

Lessons Learned from a Lifetime of Work in Information Literacy^{*}

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Abstract. This paper is the full keynote address written for the 2014 ECIL Conference by Michael Eisenberg. Key information literacy milestones in his career that are representative of significant developments in information literacy, as well as education, information and library science, and information technology are presented in the paper.

Keywords: Information literacy, information skills, Big6, critical thinking, Michael Eisenberg.

1 Introduction

I am honored to be here giving the keynote address at the ECIL 2014 Conference. Thank you for inviting me and including me among this group of outstanding scholars and practitioners.

I am retiring this coming January, and this is likely to be my very last major keynote speech on information literacy. Therefore, I hope you will indulge me as I take the time to look back over my years as a teacher, researcher, and administrator whose consistent and continuing focus has been information literacy. My intent is to select several key information literacy milestones in my career that are representative of significant developments in information literacy, as well as education, information and library science, and information technology. I will share personal recollections, but focus more on the lessons learned, implications, and looming challenges and opportunities.

2 Milestone: Relevance, 1984

Although it's out of chronological order, the first milestone to share involves our next, distinguished speaker, Professor Tefko Saracevic. I met Professor Saracevic the very

^{*} This paper is the full keynote address written for the 2014 ECIL Conference. The actual delivered keynote speech will be abridged due to time constraints. The writing style is speech-appropriate, i.e., less formal than a scholarly research paper.

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first time in May 1984 at an ASIST (then called ASIS) mid-winter conference in Bloomington at Indiana University. I had recently decided to do my doctoral thesis on the topic of relevance, and Tefko Saracevic was the number one relevance expert in the world. Truly—he was, and remains, a giant. I had emailed him before the conference asking to meet. I was hoping for his blessing on my research, as I would be building upon his work. If he wasn't supportive, I would be in big trouble. When we finally connected, I was very nervous and completely star-struck. But, he was incredibly gracious and wonderfully encouraging. That meant the world to me, and I've remembered that meeting over the years when I have been contacted by young researchers. I always try to find time to respond and assist.

Meeting Tefko was a seminal event for me, and I went on to complete an award-winning dissertation on the nature and measurement of relevance. In terms of lessons learned, the first was on the personal side—that more senior faculty can make a huge impact and help to nurture young researchers. From a research and conceptual perspective the lesson was hugely important and set me on my intellectual career path: Professor Saracevic affirmed my own conclusion that relevance was still highly “relevant” and at the center of all aspects of the information field and that in spite of comments by some that the excellent work in the late 1960s and 1970s by Rees and Schultz, 1967 [1], Cuadra and Katter, 1967 [2], and of course, Tefko Saracevic, 1975 [3] had exhausted the relevance topic, there was still very important work to do. Relevance, a multi-dimensional concept, is a foundational concept of information science and information literacy (Schamber, Eisenberg, and Nilan, 1990 [4]).

The implications carry over to today: information literacy includes understanding relevance and being able to use and apply relevance in terms of relevance criteria (e.g., topicality, usefulness, completeness, precision, authority, novelty, currency, etc.). This is more true than ever in a networked, online, information world. We know a lot more about relevance today than we did in the early 1980s; however, where we previously lived and worked in an information scarce world in which information was hard and sometimes expensive to find (remember when librarians conducted the online search for end-users after a reference interview?), the challenge today is one of coping with abundance or even overload. Yes, relevance is still “relevant,” but the dimensions concerned with credibility are even more important than ever. Thus, there are still needs and opportunities for information literacy researchers to learn more about information relevance—and particularly those dimensions related to credibility—in various contexts. Relevance and credibility are important issues for systems designers to address (especially web and app designers), and educators can help students and general users to understand relevance and credibility and apply those understandings as part of their information literacy skills set.

Meeting Tefko was a major milestone, but, chronologically comes a bit later. So, let me go back—to my earliest days as a professional when I was learning to be a teacher.

