

Information Searching and Management Literacy Needs Assessment of University Students: Impact of Gender, Education, age and Subject

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Abstract

With the growing use of digital information space in tertiary education, computer literacy, information searching and management literacy have become vital academic skills of university students. The aim of the study was to evaluate whether university students need information searching and management guidance and how the gender, level of education, age, and academic subject had any impact on their literacy needs. The data were gathered in the form of a structured questionnaire based on the quantitative survey design. A sample of 155 postgraduate students was selected from the Institute of Social and Cultural Studies, and the School of Chemistry at University of the Punjab. Data analysis was done using descriptive statistics, independent sample t-tests, and Pearson correlation. Results show that students indicated their significant needs in various aspects of information searching and management literacy, especially, information organization, internet-based information searching, and computer literacy. There were weak and positive relations between age and education with literacy needs. The differences in genders were also seen in information literacy needs. The needs in the area of internet and information retrieval were majorly driven by the academic subject, where students of science scored higher

for their needs as compared to the social science students. To fulfill needs it is crucial to establish systematic and curriculum-based information literacies programs in the universities. Academic departments and libraries need to work together to develop specific interventions which will close the learning gaps. These programs need not only be technical oriented but also based on critical thinking and ethical handling of information as well as research management practices. By recognizing the unique learning needs of students and fulfilling these needs, institutions can improve their academic performance, foster research and equip students to be productive members of the knowledge society.

Keywords: Information searching literacy, information management literacy, needs assessment, university students, information literacy instruction, higher education, Pakistan

Background of study

Information literacy (IL), the capacity of university students to efficiently find, assess and utilize information, has become a vital competence to both academic and lifelong achievement in the fast-paced environment of higher education and online information access. Information literacy does not only refer to the capacity to search the internet or use a library catalog but is a wide-ranging competency that involves critical thinking, ethical utilization of information and the capacity to navigate complicated information ecosystems (Association of College and Research Libraries, 2016). With the continued transition to digital platforms of knowledge production and dissemination, students are obliged to handle an unprecedented amount of information and the sources of different credibility. This complication highlights the great necessity to evaluate the information literacy (IL) skills of university students to recognize the gaps and develop effective educational plans. Information literacy (IL) is a term that was popularized in the 1970s and has evolved considerably in theoretical and practical aspects since that time. Originally focusing on library skills, the notion has been expanded to include a holistic approach to how individuals interact with information in both the academic and real-life scenarios (Zurkowski, 1974; Lloyd, 2005).

These notions are a paradigmatic change towards procedural knowledge to a more conceptual view of information. Nevertheless, even with these structures in place, most students join university lacking adequate information literacy (IL) skills, which undermine their capacity to engage in academic research and to be fully involved in academic discourse (Gross & Latham, 2012). A needs assessment in information literacy (IL) attempts to quantitatively measure the current competencies of students in the context of using information. The importance of such evaluation in university setting is crucial due to a number of reasons. Firstly, it enables teachers and librarians to determine the existing levels of (IL) of students and identify particular areas where teaching is deficient (Mackey and Jacobson, 2011). Second, it offers practical information that may be used to develop the curriculum so that (IL) teaching is properly scaffold and in line with the disciplinary backgrounds of students. Third, in

a world of misinformation and disinformation, it is important to provide students with good (IL) skills to foster the creation of informed citizens who can critically access information in every life area (Head, 2013).

Information literacy (IL) needs assessment should also take into account the dynamic technological environment. Students are forced to operate in a more complicated information landscape with the spread of digital tools, databases, and search engines. Nevertheless, a technologically fluent person is not always information literate (IL). A lot of students who find it easy to navigate around smart phones and social media sites do not have the skills to analyze academic sources or bring about an in-depth review of literature (Hargittai et al., 2010). Thus, the analysis of the (IL) needs of students should be multidimensional, taking into account not only the technical abilities but also the cognitive, metacognitive, and ethical aspects of the use of information.

