases, and citations. Though, as Milz [4] lined out in her work, not all IL aspects, based on ACRL standards, are taught

This article puts a special focus on the information literacy competences of LIS students in Switzerland with the assumption that their proficiency augments the more they advance in their studies. For this study, a very small convenience sampling method has been used.

2 Information Literacy of Library and Information Science Students – Swiss Case Study

The Department of Information Science at Hacettepe University in Turkey has started an international survey of information literacy among LIS students. The two universities of Applied Sciences (HEG Geneva and HTW Chur) participated in this study. In this article, the results regarding Switzerland are presented.

Until now, there has been little research directly concerning information literacy of LIS students. Therefore, this is the first study which sheds some light on the situation in Switzerland. The main interest of this research is the development of information literacy skills of LIS students during their studies. Throughout the three years of the bachelor studies, many courses include search, localization, evaluation and citation, and therefore the information literacy skills of students should gradually improve.

In order to be able to analyze this improvement statistically, the questions of the survey have been mapped to the Swiss standards of information literacy - information need, retrieval, assessment, organization, application and responsibility within information society [2]. Four of these standards were chosen for our research questions.

RQ1: To what degree do students get more proficient in information retrieval during their studies?

RQ2: To what degree does the basic information need analysis improve during their studies?

RQ3: To what degree does the responsibility within an information society improve during their studies?

RQ4: To what degree do students get more proficient in information organization during their studies?

2.1 Methodology

As stated before, the authors of this paper have participated in a larger, international study of information literacy. Therefore, the survey method was chosen in the larger research group, which decided to use an online survey for this undertaking. For this, a common questionnaire has been established. Every participant could then translate the questionnaire into the language of his or her respective country and was free to add additional questions for their own research interests.

For the survey in Switzerland, the questionnaire has been translated into French and German. The French translation was done jointly with the participant from France, whereas the German translation has been established by the Information Science Department of the University of Applied Sciences in Geneva. Several questions were adapted to the Swiss context, but no additional questions have been added.

The survey was sent in December 2012 to 290 Bachelor students. 79 responses have been collected, of which 26 were incomplete. The call for participation was sent by mail to the student's mail account at their university and the survey was accessible for three months from the beginning of November until the end of January. These dates coincided with the end of the winter semester. Therefore, the students of the first bachelor year were at the end of their first semester, the students of the second year were at the end of their third semester and the students of the third year were at the end of their fifth semester.

It is important to note that a convenience sampling method has been used. Therefore, the findings of this study are not representative for the basic population of all LIS bachelor students, but refer only to the respondents. Consequently, generalizations cannot be drawn out of this study.

For each research question, items from the survey considered relevant to the issue have been selected and analyzed by the year of the Bachelor degree course. To do so, a Spearman's rho correlation has been used in all cases. Due to limited space in this paper, the results of these tests are only mentioned when the results had a significance of $p \leq 0.05$.

3 Findings

79 responses were received of which 26 were incomplete and were therefore excluded from the analysis. Of the 53 complete surveys, the answers of three participants are not taken into consideration for statistical evaluation because they are studying part time. As their studies last for four years instead of three, the corresponding semester to the full time curriculum cannot be determined and therefore their results cannot be compared to fulltime students. The other 50 answers are complete and have been used for statistical analysis and review. Compared to the basic population (290 students), the response rate is of 17%.

3.1 Demographics

Of the 50 undergraduate students who participated in the study, 88 % were female and 12 % were male. For every bachelor year, nearly the same percentage answered to the questionnaire, with 30% (15 participants) in the first year, 34% (17 participants) in the second year and 36% (18 participants) in the third year. Concerning the two universities whose students have been asked to participate, the number of participants is exactly the same, namely 25 (50%).

RQ1: To what Degree Do Students Get More Proficient in Information Retrieval during Their Studies? Only the dimension “Frequency of use of databases” shows a statistical significance ($p=0.006$), with a low, positive correlation ($rs=0.381$), whereas the other two dimensions are not significant.

The knowledge about the existence of scientific databases within a certain field of interest, as well as an introduction into the use of these systems, is something a Bachelor student learns during his studies in Library and Information Science. As the papers which the students have to write during their studies become more complex and necessitate increasingly the use of data bases for gathering background information, the frequency of use rises until the end of the Bachelor.

Table 1. Items used for the dimension information retrieval

Dimension Information Retrieval
Finding the appropriate database is difficult
Finding the appropriate article within a database is difficult
Frequency of use of databases

The answers regarding the difficulty of finding an appropriate data base seem more scattered. Of the 48 participants giving an answer, 33% did agree having some difficulty with this task, while 23% marked the neutral category and 43% disagreed with the statement.

However, the statement about the difficulty of finding an appropriate article within a database was disagreed with by 56% of the 46 respondents, whereas the neutral and the agreeing category were each chosen by 22% of the participants. It seems that for this sample, it is more difficult to find the appropriate database than to search within the database. The most obvious interpretation of this result is that once the right database is found, it is easy to find relevant articles for a specific topic. Alternatively a database is only regarded as appropriate if relevant articles were found in it.

RQ2: To what Degree Does the Basic Information Need Analysis Improve During Their Studies? Acquiring knowledge about scientific research of information is one of the most important parts of the LIS-curriculum and its success should be seen as obligation for every LIS-faculty. In the current case, no statistical significance can be seen at all. This could be due to the small sample, which would mean that a test with a bigger sample should be done concerning LIS-Students research strategies.

Another possibility could be that the most able students already know the important basics about research strategies when starting their studies and therefore acquire only a little more knowledge about this issue. In Switzerland, it is required to have made an internship of twelve months or an apprenticeship of three years in an organization linked to the LIS field prior to starting the bachelor studies in LIS. Therefore, some basic knowledge in research strategies may be acquired before starting at the university.

Table 2. Items used for the dimension information need analysis correlations between bachelor year and research strategies

Dimension Information Need Analysis
Difficulty to develop a search strategy
Finding keywords
Creation of a research plan
Change of keywords after unsuccessful search

Generally, it can be said that the students regardless of their current semester don't report a difficulty in creating a search strategy (48% of disagreement with the statement) and often make a plan for their search (26% marked very often and 30% marked often). 46% of the participants indicated that their first activity for a search often consists of finding appropriate keywords but that changing their keywords after an unsuccessful search happens less frequently than might be expected (34% often and 42% indicated sometimes).

RQ3: To what extent does 'Responsibility within an Information Society' Improve during Their Studies? The first two analyzed dimensions don't have a statistical significance. There is no statistically relevant improvement regarding the citation behavior of LIS-students by comparison of the three bachelor years.

Table 3. Items used for the dimension responsibility within information society

Dimension Responsibility within Information Society
Difficulty to know when to cite a source
Difficulty to know to cite in the correct format
Difficulty to know when it is plagiarism or not

Regardless of the current semester of the students, the results show that the students estimate that they have no difficulty to know when they have to cite a source (62% disagreed with the statement, 20% marked the neutral category and 18% agreed with the statement). The statement about the difficulty to know the correct format to cite in showed similar results (64% disagreed, 10% marked the neutral category and 26% agreed with the statement). This could be due to the fact that there are different recapitulation sessions of citation rules during bachelor curriculum.

The last dimension is statistically significant ($p=0.047$) between the years and there is a low negative correlation between the two elements ($r_s=-0.288$). It is a fact that the more LIS-Students advance in Bachelor courses the more they learn about citation and therefore are more aware of plagiarism problems, because they have to write a bachelor thesis in the sixth semester in order to accomplish their undergraduate studies.

RQ4: To what Degree Do Students Get More Proficient in Information Organization during Their Studies? The question regarding the frequency of use of a bibliographic tool (like Zotero or Endnote) caused some surprise as 29% indicated that they never use a bibliographic tool. This result was not expected as these tools are shown and explained in classes early during the bachelor studies. It seems that they don't represent an advantage to LIS students and are therefore not used as much.

Table 4. Items used for the dimension information organization

Dimension Information Organization
Frequency of use of bibliographic tool

4 Difficulties of LIS Students

In table 5, the analyzed dimensions of the Swiss IL-standards are shown. Each item has an evaluation derived from the self-report by the participants. When the overall result of all answers was positive, the label “Good” is put in the table. When the overall result was negative, the item is labeled with “Bad”. When the results were highly mixed, the label mixed was used. Table 5 shows that LIS-students in Switzerland have a rather good level of IL. Seven out of 11 of the evaluated items have the label “Good”. Two items were stated as mixed and another two items as bad. The biggest problems apparently remain within the first standard (information need), where the creation of a research plan is realized rather rarely. Within the same standard, the change of keywords is an activity which the respondent LIS students either carry out very often or very rarely. The fourth standard (information organization), where the item “use of a bibliographic tool” has been placed, seems to be problematic as well. Most of the survey participants seldom make use of a bibliographic tool. This seems rather surprising as the importance of using those tools is explained more than once during the studies.

Table 5. Swiss Information Literacy Standards Mapping

Information need	Difficulty to develop a search strategy (RQ2)	Good
	Finding keywords (RQ2)	Good
	Creation of research plan (RQ2)	Bad
	Change of keywords after unsuccessful search (RQ2)	Mixed
Information retrieval	Finding the appropriate database is difficult (RQ1)	Mixed
	Finding the appropriate article within a database is difficult (RQ1)	Good
	Frequency of use of databases (RQ1)	Good
Information organization	Use of bibliographic tool (RQ3)	Bad
Responsibility within information society	Difficulty to know when to cite a source (RQ3)	Good
	Difficulty to know to cite in the correct format (RQ3)	Good
	Difficulty to know if it is plagiarism or not (RQ4)	Good

5 Conclusion

This study aimed to analyze the information literacy competences of information science students within two University of Applied Sciences in Switzerland, assuming that their proficiency increases the more students advance in their studies. To verify this assumption, four research questions were proposed which all map to a standard of the Swiss IL-standards (on behalf of assessment and application),.

Items from the international survey of information literacy among LIS students were selected and analyzed to describe the relationship between year of undergraduate studies and self-reported performance using a Spearman's rho correlation. Only two of the eleven analyzed items have shown a statistical significance which is unsurprising given the very small sample size. This may be due also to the effects of convenience sampling. Therefore, it is not possible to make an overall statistically significant deduction, as to whether the self-reported the IL-level of Swiss LIS-students improves, but generally, the students don't seem to have major problems concerning IL.

In regard of the Swiss standards, the biggest problems remain within the information need and information organization standards. Here, the question has to be asked whether this is due to the IL-curriculum at the Universities, because, as Milz [4] outlined in her work, generally not all aspects of IL are taught. Another possible interpretation could be the fact that students are not able to self-evaluate properly their competences within a specific field [5].

This paper is a first attempt to analyze the Swiss situation of IL-competences of LIS-students. There is definitively a strong need for further research within this field and future work should be done in regard of competences of Master students of library and information science, as well as of the self-estimation of competences of students within Library and Information Science.

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Information Behavior of University Students: From Today's Information and Communication Student towards Tomorrow's Excellent Information Specialist

Jurgita Rudžionienė

Vilnius University, Faculty of Communication, Institute of LIS, Universiteto Str. 3,
LT-01513 Vilnius, Lithuania
jurgita.rudzioniene@kf.vu.lt

Abstract. The *purpose* of the research was to analyse the information behaviour and information literacy knowledge of Vilnius University Faculty of Communication information and communication students. The main *tasks* of the research were seen at two levels. First it was to reveal the information literacy skills of LIS bachelor students, and secondly to analyse Master level students' information literacy skills. The first level research and results are presented in this article. *Quantitative method* was applied using the Project Information Literacy (PIL) survey instrument for analysis of the IL skills of LIS students. Eighty-six bachelor students were surveyed. The results of the research are presented and conclusions are drawn.

Keywords: Vilnius University, Faculty of Communication, LIS students, communication and information, information behavior, information literacy.

1 Introduction

Information today is available through plenty of resources including community resources, service providers, libraries, media, and the Internet. Questions about information authenticity, validity, and reliability create challenges for information users in relation to information evaluation, understanding and usage [1]. This is the reason why it is so important to investigate information behavior and the information literacy skills of the students, as future information and communication specialists and as those who will be responsible for quality, accessibility, and the validity of information provided to every member of society [2-3].

1.1 Information Literacy as Significant Phenomena

Weber and Johnson define information literacy as "the adoption of appropriate information behavior to identify, through whatever channel or medium, information well fitted to information needs, leading to wise and ethical use of information in society" [4-5]. Information behavior is definitely one of the most important factors for successful development of society [6-7]. It is essential for high quality welfare, and

information literacy has a direct influence on the level of information behavior [8-9]. Janiūnienė referred to. Kuhlthau and has drawn attention to Kuhlthau's numerous empirical investigations of students' information behavior and information literacy, which are extremely valuable and helpful today in building up information literate society [10-11]. The ability to gain and to apply knowledge raises new challenges for specialists, and problem-based learning requires independent information seeking, assessing and use. Information behavior as part of the learning process, is a prerequisite for high quality learning and teaching. The ability to master today's information and communication technologies plays a vital role in building up professional skills during personal learning processes and experiences [11-14]. Motivating students' to perform high quality research as one of the serious indicators of their future professional competency, creates the need to develop and adopt new information literacy training systems [15-18].

1.2 LIS Studies at the Vilnius University Faculty of Communication

Faculty of Communication (FC) at the Vilnius University was founded at 1991, by combining LIS and journalism, which since 1949 had been running in the Faculty of History. Today there are three levels of studies in the field of information and communication namely: bachelor, master and doctoral studies.

Study programs dealing with LIS studies have their own history. For decades the only LIS study program was running at a bachelor level. Then the master degree program *Library and information centres management* was run during period 2000-2008. Due to recent major changes in the Lithuanian labour market different modifications of the LIS study program were developed. As a result, at the moment there are 3 versions of LIS bachelor study programs at the FC. The *Culture information and communication* bachelor study program was re-oriented from pure LIS studies to information and communication studies aiming not to be limited to library sector but to cover the whole culture sector including libraries, museums, archives, and information centres. This version of the course fitted the emergent market requirements [19].

2 Research of LIS Students at the Faculty of Communication

Research performed at the Vilnius University Faculty of Communication is presented in this section. Research activities and the time of the research is indicated, limitations are discussed, the sampling specifics and data collection are presented, and the more significant data analysis and research results are presented and discussed together with conclusions.

2.1 Methodology

The *purpose* of the research was to analyse information and communication students' information behavior and information literacy skills at the Vilnius University Faculty

of Communication. This report presents results about the information literacy skills of LIS bachelor students at the Faculty of Communications (FC).