3 Milestone: Student Teaching, 1971

In 1971, I did a semester-long student teaching internship as part of completing my undergraduate degree in history and education. I was fortunate to have a creative supervising teacher who took an innovative, “inquiry” approach to teaching social studies. We used a special social studies through inquiry textbook that included a number of primary sources, and we closely collaborated with an English teacher as our classes were scheduled back-to-back so we had the same 60 students for a 90-minute block of time. This back-to-back blocking was repeated for three sets of students each day. The inquiry approach and block scheduling were very different from my background and training, and it forced me to think beyond narrow subject area content (social studies) to more underlying, fundamental skills and understandings that make up inquiry. I learned about framing questions to go beyond recall of facts, the use of primary sources and how to extract meaning from them, and options for class interaction, presenting, and assessment. We also used the cutting edge technologies of the day—closed circuit television throughout the school in particular—to create a massive simulation game about World War I and its causes.

Thus, at the beginning of my teaching career, I was influenced by innovative pedagogy, alternative structures, and technology. I now realize just how profound these experiences were in shaping my core values and approaches to teaching and learning. And, I am certain that my student teaching experience sowed the seeds of a lifelong professional commitment to underlying processes as well as content and to helping students to gain baseline understandings and inquiry skills. I learned that inquiry is a process and that helping students gain and master inquiry skills is even more important than transferring content. Looking back, I can see that the inquiry skills we emphasized and sought to help students gain are part of the scope of information literacy learning, no matter how it is defined: asking meaningful questions, planning a path of study, finding and using quality sources (primary as well as secondary), and communicating in a variety of forms including writing, speech, and media assisted.

The implications from this experience are as relevant today as they were then: inquiry is not just a means to learning content, inquiry itself is an essential and important goal of education. Inquiry is a process comprised of actions and skills. Technology can be used to create rich learning opportunities and experiences that are often not possible without it. I also learned to think beyond the textbook—there’s a rich world of resources out there, and we need to bring students into contact with them.

The opportunities are obvious, but the challenges that existed then still remain today. My innovative teaching internship experience was an exception, not the norm. While we see signs of renewed interest in inquiry learning, critical thinking, and our own passion, information literacy, a content learning focus is still the norm. So are traditional teaching methods (e.g., sage on the stage) rather than innovative, student-centered, or technology-enhanced (e.g., guide on the side) methods. So, my challenge to you is to seize the opportunities created by our information and technology-focused world to envision, design, and implement innovative learning opportunities focused

on inquiry and information literacy that are comprehensive—reaching every student in every classroom and setting.

4 Milestone: Library Science, 1973

I landed a high school social studies teaching job in southern California in 1971 after working as a substitute teacher for 3 months. If you really want to learn how to teach—try subbing, but that’s a story for another time. My wife Carol and I returned to upstate New York in fall of 1972. The school year had already started, and teaching jobs were scarce. To pay the bills, I took a job at a gas station on Central Avenue in Albany, New York. I actually enjoyed the job—in those days we actually “pumped” gas for customers and did a little maintenance and troubleshooting—checking the oil, tires, and antifreeze levels. But, when it started to get cold in late November—including an early snow—I knew it was time for a change. We needed to stay in Albany for family reasons, and since Carol had a good job, we thought it would be a good time for me to go back to school. But in what field? For what career? I liked teaching and I was pretty good, but I wasn’t fully passionate about it. I looked down the list of possible master’s programs at the University at Albany: business, education, social work, public affairs, ... library science. **LIBRARY SCIENCE?** Wow! I never thought of that as a career, but I immediately knew. It’s as if the skies opened with a crescendo of music and there was a great beam of sunshine on me and the words: “library science.” This was it! This was my calling. Library science. I was destined to be a librarian. Why hadn’t I realized this years before?

Reflecting back now, there were a number of influences that led me to librarianship: I read every sports book and biography in my junior high school library, and in college I often camped out in the library—often working there but also catching a nap from time to time as I lived downtown and the campus was uptown and I could not go home between classes. There was an amazing library in my student teaching experience noted above; for example, the television studio was attached to the library. And there were two amazing librarians at the school in my first teaching position in California. I had my social studies classes spend hours in the library doing projects, more than any other class or teacher.