Summing up, the evaluation of information literacy (IL) competencies in university students is a preliminary measure that can enhance academic performance and develop critical thinking skills that are crucial in the 21 st century. This is the reason behind this research work. With institutions of higher learning still struggling to cope with the challenges of an information-based society, the success in designing systematic, comprehensive and responsive information literacy (IL) instruction rests on the ability to understand the strength and weaknesses of students. When such needs are identified, educators can not only enhance the performance of students in their academic field, but also play a part in the overall mission of creating responsible, informed and capable global citizens. The research aims to fill this gap through a quantitative analysis of current (IL) skills needs of university students about information management, computer literacy and internet searching.

Research Questions

1. To what degree do students need assistance in searching and retrieving skills in internet based information searching?
2. To what degree do students need assistance in computer and information management skills?
3. Is there any effect of demographic variables on literacy needs of university students?

Literature review

1. Information literacy needs assessment

Information searching and management literacy is a need required for academic competency. The process of digitalization in higher education has been so high speed that it has changed the informational environment, under which university students study, do research and academic assignments. In the current academic contexts, students are not merely expected to find information, as they are also expected to

critically analyze, manage, organize, and morally utilize information on websites like digital databases, search engines, repositories, and other scholarly communication sites. Information searching and management literacy (ISML), therefore, has become a fundamental academic skill that is necessary to become productive in research and successful academically (Association of College and Research Libraries, 2016).

In terms of needs-assessment ISML can be perceived not as a list of competencies being possessed contingent on students but rather as an area where gaps can be present between the existing competencies of students and the competencies necessary to the effective academic performance of students. In learning research, needs assessment is defined as the process of systematically identifying gaps in performance between the actual and desired state to help in the planning and intervention in instruction (Oakleaf, 2008). In the terminology of information literacy, this implies determining what particular searching and retrieval, evaluation and organization and management capabilities that students are deficient in and what role the institutional support structures are filling that gap.

The studies indicate that undergraduate students invariably rate themselves higher in terms of their information literacy competences than they perform on objective tests of higher-order searching and management skills. Gross and Latham (2012) discovered that student perceives themselves as good researchers often despite lacking essential skills in database searching, source appraisal and source management. This mismatch highlights the importance of systematic needs assessment to determine real skill shortages but not basing it just on self-perceptions. Increasing complexity of digital academic ecosystems has increased the necessity to systematically evaluate the information searching and managing literacy needs of students in universities. Contemporary students are forced to search through institutional repositories, subscriptions databases, discovery interfaces, search interfaces, and reference management software to fulfill their simultaneous tasks of assessing the credibility of different sources and presenting ethical research methods. However, availability of these tools is not the guarantee of their efficient use (van Deursen & van Dijk, 2014).

Needs assessment help institutions identify gaps in academic information practices gaps among students and formulate purposeful instructional interventions. The key idea presented by Radcliff et al. (2007) is that information literacy teaching can be best executed based on empirical evaluation of the student requirements, rather than presumptions about digital ability. Equally, as Saunders (2012) indicates, universities tend to overemphasize that students are willing to carry out independent research because of preconceptions that being digital literate is equal to being academically literate in information handling.

Specifically, to the Pakistani context, this matter is of great concern since the growth of digital scholarly resources through the digital library programs of the Higher

Education Commission has occurred. Despite the growing access of students to databases and electronic journals, formal information literacy instruction is inconsistently able to be incorporated into university curricula (Ameen & Ullah, 2016). As a result, students might be having access without relevant competence which results in an endemic gap between resource access and its effective utilization.

2. Impact of gender, education, and age etc. on Information Searching and Management Literacy Needs

Gender has been traditionally considered as variable shaping digital and information literacy results. The initial research on digital divide proposed that male students exhibited higher technological confidence and less structured information seeking behaviors were more common in female students (Hargittai, 2010). Nevertheless, current studies are gradually pointing towards gender neutrality as far as higher education information literacy is less gendered in the case of institutionalized access. In terms of needs-assessment, gender might play a role in terms of not general competency but type of support needed. Hargittai and colleagues discovered that the male students are more likely to state their confidence in the digital space irrespective of their real performance; meanwhile, female students could underrate their abilities despite the similar results (2010). These findings imply that any gendered differences could be in confidence and preferences to learning and not due to a material difference in ability. Pakistani research also finds a weak statistically significant gender variation in scholarly information-seeking efficiency in which access to online resources is fair (Mahmood, 2013; Shafique, 2013). However, the slightest differences in the search behaviors could suggest the differentiated interests in the instructions and the needs in the support. Thus, the issue of gender still applies to needs-assessment research since it is also a factor that may influence the way students approach and interpret instruction in information literacy.