Main activities and time. The research was performed during the 2012-2013 study year. The decision was made to choose face-to-face surveying instead of e. surveying in order to attempt to get high quality feedback from the respondents. Questionnaires were delivered during lectures.

Description of respondents. 86 students at the Faculty of Communication, Vilnius University were surveyed. This was 92% of the total number of LIS students at the FC. They represented 3 bachelor study programs dealing with LIS specifics: Library Science and Information, 3rd and 4th study year; Information and Library Services, 2nd study year; and Culture Information and Communication, 1st study year. Demographical information was summarized in brief as following: 77 % were female (66 and 20 students respectively). The students were predominately young (60% of age 18-20 and only 2% of age 27-29. The current status of the students was indicated below:

first year students 40%,
second year 10%,
third year 12% and
fourth year 38%

The number of students varied from 10 to 40 students in each course across the four years of study. Most of respondents indicated that their GPA average was 8 points – 32,5 % (28 students), and only 1.2 % of respondents had their GPA average at 10 points (1 student). Unfortunately, that student indicated their negative GPA.

The rate of feedback from each study year students' varied from a minimum of 65 % to a maximum 90%.

Research instrument. A quantitative research method was chosen and the Project Information Literacy (PIL) survey instrument was used for the analysis of the IL skills of LIS students at the Faculty of Communication¹. The PIL survey is an instrument created at the University of Washington. So far, the largest group study using the PIL survey for research was performed in USA in 2010. It involved 112.844 students representing different USA universities and colleges. The PIL survey instrument was designed for the purpose of investigating research experience, information behavior and the information literacy skills of the respondents [20]. Only one question of the whole PIL survey instrument was modified to accord to the Lithuanian 10 point grade system used in Lithuanian education for evaluation the knowledge of students in education institutions. The structure of the instrument consisted of 2 parts. Section A was *Demographic information* and section B was *Research experience, information behavior and information literacy skills*). The survey contained 17 questions.

¹ The choosing of PIL survey instrument for the research was initiated by international working group under the guidance of Prof. Serap Kurbanoglu (Hacettepe University, Turkey). Original PIL survey was revised and adapted by the international group for the purpose of international IL research needs and used in different countries for LIS students' IL research.

Particularity of responses. Some data were missing but this did not influence the research results significantly. The GPA data was indicated by 2 students out of 3 second, third and fourth study years students, because due to the time of the research first year students didn't have yet any exam grades. In addition there were no comments from the respondents on the last question (*B.13 Any comments?*). All the rest of the questions were completed adequately. There were some complains about the questionnaire being too long expressed by respondents.

2.2 Data Analysis and Results

Criteria of Analysis. Research results were analysed according to the content of the answers and the study year of students. Research results were analysed also according to three aspects: 1) priorities for using information sources and tools for preparing course-related assignments, 2) information seeking and assessing, 3) students opinion and problems in preparation of course-related assignments presenting the results according to the criteria listed in the survey.

Results Interpretation. The most significant results were:

1) *Priorities for using information sources and tools were for information for preparing course-related assignments in current degree studies.* Following the question about how often different resources were consulted by respondents for providing information, about half of respondents tended to use often and almost always search engines (e.g. Google, Yahoo! Ask.com), as well as course readings and library catalogs. Search engines were the most popular among third year students. Gray literature (including thesis, reports, and unpublished papers) and social networking sites were rarely used and gray literature was the most unpopular among fourth year students. Following the questions about how often students use different tools for preparing and sharing information in communication with their teacher, mentor or librarian, the most popular ones were presentation tools (e.g., Power Point, Prezi), and spell checkers and video sharing sites (e.g., YouTube, TeacherTube). The last one was the most popular among first year students, as the presentation tools were used very often by first year students. Among the least popular tools were microblogs (i.e., Twitter) – almost 57 % of students never used them, especially fourth year students (84 %). First year students used microblogs more often compared with others. Citation-making programs were not used by 32% of respondents, and 22 % of respondents had never heard about this tool before but this tool was more popular among fourth year students. 23 % of the respondents indicated that they had never heard about social networking sites before, and 29 % had never used this tool. E-mail was the tool most often used by all students. Following the question about how often students use different kinds of technical equipment for accessing information, 66 % of respondents used laptops frequently. Desktops were used less frequently – only 17 % used them ‘almost always frequently, and 23 % – ‘always’. Most rare was the use of tablets and about 60 % never used them. It is interesting that even 20 % of the first year students use a landline telephone often. It leads to the assumption that senior

students were more able to assess the advantages of modern IT as well as to be able to obtain them (probably, they were more provided for from financial side).

2) *Information seeking and assessing aspect.* The question about how often students consult different people to get and validate information, indicated that this was predominately from instructors and classmates. Fourth year students gave the priority to instructors (63 %). Librarians were not popular and they were consulted by most students only sometimes or rarely. It should be noticed, that students probably didn't rely on librarians, and it seemed to be a very serious point for librarians to rethink their role, competency and professional behavior. Following the question about what was considered by students when a source was found through the Library, 64 % of all students identified instructors' positive role and opinion. Language of the source was the next most important point, - 57 % of all students gave the priority to the language of the source (mostly their native language). It was interesting, that source language wasn't so important to the first year students, and it meant that their foreign language competences were relatively high. A bibliography or reference list was the third most popular factor in assessing the source. It is interesting, that 38 % of students didn't consider author's credentials (e.g., where the author works), and first year students considered this factor sometimes, while fourth year students didn't consider it at all. The publisher of the source was never considered by almost 54 % of all students, and this rose to 76 % of fourth year students who didn't consider the publisher. The least popular factor among fourth and third year students was how current the source was (almost 78 % didn't pay attention to this factor).

When a source was found "out on the web", the most common motivator was whether instructor had mentioned the source. But it was surprisingly, that instructor's opinion on this matter wasn't so important to the first year students. The most popular factor considered by students was whether the site has links to other resources on the Web (65 %, and dominated by first year students). The least popular factor was the URL address (Web site address) and what it could mean.

3) *Students' opinions and problems in preparation of course-related assignments.* The next question asked about the different kinds of assignments students had during their degree studies. Oral presentations, and accompanying papers that present an argument about an issue were the most frequent (adequately 87, 79 and 43 %). Quantitative and qualitative research assignments were never or rarely done by 80 % of the first year and 94 % of the second year students. The next question about how strongly students agree or disagree with different statements about starting and searching for information for course-related assignments, produced the following results. Most of the students agreed with statement that getting started on the assignment was difficult (51 %), but a third either strongly disagreed or disagreed. A majority of students (70 %) indicated that they had no problems with finding sources on the Web.

In preparing course-related assignments, the most difficult issues were: knowing whether assignment was done well; evaluating the sources founded; and rephrasing what was already well expressed in a source.

Most students almost always or often developed an outline for writing an assignment, as well as an overall research plan and figured out search terms to use. This response indicated that students were able to choose and use adequate study practices. Students also indicated that they never or rarely started over with a brand new topic if they don't find something during one or two searches. Interlibrary loan or document delivery services were among the least popular practices. Not unsurprisingly, 86 % of respondents indicated that getting a good grade from the instructor was very important or important, and no one respondent indicated this factor was not significant. Impressing parents and friends with the grade received turned out to be not important and of little importance, especially to fourth year students, but 44 % of the first year students indicated this as a very important or important factor. Improving research, writing and analytical skills was also very important or important for most students.

3 Conclusions

Students' information literacy has not previously been thoroughly investigated at the Faculty of Communication, Mostly IL research was done by students as part of their study skills. The research revealed extremely useful information about the current situation.

On the basis of the findings and results of the research on LIS students' research experience, information behavior and information literacy skills at the Vilnius University Faculty of Communication, the main conclusions drawn were as follows:

- The PIL survey instrument revealed the current situation of LIS students' information literacy thoroughly and has proven to be an adequate tool for students' information literacy research,
- research results revealed very clear positive aspects of the current situation of LIS students' information literacy skills,
- the results also highlighted weaknesses in students' information behaviour and information literacy,
- the detection of negative aspects of current LIS students' information literacy skills indicated the gaps and weaknesses in study plans and quality of teaching; and this has created the possibility of a need to modify study content and process in order to improve the quality of university studies,
- the possibility of some bias in the final conclusions on research results should be allowed because of different interpretations and understandings of concepts used in the PIL survey instrument by the respondents,
- information literacy research created the background for the faculty administration to rethink teaching and learning strategies and methods, in order to seek to improve LIS students' opportunities to be successful as tomorrow's specialists in information literacy skills,
- precedent for constantly monitoring of students' information behaviour and their information literacy was set.

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Information Literacy Competency of LIS Students in SALSIT with a Special Focus on Intellectual Property

Tania Todorova and Irena Peteva

State University of Library Studies and Information Technologies (SALSIT),
1784 Sofia, 119 Tzarigradsko shosse, Sofia, Bulgaria
{t.todorova, i.peteva}@unibit.bg

Abstract. This paper presents comparisons between some findings from “Information Literacy (IL) Survey on Library and Information Science (LIS) students” with data obtained from a survey conducted in a research project “Analysis of the common practices in the use of products of Intellectual Property in University Information Environment”. Conclusions are drawn for optimizing the quality of LIS education and LLL programs in response to the new demands of the information and digital reality, having regard also for copyright and legal issues.

Keywords: LIS education, information literacy, intellectual property, State University of Library Studies and Information Technologies.

1 Introduction: IL Survey on LIS Students in SALSIT

Prior to this study, there had not been an examination of research experience, information behavior and information literacy skills of LIS students in the SALSIT. The invitation to join in the International Information Literacy Survey on Library and Information Science students came at an important stage in the development of SALSIT, as it is in a period of program and institutional accreditation.

In depth analysis of the findings from Information Literacy Survey of LIS students has allowed the academic staff in SALSIT to make conclusions which will help to update the curricula and programs and to enrich teaching methods and to improve the quality of education.

In SALSIT the survey covered 170 students from Bachelor Programs – Library and Information Management and Librarianship and Bibliography (both full-time and part-time) and some PhD students. The invitation for survey participation was distributed twice – on 30 November 2012 and on 10 December 2012. Each student received an e-mail message explaining the purpose of the study, the international collaboration and link to a web-based survey (LimeSurvey). On 31 December 2012, two months after the initial invitation, the survey was closed. During this period from the target group of 170 students - 116 respondents answered the survey; 94 answered all questions; 22 not completed the whole survey.

In the first part of the study questions were asked that aimed to gather demographic information and information relating to the characteristics of respondents.

The students who participated in the study included: first year students (10.3 %); second year students (21.6%); third year students (39.6 %); fourth year students (21.6%); PhD students (5.2%); 1.7% of respondents skipped this question. The Grade Point Average (GPA) of the respondents according to the grade scale using in Bulgaria is: Excellent (5.50-6.00) – 36.2%; Very Good (4.50-5.49) – 40.5%; Good (3.50-4.49) – 6.0%; Average (3.00-3.49) – 0.9%; 16.4% of respondents skipped this question. The gender of respondents is: female – 78.4%; male – 19.0%; 2.6% of respondents skipped this question. The age range of respondents is the following: 18-20 years (7.8%); 21-23 years (30.2%); 24-26 years (12.1%); 27-29 years (12.9%); 30-32 years (8.6%); 33-35 years (11.1%); over 35 years (14.7%); 2.6% of respondents skipped this question.

The data obtained from this survey (includes 15 core questions) is valuable source of information and is subject to a thorough analysis to reach theoretical and methodological implementations. For the goals of this paper we will use only a purposeful *selected sample* which will serve the needs of the analysis of the *problem of Intellectual Property Competency as part of the Information Literacy of LIS students*.

2 Intellectual Property Competency as Part of the Information Literacy

An important task of LIS higher education programs is the building of Intellectual Property Competency as part of the Information Literacy of LIS students. This statement is based on established models and conceptions of information literacy. In 2011 the experts from a SCONUL working group on Information Literacy updated the Seven Pillars of Information Literacy as a generic “core” model for higher education [1]. One of the pillars is called “manage” and this is defined as – “can organize information professionally and ethically”. This underlines the personal responsibility to be honest in all aspects of information handling and dissemination including copyright, plagiarism and other intellectual property issues.

Mackey and Jacobson in their conception of reframing information literacy as a meta-literacy include as an important component the understanding of personal privacy, information ethics and intellectual property issues. They said: “An information-literate individual must be aware of these information surroundings and understand the ever-increasing impact that information and emerging technologies have on our lives. This requires an ongoing exploration of the legal, economic, political, and social issues that mediate our access to technology and often define the types of documents we evaluate and use” [2].

In the Lifelong Learning information literacy concept together with information skills, higher order thinking skills, format of information, other skills and literacies, other important component are related issues as follow: ethical, social, political, economic, personal, security [3].

3 LIS Education in Bulgaria and Intellectual Property Competency

The role of library and information education for dissemination of knowledge and information on intellectual property is recognized as very important in Bulgaria. In the curricula of bachelor, master and PhD programs offered at the State University of Library Studies and Information Technologies (SULSIT), and in the specialty “Library and Information Science” in the Faculty of Philosophy at Sofia University “St. Kliment Ohridski” and in the specialties in the Department of “Library and Mass Communication” at “The St. Cyril and St. Methodius” University of Veliko Turnovo following elements are included: protection of intellectual property; the intellectual property of the sources of scientific information, national and international legislation on intellectual property; and information policy and cultural policy.

SULSIT has contributed to the successful dissemination of knowledge in the field of intellectual property, as there are already 18 years of experience in intellectual property education and it is the university which has defined excellence in preparing students for intellectual property practice. Galabova [4] is the founder of teaching intellectual property in SULSIT and in “The St. Cyril and St. Methodius” University of Veliko Turnovo. SULSIT was one of the first universities in Bulgaria to target action to support the initiatives of the World Intellectual Property Organization and the European Patent Organisation. This included: creating in the university library an Intellectual Property Point as part of the university network of WIPO; developing and implementing a model of education of intellectual property for the needs of specialties in the Faculty of Library Science and Cultural Heritage and Faculty of Information Sciences (including the disciplines: “Intellectual Property Protection”, “New objects of Intellectual Property”, “Licensing of Intellectual Property”, “Licensing, know-how and Franchising”); establishment of a specialized collection of publications of the Patent Office of the Republic of Bulgaria and a database for patents and trademarks and providing online access to databases on intellectual property; and the development of various new forms of promotion and distribution of IP information and knowledge among students, teachers, librarians, information specialists and professionals in the field of culture and for all interested citizens.

