The Use of e-databases and e-journals by Research Scholars in Pakistani Universities: An Evaluative Study

Muhammad Ismail[*], Amjid Khan[†], & Shamshad Ahmed[‡]

Abstract

This research was conducted to achieve three objectives; 1) to investigate the usage and acceptability of e-databases and e-journals among the research scholars in selected universities of Pakistan, 2) to indicate the preferred information resource being used by researchers, and 3) to explore barriers faced by them when consulting these resources for research endeavors. Out of a total population of 4282, a sample of 1031 respondents from four major disciplines were used for the study. The research tool used in the collection of data was a closed ended questionnaire. Key findings of the study revealed that most of the respondents accessed e-databases and e-Journals "2-3 times" a week, and have widely accepted the "importance" of these resources in research activities. In addition, the respondents usually preferred to use electronic databases, e-books and e-journals (open access) over printed collection. Though, restrictions on e-resources, slow internet connection, students' awareness and training were the major obstacles in using e-resources effectively.

Keywords: Online information use, E-databases usage, e-journals usage, research scholars, accessibility issues, universities, Pakistan

Introduction

There is a worldwide recognition of the use of e-format of information for education as well as research purposes. The provision of speedy access of electronic information to researchers is a pre-requisite for promoting research culture. Electronic information resources (EIS) are highly supporting both teaching and research activities in the academic institutes (Zhang, Ye, & Liu, 2011). Electronic journals are playing a key role in promoting learning, research and innovations, especially in developing world (Sharma, Singh, and Sharma (2011). With the passage of time these resources are becoming more important for research scholars to fulfill their information needs (Adegbore, 2011). Because, these resources provide authentic and reliable information to their potential users (Rekha & Madhusudhan, 2009). Hetreck (July/August 2002) stated that e-resources

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and e-databases are of prime importance in maintaining scholarly communication among academicians and researchers.

Researchers have documented three revolutionary phases of electronic journals. The first evaluation phase of e-journals was initiated in 1970s and remained until the 1990s (Dilek-Kayaoglu, 2008). The first free e-book made by Guttenberg in 1971 was a paradigm shift toward the provision of information services to end users into electronic formats. Thus, libraries built after 1995 are known as "intellectual information centers" where information technology and people interact with each other (Bazillion, 2001).Some exceptional digitization projects (e.g. Mercury Campus Digital Library 1987-1991, American Chemical Society 1991-95s) started in the developed countries were a massive move from print to electronic format of information (Arms, 2005) .

The second period was started in 1990 when the internet was used to publish and disseminate electronic journals. The MIT Press, Academic Press, University Press and Library of Congress (1989-1994), Wiley, Science Direct and JASTOR's (1995) e-databases and e-journals programs are the best examples of such evolution (Arms, 2005). The third phase started after 2000, where electronic journals were produced with full searching features (Carol Tenopir et al., 2003). Moreover, Carol Tenopir et al. (2003) reported three revolutionary periods of electronic journals' use by scholars; an initial phase (1999-1993), a developing phase (2000-2002), and innovative phase (2001-2002). This technological change (www) has forced academic libraries to make the provision of information in a more flexible environment than the traditional library system (Atkinson, 1996). This will facilitate potential users to retrieve their needed information quickly (Bali, 1997). Keeping in view the emerging trend of adopting the electronic format of information resources worldwide, the Pakistan Higher Education Commission (HEC) in 2004 has launched access program to 30 online databases and over 45,000 e-books to all universities and nonprofit research institutions to meet the diversified needs of academicians and researchers in the country. According to HEC (2012), nearby 75,000 electronic contents were available online, which is a unique example of country level access to e-resources in developing countries (Said, 2006).

