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## Perceptions of Research Students about Information Resources of Digital Library and Difficulties faced during usage

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## **Perceptions of Research Students about Information Resources of Digital Library and Difficulties faced during usage**

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### **Abstract**

The basic aim of this study was to examine the perception of research students about the importance of online sources of information in digital libraries and the problems faced by research students while consulting online information resources in digital libraries. To achieve these goals, a quantitative research method was used. A self-administered questionnaire was developed and used for data collection. The population of the study has consisted of research students studying in M. Phil and Ph.D. in the Faculty of Behavioral & Social Sciences and Pure Sciences. Data was collected from 278 respondents and analyzed by using SPSS software. Results showed that respondents were aware of different online information resources and had positive perceptions regarding online information resources. They possessed satisfactory searching skills. They have obtained training sessions to use online information resources. They preferred digital form, print form, and electronic form to receive information. Respondents pointed out problems in using online information resources. These problems include information overload on the web, subscription issues, infrastructure problems, load shedding issues, etc. They demanded training to increase online searching skills. The study concluded that research students studying at the University of Punjab have a good level of searching skills. It was recommended that librarians working at the University of Punjab should offer adequate training programs to assist the research students in searching for online information.

Keywords: Online Information Resources, Digital Library, Barriers

### **Introduction/Background**

Libraries are an impressive treasure of information for research and learning. With the developments in ICT, traditional libraries are turning towards digital and online shapes. Information and Communication Technology has brought astonishing changes to institutional library and info services. Conventional library services can be delivered more professionally and successfully by using ICTs. Library services provided by web consist on online textbooks, databases, tutorials and links to other useful resources. Development of Internet, as the main storehouse of information capitals, has transformed the role of LIS professionals. The web permits anyone to access information on the Internet with the help of a browser. Web has the

capacity to link with associated data rapidly. The web holds data in many formats such as scripts, sounds, pictures, and videos. These web info resources are now known as online information resources. The recent institutional libraries and information hubs have established their web portals, which are supported with modern communication devices, and being used for different tasks. The university library provides different information resources in print form and in non-print form to facilitate user's information needs. These online sources are more valuable in this regard due to their benefits. Online resources of information are being utilized in university libraries due to widening the variety of available information within the library and providing access through digital resources so that learners, researcher scholars, and other fellows of the institution can approach them and the library system of the university provides the structures and Internet facilities to develop users approachability of online possessions (Daramola, 2016). These resources deliver information in electronic form and accessible through Internet such as subject research guides, online directories, E-books and manuscripts, e-journals, library catalogues, online reference sources (Tsakonas, 2006). E-resources permit users to access, to find and retrieve information from faraway locations and without time limit through Internet (Nisonger, 2003).

Online information resources save the space issue in libraries and stop wastage of time (Kenchakkanavar, 2014). These library assets are beneficial for users to retrieve huge amount of information in short time. The accessibility of information in electronic form has created opportunities for universal access to information, enlarged the figure of users obliged, increased the quantity of information delivered, and offered new selections for research students to discover information related to their research areas (Varghese, 2008). More students in the online environment were capable to retrieve the required resources for their reading research job (Wolsiki, 2015). Universities are spending massive expanses for the richness of their digital collection to make their online resources and e-collections more and more (Kim, 2011). Although the Internet has entered in all fields of academics in universities, yet there still not adequate access to online information resources (Okon, 2010). Most university libraries have not a practical policy of providing accurate Internet access to their postgraduate students. Online information resources are particularly essential in the fields of research, education, knowledge and academic activities in any university library (Makori, 2015). Postgraduate research students can approach to publishers for publishing their writings and research papers for creation and distribution of information. Information literacy and learning skills are essential to use and retrieve online information resources in the university libraries. Traditional IR, OPAC, and Web searching studies were compared and results of this comparison showed that there are major differences in all these methods of data searching (Bernard & Pooch, 2001).