4 Comparative Analyses

In this part of the paper we will make connections between some findings from the “Information Literacy Survey of LIS students” with data obtained from a survey conducted in the research project “Analysis of the common practices in the use of products of Intellectual Property in University Information Environment”. This survey was conducted among students in nine Bulgarian Universities accredited in the educational and professional field called “Public Communication and Information Science”. We could emphasize that the intellectual property competence is an essential part of the information literacy of students in this professional field, especially in terms of Internet usage and digital content. For that reason our main goal

is to compare some of the findings from both surveys to obtain conclusions for the actualizations of the academic programs of LIS specialties.

The results from the questionnaire survey “Information Literacy Survey of LIS students” showed that in carrying out the course-related assignments more than 51% of students *always or often* used materials from an Internet search engine (e.g. Google, Bing, Yahoo!, Ask.com); 24.5% from Wikipedia; 10.2% from Social networking sites (for example Facebook) in preparation for their tasks. In total 98 respondents answered the question “How often do you consult these resources for providing information during your course-related assignments”, as shown in Table 1. Most respondents used several sources of information in Internet.

Table 1. Information sources that students consult

	Always	Often	Some- times	Rarely	Never
Course readings	59	24	11	3	1
Search engines (Google, Bing, Yahoo)	50	42	6	0	0
Library catalogs	11	33	32	18	4
Encyclopedias (Britannica, print/online)	13	47	26	11	1
Governmental web sites (.gov. sites)	13	32	28	18	7
Data bases through library web site (e.g. WoS, EBSCO, ProQuest)	4	12	39	26	17
Gray literature (thesis, reports, etc)	5	33	27	28	5
Blogs	7	19	26	24	22
Wikipedia	24	39	15	15	5
Social networking sites (e.g. Facebook)	10	14	12	21	41
Video sharing sites (YouTube)	9	11	19	25	34
Slidesharing sites (e.g. Slideshare)	5	8	17	28	40
Online forums	9	12	24	23	30
Your personal collection	22	38	25	9	4
Library shelves	14	32	37	11	4

This biggest advantage of the Internet in today's society is that it is – fast and cheap to distribute to millions of users. However, this has created a most serious problem for the protection of content against unauthorized copying and use and hence the protection of intellectual property, in particular copyright content on the Internet is an issue.

Copyright as part of the intellectual property concept can be considered as an element of information literacy in the university information environment. To be successful both as university students and also in life, they need to learn how to use efficiently and effectively the wide variety of information and communication technologies for searching, finding, organizing, analyzing and evaluating the information. In addition, they must understand the ethical use of information, including the infringement of individual rights to intellectual property such as plagiarism, and the use of works of literature, art, science, and also of patented inventions, industrial designs, marks (trademarks, geographical indications, domain names, and companies) without the permission of the author. Finally, they must be

able to systematize all this knowledge together to create an effective end product. This requires them to assemble a complete package of basic skills for research, technological skills, critical thinking and evaluation [5].

4.1 Overview of the “Protection of Intellectual Property in the Internet” Survey

The survey¹ is based on the principle of systematic random selection with stratification to 10% of the students from specialties involved in the professional field “Public Communications and Information Science” of all universities in Bulgaria, having valid accreditation program for training in this professional field. Total number of these students is 5 700, according to the register of the National Evaluation and Accreditation Agency (NEAA), and the data refer to September 2012 [6]. The sample includes 9 universities in five towns in Bulgaria. The total number of the target group consists of 570 students surveyed efficiently, which makes the sample representative for the country [7]. From SULTIT there were covered 190 respondents. In view of the specificity and accuracy obtained from the survey data, the range of the target group was narrowed and only students in degree “Bachelor” were included in this analysis. The questionnaire survey was conducted during October – November, 2012 among the students who have studied or will study the subject of Intellectual Property Protection or a related discipline, including a module of copyright protection.

4.2 Summary of the Results from the “Protection of IP in the Internet” Survey

Students studying in the professional field “Public communication and information sciences” in Bulgaria are generally less familiar with copyrighted works, but impressive is the fact that there is a statistically significant difference between the students that had completed the Intellectual Property discipline and these that had not. The students that have learned such a discipline feel more confident and better informed on issues related to copyrighted works. Worrying is the fact that a large percentage of respondents did not think about copyright in the use of Internet materials for educational purposes, but once again there was a statistically significant difference between the students that had completed the IP discipline and these that had yet to complete the module.

It is noteworthy that there are a high percentage of the respondents who are not familiar with the ways of intellectual property protection on the Internet.

¹ “Protection of Intellectual Property in the Internet” Survey, realized as an initial stage of the project “Analysis of the common practices in the use of products of Intellectual Property in University Information Environment”, DMU 03/3, funded by the National Science Fund at the Ministry of Education and Science and managed by T. Trencheva.

Respondents from the group that had completed the IP discipline perceive the misappropriation of intellectual property and copyright on the Internet as a crime and they believe that the legal and judicial system is necessary to intensify the pressure on violators. It is noteworthy that students are aware basically who wins by the proliferation of unlicensed software, and many of them clearly state its negative position.

All respondents were familiar with the institutions involved in the protection of Intellectual Property [8].

5 Conclusions

The evaluation of findings of these two surveys – the first one with a focus on the *research experience, information behavior and information literacy skills of LIS students* and the other with the main goal to explore the *common practices in the use of products of Intellectual Property in University Information Environment* – allow us to reach two basic conclusions for optimizing the role and quality of library and information education in preparing future professionals in library and information and cultural affairs, according to the new demands of the information and digital reality, and copyright and legal issues.

First, it is important for LIS students to be introduced to intellectual property as early as possible during their formal education and to have the sustained development throughout all educational levels.

In accordance to this conclusion we have updated our curriculum in SULTSIT. For example, in Library Management Department specialties, in the Bachelor Program “Library and Information Management” we prepared the following obligatory courses – Intellectual Property Protection; Information Literacy; Digitization and Copyright and we also offered one elective course of Intellectual Property in Internet. In the Master’s Program “Library, Information and Cultural Management” we have two obligatory courses: Licensing of Intellectual Property and Transparency and Accessibility of Information.

Second, for the educational process in the field of intellectual property the recommendations for IL programs are applicable. Kurbanoglu summarizes: “In order for information literacy programs to be effective, they must be truly integrated into the core curricula. Information literacy should be woven into content, structure, and sequence of the curriculum. Information literacy cannot be the outcome of any one subject. It is the cumulative experience from a range of subjects and learning experiences which creates the information literate person” [9].

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Information Literacy Skills Assessment of LIS Students: A Case Study at the Jagiellonian University

Monika Krakowska

Jagiellonian University, Institute of Information and Library Science, Krakow, Poland
monika.krakowska@uj.edu.pl

Abstract. The purpose of the research was the identification of the information behaviour and experience in carrying out research necessary for meeting the study programs' objectives, as well as the identification of information literacy skills among information and library science students. This explorative study constitutes a specific contribution and presents the particular sample perspective, and was carried out as the part of international research. The survey was disseminated within the group of 232 bachelor and master students from the Institute of Information and Library Science at the Jagiellonian University in Krakow, Poland. The data gathered from the questionnaire was analysed briefly in a quantitative and qualitative manner. The evaluation of the results helps to understand the students' information behaviour, increase awareness of information literacy implementation, development and status within the academic information environment, and also is the basis for verifying the correlation of students' skills with international standards indicators and international and national directives concerning core competencies.

Keywords: Case study, information literacy, information seeking behaviour, LIS students, survey.

1 Introduction

Issues related to information behaviour in a variety of academic environments are frequently discussed and belong to the canon of theoretical and explorative activity of researchers [1]. In the area of higher education, whose fundamental tasks are: generating knowledge, dissemination of information and formulation of the information literate society, study concerning information science is focused on the exploration of patterns of information seeking behaviour within certain disciplines [2] while comparing different groups of users and examining the core competences and the factors influencing the information processes [3]. The analysis of information held in a variety of contexts [4], information seeking divided into multiple stages and the factors which affect the process such as motivations, incentives, academic and affective components [5] linked to individual information literacy skills [6], all of these factors influence a complementary approach to understanding the users' behaviour. The holistic idea of information literacy is a crucial concept, not only in

the development of information processes, but it also constitutes the crucial factor for the quality of the information behaviour [7] and the intellectual approach to develop and interpret it.

2 Research Approach

The research presented in the article was prepared as an exploratory study and is the prelude to investigating selected aspects of the information seeking behaviour and information literacy skills of LIS students. The purpose was also to gain knowledge about some core components of information seeking behaviour connected with starting, searching, monitoring and selecting activities, evaluating the sources, using information and communication tools during accomplishing academic assignments. It should be mentioned that the research was limited only to seeking information related to academic and learning activities of the LIS Institute at the Jagiellonian University, and it is planned to extend the exploration among students of all LIS institutes in Poland. The fact that respondents come from one institution has significance in the results that cannot be generalized to the total number of Polish LIS students. Their information seeking behaviour and information skills could be determined by many local factors, like cultural and social context, academic environment with differences of study programs or individual determinants forming the subjective information process activities in a given setting. Nevertheless, the results of the survey constitute the basis or the reference point for further analyses, comparisons and considerations.

The case study was a part of the international research of students' information literacy skills that covered LIS institutes from Australia, Bulgaria, Croatia, Finland, France, Hungary, Japan, Lithuania, Malta, the Netherlands, Poland, Portugal, Romania, Russia, Singapore, Switzerland, Turkey, UK, and the USA. A joint research instrument was prepared and translated by each participating national representative, distributed via the online environment from November 2012 until April 2013. To gain the goal of the research, the online questionnaire was translated into Polish and disseminated in the online environment with the use of the *Lime Survey* software. All students were invited to answer and complete the questionnaire by sending personal messages with the use of the local university student management information system, even though the survey was anonymous. Then, the collected data was analysed using the quantitative and the qualitative manner.

The questionnaire consisted of 16 questions divided into: 4 demographic questions concerning the current status, the grade point average (GPA), the age and gender, and 12 questions about the information seeking process and typical information skills. This article will present only selected answers to questions concerning the most important aspects of students' information literacy skills in academic environment.

3 Results

The total number of participants varies from question to question (from 176 to 232), as not all the logged respondents finished the survey and filled in it completely. The group was represented by 146 bachelor students and 86 master students.

The questions were related to the model of information behaviour in the academic environment, with a particular regard to the research experience, individual stages of the information seeking, knowledge about the sources and ICT tools, their use, the evaluation criteria and creation of new knowledge. They are all the key determinants of information literacy competences that have an impact on professional development. In the program of LIS study, the group courses are carried out with related learning objectives and content, to assist in education about information sources, strategies and search methods, quality assessment and selection and presentation of information. The data presented in Table 1 dealt with the determination of the degree of difficulty during the realization of assignments, students' individual experience in the implementation of the course tasks, information seeking process and their individual information skills.

Table 1. Information processes that students find difficult while starting and searching information for course-related assignments (n=202)

Information Process/Activity	SA %	A %	NAD %	D %	SD %	NE %
Getting started on the assignment	13.86	48.51	10.40	23.27	3.47	0.50
Defining a topic for the assignment	6.93	39.60	11.39	35.15	6.44	0.50
Narrowing down a topic	2.97	37.62	12.87	39.11	5.94	1.49
Coming up with search terms	2.97	13.86	8.91	54.46	18.32	1.49
Building up the search strategy	3.96	30.69	12.87	41.09	8.91	2.48
Deciding which database to use	5.94	25.74	12.38	40.59	13.37	1.98
Finding articles in the library's databases	3.47	18.81	6.44	44.06	23.76	3.47
Finding sources to use "out on the Web"	1.98	3.96	2.97	42.08	47.52	1.49
Determining whether a Web Site is credible or not	2.97	16.34	10.40	45.05	23.27	1.98
Figuring out where to find sources in the library	1.98	10.89	11.39	39.11	35.15	1.49
Finding up-to-date materials	3.47	19.80	10.40	40.59	24.26	1.49
Finding "gray literature"	5.94	30.69	14.36	32.18	10.89	5.94
Having to sort through all the irrelevant results	5.45	33.66	17.33	27.23	13.86	2.48

SA= Strongly agree, A= Agree, NAD= Neither agree not disagree, D=Disagree SD=Strongly disagree, NE: No experience

Students indicated that they had serious problems during the undertaking of the information processes, especially at their initial stages. They found starting the course-related assignment troublesome. Probably this is due to different reasons,

motivations and factors underlying affective information behaviour of users. For respondents it was also difficult to have to sort through all the irrelevant results in order to find what was needed, as well as a challenging activity was finding gray literature like thesis, reports, unpublished papers, etc. On the other hand, the informally published written material was not hard to retrieve for 43.07% respondents. Similarly, the dualistic approach in relation to the components of the information process and competences related to the information search and the use of sources, the recognition of information needs and creating new knowledge, the students had difficulty with defining the topic of an assignment, building up the search strategy, deciding which database to use, and narrowing down a topic. The larger group of students did not have any problems with the selected modules of the information seeking process like finding articles in the library's databases like LISA, Wos, EBSCO, JSTOR, acquiring online sources like Google, Wikipedia, government sites, as well as determining whether a Web Site is credible or not. It was also not so problematic to find up-to-date materials or figuring out where to find sources in the library. The models and methodology of information searching, information resources and information research skills are presented during the first year of undergraduate studies. There was a group of students, especially from master level studies that had no experience with knowing about some information sources or searching and using them. Probably it was connected with the fact that information and library science on the master level is studied also by people who have obtained a bachelor's degree in other scientific disciplines, and who do not have adequate information literacy skills. They indicated that they had difficulty with finding gray literature, using the library's databases, building a search strategy and using critical thinking skills to sort through all irrelevant results.

A reliable and more readable dimension of acquiring and developing information literacy also provides an analysis of the major and most commonly used criteria to evaluate the quality of information resources. The data are presented in Table 2.

The lack of adequate knowledge in the area of information sources and insufficiently developed basic information skills may result in difficulties in the initial phase of starting and searching for information. It was interesting that the most difficult stages for students were the processes of sources' evaluation, composing a text or being aware that the assignment had been done correctly or not, the knowledge of whether to use a source in given circumstances, re-phrasing the text and creating their own product. Again this may stem from the fact that a large group of respondents are first-year bachelor students and have no experience in the evaluation process or writing text and using citations. Students indicated that the easiest processes were: taking notes, reading through the range of selected sources, citing them with the knowledge of how to do that and where, integrating different resources into assignments or deciding when to finish a task.

The appropriate information behaviour of users and proper information literacy skills development on the academic level in various disciplines requires knowledge of relevant information sources and use. Therefore, respondents were asked about the systematic use of selected sources, both traditional and electronic.