Literature Review

Perception of Users about the Usage of Electronic Databases and E-journals

The emerging concepts of e-databases and e-journals followed by increasing awareness have changed the mode of learning and research in the academic institutes (Owolabi, Ajiboye, Lawal, & Okpeh, 2012). Previous studies showed that teaching staff and researchers used e-databases and e-journals for various information needs as they provide quick access to updated and reliable information (Borrego, Anglada, Barrios, &

Comellas, 2007). In addition, Salisbury, Vaughn, and Bajwa (2004) examined the usefulness of e-resources among the teaching faculty at the University of Arkansas libraries and found that quick access; ease of use; and convenience of accessing e-journals 24/7 from home or offices were the main reasons that attracts them towards the usage of these resources.

Preferred Sources for Research Needs

Bar-Ilan and Fink (2005) found that about 80 percent of the respondents preferred to use e-format of information resources and inclined towards adopting e-journals. Similarly, Bhardwaj and Walia (2012); Salisbury et al. (2004); Kortelainen (January 2004) found that most of the users preferred to use e-format of information over conventional resources for various academic needs. According to Voorbij and Ongering (2006), the teaching faculty at Dutch institutes were consulting e-resources and realized its impact on science and social science disciplines. Shill and Tonner (2003) found that most of the respondents rely on the usage e-resources such as e-books, e-journals and e-newspapers for academic and research needs.

Borrego et al. (2007) reported that the teaching faculty of biomedicine, natural and engineering scientists consulted e-resources for academic and research purposes. On the other hand, it was found that humanities and social science researchers still preferred to use printed collection. This usage pattern is almost similar among the potential users in the Punjab University, Pakistan (Tahir, Mahmood, & Shafique, 2008). According to Abdul Mannan and Naved (2009), the usage of e-journals has enhanced the research productivity in Indian universities. Moreover, Tenopir (2003) explored that the allocation of the budget for the subscription of printed journals continues to decrease, because users rely more on e-databases and e-journals to fulfill their academic and research needs. Egberongbe (2011) observed that most of the respondents at the University of Lagos used e-resources, because e-resources updated them about new progress in their respective disciplines. In a study, Kurata, Matsubayashi, Mine, Muranushi, and Ueda (2007) examined the role of e-journals in research productivity of science, technology and medical disciplines in the academic and research institutions at Japan. The study results indicated that the majority (70%) of researchers' preferred e-format of articles for research work, 78.2 percent Physicists seemed to be less fervent, although they still preferred printed format of information. Moreover, the respondents used both printed as well as e-format of journals, though they recognized the importance of e-journals for scholarly publications. Consequently, Dilek-Kayaoglu (2008) found that most of the researchers in Istanbul University, Turkey used e-journals equal to printed journals. However, they preferred to use e-journals over printed collection.

Cassidy, Martinez, and Shen (2012) evaluated the use of e-books at Sam Houston State University (SHSU), East Texas. The findings have shown that up to 31 percent of users' preferred to use printed books while 28 percent preferred to use e-books for their information needs. The study concluded that tangible format of books were still on top priority for them to use. Recently, Tahira (2012) examined the trends and practices of using e-scholarly information among science faculties in higher education in developing countries. She found that respondents preferred to use electronic format of subscribed as well as open access e-journals to meet their information needs. However, the usage of these resources was not up to the maximum level. It was also found that subscribed databases by parent institutes have been considered of high quality, but were not used extensively by them.

Factors Affecting Access to E-databases and E-journals

Ghosh (2009) reported access problem, and insufficient instruction program, while McMartin et al. (2008) noted time barrier in the usage of e-resources. Byrnes and Rosenthal (2005) indicated lack of query formulation. In addition, incompetent library staff, information literacy deficiency, lack of computers also affecting the usage of e-resources (Abdul Mannan & Naved, 2009; Nasser Al-Saleh, 2004). According to Kumar, Roy, and Satija (2011), the lack of training programs for users of digital library resources is still a major issue. Another study of Owolabi et al. (2012) concluded that the bandwidth problem was a major hindrance in accessing e-resources. Bar-Ilan et al. (2003) concluded that some respondents complained about the (a) coverage of e-journals, (b) missing of various databases, (c) lack of coverage, (d) lack of access, and (e) low readability issues in accessing these resources.