The advancement in education is usually supposed to be related to the increase in information competence. At higher scholastic grades, students are supposed to have better searching and management capacities, as they are more exposed to the process of research and scholarly communication. Nonetheless, some studies have shown that when the academic level of study is increased, information literacy may not necessarily improve unless it is imparted in the curricula (Saunders, 2012). Recent studies, such as those by Mackey and Jacobson (2011) suggest that developing information literacy needs to be cognitively scaffolded and reflective, as opposed to an academic experience passively amassed. As illustrated in higher education in Pakistan, Mahmood (2016) indicates that postgraduate learners often make use of unsophisticated search strategies in spite of high academic levels, which implies that the formal advancement through levels of education does not always resolve any deficiencies in skills. The conceptualization of educational level as the needs-assessment studies thus do is thus not considered as a guarantee of competence but

as a marker of literacy demands of an ever-increasing complexity. Whereas the undergraduate students might need to be assisted with a primary support in the location and appraisal of sources, the postgraduate students can require a more sophisticated assistance between systematic searching, literature synthesis, citation management, and organization of the research.

Digital literacy and technological adaptation is often linked to age, although its impact on academic information literacy is a subject of debate. The initial theories of digital natives hypothesized that younger learners are naturally better skilled in digital because they were exposed to technology earlier (Prensky, 2001). This is however, critiqued later on in the literature with issues highlighting that age alone does not make one digitally or information literate (Bennett et al., 2008). In terms of needs-assessment, age might be a determinant of the nature of support students need as opposed to competence prediction. Older students might require some help in the transition to new digital research environments, but younger learners need more help in evaluating and critically engaging with information, despite their technical competence (Head, 2013). Age in this line will thus be an applicable variable in both making sense of the varying needs of instruction as opposed to of age differences where age is considered just a indicator of the level of education and tech savvy in the student.

The academic discipline is well-known to be one of the strongest predictors of the change in the data search and management behaviors. Disciplinary cultures form epistemological assumptions, sources of information favored, research methods, and communication expectations of the scholarship (Becher and Trowler, 2001). Science and technology students tend to use organized databases, empirical literature and paper-precision searches, as compared to students in the humanities and social sciences, who may apply more of an exploratory, interpretive and iterative search method (Talja and Maula, 2003). Such differences in disciplines impose specific information literacy requirements and demand differentiated instruction. According to Pakistani research, students of science usually report more exposure to online databases and research resources because of a more detailed infrastructural and curricular integration in STEM-related subjects (Rafique and Khan, 2018). As a result, both the difficulty of information literacy requirements among students and their possibilities to develop their skills are subject to the disciplinary context.

Research Design

Quantitative research design is used for the current study. Survey research method is used for this study. Babbie (2004) has described that “survey research is probably the best method available to the social researcher who is interested in collecting original data for describing a population too large to observe directly” (p. 243). Powell and Connaway, (2004) have also considered this method as more appropriate as “survey research is generally considered to be more appropriate for studying personal factors

and for exploratory analysis of relationships” (p. 84). In survey research the questionnaire is designed specifically to collect the data effectively as as stated by Babbie (2004) that “surveys include the use of a questionnaire an instrument specifically designed to elicit information that will be useful for analysis” (p.224). This method is used due to the following reasons:

1. This is more economical way to collect the data from the students of the University of the Punjab (PU).
2. This way yields the higher ratio of participants.

Powell and Connaway (2004) have also described the advantage of questionnaire that “questionnaire can facilitate the collection of large amount of data in a relatively short period of time” (2004, p. 125) By using the instrument of questionnaire, it is easy to measure the background, experience and awareness of users.