The most significant lesson learned in library school was that there is an important teaching and education role for libraries and librarians. In my very first class, Professor Bill Katz, who wrote the definitive textbook on reference services, posed a seminal question: “do we aim for full- or self- service?” That is, are librarians in the business of providing information services or teaching patrons how to find information for themselves? Katz made a strong case for full-service: librarians were reference experts and could provide a much richer set of resources for patrons than they could find on their own. Yes, this would require many more librarians, but we were supposed to be meeting people’s needs, not trying to teach everyone to be a librarian. Remember, this was before the Internet, the Web, and Google. It was really before computer use was commonplace. I must admit that I was swayed by Katz’s argument, although I came to realize that he wasn’t against an educational role, he

just wanted us to think carefully about what and how we would teach while recognizing that services need to be fully developed beyond simply providing collections, facilities, and answering a few questions now and then.

The implications of this dichotomy—service vs. instruction—are equally relevant today. Information systems of all kinds—the Web, Google, libraries, Craigslist, help lines, digital reference—must focus on people, their differing needs, behaviors, styles, and degrees of expertise in seeking to better meet their needs. In terms of instruction, we must focus on the same variables. That’s the basis of information literacy and why we are here at this conference. We’ve come a long way since 1973 in understanding information literacy and human information behavior. We have definitions and conceptualizations, mission statements, curricula and standards. We seek to better understand people’s needs, behaviors, styles, and degrees of expertise. We have studies of pedagogy and impact. And, we have information literacy programs at every level and in every type of educational setting, and increasingly, in social services settings as well. While we must continue to explore the nature and scope of information literacy, changing needs of different populations, and effective and efficient ways of helping people to become information literate, it’s also time to shift some of our energy and focus from conceptualizing to acting. In too many settings, information literacy learning is still optional or marginal. Even where successful meaningful programs exist, they are often optional and don’t reach every student in a consistent, comprehensive manner. I will speak in more detail about this in a moment, but if we truly believe, as I do, and have research evidence that being information literate is essential for human success across fields, domains, and endeavors, then we have a responsibility to see that every human being has the opportunity to learn to be information literate.

5 Milestone: Technology – 1978 (as well as 1984, 1994, 1999, 2009, Present)

In the mid-1970s I took a course at Syracuse University about computers in libraries. This was the heyday of the mini-computers, well before the microcomputer revolutions. The course was exhilarating, but also a bit intimidating. We learned about databases, systems for circulation, MARC records and standards, and Dialog and information retrieval systems. I saw potential, but it seemed out of grasp. And then in 1978, I met the Apple II. Here was a machine that gave instant feedback on a screen, rather than having to use a teletype terminal and trek over to Machinery Hall to pick up the results in a printout—every time. Not only could I learn to program on the Apple II using a relatively simple language (BASIC), but there were programs that allowed us to do and save things—with words (word processing) and numbers (the visual calculator, VisiCalc). Reflecting back, my life has never been the same. It may be hard for those of you who are digital natives and have never known a world without computers, applications such as word processing, graphical user interfaces and the mouse, and later the World Wide Web and Google, to fully appreciate just how amazing, magical, liberating, and powerful this was. I could have my very own

“personal computer” for fun (yes, I played many early microcomputer games) as well as for work.

With the help of a 15-year-old high school student, we set up an automated circulation system for my high school library. I created spreadsheets to control budgets and manage student flow and access. And, I switched my approach to writing from my beloved IBM Selectric to Apple Writer and Scripsit for the TRS-80. I also began to provide computer access to students and to teach them how to use the technology for their own work and play.

New hardware and software applications developed rapidly. In the early 1980s, the IBM PC invaded businesses of every kind, and then in 1984 Steve Jobs presented us with Macintosh—the machine that moved us from line prompts and esoteric codes to “what you see is what you get” (WYSIWYG), graphical interfaces, and mouse-control rather than just the keyboard. These were also pioneering days of connecting and networking—first through dial-up bulletin board systems, defense and research networks (ARPANET), and early proprietary commercial systems such as CompuServe and Prodigy. I was director of the ERIC Clearinghouse on Information & Technology and with the development of a more open Internet in the early 1990s we made large online collections of bibliographic records and full-text content available free of charge through Gopher, FTP, and Archie.

But, the world shifted on its technological axis yet again in 1994. I will never forget the day when Dave Lankes, then a doctoral student and now a full professor at the School of Information Studies at Syracuse, burst into my office to show me the most amazing information system ever—Tim Berners-Lee’s World Wide Web accessible by a graphic tool called Mosaic. In looking back on all the computer and information technology breakthroughs that I’ve experienced to date, there is no question in my mind that the World Wide Web (with browser interface) is the most profound technological invention in the past 50 years.