Problem Statement

The role of researchers in the promotion of research productivity has been recognized all over the world. For this, they always required to have a quick access to high quality and authentic information resources as well as assessing their information needs on interval basis. In the Past, majority of Library and Information Science (LIS) researchers in Pakistan have evaluated users' experiences with e-resources, e.g. (Ameen & Rafiq, 2009; Arif & Kanwal, 2009; Hussain & Mahmood, 2012; Hussain, Mahmood, & Shafique, Spring, 2008; Khan & Ahmed, 2013; Malik & Mahmood, June, 2009; Midrar, 2007; Rafiq & Ameen, 2012; Said, 2006; Tahir, Mahmood, & Shafique, 2008). Though, these studies were carried out in different periods and were limited to a specific category of users, no emphases were given to ascertain the researchers' views with the usage of e-resources in Pakistani institutions. Hence, it is highly important to evaluate the use of HEC e-resources among the researchers in Pakistan.

For this purpose, this study was conducted to see whether researchers adopting these resources for research needs with additional aims to; identify researchers' perceptions, use of preferred resources for research and hindrances being faced by them while using these resources. The results of this study will help the HEC authorities (policy and decision makers), university administrators and LIS professionals to redesign their policies in order to extend the provision of these resources to potential users in future. The outcomes of this study are valuable to LIS community as it contributes to the body of existing knowledge on e-resources usage in a developing country including Pakistan.

Objectives of the Study

This study was conducted:

1. To know researchers' perceptions about HEC e-databases and e-Journals.
2. To find out preferred resources being used by researchersfor fulfilling their research needs.
3. To determine the barriers faced by research scholars during the usage of HEC e-databases and e-journals.

Methodology

This study was conducted to examine the respondents' experience towards the usage of HEC e-databases and e-journals by following a quantitative survey research design. A Quantitative method was adopted because it has been used widely in similar LIS studies. The population of the study comprised MS/MPhil & PhD researchers enrolled in the public sector universities of Khyber Pakhtunkhwa, Pakistan. A close ended questionnaire was distributed randomly to a sample of 1031 (out of 4282) scholars at these universities. The sample included 397 social science researchers, 246 engineering scientists, 208 applied science researchers and 180 agricultural scientists. Out of 1031 distributed questionnaires, 981 were received back dully filled in with a response rate of 95.2 percent, varying from 393 (40.1%) for the Social researchers, 230 (23.5%) for the engineering scientists, 198 (20.0%) for the applied science researchers and 160 (16.4%) for the agricultural scientists (Table 1). The questionnaire contained respondents' demographic information such as gender, age group, degree level, discipline and their working institutions and the university attended by them. The topics of the questionnaire were respondents' knowledge about the HEC e-databases and e-journals, frequency of use, use of preferred resources for research and the barriers faced by them in the use of these resources. The Statistical Package for Social Sciences (SPSS-19 for Windows) was used for quantitative data analysis.

Results

Participants' Profile

The data analysis showed that fifty six percent (n=548) males while 44 percent (n=433) females participated in the survey (Figure 1). Out of them, 60.8 percent (n=596) aged 22-30, 27.9 percent (n=274) aged 30-40; 9.3 percent (n=91) aged 41-50 while 02 percent (n=20) aged 51-60 years (Figure 2).In addition, 75.7 percent (n=743) of them pursued a Master degree, followed by 24.3 percent (n=238) of the respondents who pursued doctorate degree (Figure 3).

PARTICIPANTS' PERCEPTIONS ABOUT HEC E-RESOURCES

Figure 4 shows that most of the respondents i. e. 535 (54.5%) were aware (middle level) about the use of HEC e-databases and e-journals while 429 (43.7%) were partially aware (limited). On the other hand, 16 (1.6%) of the respondents were not aware while only one (0.1%) respondent showed extreme understanding with the use of HEC e-databases and e-journals.

