Academics' Use of Scholarly E-Journals: A Case of University of the Punjab

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Abstract. The emergence of electronic information resources has made a profound impact on academic scholars, libraries, publishers and information professionals. The use of e-journals has become common in the developed countries. The awareness and use of e-journals is also growing in the developing countries. University of the Punjab provides access to full text e-journals through University Library E-journal Resources (Higher Education Commission's National Digital Library Programme) for faculty members, students and researchers. However, recent studies have also revealed that our researchers use general internet resources and free scholarly journals more than the subscribed high quality e-journals. This study aims to investigate the patterns of using scholarly e-journals and articles among academics of various disciplines. The study will also seek to determine the barriers academics face while consulting e-journals. This paper is based on an ongoing research project and the researcher will report the results of pre-testing. The design of the research study is 'Quantitative' and survey method has been adopted to accomplish the objectives of the study. Keeping in view the study's findings, a strategy might be made to maximize the utilization of HEC e-journals and improved accessibility to academics.

Keywords: Scholarly communication, e-journals, information seeking, digital literacy.

1 Introduction

Developments in information and communication technologies since the latter half of the 20th century have revolutionized almost all spheres of life such as business, industry, agriculture, health and education. Libraries and information professionals have embraced these advancements with the adoption of various forms of electronic information resources (EIR) - web-based catalogs, bibliographic and full-text databases, electronic journals and electronic books. The technological advancements have significantly transformed traditional libraries to hybrid ones.

EIR have overcome the limitations of physical libraries and provide convenience of time, ease of use and 24/7 access to information. Ball [1] stated that the obligation of librarians is "provide to the user in the electronic environment is a service – access to information - not the physical product itself". He also slightly re-paraphrased Ranganathan's five laws of library science presented in 1931 and stated that they are just as applicable to electronic resources as they were for print resources. The first

paraphrased law 'Resources are for use' demands information professionals to maximize the use among their potential users by creating awareness and providing facilitated access to resources.

Electronic resources have become essential for users and consequently a number of studies on assessing use patterns of electronic information resources have been conducted. Literature reviews reveal a growing trend of studying the use of electronic information resources i.e, e-journals, e-databases, and World Wide Web, among students, researchers and faculty. Tenopir [2] analysed more than 200 research studies which were focused on the use of electronic library resources and made significant findings of user behavior and their preferences regarding e-journals. Wong et al [3] in a research report also exhibited trends of searching techniques and preferences of e-resources among business and economics students with reference to subscribed and free internet resources in three UK Universities. Nicholas et al [4] in a two phase research report investigated the information seeking behavior and use of e-journal articles by UK academic researchers. The study provided significant findings of e-journals use patterns in different subject areas, searching techniques and value for money spent on these resources.

Talja and Maula [5] explored the reasons for both use and non-use of e-journals and databases in four scholarly disciplines in Finland. King et al [6] examined the patterns of e-journals use by faculty at three diverse universities in the United States and demonstrated that electronic journals' use is high when available through library collections. Tenopir and King [7] tracked the information seeking and reading patterns of science, technology, medical and social sciences faculty members to examine the ways faculty members locate, obtain, read and use scholarly articles.

The above studies from the USA and UK exhibit the use of electronic journals among faculty, researchers and students as well as their perceptions, preferences and searching patterns. However, very few studies addressed the reasons for non-use of electronic journals in different disciplines. The studies of e-journals' use were mostly for the disciplines of Sciences, Social Sciences, Medical, Engineering, Social Sciences, Arts and Humanities. However, many other academic disciplines - Management Sciences, Law, Commerce and Oriental languages were not focused by researchers.

Studies conducted in the local scenario: Arif and Ameen [8]; Mirza and Mahmood [9]; Rafiq and Ameen [10]; Tahir, Mahmood and Shafique [11]; Tahira, Alias and Ameen [12]; Tahira and Ameen [13] commonly revealed the increasing trend of using EIR among students and academics. Findings showed that general Internet resources and open access scholarly journals were preferred sources in comparison to the subscribed databases and journals for users' academic and research information needs. The academics' trends of e-journals use and barriers associated with the use in Pakistan were not studied. Scholarly e-journals are an important channel of information communication and researchers make heavy use of them for research and academic tasks. Faculty contributions to research output are a core function of a university. There appears a need to investigate academics' use of e-journals as well as their preferences in this regard.

2   Research Questions

1. How do academic staff access and search e-journal articles?
2. What kinds of barriers do the academics experience while using e-journals?
3. What are the suggestions to maximize the utilization of HEC e-journals?

3   Literature Review

An extensive review of literature on the use of e-journals showed that researchers investigated the use patterns of scholarly e-journals among faculty staff, researchers and students in the disciplines of Sciences, Medicine, Engineering and Social Sciences. Researchers reported the increasing use of e-journals and found that there is a rapid growth in the number of e-journals since its inception from 1990's and users' preferences also going through gradual transition from print format to electronic.