As we all know, technology continues to develop at a breathtaking pace. For example, in the past 20 years we’ve seen Google, wireless access and devices, smartphones, apps and tablets, 3D interactive games, Facebook and social media, The explosion of innovation and invention continues—wearable, embedded, virtual, intelligent, nano, ubiquitous. I have given entire speeches on the impact and consequence of each of these technologies, but what are the collective lessons learned and implications? I see three:

1. First and foremost, don’t get comfortable—it’s going to continually change, often in ways that we can’t predict. Right now, it’s the time of the smartphone, but will we still be tied to handheld devices in 10 or 20 years? Twenty-five years ago, there was no World Wide Web, Google, smartphones, or apps. What might we expect in the next twenty-five years? The implications for information work and education are profound. We are responsible for educating students to cope in a continually volatile technological environment. The focus cannot be on the technology itself; it must be on gaining skills and understanding that will help individuals and groups to thrive.

2. A second lesson is that technology matters—it does change things fundamentally. For most of human history, including almost all of the 20th Century, the information challenge was to overcome scarcity—to identify and gain access to relevant sources and information to meet needs and solve problems. The Web and search engines have changed all that. The challenge now is to be able to cope with an abundance of information riches that affects how we live, work, learn, and play. Information literacy is more essential than ever, but the fundamental problem has shifted from “find” to “use,” and credibility is key.
3. Lesson three—remember context and integration. Technologies and technology skills are powerful when they are integrated into the information problem-solving process as well as a specific subjects or areas of need. Technologies should not be approached as a laundry list of items to be understood or mastered. Technologies are powerful, many are tools that boost human capacity to think, do, and remember. But, it’s not simply about being proficient in word processing, creating graphics, using search terms, or video communication. It’s about using a technology to more effectively and efficiently accomplish requisite actions in the information problem-solving process, such as word processing for note-taking (use of information) or presenting (synthesis), search terms for identifying and finding sources (location and access), video communication to conduct interviews (use of information) or to share information (synthesis), and so on.

6 Milestone: Information Literacy – 1981 - Present

The last milestone to share centers on information literacy itself. As a high school teacher and library media specialist, I had taught students about selecting quality resources, using search tools, applying criteria, and creating bibliographies. However, I had not formally studied, analyzed, or developed curriculum or programs related to library, research, or information skills.

That changed in 1980, when I was asked to work on implementation of the recently developed New York State elementary level library skills curriculum, and a few years later, when I was asked to serve on the statewide committee charged with creating a new secondary-level library skills curriculum. I remember a series of tedious meetings where we sought to reach agreement on a scope and sequence of library and research skills for secondary school students. I recall feeling discouraged as we spent most of the time identifying and making long lists of resources that students should know about. Finally, I had had enough and voiced my frustrations, “This isn’t really helping our students. Research isn’t just about finding and it’s certainly not about a laundry list of resources. Research is a process and we should be focusing much more on what makes up the research process.” While taken aback, many on the committee were willing to listen as I went on to explain what I meant by process. “Our students need to be able to figure out what they are being asked to do and what types of resources might help them in that. Then they need to select resources, and find them. They also need help in using the sources—reading, skimming and scanning, and recognizing what’s valuable in order to take notes.”

I'd been thinking along these lines for a while, but this was the first time I publicly articulated and advocated for a process approach to library and information skills instruction.¹

Shortly after the curriculum committee's last meeting, I met Bob Berkowitz for the first time at a professional conference. We connected immediately, sharing ideas and finding much commonality of thought and approach. At one point I explained about the work of the secondary level library skills curriculum committee, my concerns, and my description of the process: Task Definition, Information Seeking Strategies, Location & Access, Use of Information, Synthesis. Bob enthusiastically agreed—except he noted I was missing something important: a crucial step in the process—Evaluation. Bob explained that students must be able to evaluate the final result of their work as well as how well they've done and areas for improvement. This was incredibly insightful, and we added Evaluation as step 6 of the process that we called, the Big Six (later changed to the Big6). Bob and I started to work together and published our first book in 1987, *Curriculum Initiative* [5], which offered a full treatment of the Big Six skills and process as part of a systematic approach to developing instruction-focused library media programs. The book was very well received and is still in print. Later, we became familiar with similar efforts by Joyce Kirk and others in Australia [6], and Ann Irving in the UK [7]. We also became aware of the significant work of Carol Kuhlthau and other scholars and practitioners.