HEC E-resources access frequency

Figure 5 indicates that 37.9 percent (n=372) of the participants accessed the HEC e-resources two to three times a week, 22.1% percent (n=217) accessed these e-resources on need bases, followed by 20.3 percent (n= 199) who accessed them on weekly basis for research purposes. In addition, 18.2 percent (n=179) of them accessed these resources on daily while 1.4 percent (n=14) accessed them on monthly basis for their research needs.

Participants' Usage of the HEC E-resources

The descriptive statistics in Table 2 demonstrate that majority of the respondents often consulted HEC databases and open access journals (mean= 3.87 and 3.65, respectively). They occasionally used open access e-books and e-brary collection for research activities (mean= 3.14 and 3.01, respectively). In Table 3, it was noted that the HEC databases, e-books, open access e-books and open access e-journals were useful resources for respondents' research activities with a mean score of 4.28, 3.95, 3.73, and 3.64, respectively.

Usage of Preferred HEC E-Resources for Research Needs

As given in figure 6, it was found that a vast majority of the respondents (n=956, 97.5%) preferred e-databases, 874 (89.1%) of them preferred Open Access Journals and 871 (88.8%) of them preferred to consult e-brary collection for their research endeavors. A vast majority 829 (84.5%) of the respondents preferred Open Access e-books, 729

(74.35%) of them preferred printed books while 538 (54.8%) of them preferred printed journals for their research studies.

Preference for HEC E-databases and E-journals over Conventional Materials

Descriptive statistics in Table 4 illustrates that majority of the respondents usually preferred e-databases, e-brary (e-books) and open access journals over printed resources for research work with a mean score of 3.94 and 3.84, respectively).

Issues in the Usage of HEC E-Resources

The IP based access to HE e-resources, internet connection issue, lack of familiarity with the usage of these resources, and insufficient training were the key issues in the usage of HEC e-resources and services for various research purposes (mean = 4.31 and 4.08, 3.78, and 3.62, respectively). Moreover, the respondents reported that the restriction on journals' archives and non-availability of the most relevant journals also affected their research progress with a mean score of 3.51 (Table 5).

DISCUSSION

The findings show that majority of the respondents (56%) who participated in this survey were males, as the enrollment ratios of male researchers are greater than females in target universities. The survey population was scholars from social, engineering, applied and agricultural sciences who are known to be "heavy users" of databases, electronic journals and other electronic media(Bar-Ilan & Fink, 2005; Bar-Ilan, Peritz, & Wolman, 2003; Mammo & Ngulube, 2013; C. Tenopir et al., 2003; Tenopir, Wang, Zhang, Simmons, & Pollard, 2008; Warraich & Kanwal, 2008), which may confirm our findings to a certain extent.

The outcomes of this survey reveal that most of the respondents (54.5%) were aware (middle level) about the use of HEC e-databases and e-journals while 43.7% of the respondents were partially aware (limited level) about these resources (Figure 4). This awareness shows that these resources have been accepted and used by the researchers to fulfill their research needs. These results also verify findings of (Bar-Ilan& Fink, 2005; Bhatt, 2010; Mirza & Mahmood, 2012; Nisha & Pm 2012) who found that most of the respondents had knowledge about the use of e-resources. In our coherent, majority (37.9%) of the respondents accessed the HEC e-databases and e-journals 2 or 3 times a week while 22.1% of them accessed these resources only when needed. These findings also conform Dilek-Kayaoglu (2008) results. Moreover, this survey indicates that most of them often used the HEC e-databases and e-journals (Table 2), and knew the importance of them in promoting research activities in their respective field of study (Table 3). These results support (Dilek-Kayaoglu, 2008; Mammo & Ngulube, 2013;

Mirza & Mahmood, 2012; Said, 2006; Warraich & Kanwal, 2008) findings, where they found that respondents gave immense importance to e-databases and electronic format of journals. These are common resources consulted by respondents to fulfill their academic and research needs. This shows that research scholars are much comfortable with these resources.