Borrego et al [16] found that the awareness of e-journals was increasing among academic staff and the use of electronic journals increased with time. Researchers exhibited the fact that users' preferred medium was e-journals and their acceptance is gradually increasing especially among students, researchers and faculty (Nicholas and Huntington [17]; Borrego et al [16]; Bar-Ilan, Peritz and Wolman [18]). Tenopir [2] in a comprehensive study found that faculty and students readily adopt electronic resources if they were perceived convenient, relevant and time saving for their natural workflow. She also ascertained that the use of electronic information resources is dependent on users' age, discipline of study and gender.

The factors that affect the patterns of use were examined by Eason, Richardson and Yu [19] and they concluded that "the contents (both coverage and relevance) and ease of use of a system as they were perceived by the user were the most important significant factors affecting patterns of use". Bar-Ilan, Peritz and Wolman [18] also found that disparities were found between the usage patterns in the different disciplines.

Above studies presented findings of electronic journals use patterns in developed countries. Studies were also conducted in developing countries like Taiwan, India, and Bangladesh. Wang [20] conducted a study of Social Scientists' information seeking and use of scholarly journals in Taiwan. He concluded that Social Science faculty relied more on electronic journals than print journals and their main source of accessing e-journals was library database collection.

Studies related to the use of electronic information resources were conducted in Pakistan. Arshad and Ameen [21] depicted in a transactional log analysis study of a University Library web site that free scholarly journals and articles are the predominant reason for using the library website. It was interesting to find that a university library website provided access to both free scholarly journals and subscribed journals through HEC Digital Library Programme had more usage of free scholarly journals as compared to e-journals of HEC. The usage of web site had also significant off-campus use.

More use of general web resources than subscribed HEC e-databases was also reported by Tahira [23] in a study of information needs and seeking behavior of Science and technology faculty members and concluded that users preferred general web sources more than both HEC online subscribed databases and library's print

subscriptions for obtaining information from journals. The reason of lower use of HEC journals than free scholarly journals might be that free scholarly journals can be accessed off-campus and even at home, but full text access to HEC journals is limited to on-campus residents only.

The literature presented significant findings on the use of e-journals and databases in the academic environment. The majority of the studies showed the adoption of e-journals by students, researchers and faculty members and an increasing trend of using electronic journals in comparison to printed journals in both developed and developing countries. The use of electronic journals is dependent on age, discipline, ease of use, relevance and accessibility. Both quantitative and qualitative studies were conducted to investigate the use of e-journals. Many studies were found regarding the use of e-journals and very few studies investigated reasons of non-use of e-journals among researchers and academics.

3.1   Faculty's Access to E-Journals at University of the Punjab

University of the Punjab (PU), established in 1882 at Lahore, is the oldest and largest institution of higher learning in Pakistan. The University has five campuses, ten constituent colleges and over 818 permanent and contractual faculty members. It offers Ph.D., MPhil, MS and BS programmes in 12 different faculties i.e., Sciences, Life Sciences, Engineering & Technology, Social Sciences, Humanities and Oriental Learning [14].

Academics in the University engage in teaching and research. Faculty members have desktops and internet provision in their offices as well as in departmental libraries and the central library of PU. Academics use open access (OA) e-journals accessible through the web; however, University library also provides access to e-journals available through Higher Education Commission's National Digital Library Programme (NDLP) to public and private Universities in Pakistan to meet the scholarly needs of faculty.

HEC National Digital Library Programme (NDLP) was launched in 2003 to provide researchers within public and private sector Universities in Pakistan the high quality, peer-reviewed journals, databases, articles and e-Books across a wide range of disciplines. Usage statistics of HEC's e-journals since the launching of National Digital Library Programme in 2003 till now depict a gradual increase in the use of e-journals in public, private, research and non-profit organizations of Pakistan. HEC provides e-journals in the disciplines of Sciences, Engineering, Computer Technology, Social Sciences and Arts and Humanities [15].

4   Significance of the Study

E-journals are an important channel of scholarly information communication. There is a need to explore the use of e-journals among various faculties in an academic setting. The study's findings will help to know the academics' trends of e-journals' use, reasons of less use of subscribed journals and barriers in the effective utilization of e-journals. While considering the study's findings, a strategy might be made to maximize the utilization of e-journals and arranging instruction programmes for

academics. The study will provide academics' use patterns in different faculties - Sciences, Social Sciences and Arts and Humanities that will help to provide suggestions for the entire community. It will also help to know the various means of accessing, identification and location of e-journal articles. The needs for digital literacy skills to use e-journals will also be identified. The findings will be important for Punjab University librarians particularly, and for other universities' librarians in general. It is expected that the outcome will facilitate academics, researchers and students in their research output.