Table 2. Information processes that students find difficult while realising the course-related assignments (n=190)

Information Process/Activity	SA %	A %	NAD %	D %	SD %	NE %
Evaluation of sources	2.63	33.68	26.32	28.42	3.68	5.26
Reading through the material	1.58	16.84	7.37	49.47	24.21	0.53
Taking notes	1.58	8.42	6.84	51.58	31.05	0.53
Integrating different sources from research into assignment	1.58	20.53	22.63	40.00	8.95	6.32
Writing	6.32	28.95	14.21	39.47	9.47	1.58
Re-phrasing text from a source	7.37	29.47	12.11	35.79	12.11	3.16
Knowing when to cite a source	3.16	18.95	16.84	46.32	11.58	3.16
Knowledge of how to cite a source in the right format	4.74	21.58	17.89	37.89	13.68	3.68
Knowledge of whether using a source constitutes plagiarism or not	5.79	30.53	15.79	30.00	12.11	5.26
Decision of whether to finish or not	2.63	19.47	24.21	38.95	13.16	1.58
Knowledge of whether the assignment is well done or not	4.21	32.11	21.05	33.16	7.89	1.58

SA= Strongly agree, A= Agree, NAD= Neither agree not disagree, D=Disagree SD=Strongly disagree, NE: No experience

Table 3. Frequency of sources referred by LIS students for providing information during the course-related assignments (n=187)

Information Sources	AA %	O %	S %	R %	N %
Course readings	13.37	31.02	32.62	16.58	6.42
Search engines	59.36	31.55	6.42	2.14	0.53
Library catalogues	21.39	40.11	26.74	9.09	2.67
Encyclopaedias	16.04	37.97	24.60	17.65	3.74
Governmental Web sites	3.74	12.83	42.25	34.22	6.95
Research databases through the library Web site	16.58	27.81	29.41	21.93	4.28
Gray literature	1.60	10.16	21.39	41.71	25.13
Blogs	3.74	17.11	33.16	31.02	14.97
Wikipedia	22.99	40.64	17.65	15.51	3.21
Social networking sites	11.76	18.18	19.25	20.32	30.48
Video sharing sites for getting information	12.83	20.86	25.13	24.60	16.58
Slide sharing sites for getting information	5.35	32.62	36.90	15.51	9.63
Online forums for getting information	6.95	18.18	34.22	26.74	13.90
Personal collection	21.93	37.43	22.99	12.83	4.81
Library shelves	29.95	40.11	20.86	7.49	1.60

AA= Almost always, O= Often, S= Sometimes, R= Rarely, N= Never

From the data indicated in Table 3, it is apparent that the sources mostly used by respondents during the completion of academic tasks were search engines like Google (which allows multi-faceted search), Bing or Yahoo, library catalogues and shelves, as well as personal collections. Students often used Wikipedia and encyclopaedias such as *Britannica*, either online or printed. Most likely they use sources that are known to them and from which information can be quickly and easily reached. It is interesting that students rarely or never used gray literature, blogs, online forums, government web sites, video sharing sites or social networking sites like Facebook to get information. (It can be concluded that they treat it as a form and communication tool, not as a source of information). The course readings were used sometimes, similarly to slide sharing sites. It would be useful to deepen analysis of reluctance in relation to the usage of such resources, especially in relation to information skills and presenting a wide range of sources during the LIS teaching process.

The question about how students value information, according to specific criteria for the evaluation of resources, has been formulated in a way to check on whether a student uses the dimensions to guarantee the quality of sources. The data appearing in Table 4 shows that the significant factors considered most frequently-used evaluation criteria of online resources were: recurrence and the possibility to re-use, acquaintance, instructors' mentioning its use, the bibliography list and references, and the native language of the resource.

Table 4. Web site's quality evaluation criteria indicated by LIS students (n=182)

Evaluation Criteria of Information Sources	AA	O	S	R	N
	%	%	%	%	%
Currency	5.43	35.87	40.76	11.41	6.52
Author's affiliation/credentials	9.78	33.70	25.00	24.46	7.07
The content acknowledges different viewpoints	1.22	40.22	33.15	8.15	3.26
The author gives credit for using other ideas	28.26	41.30	22.83	5.43	2.17
Whether it has a bibliography/reference list.	23.37	42.93	20.65	10.33	2.72
If there are charts - whether they have vital information	11.96	39.13	28.80	17.39	2.72
Publisher of the source.	9.78	22.83	30.98	26.63	9.78
Whether a librarian mentioned using this source.	4.89	25.00	30.98	20.11	19.02
Whether an instructor mentioned using this source.	25.00	44.02	20.65	8.70	1.63
Whether the student has ever heard of this source before.	14.13	42.93	33.70	7.61	1.63
Whether the student has used this source before.	25.00	46.20	20.65	6.52	1.63
Whether it is written in the native language.	33.15	39.67	17.39	7.61	2.17

AA= Almost always, O= Often, S= Sometimes, R= Rarely, N= Never

Currency is often important for students or sometimes taken into consideration. It was interesting that 69.02% respondents indicated that almost always and often, an important criterion for evaluation is the source of a personal expert and the

recommendation of the instructor. They never used the criteria of the librarian's advice, publisher information or the author's affiliation. Students characteristically prefer sources well know and previously used.

4 Conclusions

The study requires an in-depth analysis and comparison of information seeking processes and information competences of LIS students of other Polish institutions in order to form a comprehensive picture of the information behaviour and the information literacy impact on this activity. What also should be taken into account are the intensive actions in the field of understanding of relevant information skills training, especially in the face of key competences to implement guidelines associated with the effects of training in different fields of science. The next stage of the analysis would be the comparison of test results carried out in international groups as a part of one international study.

It can be expected that a similar survey conducted among students of other fields would also give interesting results. A kind of comparison of the results would be an answer to the question why some students, in particular with master degrees, pointed to the lack of knowledge and experience in the evaluation process, integrating knowledge from different sources, citing the resources and using them in a correct manner. Students cannot efficiently use the variety of new information and communication technologies, and what is more, they also seem to be unable to take full advantage of the sources they are already familiar with, like search engines (Google) or online encyclopaedias (Wikipedia).

It would be useful to consider the possible cause of not using the social networking sites or slide sharing sites for getting information, and whether this is a general trend in information processing that is caused by other factors, new social relationships or the real ignorance of new forms of communication. Quite interesting is the fact of ignoring or doubting librarians, their knowledge, or that of disregarding traditional library services. There has been observed a change in the sources' preference (students use mainly the online resources that could be searched instantly), significance of sources and criteria for their evaluation. The activities connected with the development of the information competences, the improvement of analytical and research skills and gaining new knowledge are foundations for information processes undertaken by students and their motivation, which will determine the realisation of the assignments in the academic environment. It is therefore the need for in-depth evaluation of information literacy, as well as drawing attention to factors that affect and shape information behaviour, and also attempt to compare not only users' competences in different training centres, but also at the level of undergraduate and master studies. This will also help to look at programs of study, effects of information literacy training and expectations in relation to students.

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Conceptions, Ideas, What Else? Information Literacy in Hungary

Tibor Koltay¹ and Katalin Varga²

¹ Szent István University, Faculty of Applied Arts and Pedagogy, Jászberény, Hungary
Koltay.Tibor@abk.szie.hu

² University of Pécs, Faculty of Adult Education and Human Resources Development,
Pécs, Hungary
Varga.Katalin@feek.pte.hu

Abstract. In Hungary, information literacy has been constantly present in the LIS and related (mainly pedagogical) literature since the second half of the 1990s. Writings directed towards LIS professionals addressed new media and a wide array of literacies. A number of papers approached issues related to the role of amateurs and professionals, IL's relationship to abstracting and information overload, as well as to LIS education. Especial attention was given to make the international literature accessible in Hungarian. Although the library profession is apparently aware of the concept, there seem to be no signs of any of its frameworks being used. Fortunately, a number of recent information literacy initiatives are emerging.

Keywords: IL literature, IL practice, IL survey, Hungary.

1 The Beginnings

In Hungary, information literacy has been constantly present in the literature since the second half of the 1990s. A few papers also appeared in international journals and conference proceeding. Notwithstanding, we will mainly (although not exclusively) concentrate on the national literature, published in Hungarian.

Information literacy appeared in the Hungarian literature for the first time in 1997. It was explained against the background of the information society pointing towards its close relationship with lifelong learning [1].

It has to be mentioned that the necessity of IL, even though without using the expression *information literacy*, was present. The thought that it depends on us, how much we use from the increasing amount of information, and there is a relationship with learning and teaching, appeared in 1995 in a short book on the need to adapt ourselves to the networked world [2].

The first paper that discussed basic issues of information literacy in an LIS journal for a potentially wide range of information professionals appeared in 2004 [3].

The two leading Hungarian LIS journals regularly have been publishing abstracts of the international literature on IL. In addition to this, paper-length extended abstracts were published on two key articles. David Bawden's paper on information

and digital literacies [4] and the article on information literacy 2.0 by Sonja Špiranec and Mihaela Banek Zorica [5] were each covered by this kind of abstract.

An extensive, book-length review of the international literature contains the most important content (among others) of the following documents:

- Information literacy and competency standards for higher education (ACRL),
- Standards for accreditation of master's programs in library and information studies (ALA),
- ALA/AASL standards for initial programs for the preparation of school library media specialists [6].

Reflections on IL can be found in a chapter of a textbook that addresses actual topics for the library and the librarian of the 21st century [7].

One of the major publications on information literacy is an electronic book [8]. This book addresses among others the origins of information literacy, its understandings in Europe and in other cultures, and its role in providing equal opportunity. It also provides empirical data on the possibilities of developing information literacy in the educational system.

A PhD dissertation, most possibly the first one on IL in Hungarian language, examined children's conceptions about IL, was defended at a faculty of pedagogy in 2012 [9].

2 The Literature in Detail

A wide array of topics appeared in papers during the following years. Writings directed towards LIS professionals addressed the relationship between new media and IL, expressing the similarities and differences between information literacy, digital literacy and media literacy [10]. (We will deal with the dissimilar understandings of digital literacy in the section where we discuss terminology.)

A number of relationships between IL and information overload [11], abstracting [12] and academic literacy [13] have been also outlined. The latter two not only draw the attention of information professionals, but are of interest for applied linguists, as well. The key to this is that the study of information literacy requires a multifaceted interdisciplinary approach, which is related to verbal communication, literacy, and functional literacy, as well as issues of plagiarism [14].

The reason why information literacy and (predominantly) verbal communication are closely connected is that the former includes the abilities and the activities of reading and writing [15].

Information literacy was also approached by stressing the need for differentiating the information needs of amateurs and of professionals [16]. Obviously information literacy also appears in the literature in the context of LIS education [17]. The literature of information literacy also shows that LIS can export ideas into other disciplines, e.g. pedagogy [18].

A review of the literature and initiatives in the Visegrad group countries (the Czech Republic, Hungary, Poland and Slovakia) documents that information literacy is not only an international and a national issue, but can obtain a regional character, as well [19].

A notable paper in a Hungarian LIS journal states that *Historia litteraria* at their age fulfilled the same functions as information literacy today. It addressed namely the skills needed to find reliable information resources and the ability to differentiate between fact and opinion by employing critical thinking [20].

A relatively recent article endeavours to clarify the differences between information, digital, and network culture. Its author identifies a three-level model, which places culture on the macro-level. The meso-level is composed from the different information subcultures, while the micro level is the individual's playground. The meso-level materializes in concepts like business information culture and the information culture of organizations. The micro level is that of the individuals. This approach postulates that there are three stages (elementary, middle and higher stage), instead of conceiving information literacy as a monolithic concept [21].

Attempts to popularize the idea of information literacy beyond the community of the information professions, mentioned above, are not new. Media professionals became informed in this way about media literacy, digital literacy and information literacy. In terms of being frequently cited, two papers received considerable attention. One of them is directed to the national audience [22], the other one international professionals [23]. The literature also shows that we can find a number of examples of how typologies that reflect library-specific thinking are transformed to systems of organization that are general and sensitized to certain aspects of the flow of information [24].

3 Terminological Difficulties

The practice of terminology in Hungary complies with international usage in the sense that information literacy is treated as a concept, which is closely related to literacy (*írásstudás* in Hungarian) and functional literacy in their traditional sense; thus it would seem to be appropriate to translate it as *információ írásstudás*. However, the most acceptable and probably already most accepted form is *információs műveltség*. This terminological development is a result of a practice, which is based on (informal) agreements among authors and editors. A more conceptual reason for the relatively wide dissemination of this term can be understood if we know that besides of being able to read and write, an information literate person is regarded as one *having erudition* and *being educated*. In this quality, IL is fundamental [25]. Nonetheless, there are also Hungarian writings that follow the German approaches by using the expression *információs kompetencia* (information competency) [26].

A recent conference on the future strategy of the Hungarian library system dedicated a whole section to the concept of digital literacy. The fact that this topic was included in the agenda of the conference indicates the growing awareness of the importance of information literacy. On the other hand the discussion showed that the terminology remains ambiguous, that is there is a lack of differentiation and clarity in using the term *digital literacy*, which is often associated with and restricted to computer literacy, i.e. the skills of using information and communication technologies efficiently.

The new, 2013 version of the Act CXL of 1997 that regulates – among others – the Hungarian library system, contains an important statement. It states that libraries support their users in acquiring digital literacy and information literacy, as well as in lifelong learning. Even though the act uses both *information literacy* and *digital literacy*, it tends to differentiate the two concepts from each other properly [27].

4 Information Literacy in Practice

In Hungary 11 higher education institutions are offering BA and MA programs in library and information science. LIS schools in Hungary work with the same core curriculum, which is supplemented by different specializations. All of these institutions use state of the art curricula, which include a substantial number of ICT modules. Hungarian LIS students are well trained in digital literacy and can attend high quality courses on reference work.

A specialization in information literacy pedagogy is offered in the LIS BA program at the University of Pécs. This program emphasizes the importance of a critical approach towards information and information resources, and teaches strategies of information retrieval, legal and ethical questions related to the use of information. The aim of these courses is to develop students' consciousness of information literacy, and to prepare them for teaching the competencies of information literacy in schools and libraries. They learn the basic terminology and components of information literacy, critical thinking, teaching methods, and project management, as well as some school library issues. Many of these students choose a topic for their theses from the field of information literacy, so there are high quality works on these topics. Several students surveyed information literacy skills of fellow students who study at different faculties of the university. The results of these surveys form the basis of a recent research project at the university, which aims at revealing the current situation and is directed towards outlining a new information literacy strategy for the country.