The researchers usually prefer to consult HEC e-resources covering the conventional format of books and journals (Table 5). This preference for HEC e-databases and e-books support the findings of Kurata, Matsubayashi, Mine, Muranushi, and Ueda (2007), who found that researchers at Japani research institutions preferred to use e-resources over printed materials. The study of Smith (2003) concluded, that science and social science scholars preferred to read journal articles in electronic format. However, the results of this study are not in line with the findings of Cove (1999), who found that users still prefer reading from print format due to the easy access; prolong reading and flexibility. These findings also confirmed the increasing trend of using e-databases and e-journals among the users due to its flexible formats and retrieval features (Lee & Boyle, 2004).

In addition, an attempt has been made to find out barriers being faced by respondents when using the HEC e-databases and e-journals. In Table 5, the findings show that access restriction on e-databases and e-journals out of university premises "low speed of internet", and "lack of knowledge were the major issues with the usage of these resources. Moreover, no or little access to the archive and non-availability of most frequent journals were found to be the main barriers faced by the respondents while using these resources more effectively. This indicates that such barriers could affect the quality and quantity of respondents' research output (Khan, Ahmed, & Masrek, 2014). Some local studies conducted by Pakistani authors have also pointed out these problems in the context of Pakistan universities, e.g. (Arif & Kanwal, 2009; Khan & Ahmed, 2013)

Based on the respondent opinions, the following suggestions are presented to further improve the use of HEC e-databases and e-journals in the academic institutions of Pakistan.

Recommendations

1. HEC authorities and university library administrators should formulate promotional and marketing policies to expand the usage of e-databases and e-journals in the academic libraries.

2. Restrictions on the usage of e-resources should be eliminated and information literacy work should be started on HEC e-resources' usage as a part of MS/MPhil and PhD programs.

3. Library administrators should evaluate the usage of HEC e-resources on a regular basis by gathering researchers' opinions as they are the best clients of these resources.

4. The digital library developers and library professionals should further improve the use of online help and query operators which could aware the research scholars about the special features of these resources. It will help the researchers discover efficiently and effectively the needed information.

5. The LIS professionals, LIS schools and professional associations should extend the usage of e-resources by conducting orientation seminars, workshops etc in the academic institutions.

Conclusion

Keeping in view the emerging concept in the use of e-resources for academic and research needs, this survey was carried out to evaluate the use of HEC e-resources by researchers with major aim to examine whether the researchers prefer and adopt these resources for research activities. In order to meet these objectives, a questionnaire-based descriptive survey was conducted to solicit respondents' views. Out of 4282 population, a sample of 1031 researchers was randomly selected from the discipline of social, engineering, applied and agricultural sciences with a response rate of 95.2% (981).

The previous research studies showed that a vast majority of scientists and academicians were adapting e-resources for different purposes. The findings of this study seem to verify this trend among the researchers in the academic institutes of Khyber Pakhtunkhwa, Pakistan. The results regarding the researchers' awareness with the HEC e-databases and e-journals were also encouraging. More than 54% of the researchers were found to be aware about the use of these resources. On the other hand more than 43% of the respondents had little understanding of the use of these resources. This lack of awareness among the respondents shows that they were unfamiliar with these resources. Based on the findings of this study, it can be said that they accept and support the conversion from conventional sources of information to e-resources for research endeavor. The findings regarding the format preference were also found to be highly encouraging and showed researchers' trends towards the adaptation of e-databases and e-journals. However, they faced some problems in the usage of these resources which affect respondents' research progress and diminish research productivity.