Today, the Big6 is one of the most widely adopted and used approaches to information literacy worldwide—used in thousands of educational settings from kindergarten through higher education. Over the years, we refined the Big6 model and approach, adding more depth conceptually and a wide range of practical tools, lessons, units, examples, strategies and tactics for implementation. In our first book, *Curriculum Initiative* [5], Bob and I offered a framework of the Big6 focused on higher-level thinking based on Bloom's Taxonomy. Unfortunately, some educators found this approach difficult to implement. In workshops and conversations, we found that they vastly preferred treating the Big6 as a set of stages and skills within a process framework. A process explanation and framework resonated with the students, was consistent with other curriculum approaches, and was flexible for implementation in different educational contexts. In our next book, *Information Problem-Solving* [8] and in all subsequent work, we frame the Big6 in terms of process and skills.

In terms of lessons learned and implications, my experiences confirm that a behavioral, process-skills approach to information literacy to be meaningful and helpful both conceptually and in practice. Teachers, administrators, parents, and others unfamiliar with information literacy “get it” when you explain information literacy in terms of the skills that make up the information problem-solving process. A process-skills approach is also consistent with a cognitive psychology view of

¹ In the end, the committee didn't quite know quite what to do with me or my points, so they did what most curriculum or standards committees do—they compromised. They retained a resources-focus for the curriculum, and the final document was dominated by lists of resources. But, they also included a section on the research process—adopting my approach and terminology.

problem solving. For example, in the *Handbook of Child Psychology*, DeLoache and colleagues [9], define problem-solving as having four basic elements: a goal, obstacles preventing one from achieving the goal, strategies for overcoming the obstacles, and an evaluation of the process. A skills-process perspective is also compatible with processes of other fields, for example, science (the scientific method), language arts (the writing process), and engineering (design methods).

I am well aware that there are alternative viewpoints of information literacy (SCONUL Working Group on Information Literacy [10]) as well as criticisms of the process-skills approach (Bruce [11], Association of College and Research Libraries [12]). Some of you may be among those in the field who support broadening the conceptualization of information literacy as relational and subject-focused and involving more than a process with associated skills. For discourse and conceptual underpinnings, I am comfortable with discussions of broader, more encompassing definitions that speak to broader issues and conceptualizations of learning, teaching, and education. My concerns, however, are two-fold: losing a focus on “information” in information literacy and difficulties in implementing and using more complex and intricate articulations, for example, the revised AASL standards (2009) [13] and the current effort to revise the ACRL standards (2014) [12].

I am an educator. I have taught information literacy at every level—kindergarten, elementary, secondary, undergraduate, graduate, and in the workforce. I am most concerned with helping students to learn and to fulfill their dreams. I am convinced—from research and 44 years of teaching experience—that students who are information literate are better able to learn, to do, and to succeed. As an information educator, I fully embrace the mission statement of the American Association of School Librarians: that my job is to ensure that students are effective users and producers of ideas and information (paraphrased from AASL 1998 [14]). I often tell audiences that I have a dream—that every student in every educational setting, formal or informal, who is given any task, assignment or test, will “be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information.” [15].

7 Closing

Information literacy—defined as a process and skills, relationally, or otherwise—is essential for every human being on the planet. Regardless of where you live, society is increasingly information-intensive, interconnected, and quickly changing. And, changes in the information landscape are finally starting to affect education in terms of modes of learning, teaching, and schooling. While education is still dominated by a mass-production, factory model that began in the industrial age, I have no doubt its days are numbered due in large degree to a rapidly-developing digital information and technology infrastructure with wide-ranging but flexible capabilities. In such a world, being information literate is not an option—it’s a necessity.