The Department of Information and Library Studies at Szent István University has recently participated in an international survey about research experience, information behaviour and information literacy skills of LIS students. The sample did not cover all Hungarian LIS students, since only a small LIS school participated in the research. The number of answers was 47, so it represented 58.02% of the undergraduate student population. Though this was not a representative survey on the national level, some clear tendencies can be followed, and a picture about the strengths and weaknesses of Hungarian LIS students can be drawn.

During their studies, students have a number of assignments that require competent literature searching and analysis. They like these assignments, and they do not feel any difficulty related to them. They also acquire substantial experience in making presentations, and have many opportunities to apply up to date digital technologies. There are no difficulties for them in defining a topic and getting started on an assignment.

Except for thesis writing, Hungarian students rarely are required to fulfil tasks that would be called research, either qualitative or quantitative.

The survey shows that they have no greater difficulties in defining a search question and strategy. However, about 20% of the students said they have problems

with identifying relevant hits. It is difficult for 40% to determine whether a web site is credible or not. It is also hard for them to convert the collected material into new information. This means that, despite the fact that they have opportunities for carrying out independent research, some very basic competencies are missing that would enable them to accomplish these assignments in an efficient way.

For information seeking, the majority of the students uses internet search engines, mainly Google. Library catalogues, encyclopaedias and lexicons are less frequently used. Hungarian students rarely consult government sites, and unfortunately they do not like to use research databases in order to solve study assignments. Taking into consideration that we are talking about LIS students, this fact is quite alarming. Only one-third of the LIS students uses Wikipedia as a main information resource, and 66% never uses Facebook for this reason. At the same time they like to use library services. These are good signs.

In the selection process, freshness and reliability are major issues; the publisher or the existence of a bibliography is not important for them. Unfortunately, Hungarian students still have difficulties in using foreign languages, so one of the most important aspects is that the resource should be in Hungarian.

The application of modern digital tools in the research process is not common for Hungarian LIS students. They almost never use a highlighting feature for underlining text on a computer screen, track-changes feature of word processors, digital "sticky notes", reference management software, social bookmarking, alerting services, document sharing programs, wiki server providers, photo-sharing sites, blog server providers, video sharing sites, slide sharing sites, social networking sites, micro blogs or online forums. They like to apply spell checkers and presentation tools. Taking into account that younger generations are much more avid users of new technologies, than the previous ones, this fact seems to be controversial.

For accessing information, Hungarian LIS students mainly use desktop computers and laptops, thus they do not use tablets and mobile phones for this purpose. For communicating with a teacher, mentor or librarian about course-related assignments, the majority of the students uses e-mail and a face-to-face contact.

The results of this survey, compared with other surveys about students' information gathering methods, give some hints about information literacy in Hungary [28]. Students all over the world like to choose the easiest ways to get information. Higher education institutions try to force students towards deep and reliable research methods, so they have to face several information seeking assignments. However, unfortunately Hungarian students are not well trained in gathering and selecting relevant information. In other words, their information literacy skills are limited.

In the next academic year, we plan to administer a national survey of LIS students' information literacy skills, based on the international survey, mentioned above. This survey, based on representative data, will hopefully give a nuanced picture about this segment of the student population.

Let us state that the roots of the problems are in public education. In the Hungarian National Core Curriculum [29] there is no special focus on information literacy skills. Students in primary and secondary schools learn digital literacy and a little library literacy as a part of informatics (computing) courses, and there is a substantial emphasis on media literacy. Nonetheless, the holistic view of information literacy is

not manifest in the curriculum or in everyday school practice [30]. One of the reasons is that school teachers' information literacy skills are often below of that of their students'. This is one of the reasons why there is a strong and urgent need for reforms in teacher education.

At the same time there are many enthusiastic school librarians, who do excellent work in developing information literacy in their pupils. Gifted students can participate in a nationwide competition of secondary school students about library literacy skills. This competition has been applying the project method for several years: the children have to make full projects, based on the collected information (e.g. in the form of journals, presentations, travel plans, etc.). The competition takes place in the libraries, and they have to use both library and internet resources [31]. There are also a number of extracurricular programs in the school libraries, where pupils can learn and practice information literacy skills.

5 Conclusion

Although the library profession is apparently aware of IL, there seem to be no signs of any IL framework being used. Fortunately, recent activities show a slow shift in the attention towards IL. Administering the national survey, mentioned above and analyzing its results will raise awareness of IL in LIS schools and popularize the concept at least among LIS students. The profession is slow to react. Nonetheless there are positive signs that there will be activity beyond conceptions and ideas.

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Information Literacy and the Public Library: Danish Librarians' Views on Information Literacy

Bo Gerner Nielsen and Pia Borlund

University of Copenhagen, Copenhagen, Denmark
q1c286@iva.ku.dk

Abstract. This paper reports on the results of an empirical study of Danish public librarians' conceptions of information literacy and user education in order to support and optimize lifelong learning of library users. The study builds on data from interviews of purposely selected public librarians and a large-scale e-mail survey (questionnaire). The results show that the public librarians consider the public library an important place for learning, but also that they do not share a common understanding of the concepts of information literacy and lifelong learning. The study further reveals a diversity of user education in public libraries with a strong focus on the individuality of the user and that hands-on courses are preferred as the pedagogical form.

Keywords: Information literacy, lifelong learning, public library, user education, information literacy instruction.

1 Introduction

This paper reports on a study of perception of information literacy and learning among public librarians and public library managers. In this study, we identify how they perceive information literacy and which types of courses and guidance they provide to the users. The study is motivated by a need for a deeper understanding of the role of the public library as a place for learning and how public librarians can support learning. This knowledge is essential for public librarians and library managers as a prerequisite to discuss, to improve, and to adapt information literacy education to users' needs. In order to improve information literacy instruction in the public library and to qualify public librarians for user education, one of the first things we need to understand is what information literacy is in the public library context, and how the public library support users through courses and guidance. It is therefore our ambition with the present study to enhance our understanding and to bring new insight on how information literacy is understood. As a result, public librarians may adjust services and pedagogies to the needs of individuals, as well as to specific target groups, when they design information literacy education. To do this, the present paper aims at answering the following research questions:

1. How do public librarians perceive information literacy?
2. What types of courses are offered in the public library?

Thus the aim of this paper is to present empirical results of the perceptions of public librarians and library managers about the public library as a place for supporting information literate users, and on this basis to motivate a discussion of how public librarians and library managers perceive the public library's role in learning, user education, information literacy, and librarians' information competencies.

1.1 Literature Review

The theoretical point of departure of the paper is a constructivist view of learning. The constructivist process theory for library and information services emphasizes the information search process as an essential component of learning [1]. In the learning process the user passes through a number of phases, in which the public librarian may act as adviser, tutor or counsellor in the information search process [1]. Hence, with a focus on information search processes the ability to locate, manage, and use information, which is also labelled "information literacy", has become important in relation to "...decision-making; problem-solving; independent learning; continuing professional development; and research" as reported by Bruce [2]. Since the mid-1970s considerable research has been conducted with the focus on information literacy (e.g., Zurkowski [3], Breivik & Gee [4] Bruce [5], Rader [6], and Hall [7]). The most widely accepted definition of the information literate person stems from the American Library Association ALA [8] which states that: "To be information literate, a person must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information" [8]. This definition further makes a connection between information literacy and learning for life. "Ultimately, information literate people are those who have learned how to learn." [8]. Hence, it is important to develop information literate citizens at all times and in all types of libraries. But despite the obvious potential of the public library in developing information literate citizens and stimulate lifelong learning, there is only a minor part of the research which relates specifically to the public library (e.g., Hall [7], Harding [9]). Consequently, we do not have enough evidence on public librarians' perception of teaching and information literacy. Gilton [10] characterises learning and information literacy instruction in the public library as a space for self-directed informal learning, with very basic instruction and guidance that has a focus on informational resources in both print and electronic formats. The library has staff, information resources, and physical and virtual space readily available to use not only for students but for anyone. This raises the question of the librarians' role in the learning process and how far the librarians can take their role as learning facilitators. McNicol & Dalton [11] and Spacey & Goulding [12] emphasize the need for public librarians to know their own role in relation to learning. This can be difficult, since librarians (in Denmark at least) are not formally trained educators. Still they need to know how to identify the users' information needs and subsequently support them in their information seeking and learning processes which is part of developing information literate users.

2 Methodology

We have studied how information literacy and learning is perceived and provided in the public library partly through interviews and partly through a survey. The two data collection methods are described in further details in the following sub-sections.

2.1 Interviews

A semi-structured interview guide was designed for data collection. Interviewees were recruited purposively based on their involvement in information literacy instruction or because of their involvement in the development of the public library as learning places, but at the same time they worked in different public libraries and had different functions. This was done to ensure that as many viewpoints as possible was adequately represented within this group. As a result the study's participants were eight librarians and three library managers. In the data analysis process the collected data forms the basis of the researcher's constructs of a limited number of categories depicting the perceptions of the concepts in question. The categories of description are useful to us in that they help to understand the different ways public librarians and library managers understand phenomena and by gaining insight into the users' perceptions be able to propose how public librarians can act accordingly in the actual situation. Furthermore it has helped in the design of our large scale survey described below.

2.2 Survey

The second part of our study is based on an Internet survey. The survey was a self-administered, structured on-line questionnaire [13]. The questionnaire was distributed to 96 public libraries which basically constitutes the entire population of 98 public libraries in Denmark. E-mail addresses were not available for the remaining two. Almost all public libraries responded often with replies from several employees. A total of 740 questionnaires have been answered. The answers are in the form of either single words or short sentences. We have read the interview and questionnaire answers line by line and analysed them into broad categories, which bring together answers that resemble each other. The categorization of answers represents the respondents' coherent understanding of information literacy and learning.

3 Results

The objective of this section is to present, discuss, and put into perspective the results of our empirical study. In that way we aim to answer our two research questions.

3.1 How Do Public Librarians Perceive Information Literacy?

The aim of answering this first research question is to contribute to an understanding of information literacy from public library employees' perspective. This subsection presents the results based on a combination of data from both the interviews and the survey. The results show a great diversity in the perception of information literacy among our respondents. The survey has revealed this multiplicity in understandings, of which we can only present indications in this short paper, while the interview study resulted in more homogeneous answers. We have identified the following four categories: Finding information, Process of making meaning, Mediation and communication of information, and Metacognitive function.

The "finding information" conception illustrates a focus on information search. We have found very simple perceptions where information literacy is seen as equal to how to search for information and nothing else. This is either stated as: "Finding information"; "Finding knowledge"; or "Searching for information". Although this is a modest way of perceiving information literacy, this perception still indicates an understanding that information is important for learning. However, the conception can be seen as closely related to a focus on concrete skills in information searching and less related to learning to learn in a broader sense. This kind of conception could lead to information literacy instruction which focus on traditional library skills.

The second understanding of information literacy "process of making meaning" is an elaborated version of "finding information". Similar perceptions are found in the interviews: "The ability to search for information, the ability to find out what kind of information you find, evaluate the information, and act critically based on this information". This perception was repeated in many of the interviews. One exception adds that information literacy is a prerequisite for a democratic society. Another exception is an interviewee who perceives information literacy as the basis for further development, which we may translate into learning. To understand information needs was also considered as important for being information literate. This is evident in many responses from the survey and is part of the process of making meaning e.g.: "...be able to find information – be able to manage and organize information – be able to identify a given information need – the ability to find the proper resources and develop search strategies – be able to assess information based on relevance, current interest, level, etc."

The results from the survey revealed that information literacy is also perceived as "mediation and communication of information". There are two points of view about this category. Mediation and communication of information is seen from the librarians' point of view as part of the information search process, and the librarians' acts like intermediaries between the information systems and the users. The second conception is a more general point of view which emphasizes the information literate person's ability to use and communicate information. This is articulated in the survey as: "...to find, sort, manage, and use information, so that the information adds value to the person and has potential to become knowledge."

The last conception of information literacy is the "metacognitive function". This conception is found in both interviews and in the survey results. Information literacy

is perceived as being a higher order thinking skill required in order to be well-informed. Hence search experience and a knowledge of search tools is seen as part of general education. One of the interviewees said that information literacy is "...as important as being able to read and write." As a result we can say that information literacy is perceived as a fundamental competency by public librarians just like the research based on academic and school libraries has shown (e.g., Bruce [5]).

3.2 Which Type of Courses Does the Public Library Offer?

In table 1 we present the types of courses and guidance that the survey revealed that the public library's offer based on our survey.

Table 1. Types of courses and guidance in public libraries (survey results)

Heading level	Total number	%
General Introduction	68	70.1
Introduction to Library Catalogue	63	65.6
Information Seeking on the Internet	62	64.6
Book a Librarian Service	53	55.2
Use of Print Bibliographies and Indexes	50	52.1
Information Literacy	49	51.0
Information Seeking in Subject Specific Databases	48	50.0
Information Seeking in Print Journals	43	44.8
Course in Evaluation of Information	40	41.7
IT-courses (Computer or Mobile Technology)	39	40.6
IT-Courses (Specific Software)	37	38.5
How to Write Good Assignments	33	34.4
Social Technologies (e.g.. Facebook, Del.is.cious, Twitter)	30	31.3
Information Seeking in E-journals	28	29.2
Other Types of Courses	18	18.8
How to Cite and Make References	7	7.3

We can see from Table 1 that general introduction to the library is the most frequent type of courses. This covers tours of the library and introduction to public library services. Next comes "book a librarian services", which allows the users to reserve a free half hour session with a professional reference librarian for guidance. From the interviews we know that this is most often used in relation to writing assignments. Following these two types of services come a range of different types of courses which support information seeking. Specific information literacy introduction is only at a 6th place and very few public libraries offer courses in how to evaluate information; how to write good assignments; or how to cite and make references. So we can conclude from Table 1 that there is more focus on information seeking than on information evaluation and use in the type of courses that the public library offers. This is also evident in the

interviews, where information seeking is closely related to learning in the public library. This is also in accordance with Gilton's [10] description of the most common types of courses and guidance in the public library. The focus on information seeking courses is further evidence that many public librarians perceive information literacy as something that focuses on the information search processes and less on information use. This concludes the presentation of the results.

4 Conclusions and Discussion

This study provided an opportunity to learn about how information literacy and learning is perceived and supported in public libraries.

Our study identifies four categories of description (finding information, process of making meaning, mediation and communication of information, and metacognitive function) of the concept of information literacy. A recurrent theme in most of the perceptions of information literacy is that of information seeking and searching.

All in all we can see from the interviews and survey that there is diversity in the perception of information literacy. Most public librarians perceive information literacy as closely connected to the information search processes including the ability to understand information needs, know relevant information resources, search and select information based on critical evaluation, and use this information.