The aim of the present study is to investigate researcher's perceptions about importance of online information resources to obtain information provided by these resources and the difficulties they face in accessing these sources. Challenges involved in using online sources of information in libraries are also one of the core issues of the present research paper. Researchers express their skills and preferences during utilization online information resources. Their skills

help them to understand the type of the content resources and their consequence to their informational needs. These skills help the researchers about system properties like interface, system features and system functionalities. This means that the researchers have to develop specific skills in order to utilize and handle the system functionalities and components. Most university libraries boost their students to access their online information resources to help in the progress of information and investigation. Thus, this study is an effort to discover the perception about importance of online information resources, level of online searching skills and hurdles faced during usage online information resources by postgraduate research students in university of the Punjab, Lahore, Pakistan.

### **Research Objectives:**

1. Perception about importance of online sources of information
2. Barriers in searching online information

### **Statement of Problem**

Academic libraries in universities are information hub and play a key role in educational, teaching and research necessities of the parent organizations. Online information resources of any academic library are more effective teaching and learning apparatus in higher education especially for research purpose. These are effective for researchers, and offer tools for life-long learning, knowledge and wisdom. Internet renders worldwide information accessibility and allows researchers to have access to huge amount of information. It enables to communicate through e-mail, virtual discussion groups and provides opportunities for distance education in institutions.

Usage of online information resources in libraries has changed the traditional way of locating information from libraries. Now researchers interact with library online information resources to search the required information from libraries. Thus, this study is an effort to discover the perception about importance of online information resources and hurdles faced during usage online information resources by postgraduate research students in university of the Punjab, Lahore, Pakistan. So this research has been conducted.

### **Review of Related Literature**

“Web pages and documents available on net that deliver valuable information. An online resource is normally data and educational in nature, any supporting software available online can also be rated an online resource.” An online resource is data you find online. It can be an online magazine, newspaper, channel or television website. Webpages, peer-reviewed journals, blogs

and forums are also online sources. Some other names for online sources are web sources, electronic sources, and Internet sources” (ODLIS: Online Dictionary, 2004).

Many kinds of online information resources are being used by researchers for searching information. These information resources include E-books, E-journals, HEC databases, Google scholar, OPAC of different libraries, Online Archives, Digital libraries, Social media blogs, Online search directories, Search engines (Google, Yahoo, Bing, ask.com etc.), HEC research repository, E-magazines, repository of other universities, E-thesis and dissertations, E-research reports, online reference databases, indexing and abstracting databases and so on. All these online resources are designed to cover the requirements of general library users in effective way. Research students depend upon information resources available in institution libraries, in both electronic and print formats. Kenchakkanavar (2014) described that research scholars use many kinds of online information resources in libraries like E-journals, E-books, Research repositories, Digital libraries, Databases, OPAC of different libraries, Search engines(Google, Yahoo, Bing, ask.com), Google Scholar and so on. Online information resources have many benefits such as to access to an information source by several users in same time, these sources can be explored rapidly, huge amount of information can get from these resources and can be stored in less space etc.

Ebijuwa and Mabawonku (2019) observed “the use of electronic library resources for academic activities”. The studies conducted in past showed that usage of electronic library resources are small in Nigeria. There were some factors like user's approach, computer operating skills and information retrieval techniques, found. This study tested usage of electronic library possessions on the basis of demographic variables (age, gender) and academic programs, in selected universities of Nigeria. The descriptive survey was performed for the study to meet the objectives of study. To collect 1,526 responses from targeted population in the selected universities of Nigeria, multi stage sampling technique was used. The study results revealed that age influenced the use of electronic library resources on a small scale, while gender and academic program did not. So the recommendation was made for the university libraries to ensure that the use of electronic library resources in users, irrespective of age, gender or academic discipline.

Brar (2017) investigated the purpose of interacting with online system, users’ preference to search information online with author, title, subject, and with other bibliographical elements of a document, user’s preferences to access the databases online, the way that users learn to interact

with online information systems, and barriers that users face while searching information online. The researcher users' quantitative research designed and data collected from 75 respondents by making a survey. The study revealed that 36 (48.0%) users interact with systems to search for information they need, 29 (38.7%) users prefer to search documents with author, 22 (29.3%) users like to get information from e-journals, 24 (32.%) users get guidance from library officials to learn how to use the system online, and the barriers that users face are linguistic, access to terminal to use the online systems, lack of skills and knowledge, and the massive 40 (51.%) respondents face barrier is the bulk of information retrieved and available on interface.