5   Methodology of the Study

The design of the present study is quantitative and survey method has been employed, as Creswell [23] enumerated that "a survey design provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population". This study will seek to determine trends of e-journals use; therefore the survey method will be most appropriate to achieve the objectives of this study.

Population in the present study is the faculty members of 12 faculties of the University of the Punjab. The faculty of medicine and dentistry has no on-campus academic staff and students; therefore, it will not be included in the study. The total population of academic staff working on permanent, contract and visiting basis is more than 1,000. Targeted population of the study will comprise full time academic staff working on permanent and contract basis in 12 faculties, which total 822 according to the list provided by University administration. Among these 822 staff, 132 faculty members are on leave. The researcher will approach all the academic staff working on regular and contract basis to investigate the use of e-journals among different faculties for comparative analysis.

The research instrument of this study is a self-administered questionnaire.

Content validity is important especially for a new established instrument; therefore the questionnaire was sent to subject experts and Social Science researchers for comments. Minor modifications were suggested regarding content, scale and layout of questionnaire. However, no suggestions were made to delete or add any part to the questionnaire.

5.1   Pretesting of the Questionnaire

The questionnaires were sent to faculty members of Gujranawala amd Jhelum campuses working on permanent and contract basis for pre-testing. Questionnaires were distributed to faculty members of Law, Commerce, Information Technology, Social Science and Humanities disciplines. About 15 questionnaires were returned. The data was entered in SPSS 21and reliability of questionnaire items with Likert scale was measured and established.

6   Data Collection and Data Analysis

The researcher personally visited departments, colleges and institutes of University of the Punjab. Questionnaires were distributed to academics that were found available in their respective departments. Library professionals were mediators in this entire data collection process; they distributed and collected questionnaires to faculty members with whom the researcher could not meet. Data collection is still in process; therefore the results of pre-testing are reported here. Data collected was analysed using SPSS 21 and 'Descriptive' statistics were applied to analyse data. Five point Likert scale categories were combined to three. The responses of [Frequently and Very frequently] were combined to 'More Frequently' while [Never and Rarely] were combined to 'Rarely' to simplify the results.

7   Results of Pre-Testing

7.1   Use of Electronic Information Resources

Respondents were asked about the use of formal and informal information sources for their research and teaching tasks. Table 1 depicts that the majority of respondents (86%) use search engines more frequently than all other sources. Discussion with colleagues and electronic research reports were also found important sources of information by most of respondents (79%). Respondents were also making considerable use (64.3%) of library print sources – books, journals and research reports along with other electronic sources. Among print, electronic and informal sources of information 'E-Journals' use was least among respondents.

Table 1. Use of electronic information resources

Information Sources	Rarely %	Occasionally %	More Frequently %
Search engines (Yahoo, Google, ...)	7	7	86
Search engines (Yahoo, Google, ...)	7	7	86
Discussion with colleagues / peers	21	-	79
Electronic research reports	-	21	71
Library print sources (Books, Journals, …)	14	21	64
Online indexing and abstracting services	7	36	57
Online reference sources (Encyclopedias, Dictionaries, …)	14	29	57
Electronic books	-	43	57
Electronic theses and dissertations	-	29	57
Electronic journals	7	36	50
Any other source (Please specify)	14	-	28

7.2   Accessing E-Journal Articles

Academics were accessing e-journal articles from various sources and Table 2 depicts the means of accessing e-journal articles through the web. It was interesting to find that majority of respondents (86 percent) were accessing e-journal articles through 'Google Scholar' followed by general search engines – Yahoo, Google and Alta Vista

and Open Access E-Journals websites. The use of high quality subscribed e-journals use was less than all sources of e-journals.

Respondents were accessing open access e-journal articles more than Higher Education Commission (HEC) subscribed e-journals. The results of pre-test confirmed that respondents are using sources of e-journal articles that are freely available and are convenient to use.

Table 2. Sources of access to e-journal articles

Sources	Rarely %	Occasionally %	More Frequently %
Articles through Google Scholar	-	7	86
General search engine (Google, Alta Vista….etc.)	-	29	64
Open access e-journals websites	21	14	50
Provided by a colleague	21	29	43
Articles on author's personal website	29	29	36
Journals subscribed by Department	28	29	36
Personal subscription	36	21	36
Full text databases (Medline, PsyInf, ….)	29	21	36
Higher Education Commission e-journal collection	36	21	28
Any other source (Please specify)	21	-	21

7.3   Methods to Become Aware of E-Journal Articles

Respondents become aware of their desired e-journal articles through various approaches such as browsing, searching, e-mail alerts. Table 3 depicts the academics' methods of getting aware of e-journal articles. Picking titles from the reference list of publications and 'Searching' were most used methods. However, the method of e-mail alerts of chosen journal was less used among respondents.