The literature on information literacy instruction indicates that there are different approaches and focus in guidance and teaching information literacy in public libraries. Some are skill-based, some focus on technology, and others focus on a more coherent approach to the information search process. Hence it is relevant to investigate further how public librarians operationalize the concept of information literacy. We found a tendency towards more skill-oriented courses when we look at the typical courses offered in the public library. These are primarily directed towards information seeking and searching and not so much towards a focus on learning to learn.

If librarians in public libraries are to stimulate the ability of clients to learn they require a stronger focus on how to understand and use information together with their present awareness of information as a prerequisite for learning.

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Defining Information Literacy Competences in a Professional Framework of Library and Information Professionals in Croatia

Dijana Machala¹ and Aleksandra Horvat²

¹ National and University Library, HR-10000 Zagreb, Croatia
dmachala@nsk.hr

² University of Zagreb, HR-10000 Zagreb, Croatia
ahorvat@ffzg.hr

Abstract. This paper presents the main findings of research conducted with the aim of proposing and exploring a professional framework for library and information professionals in Croatia. Two online surveys were conducted among key library and information stakeholders in Croatia, and part of the *Tuning* methodology was applied for the purpose of identifying subject-related and generic competences in the library sector in Croatia. The results revealed that all respondents agreed on one distinctive core of subject-related competences which consists of user-centered and information-based competences, and which were identified as information literacy competences. Information literacy competences are valued equally highly by labor market stakeholders as in academia, while subject-related competences within the competence periphery point to differences in opinions among all respondents. Generic competences were highly rated by all respondents.

Keywords: Information literacy competences, library education and training.

1 Introduction

The aim of this paper is to address information literacy competences in library and information science (LIS) in Croatian higher education and in professional practice. The findings reflect national historical givens and current development in the library field.

The first university library school was introduced in 1976 at the Faculty of Philosophy, Zagreb University, and was characterized by its interdisciplinary approach to library study [1]. Before the introduction of the Bologna reform in 2005, which initiated a formal revision of the program in order to follow the 3+2 cycle, more than 650 students had graduated in librarianship. The current library program at the University of Zagreb has been carried out by a faculty of 25 teaching staff. Two additional LIS graduate programs were introduced in 1998 at the University of Osijek, and in 2003 at the University of Zadar. Content analysis of all three graduate library programs revealed that graduate librarians in Croatia acquire subject-specific competences

through one or more core or elective courses and that there is a tendency toward certain program generalization regarding information sciences [2]. Research on the prerogatives and quality of library education in Croatia, and on the knowledge and skills of alumni and their further professional development have been actively conducted [3]. However, it has become evident that a holistic approach to define core competences in the common professional framework is very much needed.

2 Research

The research was designed to analyze the perception of key stakeholders in LIS in Croatia: academics at library schools, library professionals, and library directors and their views on subject-related and generic competences in a potential professional framework of LIS in Croatia. The presented findings were obtained as part of doctoral research [4] on competences in LIS in Croatia, carried out within the project Lifelong Learning for Librarians (CUK), supported by the National Foundation for Science, Higher Education and Technological Development in 2008 (<http://www.nsk.hr/cuk>). In this research, only the findings related to the identification of information literacy competences and their status in the context of professional framework are presented and analyzed.

Tuning [5] methodology was applied in part for the purpose of identifying subject-related and generic competences in the library sector in Croatia. As the aim of *Tuning* is “to develop reference points for common curricula on the basis of agreed competences and learning outcomes as well as cycle level descriptors for many subject areas”, for the purpose of our research, more limited *Tuning* methodology was applied. As part of the limited *Tuning* methodology, two online nationwide surveys were conducted. The first survey was performed in 2009 among library professionals and library directors, and the second in 2012 among LIS academics at three Croatian universities. Three separate online questionnaires were created, one for the academics, one for library professionals and the third for library directors. The main part of all three questionnaires was identical for all three research groups, asking the respondents to rate 21 subject-related and 14 generic competences from the point of view of their importance for the profession and the level of achievement of graduate librarians at the library schools in Croatian universities. A 5-point Likert scale was applied, where 1 stands for less important or less acquired, and 5 for the most important or the most acquired competence by graduate librarians.

For the purpose of defining a set of subject-related competences that should be included in questionnaires, the IFLA SET *Guidelines for professional library/information educational programs* [6] was consulted. *The Guidelines* propose core elements that should be included in an academic LIS program. A set of generic competences was acquired from the OECD *DeSeCo* [7], a document whose aim is to help define and select key competences. A proposed set of competences was discussed and agreed among participants (academics and graduate librarians) during two CUK project workshops, held on April 6th and May 22nd 2009 in the National and University Zagreb. The method of triangulation of data was applied for the analysis of the results.

3 Findings

In total, 16 academics, 266 graduate librarians and 113 library directors responded to both online surveys. The stratification of respondents by university and by type of library is presented in Table 1. An analysis of the socio-demographic characteristics of librarians and library directors shows that library and information professionals in Croatia are middle-aged females, with a median age of 41.0, among whom the highest percentage are graduate librarians with short experience in a library (up to five years).

Table 1. Stratification of respondents by university and by type of library

	<i>Respondents</i>						<i>Total</i>
	University of Zagreb		University of Zadar		University of Osijek		
Academics	N	%	N	%	N	%	16
	9	56.00	4	25.00	3	19.00	
Librarians	Public libraries		School libraries		Academic libraries		266
	N	%	N	%	N	%	
	161	60.00	54	20.00	51	20.00	
Directors	36	31.00	55	48.00	22	21.00	113

3.1 Importance and Achievement of Subject-Related and Generic Competences

All three research groups agree upon the most important subject-related competences. Ranking in order of importance and in level of achievement of subject-related competences is shown in Table 2. When comparing an average value of the importance of competences for the profession, certain statistical differences in opinions of all respondents are indicated. The most important average subject-related competences obtained from all respondents are user-centered competences: Information Searching & Retrieval (4.93), Providing Information to Users (4.91), Information Resource Management (4.89), and Assessing Information Needs & Designing Responsive Services (4.88).

The negligibly small differences of opinions of all three research groups are for the competences of 'bibliographical paradigm' [8], i.e. Cataloguing, and Classification, followed by Research & Analysis of Information, and Information Policy & Ethics. Competences within the curriculum periphery indicated significant differences in opinions when comparing the opinion of academics on the one hand and the opinions of librarians and directors on the other. Although labor market stakeholders, librarians and library directors valued all subject-related competences as more highly important (4.41) than academics (4.22), the academics more clearly demarcated core competences from those they believed of less importance for the profession and which should be regarded as belonging to the curriculum periphery.

Competences such as Knowledge Creation, Teaching Skills, and Media Skills were highly valued by labor market stakeholders. Digital Collection Management is the only subject-related competence that was less valued by labor market stakeholders

(-0.2) than by academics (0.34). It appears that this competence has not yet achieved its market value.

According to the academics, nearly all subject-related competences were considered highly achieved by graduate librarians during their study (3.81), while librarians (3.28) and directors (3.44) rated competence achievement more critically.

The most highly achieved competences by graduate librarians in the opinion of all respondents were Cataloguing (4.41), and Theory & History of the field (4.04).

Table 2. Ranking in order of importance and in level of achievement of subject-related competences

<i>Subject-related competences</i>	Level of Importance				Level of Achievement			
	<i>Academics</i>	<i>Librarians</i>	<i>Directors</i>	<i>Total</i>	<i>Academics</i>	<i>Librarians</i>	<i>Directors</i>	<i>Total</i>
Information Searching & Retrieval Providing	5.00	4.91	4.88	4.93	4.31	3.60	3.78	3.90
Information to Users	4.94	4.92	4.88	4.91	4.19	3.58	3.63	3.80
Resource Management	4.94	4.88	4.85	4.89	4.44	3.58	3.78	3.93
Assessing Information Needs & Designing								
Responsive Services	4.88	4.89	4.87	4.88	3.88	3.59	3.61	3.69
Collection Management	4.69	4.44	4.33	4.49	4.06	3.17	3.19	3.47
Digital Collection Management	4.69	4.17	4.19	4.35	3.94	2.66	3.11	3.24
Classification	4.50	4.64	4.56	4.57	3.94	3.50	3.63	3.69
Information Policy & Ethics	4.50	4.52	4.48	4.50	3.88	3.74	3.65	3.76
Cataloguing	4.38	4.49	4.50	4.46	4.56	3.95	3.91	4.14
Information & Communication								
Technologies	4.19	4.63	4.71	4.51	4.06	3.43	3.77	3.75
Advocacy	4.19	4.57	4.64	4.47	3.19	2.86	3.03	3.03
User Education	4.13	4.59	4.71	4.48	3.31	3.16	3.24	3.24
Library & Information Products & Services	4.13	4.50	4.38	4.34	3.88	2.96	3.24	3.36
Research & Analysis of Information	4.06	4.09	4.14	4.10	3.81	2.93	3.27	3.34
Preservation & Conservation	4.00	4.28	4.24	4.17	3.88	3.69	3.63	3.73
Theory & History	3.75	3.65	3.51	3.64	3.81	4.26	4.05	4.04
Digitization Process	3.63	3.89	3.96	3.83	3.88	2.41	2.91	3.07
Knowledge Creation	3.56	4.42	4.37	4.12	3.13	3.06	3.35	3.18
Teaching Skills	3.56	4.13	4.36	4.02	3.25	2.98	3.22	3.15
Media Skills	3.50	4.38	4.43	4.10	3.25	2.89	3.22	3.12
Publishing Process	3.44	3.61	3.64	3.56	3.36	2.81	3.10	3.09
Total average	4.22	4.41	4.41	4.35	3.81	3.28	3.44	3.51

Table 3. Ranking in order of importance and in level of achievement of generic competences

<i>Generic competences</i>	Level of Importance				Level of Achievement			
	<i>Academics</i>	<i>Librarians</i>	<i>Directors</i>	<i>Total</i>	<i>Academics</i>	<i>Librarians</i>	<i>Directors</i>	<i>Total</i>
Elementary								
Computer Skills	4.88	4.79	4.83	4.83	4.56	3.56	4.13	4.08
Information								
Management Skills	4.88	4.83	4.79	4.83	4.44	3.44	3.77	3.88
Teamwork	4.81	4.73	4.76	4.77	3.81	3.23	3.39	3.48
Ethical Commitment	4.69	4.83	4.77	4.76	4.13	3.79	3.91	3.94
Capacity to Learn	4.75	4.68	4.71	4.71	4.06	3.75	3.85	3.89
Communication								
Skills	4.44	4.85	4.81	4.70	3.81	2.99	3.41	3.40
Capacity for applying								
Knowledge in								
Practice	4.56	4.70	4.59	4.62	4.13	3.41	3.56	3.70
Ability to work								
autonomously	4.56	4.59	4.66	4.60	4.25	3.29	3.45	3.66
Capacity to adapt to								
new situations	4.38	4.7	4.68	4.59	3.88	2.96	3.19	3.34
Leadership &								
Management Skills	4.50	4.39	4.55	4.48	3.81	2.96	3.07	3.28
Critical &								
Self-Critical Abilities	3.88	4.46	4.48	4.27	3.50	3.09	3.36	3.32
Second Language	4.13	4.30	4.33	4.25	3.75	3.32	3.68	3.58
Research Skills	4.19	4.04	4.11	4.11	3.81	3.25	3.40	3.49
Will to Succeed	4.00	3.88	4.15	4.01	3.36	3.15	3.48	3.33
Total average	4.48	4.56	4.59	4.54	3.95	3.30	3.55	3.60

Ranking in order of importance and in level of achievement of generic competences is shown in Table 3. The most important generic competences according to all respondents were Elementary Computer Skills (4.83), Information Management Skills (4.83), Teamwork (4.77), Ethical Commitment (4.76), and Capacity to Learn (4.71). Academics ranked the importance of generic competences more critically (-0.06) than labor market stakeholders. The achievement rank for all generic competences expressed totally opposite directions when the opinions of academics were compared with the opinions of library professionals and library directors. The academics considered that all generic competences were more highly achieved by graduate librarians (0.35).

3.2 Importance-Performance Analysis of Subject-Related Competences

Difference between the average value of the importance of subject-related competences (4.22) and the average value of competence achievement by graduate librarians (3.81), reveals the opinion of academics on the efficiency of the LIS education in Croatia (-0.41). The largest differences between the importance and the achievement of competences are in Assessing Information Needs & Designing Responsive Services (-1.00), Advocacy (-1.00), User Education (-0.82), Providing

Information to Users (-0.75), Digital Collection Management (-0.75), and Information Searching & Retrieval (-0.69). According to the academics, these competences are less achieved by graduate librarians than they are valued for their importance.

The Importance-Performance Analysis (IPA) [9] is used to investigate the importance and the achievement of subject-related competences as perceived by all respondents (Fig. 1). The IPA approach is seen as a means to measure respondent’s satisfaction. The importance and the achievement values are compared in two pairs of coordinate axes. The intersection in the IPA is made available using the average of importance at 4.35 and the average of achievement at 3.51. Subject-related competences were arranged into four categories: **concentration** for competences that are considered important but have low achievement; **low priority** for competences that are not considered important and have low achievement; **excess effort** for competences that are not considered important but have high achievement, and **maintenance** for competences estimated both as highly important and as highly achieved.

Importance	CONCENTRATION:	<ul style="list-style-type: none"> - Collection Management - Digital Collection Management - User Education - Advocacy 	MAINTENANCE:	<ul style="list-style-type: none"> - Cataloguing - Classification - Assessing Information Needs & Designing Responsive Services - Information Policy & Ethics - Information Resource Management - Information Searching & Retrieval - Providing Information to Users
	LOW PRIORITY:	<ul style="list-style-type: none"> - Digitization Process - Library & Information Products & Services - Knowledge Creation - Media Skills - Publishing Process - Teaching Skills 	EXCESS EFFORT:	<ul style="list-style-type: none"> - Theory & History - Information & Communication Technologies - Preservation & Conservation - Research & Analysis of Information
Performance (Achievement)				

Fig. 1. Diagram Importance-Performance Analysis (IPA)

The IPA diagram shows that Collection and Digital Collection Management, User Education and Advocacy are perceived as of high importance but of low achievement by all respondents. It seems that, according to all respondents, a part of a core curriculum requires more effort or more investment in order to increase the level of achievement by graduate librarians. Most of the competences are arranged in the field of maintenance, including information literacy competences. Great efforts had been invested in the competences arranged in the quadrant of excess effort (Theory & History, Research & Analysis of Information, Information & Communication Technology, and Preservation & Conservation). Competences with low importance and low achievement are those arranged in the field of low priority, such as Digitization Process, Library & Information Products & Services, Knowledge Creation, Media Skills, Publishing Process, and Teaching Skills.