Sife (2013) conducted a study on "the Web searching behavior of postgraduate students at Sokoine University of Agriculture". The purposes of the study were to examine searching behaviors of students, to focus the causes of using the Web resources, to describe usage of different features of web, to guess web searching skills and to highlight the difficulties faced while using the Web. The study was performed from all postgraduates at SUA. Self-administered questionnaire was the data collecting instrument. Data was randomly gathered and calculated with the help of statistical package for social sciences (SPSS). The results of the study indicated that the majority of the postgraduates were expert in using of Web and they were familiar about the web resources. Many students trusted on Web resources for their research and academic activities. A notable number of students were using search engines and subscribed databases to find information. It was also found that majority of students were using simple searching techniques. The use of advanced searching techniques was very low. The use of e-resources such as e-journals and databases among students of SUA was not up to satisfied limits. Study recommended that university authorities should encourage e-resources in libraries and include awareness programs for information literacy into their curriculum.

Ahmed (2013) assessed the usage and satisfaction with university subscribed e-resources in public and private sector universities in Bangladesh. For the assessment about the usage of e-resources and satisfaction of users with university subscribed electronic resources by the students a questionnaire was utilized. The obstacles challenged during accessing e-resources were also discussed. The study explored that the students were not entirely satisfied with the present subscribed online resources available in universities. The problems pointed out by students were

restricted access of PCs and data speed. Poor ICT setup is the main cause of these problems which may also lead to other drawbacks.

Ugwu & Onyegiri (2013) found that the university library atmosphere is changing, so university librarians are directed to take necessary steps with changing demands. Providing unrestricted access to OIR in the university library is basic step and essential need in this changing atmosphere. The achievement of the university library in providing OIR depends upon ability of library management to fight with the problems associated with the management of OIRS. There are several problems related with OIR, such as, organizational policies/practices, finance, recruitment and e-resources provision using ICT. Following recommendations were made keeping in front findings revealed in study. A reasonable amount from the library budget should be allocated for the progress of e-resources in the campus collections. Staff of libraries should be trained to work effectively with an ICT based system. There should be a strategy as well a plan for ICT infrastructural development in the university libraries. This will offer a supporting environment for the institutes and use of OIRS in the university Library.

Adeniran (2013) explored that majority of the library users 'access e-resources for self-research purpose, projects, knowledge of current researches and other information needs. However, some factors associated with e-resources including: information overloaded on net, low download speed, lack of searching skills and costly systems were found to be the challenges affecting against Library usage.

Gagan and Rakesh (2013) described that the Internet has many opportunities of uses and treasure of information resources for the students and researchers. It was found that the majority of students (92.30%) have good using Internet experience. Respondents of the study reported generally that Internet information resources were more useful than conventional documents. The educational efficiency and research productivity of the researchers has enhanced to a great level due to free access to Internet resources provided by the university. Following are some issues pointed by the respondents of present study. Users were not satisfied mostly due to the time limits, slow Internet connectivity and lack of experience to find out information quickly. Hence, regular training programs for use of Internet resources and enhanced speed of connectivity may solve most of the existing problems of Internet use at university campus.

Baro, Endouware & Ubogu (2011) investigated “ the awareness and application of the medical databases and other online information resources associated with medical library”from the students of the College of Health Sciences in Delta State University. Responses of the respondents were collected with the usage of interviews and questionnaire. It was observed after analysis that many students did not know and do not use the online information resourcesto retrieve related information of their studies. There are many reasons behind this such as shortage of required skills to searching information, insufficient information literacy skills and to use the medical databases and other sources of informationoffered online. Some more issues were stated by the respondentssuch as timings of libraries, deficiencies in curriculum, and speed of net. The results of study were useful for medical institution authorities along with libraries management. It was suggested to organize training sessions for participants to promote information literacy skillsand its inclusion into medical course in developing nations.

Badu, Adjei & Fordjour (2010) studied “the predictions and challenges of information retrieval among university students”. The survey was performed to achieve following objectives. “To explore the awareness and usage of information retrieval systems, document retrieved and its relevance to student’s information need, challenges of information retrieval among students during this process and future expectation of information retrieving skills by students”. The findings about study revealed that respondents were greatly aware of the IR systems. The current research article also showed that the process of retrieving relevant information depends on the information needs of the user. It was recommended that IR training program for improving required skills should be executed.