Table 3. Methods to become aware

Methods to become aware of articles	Rarely %	Sometimes %	Very Often %
By picking relevant titles from the reference list of other publications	7	7	64
Searching (i.e. by author or title)	7	21	57
Recommendation by a colleague	21	7	57
Browsing through issues of e-journals	-	36	50
Through e-mail alerts of chosen e-journals	36	29	21

7.4   Web Literacy Skills

Table 5 depicts the academics web literacy skills of respondents particularly while using e-journals. It was found that all respondents were highly aware of search engines and they were quite capable of accessing e-journals through WWW. However, they did not have enough skills to make effective use of 'Advanced Searching Techniques'.

Table 4. Web literacy skills

Web Literacy Skills	Poor %	Satisfactory %	Very Good %
Awareness of search engines to find e-journals and articles			100
Accessing e-journals and articles through WWW effectively	7	14	78
Evaluation of the quality of an e-journal	14	14	71
Familiarity of full text databases of e-journals (Elsevier, JSTOR, Emerald)	7	43	90
Effective use of advanced searching techniques to retrieve relevant articles.	28	29	43

7.5   Searching Strategies

Academics were employing different search strategies to retrieve e-journal articles. They were frequently employ 'Title' words to retrieve e-journal articles, then keyword, and author name was least used.

Table 5. Search strategies

Search features	Rarely %	Sometimes %	Most Often %
Title words	7		79
Keyword searching	7	21	57
Author name	14	43	29

7.6   Barriers to E-Journals Use

Respondents were also asked about the barriers they face while accessing, searching and consulting e-journals. Table 6 shows that 'Payment of e-journal articles not available through HEC' greatly affected these academics. They also felt the need of training and instruction programs for effective use of e-journals. Slow internet speed and difficulty in reading text on computer screens were factors that lead to non-use of e-journals by hindering access to e-journals.

Table 6. Barriers to e-journals use

Barriers	Only a little %	Moderate %	Extremely %
Payment for e-journals and articles which are not available through HEC.	14	7	71
Lack of training and instruction programmes for effective use of e-journals	29	21	50
Difficult to read text on computer screen.	28	29	43
Slow internet speed	36	21	36
Availability of too much information through e-journals is creating information overload for me.	50	14	36
Unaware of reputed e-journals in my field.	57	7	29
It is time consuming to search and find the relevant articles.	29	43	21
Back issues of relevant e-journals are not available.	43	36	21
Lack of technological skills	57	21	21
Lack of searching skills	71	7	21
My subject area is inadequately covered in e-journals.	64	29	7

8   Findings and Discussion

There is a growing trend of using electronic information sources (EIS) among academics of various disciplines – Law, Commerce, Information Technology, Arts and Humanities and Social Sciences. They are using electronic information sources more than library print sources - books, journals, theses, and reference sources for their research and teaching tasks and it shows a transition from print sources to electronic information sources. However, the use of print sources still persists among faculty members.

Academics are quite aware of 'Google Scholar' and other search engines and have enough literacy skills to access and evaluate e-journal articles. However, they are not fully familiar of full text databases of e-journals like Emerald, Elsevier and JSTOR. They also lack enough skills to effectively use advanced searching techniques. They need instruction programmes for searching e-journal articles, especially the use of advanced searching techniques. Academics become aware of e-journal articles by picking titles from reference list of publications and searching. E-mail alerts of chosen journals are not a popular method among academics. They use 'Title words' mostly to retrieve e-journal articles.

Academics are accessing e-journals and articles from open access sources. They are frequently accessing e-journal articles from 'Google Scholar', General Search Engines and Open Access e-journal websites. It indicates that academic staff use sources that are available 24/7 both at home and University departments, and are convenient to use. Hemminger, Lu, Vaughan and Adams [24] also reported that academic scientists use open access sources to meet their information needs. However, the use of Higher Education Commission subscribed e-journals is much less than all other means of accessing e-journals. In fact HEC e-journals have restricted access to on-campus only and academics cannot consult them at home. 'Google Scholar' and other search engines provide users one stop shopping – they get e-journal articles through one interface only. University e-journal collection has databases – Emerald, Elsvier and JSTOR with different interfaces and users may find it difficult to search through different databases.

The barriers affecting academics' effective utilization of e-journals are payment of e-journal articles not available through HEC, lack of instruction and training programmes and slow internet speed. The university's main library and information professionals need to publicize HEC e-journal databases – Emerald, JSTOR, Elsevier etc. and arrange instruction programmes to enhance digital literacy skills of academics. Training and digital literacy programmes should be conducted on a continual basis to familiarize academics of high quality peer reviewed e-journals accessible from the university library e-collection. Assessment studies on learning of digital skills will also help instructors to plan literacy programmes according to academics needs.

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