The outcomes of this survey will enable competent authorities, university librarians and LIS professionals to further explore the tendency of research scholars towards adopting e-resources for learning and research purposes. In the context of Pakistani academic

institutes, little studies have been conducted to examine the usage of e-resources (e.g. e-databases and e-journals). Hence, there is a need that comprehensive users' studies need to be carried out to provide a holistic view on the usage of the e-resources and services in an academic setting. In addition, future research studies should be conducted on an interval basis to cope with the rapidly changing formats of information resources and services in this digital age.

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ANNEXURE

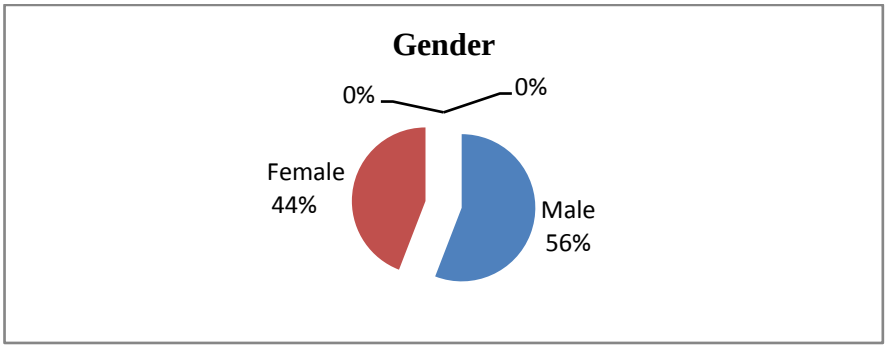


Figure 1Participants' Gender (n=981)

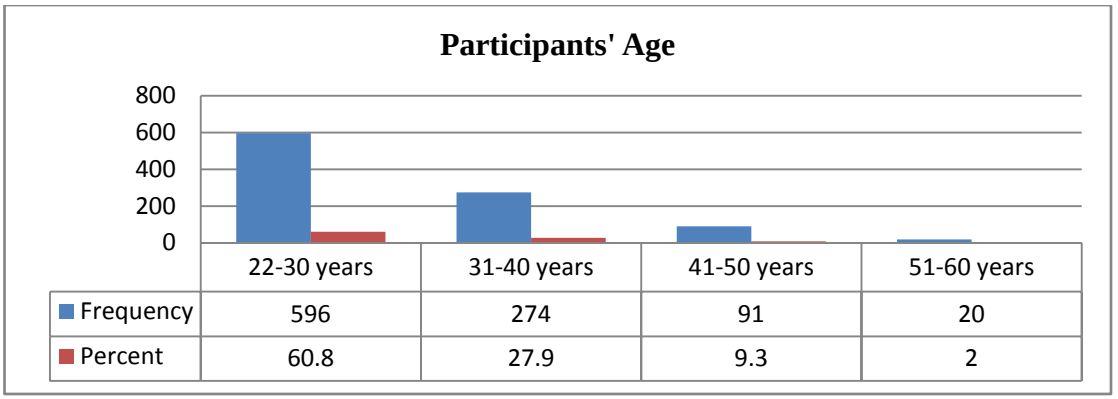


Figure 2 Participants' Age (n=981)