Akussah, Asante and Adu-Sarkodee (2015) examined “the relationship between the impact and usage of e-resources in academic libraries in Ghana”. This relationship has been examined by keeping these variables in front, satisfaction level, preferred database, time and frequency, and level of awareness. Impact of e- resources showed a progressive association with usage among the users. The study recommended that institutions should work on making more awareness regarding utilization of e-resources. This can be enhanced on the availability of databases, more time and easy accessibility towards system. These can be carried out by fresh student’s orientation, seminars, new arrival information to users, circulars, memorandums, selective dissemination of information and many more.

Qasim and Khan (2015) gave following recommendations of their study for the worth and maximum utilization of E-journals. Effective and quality user training and technical support must be provided for the accurate utilization of E-journals. The libraries should establish regular training workshops to develop usage of E-journals and access the needed information effectively, efficiently and comprehensively. Online tutorials should also be offered as an option. The IT specialists of the universities should try to make searching process by single keywords to avoid consuming lot of time getting irrelevant results. Researchers should be taught about latest searching techniques like Boolean searching and searching by wild card characters, truncation etc. which would be largely useful for collecting data for research. User' assessment should be conducted occasionally to evaluate and determine the electronic information needs of users, and problems while accessing them. The library should establish a main point of subscribed E-journals in order to enable users to search full-text journal articles by subject, keywords and topic from a single place. The libraries should engage more trained and skilled IT staff, which can be helpful for the users in areas like accessing, downloading, and suitable utilization of the E-journal services. Appropriate response system should be hosted to know about several problems faced by the users and to solve them effectively. Library should claim for more funds in order to develop their collection both in soft and hard.

Kumbar and Kotabagi (2014) concluded that many scholars rely on electronic resources to achieve the required and updated facts. When, practically usage of electronic resources studied, it was found that usage level of e-resources was low due to following reasons; less amount spent on e-resources, improper infrastructure and not implementation of training programs. It was perceived that the number of electronic resources was insufficient for present faculties. Respondents were expecting more current e-resources, since maximum of the respondents were research students and using e-resources for research only. It was proposed that the library personals must take maximum interest in creating awareness about the availability and usability of e-resources, because electronic resources have more valuable and important in improving the worth of the research. With the usage of updated and quality electronic resources in research work, it will provide an improved knowledge and standard publications as well as thesis by researchers.

Groote, Shultz & Blecic (2014) investigated “the information seeking behaviors of health sciences faculty, including their use of online databases, journals, and social media for fulfillment of information need”. A survey through email to 754 health sciences faculty at different health colleges was conducted. It was concluded after analysis of received data that usage of online databases and online social media blogs were comparatively low. Getting the benefits from online journals was also not convincing due access issues. So, it felt the need of campaign

of usage of online resources and IL education for faculty. Library personals were needed to support users to trace and utilize the resources and tools that libraries possessed.

Bhukuvhani, Chiparausha & Zuvalinyenga (2012) recommended that training sessions should be arranged for faculty, students and other library users for awareness regarding online information resources. It is fact that research productivity in any institution places particular university at higher ranks, and obviously electronic resources are contributing maximum in research. It becomes compulsory for universities to spend more on access to electronic resources.

According to Gowda and Shivalingaiah (2009) the electronic resources are influencing positively towards the type and worth of research internationally. The ICT progresses are also influencing users' information seeking behavior and procedures of information retrieving. The fundamental job of institutional libraries is to provide needed materials to the researchers. Libraries have to maintain information resources both in print and electronic formats. Digital repositories should be managed and organized in separate section in the libraries, where trained personals guide the researcher scholars to utilize electronic resources. The libraries must offer distant and web-based access to the e-resources reachable with them and links to other important resources subscribed for research requirements. The regular feedback from researchers and general users should be followed about the availability of library facilities and services. It is necessary to recognize their changing information requirements.