4 Discussion - Information Literacy Competences

Kajberg, Horvat and Oğuz stated that “a growing interest in information literacy has been seen as a field of research and analysis, as a policy area and as a curriculum subject” [1]. Our research examined information literacy competences as a curriculum subject. Findings revealed that all respondents agreed on one distinctive core of subject-related competences consisting of user-centered and information-based competences, and which was identified as information literacy competences [10]. According to the results of the IPA approach, information literacy competences appear in conjunction with competences of the ‘bibliographical paradigm’ in a steady maintenance area, while User Education is in the concentration quadrant. The reasons for a certain inability of the academic curriculum to achieve its goals in respect of information literacy has been researched by Heidi [11], who concluded that information literacy courses have been mainly part of elective courses. Information literacy competences are valued as highly by labor market stakeholders as by academics.

5 Conclusion

Although the findings cannot lead to a of generalization of conclusions on the core curriculum in LIS, they may serve as a starting point for further analysis of the attributes of information literacy competences from the perspective of the professional framework.

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Empowering Information Literacy and Continuing Professional Development of Librarians: New Paradigms for Learning

Konstantina Martzoukou

University of Malta, Department of Library Information & Archive Sciences,
Msida, Malta

konstantina.martzoukou@um.edu.mt

Abstract. Information professionals play a key role in facilitating and advocating the development of information literacy in educational, organizational and everyday life contexts. However, their information literacy continuing professional needs have not attracted sufficient attention in research. This qualitative study explores information professionals' perspectives of information literacy within their working practices. The paper reports on the preliminary findings of interviews conducted with a total of seventeen professional and non-professional librarians with experience of working in academic, public or special libraries. Librarians' definitions of information literacy highlighted a weak connection between information literacy development needs and everyday working context, when not directly involving information services to library users. However, information literacy and digital literacy were perceived as interconnected competencies, with the latter requiring ongoing development. Participants highlighted examples of blockage to their overall continuing professional development (e.g. management style, lack of resources) which emphasize the need for expanding online professional educational opportunities and promoting a culture of sharing and openness in the library profession.

Keywords: Librarians, continuing professional development, information literacy, digital literacy, online learning.

1 Introduction

Information literacy (IL) is linked to the development of essential survival skills in the 21st century, which include critical thinking, communication, problem solving, creativity and the ability to continue learning throughout life. The Chartered Institute of Library Information Professionals in the U.K. has defined information literacy as “knowing when and why you need information, where to find it, and how to evaluate, use and communicate it in an ethical manner.” This definition implies several interconnected competencies which require not only information seeking skills, but also the ability to synthesize, manage, use and disseminate information [1] within an increasingly changing and technologically growing information environment.

The development of IL competences among information professionals is directly linked to their role as “custodians of the highest standards of intelligent information use” [2]. They should act as information seeking experts and information literacy mediators [and educators] for users [3] to help them achieve higher objectives. The LLUK National Occupational Standards for Library, Archives and Information Services provide a framework of the skills required by staff, emphasising the importance of engaging with customers to develop their own IL skills, helping them to “critically appraise various types of information, to understand its significance, make inferences and deductions, and evaluate its reliability for decision making” [4]. The information literate librarian should have expert knowledge to be in a position to assist and direct users to become more competent and confident in their own abilities. A professional dimension of information literacy also requires continuing professional development (CPD), i.e. the “ability to participate in the development of one’s profession and the ability to continuously gather information in one’s professional field, ability to develop one’s tasks and continually search for data, information and knowledge to fulfill these tasks” [5].

2 Rationale and Review of the Literature

The bulk of IL research has concentrated on the extent of librarians’ involvement in the provision of IL and less on their own IL CPD needs in the context of their working practices. Hedman argued that “ironically, against the background of the plethora of user studies in LIS, librarians’ own professional information seeking is still partially unexplored” [2]. Womack [6] explored the orientation and training process of new business librarians and found that responding to the changing information needs of users requires active investigation on the part of the librarian that goes beyond initial training. In a study conducted by researchers at the University of Gothenburg and the University of Borås, it was concluded that although information seeking is essential in the library profession, librarians were never trained to stay current [7].

In addition, the ‘Googling’ phenomenon challenges the traditional skills of librarians as information providers and the role of library and information service provision in general. Young information users, the so called ‘Digital Generation,’ prefer using the most time-saving and convenient methods of information seeking and are over-reliant on Web search engines [8]. Recent research has found that some of these behavioural characteristics may be prominent even amongst librarians [9]. It is also stipulated that the Digital Generation uses technology intuitively, is comfortable with communicating online, works well in teams, multitasks with ease and values life-long learning. These characteristics may offer novel possibilities for engaging in less conventional activities for upgrading competences and skills.

There are numerous recent studies that have examined the CPD of library professionals in different contexts. However, these lack particular emphasis on IL. This is a competency that underpins all areas of information and library work such as collection development, circulation, promotion of information services, reference

services, IL user education, and it is therefore imperative that librarians upgrade/actively expand their knowledge and skills to maintain the quality of their services in the contemporary library workplace.

3 Methodology

This research study examined views/attitudes, current practice and barriers towards IL CPD of library staff working at (self-perceived) professional and non-professional positions. The research used an interpretative research approach which aimed to understand the research themes from the point of view of librarians and via the meanings they assigned to them within their work environment and surrounding context. The participants of this study were recruited by means of convenience sampling with the majority of them drawn from a Scottish university library school alumni list and they all held a postgraduate degree in a related study area. The research aimed to gain insight into a range of perspectives and for this reason participants with different lengths of library experience and age demographics were recruited. Although this study was by no means representative of these different categories, it may constitute a basis for further quantitative exploration in follow-up research.

Data were collected via semi-structured interviews (face-to-face or remote) with seventeen librarians between March – July 2012¹. The interviews were based on mostly open ended directional and other demographic questions (e.g. age, work experience). The average interview lasted approximately sixty minutes.

For the purposes of analysis, all interviewees were transcribed verbatim and were assigned a unique participant code (e.g. P.1, P2). The interviews were manually analysed following the constant comparison method [10]. An initial axial coding scheme was created based on CILIP's IL model [1]. Thus coding themes addressed not only the process of information searching but also ethics, communicating and managing information, examined via the lenses of participants' needs for further development and the barriers experienced in the process. This paper reports on the preliminary findings only.

4 Results

A total of 17 librarians took part in the research, 14 of whom were female and only 3 male. Most of them (n=10) held professional level jobs (n=10) and belonged to the Digital Generation (considered only those born in the year 1980 and after) (n=10).

¹ The author gratefully acknowledges the continuous support of the Robert Gordon University during the collection and initial analysis phase of the research project, the invaluable contributions of the research participants and the feedback of the anonymous reviewers.

The participants worked in public (n=7), academic (n=6) and special libraries (n=4) and had different lengths of library experience (<2 years, n=3, 2 – 4 years, n=4, 5-7 years, n=2 and >7 years, n=8).

4.1 Information Literacy Definitions and Professional Development Needs

Participants emphasized that a single encompassing definition of IL would not be meaningful unless it was developed within a very particular context (e.g. the type of library and the nature of the particular work role). Thus, IL was described as a “very broad” term (P8, P11) with its meaning changing “from meeting to meeting and job to job” and “for different people” (P11).

The majority of the professional librarians interviewed, touched upon, almost holistically, several aspects/layers of IL which addressed recognising information needs, selection of appropriate sources, locating information, critical evaluation, use, synthesis, ethics and communication. However, in participants’ verbalizations, IL had meaning for teaching or advising others and their accounts rarely addressed activities beyond an instructional or reference service role. For example, one librarian defined it as “being able to accompany *the students* in using their resources properly, ethically and wisely in terms of which ones to choose from” (P3); another participant thought of it “in practical terms, whether *the users of the library* are confident and able to search on the site and find what they are looking for” (P12). Others could not find a connection with it at all because, for instance, their job was in a “background department” and they were “not involved with the students” (P2).

Interviewees were overall confident about their information searching skills and felt that their current knowledge and experience were sufficient to cover their needs at work. Only a few librarians mentioned the value of CPD in terms of upgrading their own skills, yet again, these were mainly in the context of demonstration/instruction purposes (P11; P16). For example, a Digital Generation participant highlighted the value of having the opportunity to attend a course on advanced Google searching for the purpose of teaching end-users (P16). “Involved searches” were generally ignored as they are “not for the workplace” because of the limited time available (P12).

On the other hand, librarians mentioned the need for training on the use of a range of technological tools (e.g. iPads and iPhones), software (e.g. image manipulation tools such as Gimp) and experimenting with QR codes. Digital literacy is an emerging concept which refers to the ability to “use information and communication technologies to find, evaluate, create, and communicate information requiring both cognitive and technical skills” [11]. Except for one librarian who saw digital literacy related to technical, technology based skills and information literacy connected to critical evaluation (P7), most librarians perceived information and digital literacy (DIL) “as the same” (P12) or conceptualized them as “almost together given that most of the information these days is in a digital format” (P16). Digital literacy was also described as a continuing learning ability sharing many of the characteristics of information literacy, i.e. encompassing “everything that you can do in an electronic environment, from awareness of “newer advances in websites” to the “knowledge of how to go about your basic searches to the more advanced, actively seeking

knowledge” (P8). Indeed, according to the European Parliament Recommendations, digital competence is one of the key skills for Lifelong Learning, encompassing the ability to use tools to produce, present and understand complex information as well as the ability to access, search and use Internet-based services and Information Society Technology to support critical thinking, creativity, and innovation [12].

4.2 Support for Continuing Professional Development

Participants who held non-professional positions described a working environment involving a range of tasks that required DIL skills which often transcended the prescribed remits of their formal roles. These tasks varied from administration of day-to-day business (e.g. stock reports, budgets, book processing and classifying, managing records in the institutional repository) to dealing with user enquiries and working across different branches in collaboration and partnership work, participating in the delivery of training courses, writing library blogs and creating reading groups.

However, only two of the non-professional librarians had been involved in more professional activities (P6; P3). The other participants experienced lack of opportunities for extending their portfolio of involvement beyond standard expectations, and described a working environment which was far from ideal, affording few opportunities for career development or progression (P4). Training was less person-oriented and more based on prescribed roles, “for the person in the post as opposed to for the person generally” (P1). As one of the participants put it: “...they are very particular about you staying within your very prescribed position and not going out with that whatsoever ...they don’t do very much to keep you there or add value to you” (P2).

Considering that participants held postgraduate academic qualifications and that “most library assistants will probably come in to the library with more experience than their job requires” (P1), this lack of opportunity for development was found to be frustrating on different levels. It was perceived as a serious barrier to utilizing existing skills, to career progression and to ultimately feeling a valuable asset in the organization. Blocking access to CPD could also potentially create feelings of resentment, as highlighted by one of the professional librarians: “My first job was at [...] university. I needed to work in three languages, be able to do all things in several other languages, I needed the postgraduate qualification and I was paid 12,000 a year and I was called an assistant” (P7). Leadership style, “higher management and their approach to things” (P6) played a key role in this process. For example, whereas the management of one public library local authority would block innovative ideas, another would invest in the person rather than the post: “They were excited to have an enthusiastic member of staff...I didn’t really have so much of okay you ‘are not professional’, ‘you are professional’” (P6).

However, CPD was not always supported even when it was directly related to a particular role. As one of the professional librarians put it “...it’s got to be my own time, my own initiative, my own reading, my own training, in my own time ...professionally you can’t remain sustainable” (P7). Another librarian explained that in terms of developing they did not feel supported because CPD is not taken “as

serious” and most of the learning has been “informally through my own research through reading and through getting books” (P16). Similarly, one of the older librarians in this study had been involved in a number of digital initiatives, taking an active role in using online social communication media and working with e-content. However, they reported large gaps (4-5 years) in terms of their participation in formal training opportunities (P15). As another librarian put it, the possibilities of CPD were constrained in view of libraries “struggling with capacity and finances to release staff to attend courses and “to be sustainable in a time of change and cuts we have no option but to share” (P11). Flexible learning via online information sharing and freely available courses was thus embraced by several librarians as key to less resource and time intensive CPD.

5 Discussion and Conclusions

Librarians operate on the basis of a chameleon-like, polymath work ethic which requires them to be highly adaptable and demonstrate an overarching ability that covers a whole spectrum of technical and subject related skills. A European report on LIS competencies and aptitudes for information professionals [13] puts emphasis on traditional librarianship expertise, but also on technology, communication, management skills as well as other scientific knowledge associated with specific domains. Librarians are also expected to have the ability to adjust to and embrace rapid change in response to evolving end users’ needs and new paradigms of online information seeking and sharing. Therefore, continuous development and upgrading of knowledge and competencies underpin their working practices on multiple levels.

As this research demonstrated, librarians had different levels of CPD needs which put emphasis on the development of DIL as interconnected competencies; however, these were not always supported. CPD promotes innovation and creativity, and positions the library as the first port of call for its users. However, this vision requires a shared perspective where continuous learning and innovative ways of thinking are embraced within an organisational culture that is open to sharing. A learning organisation values team working, communication and employee empowerment via participatory management practices that respect the point of view, needs and aspirations of employees at all levels. It also means offering opportunities for shared decision-making, putting emphasis on staff qualities and professional growth, where individual employees are perceived as “containers of intangible investments” [14].

Libraries as learning organisations should develop a vision that permeates the entire library profession and fosters a learning culture for staff beyond the walls of single organisations. In the same way that libraries should think beyond the restriction of their physical space and resources, expand to online open access information spaces and deal with intelligent Internet sharing and social communication tools, learning should equally take place beyond the restrictions of space, location or timing. This is particularly true within an era of emerging technologies which have revolutionised the way in which library services are provided, but also at a time where limited available funds and resources create fewer opportunities for formal learning

and development. Within this context, there is an emergent need for flexible, online learning that transcends geographical borders and enables sharing of expertise on online, synchronous or asynchronous learning spaces. There are currently very few good working examples of shared online flexible learning taking place for library staff of all levels (see for example “23 Things for Professional Development”²) and increasing awareness of the affordances of technology in the areas of training and CPD is paramount for libraries.

It is not sufficient to rely any longer on basic understanding of technology, search skills and on the job experiential learning. The same technology that is challenging librarians also carries unprecedented affordances for them to demonstrate the value of their services and exchange their expertise across the globe. Librarians ought to be more flexible and adaptable in the ways in which they learn. As they are called to assert their roles in a changing technological environment there is also a need for a wider exchange of information and collaboration with other professional groups, who can provide their expertise on technology and contribute to librarians’ development of digital literacy.