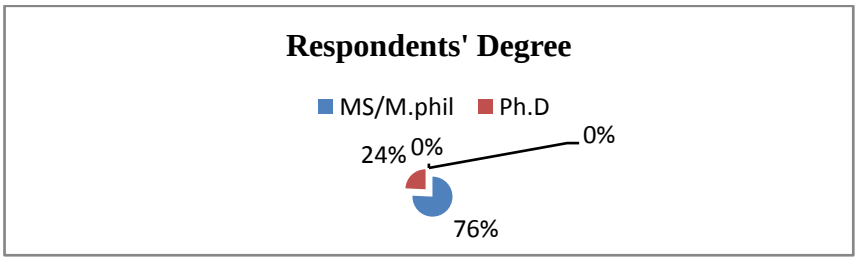
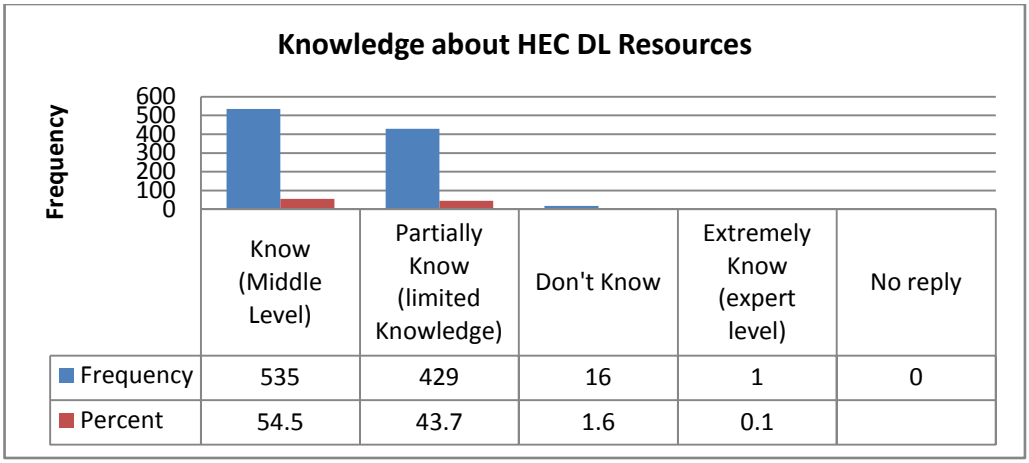
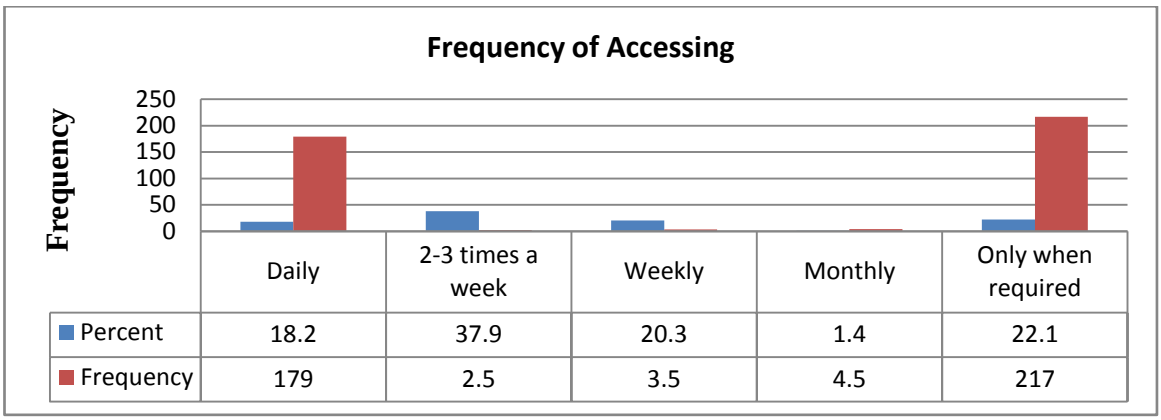


Figure 3Participants' Degree (n=981)



	Know (Middle Level)	Partially Know (limited Knowledge)	Don't Know	Extremely Know (expert level)	No reply
Frequency	535	429	16	1	0
Percent	54.5	43.7	1.6	0.1	

Figure 4Respondents' Knowledge about HEC E-Databases and E-journals (n=981)



	Daily	2-3 times a week	Weekly	Monthly	Only when required
Percent	18.2	37.9	20.3	1.4	22.1
Frequency	179	2.5	3.5	4.5	217

Figure 5Respondents' Opinions about Accessing HEC E-Databases and E-journals (n=981)