### **A Review of Related Literature in Pakistani Perspectives**

Hira and Waseem (2014) conducted a study "to find the use of Electronic Information Resources by the students of Faculty of Science, University of Karachi". They estimated the rate of utilization and difficulties faced by users while using EIR. Purpose of using EIR and the advantages and drawbacks of EIR were also checked in the study. The figures was collected through questionnaire and evaluated by simple statistical method. The findings of study revealed that the students use EIR for the fulfillment of their academic needs. Another purpose of using EIR found out that respondents wanted to become aware of the updates of their fields. The problems pointed out by the respondents were network slowness, dodging of electricity, viruses, access of quality resources etc. The need of training for effective utilization of these resources was also felt. It was mentioned that Government of Pakistan should resolve the electricity issues. HEC should have to offer high speed network within the campus and it is the responsibility of the University authorities for the provision of more access points for the use of EIR in the institution. Ali (2014) investigated the Pakistani Students' observations about use of the Internet in their educational activities and stated that the Pakistani students' have the view about the Internet that it conveys advanced changes in academic activities by providing resources for research, information and educational needs. Students use Internet for locating resources for projects, reports, presentations and exam. They think that the use if Internet is not wastage of time. Some of them say that Internet enhances cheating in writings and papers. It can be decided that the Internet gives a wider and advanced choices for students in their projects, reports,

presentations and exams. With the help of Internet student of current era can better find study and research related problems and its solutions. It is a fact that Internet has finished all difficulties in getting information. The advent of the Internet has extremely changed the education process. Ullah and K.Amin (2014) conducted a study “to explore the current practices of information literacy (IL) instruction in medical libraries of Pakistan”. Head librarians of all 114 educational medical libraries of Pakistan were contacted through mail and semi-structured questionnaire was used to get responses. The following variables were measured in the study, IL instruction, topics covered related to IL, methods of delivery and assessment, level of integration in the curriculum, and level of association with teaching staff. The present study concluded that IL instruction activities in medical libraries of Pakistan are in their inauguration. Medical librarians need to organize IL instruction programs. Information literacy instructions should be incorporated in course. Khan and Qutab (2016) found in their study about major challenges regarding ICT-based library resources were fewer budgets, price involved in networking system, inexperienced personals of libraries, less ICT equipment, lower ICT skills of students and improper knowledge of retrieving ICT-based library means. Following suggestions were made for the effective implementation of ICT-based library resources in universities. The charges involved in ICT-based library resources should be reasonable, skilled and trained library staff should be provided for ICT-based resources for the training of the postgraduate research students and university websites easily accessible to the research scholars. Some more recommendations were also mentioned. Financial issues should be resolved so that university libraries can manage to pay the cost of ICT-based library resources for researchers. The insufficient awareness of ICT can be handled by the library management in Universities. Training sessions should be arranged for library on the use of ICT resources. The expertise of librarians on ICT-based resources should be proficient to direct the researchers for the use of ICT resources for research purposes. The skills of research students can be improved through attending seminars, workshops, conferences and short course training. There should be awareness and training programs of research students for the effective utilization of ICT-based library resources. This will be helpful to prepare the postgraduate researchers on importance of ICT resources available in libraries. University management should make university websites without restrictions accessible to the research scholars and as well connect them to research databases for consistent research. Tahir, Mahmood and Shafique (2010) stated the consequences of their study that the provision of electronic resources i.e. databases, e-journals, digital books, Internet and e-mail has a positive influence on users. Although print resources are still preferred medium, but transformation towards technology is not far away. Discussing problems during using electronic resources was an objective of this study. They face many problems in retrieving and using electronic resources. Information scattering, information explosion, cost of using and lack of retrieving skills were major problems mentioned by respondents.

Khan (2016) investigated the causes that influence the recognition of digital libraries between research scholars. The outcomes revealed that interface features of digital library can predict student’s using digital library, while navigation, specific features provide of different digital

libraries and system appearances considerably affected the ease of use. Usefulness of system features and quality of systems have also impact on usability. It was found that usefulness of digital library is the most effective point. The findings revealed that functionality of different features can affect the use of digital libraries. Judgments of the study were valuable for Pakistani educational librarians to boost approval and usage of the HEC digital library of Pakistan.