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A Bibliographical Overview of “Copyright Literacy” as a Key Issue in Memory Institution Management

Ivanka Yankova¹, Rumelina Vasileva¹, Silvia Stancheva¹, and Plamen Miltenoff²

¹SULSIT, 1784 Sofia, Bulgaria

vania_yankova@abv.bg, rumivas@gmail.com, mikovska@mail.bg

²St. Cloud State University, St. Cloud, MN, USA

pmiltenoff@stcloudstate.edu

Abstract. This publication discusses the issue of copyright literacy as a key element in the management of memory institutions in the context of digital information environment and includes issues regarding the law enforcement and the use of Open Access (OA) documents and protected authorship. The study is part of the project ‘Copyright policies of libraries and other cultural institutions’, DFNI-K01/0002-21.11.2012. The bibliographical review covers the following main subject areas: Copyright limitations and exceptions for libraries and archives; Library Copyright Policy; Information Literacy and Copyright Literacy; Plagiarism, Copyright conventions and directives; Public domain, Orphan works, Out-of-print works; OA, Open Educational Resources (OER) and Repositories, Licenses, Fair Use. The range of the sources includes monographs, collections of articles, e-publications from the period 2003-2013, which were searched in catalogs of scientific and university libraries, free repositories, data bases (DB) and e-platforms with paid access.

Keywords: Library copyright policy, copyright limitations and exceptions for libraries and archives, copyright literacy, information literacy.

1 Introduction

Digital Literacy and Copyright Literacy are relatively new terms and concepts in the scientific, social and legal world. Copyright Law (CL) evolved alongside the invention of the Gutenberg printing press in the XV century and in conjunction with expanding public literacy. “For the first time publishing privilege for (sales) monopoly for 5 years (equivalent to a patent) was given in 1469 in Venice (from *Venetian Collegio*) to the publisher *Johann von Speyer*. The data for this privilege to the publisher are printed on the books from this period, which usually begin with *Cum privilegiu...*”[1]. At the end of the XV and the beginning of the XVI century, authors were also awarded privileges and these already contained elements which later would become the basis of CL, such as exclusivity rights, limitation of rights in time and penalties”. However, as a legal concept, “copyright” appeared at the beginning of XVII century in the *Licensing of the Press Act 1662* by Act of the English Parliament

[2]¹, which established a public register of licensed books, and also required a ‘deposit’ copy for censorship and for licensing by the *Stationers’ Company* [3]. Five and a half centuries ago, CL was designed as a limit to printing in order to protect the interests of the state and as a rights protection for publishers. Today copyright promotes writing and publication, generating added value and profit for the authors and publisher and benefits society.

2 Copyright Literacy and Its Impact

The attitude towards copyright today is becoming a serious problem. The reason for this lies in the comprehensive network of digital environments and unprecedented active communication between people with different backgrounds, skills, interests and goals. The large scale of the access to information, training and education has totally changed ideas, paradigms, values, responsibility, and morality. It is quite natural that all the rules, agreements and moral criteria of the physical world have other dimensions in the digital environment. The “memory institutions” by definition not only store, but also provide equal access to the memory of humanity in its immeasurable borders. For such broad social and publically significant organizations it is essential to seek a balance between marketing on the one hand and arrangements to honour the public contract with the society for equal access in the welfare and interests of all. The ability to use information within legal and ethical boundaries is an important component of information literacy (IL). With an abundance of available information – it is easy to reproduce copyright protected works and incorporate these into projects and claiming these to be something different and new. Modern technologies of scanning and reformatting increase opportunities for access and replication of authors’ works. The contemporary consumer of information needs to be informed and educated about the nature of intellectual property (IP) rights.

This report presents a summary of bibliographical review of publications on the subject of Copyright Literacy and Intellectual Property Competency. Further it summarizes publications which focus on copyright policies of libraries and cultural institutions, and the current copyright regulations affecting the provided services in cultural institutions, as well as proposals on exceptions and limitations for libraries, educational institutions and archives.

3 The Methodology

The research team, which is part of the project *Copyright Policies of Libraries and Other Cultural Institutions*, headed by T. Todorova and financed by the Ministry of Education and Science, presents in this article a short bibliographical review of the existing publications on the subject matter discussed, with no claim for completeness.

Our main goal is to cover scientific publications discussing the issue of copyright literacy as a key element in the management of memory institutions in the context of the digital information environment and includes issues on law enforcement and on

¹ The *Patterson Copyright Award* recognizes contributions of an individual or group that supports the Constitutional purpose of the CL, fair use and the public domain.

the use of OA documents and protected authorship. Here we summarize the results of a bibliographical review – data found in various type and format of publications (monographs, articles, e-publications) on the topics. Its geographical scope includes publications, searched in publishing catalogs, catalogs of scientific and university libraries; free repositories and e-libraries; DB and e-platforms with paid access from Bulgaria, Russia, some countries of Europe, and North America. The temporal scope of the study covers the period 2003 – 2013.

This bibliographical review is based on a specially designed methodology of thematic bibliographic study of copyright policy in “memory institutions” and existing copyright standards affecting the services provided, and proposals on exceptions and limitations for libraries, educational institutions and archives, and covers the following main subject areas: 1. Intellectual Property (IP), Copyright and Related Rights; 2. Copyright Limitations and Exceptions for libraries and archives; Library Copyright Policy (including library services that relate to copyright; copyrighted content; copying of copyright materials; inter-library document supply for end-users; preparation of course packs and e-learning content and services; digitization of library materials); 3. Information Literacy, Copyright Literacy; 4. Information Law, piracy, plagiarism, counterfeiting, copyright conventions and directives; 5. Public Domain, orphan works, out-of-print works; 6. OA, OER; licenses; fair use.

4 The Bibliographical Overview

Our purpose is to track the development of the topic in the framework of a 10 years period from 2003 to 2013 in various countries surveyed. The lack of a thorough understanding of both the importance of the problem and the solutions to emerging cases and practices can be a major barrier to the development of education and knowledge. “Copyright in the world of digital information is changing at a fevered pace, even as educators and librarians digitize, upload, download, draw on databases, and incorporate materials into web-based instruction. It's essential to stay abreast of the basics of CL and fair use”, says K.D. Crews². He gives timely insights into applications of CL for librarians, educators, and academics in his book *Copyright Law for Librarians and Educators*. The purpose of the book “is to provide a basis for understanding and working with the copyright issues of central importance to education, librarianship, and scholarship” and affects the reach of copyright, needs and copyright solutions, protectable and un-protectable works; exceptions to the rights of owners; fair use and its four factors; technology changes and educational innovations; distance education and the TEACH Act, [4]. The author K. D. Crews is compiler also of the *Study on Copyright Limitations and Exceptions for Libraries and Archives* [5].

Defining well the terms and practices determines the professionalism of stakeholders and their proactive participation. The direction of the modern copyright protection isn't to prohibition, but to the cultivation of high copyright literacy,

² Kenneth D. Crews has specialized in copyright issues as they relate to education, libraries and research. He was the first recipient of ALA's L. Ray Patterson Award.

intellectual sentience, responsibility and ethics. The new generation learns quickly so the techniques for their cultivation must be innovative in order to be effective. The concept of copyright in the digital environment is growing with the digital distribution of information and this isn't only legal and academic problem, but it is of considerable social and public significant. Many publications provoked our interest and their range makes the task to select a few of the important works, written on the subject extremely difficult.

Interesting to us seemed the guidance by B.M. Jones³ for OIF *Protecting Intellectual Freedom in Your Academic Library* [6] which safeguards the intellectual freedom principles in the academic libraries in the context of the complex of social, economic, and political issues related to telecommunications and e-resources. This work covers the academic library functions around which placed censorship issues – collections, internet access, exhibit spaces, and programs [7]. The author treats the troubling problem of privacy and the issues about sharing, privacy and trust in networking world, as well as the implications of e-surveillance, in real time without the knowledge of people Probably this problem will be developed with specific sharpness in the future. Jones presents some definitions of key terms, sample policies, and analysis of important decisions affecting the protection of intellectual freedom in a library environment.

Extremely interesting publications exist in all countries surveyed in our study. We think it is normal for the interest of colleagues to be focused primarily on the translated publications because of their easier use. In the upcoming establishment of the *scientific review* of selected documents within a project task we intend to draw attention precisely to publications that affect the common cases and situations of the daily library work. The guidance of C. Russell⁴ *Complete Copyright: An Everyday Guide for Librarians* [8] covers the modern-day legal issues and coverage especially as it applies to libraries ranging from the Concept of fair use to the first sale doctrine that allows the resale or donation of lawfully purchased or acquired books. This book is thorough, useful, and in interesting format it explains lots more points from the library life. It is filled with excellent examples.

In this context, the eIFL guide *Developing a Library Copyright Policy* [9] is useful because it provides clarity on copyright issues that arise during the provision of library services, and helps with advice on how to manage risk for the library and its parent institution. These are the main objectives: *compliance* – consistency in managing the copying of copyrighted materials by library staff and users in order to avoid infringing activities, and compliance with the CL in the relevant countries, and the licenses applicable to e-resources in library; *guidance* – clear guidelines to staff and users on aspects of library services that relate to copyright; *education* – educating librarians and end-users about copyright and what they may and may not do.

³ Barbara M. Jones is current US representative to the Committee on Free Access to Information and Freedom of Expression Committee of IFLA. She is the author of book *Libraries, Access, and Intellectual Freedom* [2].

⁴ Carrie Russell is the copyright specialist for the OITP of the ALA, and the author of numerous articles on copyright and information policy in journals as *Library Trends*, *Library Issues*, *Public Libraries*, *Library Journal*, etc.

We highlight also the publication ‘*Copyright for Librarians: The Essential Handbook*’ by Berkman Center for Internet and Society at Harvard University and eIFL [10].

Great contributions on this topic have been made by the experts of eIFL-IP. They advocate for fair and balanced CL that support libraries in providing access to knowledge. We recommend the use of a variety of tools and resources for library copyright issues, which they prepare and publish on the eIFL website, both for the needs of academic education, for continuing education, and in the daily work of practitioners [11].

Important in the activities of libraries and archival institutions are the exceptions and limitations of copyright. These reflect on the main tasks of these institutions such as the reproduction of documents for the purposes of education, teaching and research; free use of works, storage of the documents, mandatory deposit, interlibrary loan and Document delivery service.

The library associations IFLA, eIFL, EBLIDA, as well as NGOs such as Commonwealth of Learning (COL) cooperate with the World Intellectual Property Organization (WIPO) in this direction. Here we will list some of the important draft documents prepared for consideration in WIPO as “eIFL-IP Draft Law on Copyright Including Model Exceptions and Limitations for Libraries and Consumers’ [12] and ‘Treaty Proposal on Limitations and Exceptions for Libraries and Archives’ [13]. Also we would like to underline one other important survey made by J. Sullivan ‘Study on Copyright, Limitations and Exceptions for the Visually Impaired’ [14].

The publications by T. Todorova [15] also contribute to the increase of awareness of the Bulgarian professional community concerning the role of library associations in discussions about exceptions and limitations of copyright for libraries and archives.

In respect of critical information activity for academic libraries, related to the monitoring of impact factors and publication activity of faculty researchers in universities, we endorse the opinion expressed by the authors of the article ‘*The Green and the Gold Roads to Open Access*’. It surveys the issue of the accessibility of scientific publications to all would-be users and the impact of their potential research. According to the authors the solution is to make all articles OA, because they have significantly higher citation impact than non-OA articles. The most important point in this article is the statement of the authors that “to reach 100% OA, self-archiving needs to be mandated by researchers, employers and funders, and universities need to implement that mandate” [16].

An important issue for the copyright competency of librarians is the knowledge of DRM and digital piracy, which is referred to in the publication *Digital Right Management (DRM) and Library Copyright Policy* [17]. The authors recommended taking account of the different conditions and interests of the states in order to have effective library legislation and to adopt legislative or order measures which are in conformity with the principles outlined in the (different) Guidelines, and to bring existing guidelines into line with these same principles.

Finally copyright literacy is an important part of modern IL in the 21 century. “Characteristics of the new generation require a high level of critical thinking skills. As a result, IL skills are a survival skill in the information age, and the traditional content and the mode of IL instruction requires alteration” says S. Kurbanoğlu in her article *The Increasing Importance of Information Literacy as a 21st Century Skill* [18].

5 The Results

The results of the bibliographical review will pass the scientific analysis that will lead to the creation of a scientific overview. At the moment our results are approximately 3 200 bibliographical records. Another goal is to collect the selected bibliographic descriptions of the methodology set criteria and present them in a database. The DB will allow searches to be performed by: keyword; type of publications; years; types of cultural institutions, ranked by relevance and chronologically. The ambition of the project team is to maintain the established DB accessible through the project website (<http://copyrightlib.unibit.bg>), thereby ensuring the sustainability of results over time and providing information for an unlimited number of users.

6 Discussion

Findings – this article briefly examines the condition of publications on CL and in particular the problem of copyright which is applied to the professional activities of the *memory institutions* in terms of quality and competent satisfaction the information needs of their users – in fact of society in general, moreover – within the law. *Research limitations and implications* – this bibliographic study within the projected scope is the first of its kind in Bulgarian academic and library environment. It will contribute to the development of the institutions (subject of the study) in the direction of cooperation and mutual benefit between the different social groups of readers, researchers and students. *Practical implications* – the results of bibliographic research will be useful for librarians, archivists and museum workers, lawyers, students, distance learning and continuing education – they will contribute to forming high-information culture, including copyright literacy as well as implementing relevant and legitimate practices and models. *Social implications* – placing of the issues on the agenda and adopting world practice could lead to updates in national CL and dialogue at national and international level. *Value* – we offer a sustainable method for maintaining current awareness of stakeholders and institutions in the field of copyright and all issues arising out of it including limitations, possible exceptions, practices and precedents in favor of modern memory institutions and for the benefit of the society.

7 The Conclusion

In our opinion, this *bibliographical database*, will be a single point of access to information and publications on the topics not only from a specific country but also in other countries, similar in organization of publishing, copyright legislation, or leading countries in the field of copyright practices and standards affecting the activity of memory institutions and their associated limitations, exclusions and ‘privileges’. Copyright protects the interests of the author and the publisher, but also ever more distinctly in the new conditions the authors rely to ‘be read’ to the maximum and access needs to be provided to the public for use, naturally according to the rules. As M. Lowry has put it about book distribution, “if Gutenberg invented typography,

Jenson and John of Cologne have a strong claim to have turned it from a jealously guarded commercial secret into a vehicle of mass-communication” [19]. Today in an identical manner we can say the same about the potential of the Internet.

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