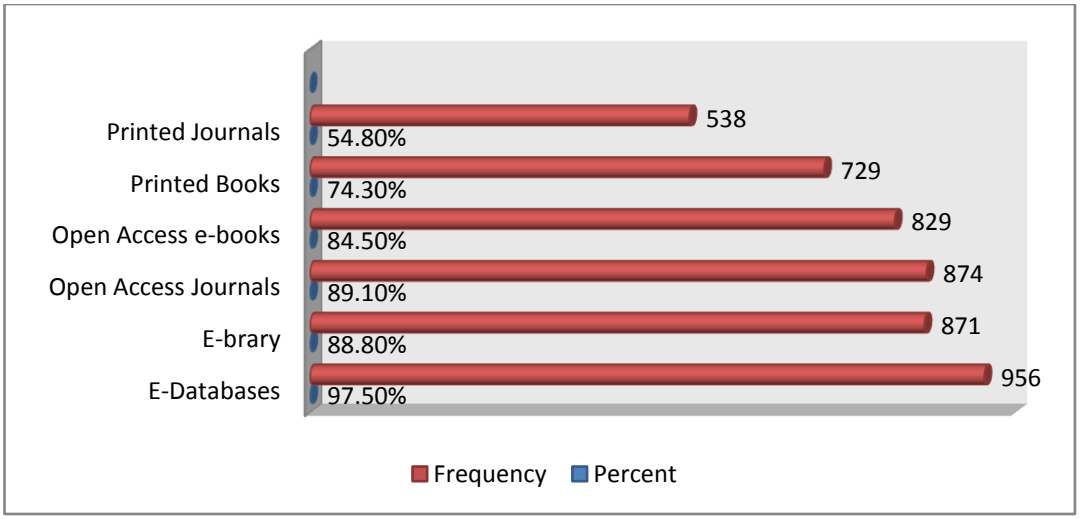


Figure 6 Respondents' Use of Preferred Resources for Research (n=981)

Note: Multiple Responses were permitted

Table 1

Response per Discipline

S. No.	Discipline	Sample Size	Obtained Responses
1.	Social Sciences	397	393 (40.1%)
2.	Engineering Sciences	246	230 (23.5%)
3.	Applied Sciences	208	198 (20%)
4.	Agricultural Sciences	180	16.4 (160%)
Total		1031	981 (100.0%)

Table 2

Descriptive Statistics of Participants' About HEC E-resources Usage

S. No.	Use of HEC E-Databases and E-journals	Mean	S.D
1.	E-databases	3.87	1.003
2.	Open Access Journals	3.65	.995
3.	Open Access E-books	3.14	.989
4.	E-brary Collection	3.01	1.047

5= Very often, 4=Often, 3= Occasionally, 2= Rarely, 1= Never

Table 3

Descriptive Statistics of Participants' Views regarding the usefulness of HEC E resources (n=981)

S. No.	Useful Resources	Mean	S.D
1.	E-databases	4.28	.942
2.	E-books	3.95	.714
3.	Open Access e-books	3.73	.640
4.	Open Access Journals	3.64	.988

5= Very Useful, 4=Useful, 3= Sometimes Useful, 2= Rarely Useful, 1= Not Useful

Table 5

Respondents Preferences to HEC E-Databases and E-journals over Conventional Materials (n=981)

S. No.	E-databases and E-journals overConventional Materials	Mean	S.D
1.	E-databases & e-books over print format of books, Journals	3.94	1.181
2.	Open Access Journals and Books over print format of Journals	3.82	.949

5= Always, 4= Usually, 3=Sometimes, 2= Seldom, 1= Never

Table 6

Descriptive Statistics of Issues faced by Participants in Using the HEC E-resources (n=981)

S. No.	Factors	Mean	S.D
1.	Restriction on resources out of university premises	4.31	.799
2.	Low speed of internet	4.08	.962
3.	Lack of knowledge	3.78	1.128
4.	Not enough training or instructions	3.62	1.128
5.	Do not provide access to frequently used journals	3.51	1.115

5=strongly agree, 4=Agree, 3= Neutral, 2=Disagree, = Strongly Disagree