## **Research Methodology**

To attain the goals of the study, quantitative research method adopted and survey was performed. The population of the study was the research students of Faculty of Behavioral and Social Sciences and Faculty of Sciences in university of the Punjab, Lahore, Pakistan. A self-administered questionnaire was utilized as research instrument. Comprehensive review of the related literature was conducted for preparation of a draft questionnaire, which was peer-reviewed and pilot-tested. Questionnaire survey was conducted among research students, studying in university of the Punjab, Lahore, Pakistan for data collection. The collected data from respondents was analyzed through SPSS. Descriptive and inferential statistics were applied to achieve results. Tables and charts were used for the demonstration of results of the study. The study was delimited to the research students of faculty of behavioral and social sciences and faculty of sciences of University of the Punjab, Lahore, Pakistan. The present study is restricted only in University of the Punjab, Lahore, Pakistan. The data for this research was collected from the research students of faculty of Behavioral & Social Sciences and faculty of Sciences.

## **Analysis of Data**

### **Demographic Information of the Respondents**

Out of 278 respondents, males were 138(49.6%) and females were 140(50.4%). Research students of University of the Punjab, Lahore studying in two faculties' i.e., Faculty of Behavioral & Social Sciences and Faculty of Science were respondents of present study. The response ratio from both faculties Behavioral and Social Sciences and Faculty of Science was 167(60.1%) and 111(39.9%) respectively. The respondents were studying in M. Phil and PhD program. A large number of the respondents were enrolled in M. Phil 213(76.6%), while PhD research students were 65(23.4%). The maximum feedback was received from age group of 20-25 (n=113)40.6% and 26-30 (n=108)38.8%. The respondents belonging to 31-35 years age group were 50(18%). There were also some respondents who declared themselves as 36 years old and above (n= 07)2.5%.

### **Perception about Online Sources of Information**

Respondents were inquired about their perception regarding importance of online information resources in their research execution. According to analysis of received data, respondents were agreed that online sources of information contributed a lot in conducting research work (Mean=4.24). Respondents were also agreed about highly utilization of online

sources in their research work (Mean=4.07). Their perception was also positive with other statements.

Table 1

*Perception about Online Sources of Information*

Statements	Mean	Std. Deviation
Online sources of information contribute a lot in my research work.	4.24	.937
I highly utilize online sources to conduct my research work.	4.07	.810
It is really hard to carry out research work without consulting online sources.	3.97	.921
I obtain latest information related to my research work through online sources.	4.01	.860
I prefer online sources for my research work as compared to print sources.	3.83	.992

(Strongly Agree=5, Agree=4, No opinion=3, Disagree=2, Strongly Disagree=1)

**Online Searching Experience of Research Students**

Respondents were asked about their online searching experience. The responses revealed that the maximum of the respondents were on their initial stage and had search experience of 1-2 years 130(46.8%). Those respondents who had searching experience of 3-4 years were 100(35.9%), while the respondents using online information resources since 5-6 years were 48(17.3%).

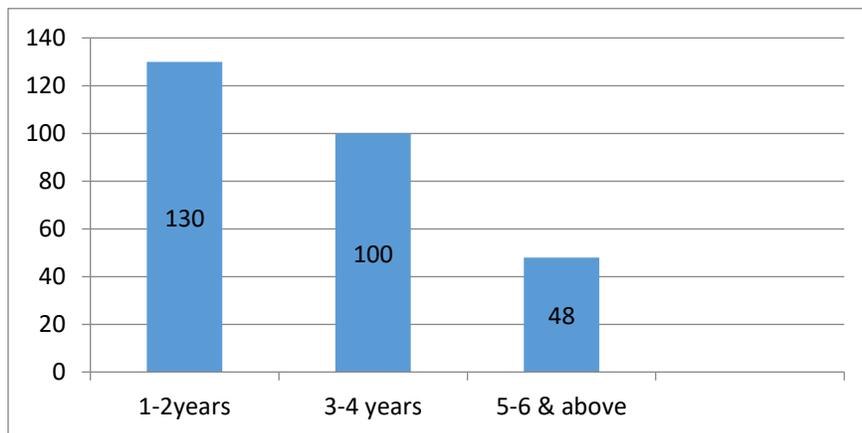


Figure: *Online Searching Experiences*

### Level of Online Searching Skills

Analysis of responses regarding level of online searching skills described that the respondents were at their beginner level 89(32%), while at moderate level were 155(55.8%) and respondents who rated themselves as expert were 34(12.2%).