That’s why I am “insanely optimistic” about the future of Information literacy in education and society. We have made great progress since Paul Zurkowski first

coined the term in 1974 [16]. Information literacy is part of the conversation at every level of education, in business and government, and across society. In 2009, US President Barack Obama declared the month of October National Information Literacy Awareness Month stating, “Rather than merely possessing data, we must also learn the skills necessary to acquire, collate, and evaluate information for any situation.” [17]. We’ve come a long, long way and those of us who work in this field should celebrate even as we push to the next level.

In terms of scholarship, there are more research efforts and publications about information literacy than ever. We see conferences and proceedings such as ECIL, journal papers, presentations, and sharing of ideas and examples using the communication and social networking tools of the Internet and Web. A search of all databases at the University of Washington Libraries found 1,746 articles and books about information literacy published in 2013 alone [18]. Dr. Alison Head’s work, Project Information Literacy (PIL), an effort that I’ve been fortunate to have a hand in, is an impressive example of rigorous and multi-faceted investigation of the nature and scope of information literacy and the habits and behaviors of students and early adults in school and work settings.

This is our time! We live in an INFORMATION SOCIETY in which people are increasingly recognizing that information matters. Information understandings, systems, management, organization, tools, processes, policies, and services are central to every aspect of human existence. That’s why schools such as mine, the Information School of the University of Washington, are booming. In 1998, we were a library school with only 5 faculty and 150 students in a single master’s degree program. Today, we have 57 core faculty and 948 students spread across 5 degrees (from undergraduate to doctorate). iSchools are popping up everywhere across the globe—in 2001 there were 5 of us, 10 in 2003; at the iConference last year in Berlin, there were over 30 iSchools represented, and the current (2014) directory of the iSchools Caucus shows 59 members [19]. Information schools are built on an information literacy foundation, and their success and bright future are testament to the centrality and importance of information literacy in our world.

Information literacy is fundamental and essential. There is *nothing* more important or basic to learning and living than information literacy. This is the overwhelming lesson learned from my entire career, and the implications and opportunities are profound. We have a crucial role to play in education and society as champions of information literacy, as scholars adding to what we know about information literacy, and as practitioners providing a wide range of opportunities for people to become information literate.

However, as already expressed, I am concerned that we are getting too far removed from the essence of information literacy. I worry about losing focus and having our core message become diffused. While we are broadening the scope of information literacy intellectually, we aren’t expanding in practice. I work regularly with educators at all levels—elementary through graduate school—and there are still very few information literacy programs that systematically and comprehensively reach every student. Far too often, information literacy educational programs can be characterized as irregular, partial, incomplete, or arbitrary. Some students receive

excellent information literacy instruction, but most receive little or none. Many classroom teachers, librarians, and technology teachers offer excellent lessons on specific skills, tools, or techniques, but very few schools on any level offer a complete program—with clearly-defined goals and objectives, planned and coordinated instruction, regular and objective assessment of learning, and formal reporting of results.

The reasons for this situation are varied and understandable. In some situations there are insufficient staff or limited resources for developing and delivering programs. Lack of space, facilities, and access to technology may be problems. And, information literacy doesn't fit nicely into the current curricular structure of most schools. Most telling, the main reason for irregular or incomplete programs is that the information literacy program is not viewed as a vital part of the school's curriculum program; information literacy is not treated as essential for every student in the same way as reading, writing, science, math, or social studies.

This non-essential status must end! In the 21st Century, reading and writing are no longer sufficient for success in school and work. To succeed in our global information society, students must be able to determine information needs, to find and use information in any form, and to produce and present information for a range of audiences. To me, this is the heart of information literacy, and any student who graduates without these skills is at a serious disadvantage.

It's time to turn this around—and this is my final message to you: accept the challenge of ensuring that every student is information literate. Let's focus our efforts on developing and implementing comprehensive information literacy programs that address the needs of every student. Let's clearly define the specific learning outcomes for each and every student and develop predictable plans for ensuring that each and every student gains those outcomes. Let's also determine and put in place effective and efficient ways of measuring student information literacy competence and report the results throughout our institutions and communities.

I hope that each and every one of you accepts the challenge. How can we best prepare people—individually and collectively—to not only cope but to thrive and to make the world a better place? We all know the answer: help them to become more information literate.

Thank you for listening!

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