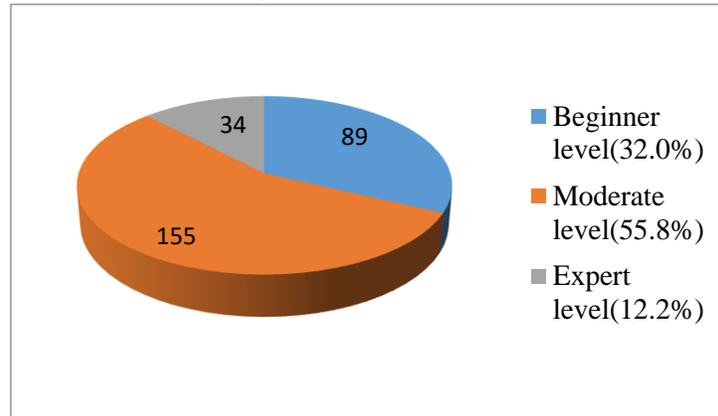


Figure: *Levels of Online Searching Skills*  
**Trainings Received by Research Students**

Respondents were asked whether they have received any training to search online information resources. Results showed that respondents had obtained training to search information from online sources were 172(61.9%), while those respondents who did not get any training were 106(38.1%).

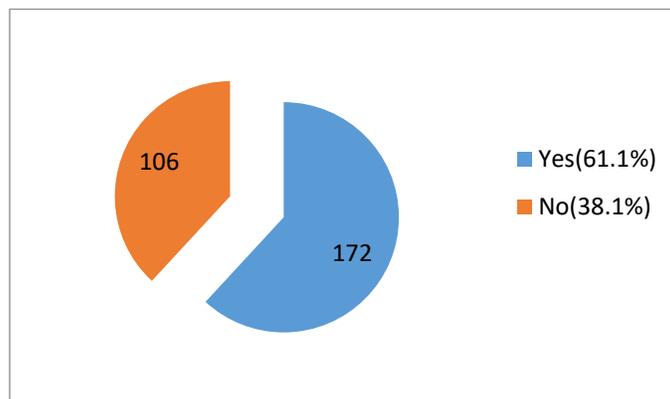


Figure: *Status of Training to Search Online Information Resources*

### Preferred Form of Information

Respondents were questioned about their preferred format of information. Data in table 4 illustrated that majority of the respondents preferred print form of information (Mean=4.13). However, results showed that respondents were also preferring digital format (M=3.94) and electronic format (M=4.01).

Table  
*Preferred Form of Information*

<b>Information Format</b>	<b>Mean</b>	<b>Standard Deviation</b>
Digital	3.94	.952
Print	4.15	.693
Electronic	4.01	.781
Audio Visual	3.38	1.040

(Highly preferred=5, Preferred=4, No opinion=3, Not preferred=2, Not preferred at all=1)

### **Barriers in Using Online Information Resources**

Respondents were asked about the difficulties they are facing in using online information resources. Results showed that respondents were facing problems in online searching due to lack of searching skills, information overload, and inadequate knowledge of online sources, lack of access to HEC databases at home, power supply issue and passive role of librarians in libraries to guide them in using online sources of information.

Table  
*Barriers in Using Online Information Resources*

<b>Statements</b>	<b>Mean</b>	<b>Std. Deviation</b>
Lack of searching skills.	3.92	1.087
Information overloaded on the web.	3.99	.841
Inadequate knowledge of online information sources.	3.83	.865
Lack of Internet access.	3.52	1.064
Lack of access to research HEC databases at home.	3.88	.915
Lack of assistance to learn about advance searching techniques.	3.69	.848
Power supply issue (load shedding etc.)	3.67	.942
Passive role of librarian in providing trainings to search online sources.	3.63	.985
Lack of personal interest to learn about online searching skills	3.42	1.074

(Strongly Agree=5, Agree=4, No opinion=3, Disagree=2, Strongly Disagree=1)

### **Training Needs of Research Students**

Respondents were inquired about training needs of research students to increase their online searching skills. Results showed that vast majority wanted to get training to progress their online searching skills 262(94.2%).

Table

*Training Needs of Research Students*

<b>Response</b>	<b>Frequency</b>	<b>Percentage</b>
Yes	262	94.2
No	16	5.8
Total	278	100

**Useful Training Methods for Research Students**

The respondents were inquired about their preferred type of training methods to improve their searching skills. Analysis of collected data described that use of online tutorials was the most preferred choice 127(45.7%). Training courses offered by LIS schools/associations was another favorite method of training 110(39.6%). The lowest choice of respondents was hands on training 29(10.4%).

Table

*Preferred Type of Training Methods*

<b>Types of Training</b>	<b>Frequency</b>	<b>Percentage</b>
Training workshops	104	37.4
Training provided by librarians	103	37.1
Use of online tutorials	127	45.7
Hands on training	29	10.4
Training courses offered by LIS schools/associations	110	39.6
Seminars on searching skills	90	32.4

(Note: More than one option was permitted)

## **Major Findings of the Study**

The objectives of this study to examine the perception of research students about importance of online sources of information, status of their online searching skills and barriers in searching online information & useful training methods to improve searching skills.

The major findings of the study are as under.

Different types of online information sources are available in central and departmental libraries of University of the Punjab. Respondents access these sources to fulfill their educational and research needs. Respondents were inquired about their perception regarding importance of online information resources in their research execution. According to analysis of received data, respondents were agreed that online sources of information contributed a lot in conducting research work. Respondents were also agreed about highly utilization of online sources in their research work. Their perception was also positive with all inquired statements.

Respondents had various kinds of skills in using online information sources. They rated their skills as somewhat good in different categories of skills set. These skills set include ability and knowledge about searching online information, effective communicate with online information systems, using conceptual/analytical skills to understand the search results and applying different search strategies to evaluate search results, knowledge of different subject terminologies, knowledge of different file formats, knowledge of different online information sources related to their subjects, understanding indexing policy and vocabulary control used by the online information system, use of vocabulary control techniques, refining and narrowing search terms. These results demonstrated that respondents were familiar with all searching techniques to effectively utilize online information resources which were available to them. Following results were obtained regarding searching skills of the respondents in using advance searching technique. According to their self-evaluation, it was found that they had skills to use phrase searching, Boolean operators, use of + or – sign, use of NEAR operator, use of file extension, use of domain search, use of truncation marks and use of proximity searching. Knowledge of advanced searching skills is highly beneficial for online information seekers to limit the searching results by excluding irrelevant material. However, they don't have good level of searching skills in using ~ (tilde sign), range search and proximity searching. It showed that they were not good in using these particular search techniques. There is a need to develop their ability in these areas or there may not require for the researcher when searching online information.

Results revealed that respondents were facing problem due to information overloaded on web, lack of adequate searching skills, lack of access to HEC research databases, inadequate knowledge of online information sources, lack of assistance to learn about advance searching techniques, power supply issue and inadequate role of librarian in providing trainings to search online sources. Findings also revealed that they were not fully satisfied with current Internet services.

These results showed the need to take necessary steps for addressing the problems faced by research students in University of the Punjab. Research studies conducted by Adeleke and Nwalo (2017) and Mirza and Mahmood (2012) mentioned similar results in their research studies. Hence, the results of this study are greatly in line with the literature produced by earlier investigators.

## **Conclusion**

The conclusions of the present research are as under.

The research students of the University of Punjab, Lahore had a positive perception regarding online information resources. They were aware about importance of these resources in academic and research works. Research students studying in University of the Punjab have good level of advance searching skills. Research students preferred information in print, digital and electronic format. Research students are facing problems in using online information sources due to lack of searching skills, information overload, inadequate knowledge of online sources, lack of access to HEC databases at home, power supply issue. Majority of the respondents wanted to get training to improve online searching skills. Use of online tutorials would be the most preferred choice, training courses offered by LIS schools/associations will be another favorite method of training.

## **Recommendations**

Some necessary recommendations are mentioned as under.

1. Research students in University of the Punjab should be introduced about the availability of online sources of information in the library which are beneficial for their research work.
2. They should be provided adequate access to Internet so that they can easily utilize HEC databases and resources provided for research students in different HEC recognized universities.
3. Government, University management and Library authorities should solve barriers pointed out by research students.
4. Librarians should offer adequate assistance for research students to improve their searching skills in using online sources of information.
5. They should be provided training workshops, use of online tutorial service, seminars and proper training courses to obtain adequate knowledge about online information searching and resources available for researchers.

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