1. Population and Sampling

The target population of the study was all the students of the Punjab University. While to overcome the whole population of the Punjab University convenient sampling technique was used. One hundred fifty five respondents participated in the survey. These students belong from two departments of the University of the Punjab. These were ‘Institute of Social & Cultural Studies’ and ‘School of Chemistry’. Both units are located in Quaid-e-Azam Campus, University of the Punjab, Lahore.

2. Data Collection and analysis

Data is collected through personal visits. In the process of data collection there was challenging situation, as there were two main problems. First of all there were summer vacations in the University of the Punjab and second problem was the schedule of examinations in the Departments. So, students were not available in full strength because they were busy in their final assessment. Therefore, it was a difficult job to collect data from the students so keen efforts were made in this regard and data was collected through convenient sampling. Responses were 155. All those efforts were proved successful and response rate is 99 percent. This is very good as “a response rate of 50 percent is adequate for analysis and reporting. A response of 60 percent is good; a response rate of 70 percent is very good” (Babbie, 2004, p.261).

Results

1. Demographic information of the Respondents

One hundred fifty five respondents participated in the survey. Frequency distribution of the respondents’ gender shows that there are 104 (67.1%) female and 51 (32.9%) male respondent.

With respect to subject, students belong to two units of the University of the Punjab. These were ‘Institute of Social & Cultural Studies’ and ‘School of Chemistry’. The

frequency distribution shows that 60% students were from Chemistry department. In respect of education, 143(92%) students were studying in MPhil and twelve students (8%) were enrolled in PhD programs.

Majority of students have less age and 59 (38%) respondents were between 18-22. 60(57%) respondents were 23-27 years old. There are only 9 (6%) respondents having the ages among 33-37 and only 07 students (5%) were above 38 (Table 1).

Table 1: Demographic details of respondents

Gender	Frequency	Percent
Female	104	67.10
Male	51	32.90
Subject		
Sociology	60	37.50
Chemistry	95	59.40
Education		
PhD	12	67.10
MPhil	143	32.90
Age		
18-22	59	30.06
23-27	61	39.35
28-32	19	12.26
33-37	09	05.81
Over 38	07	04.52
Total	155	100.0

2. Information Management Literacy Needs

Table 2 shows that all the items falling under the information management needs are ranked highly by the respondents. It is clear from the mean distribution of responses (with values range from 4.10 to 4.28), that respondents have agreed that they should be given information management literacy.

Table 2: Information Management Literacy Needs

Statements	Mean	SD
Information organization	4.28	.762
Information keeping (Files folders etc.)	4.07	.846
Information finding and re-finding	4.07	.947
Information Maintaining	4.10	1.04

Scale: (Strongly Disagree=1, Disagree=2, Undecided=3, Agree=4, Strongly Agree=5)

3. Internet and information retrieval literacy needs

Table 3 shows that respondents were interested in learning the use of online communication applications. Mean values show that users give the most value to the item learning the use of online communication applications (M=4.30) followed by learning the use of internet search engines (M=4.27). Learning about skills to retrieve

information from Web OPAC was also rated higher with the mean value of 3.97 and the least value that to learn the use of searching social networking sites (M=3.97).

Table 3: Internet and information retrieval literacy needs

Statements	Mean	SD
Use online communication applications (Zoom, Google meet, Skype)	4.30	.864
Using different internet search engines (Google, Yahoo, Bing)	4.27	.864
Retrieve information from Web OPAC	3.97	.983
Search information on social networking sites (Facebook, Twitter).	3.97	1.03

Scale: (Strongly Disagree=1, Disagree=2, Undecided=3, Agree=4, Strongly Agree=5)

4. Computer Literacy Needs

The respondents were not quite, so agreeable with the items in the Section D regarding computer literacy needs. Table 4 shows the mean distribution of the sample's responses. It is quite clear from the summary of the mean distribution of responses (M=4.02 to M=4.28) the students expressed their need for computer literacy. They intend to learn word processing, databases, and operating systems. They intend to increase their ability to troubleshoot technical issues.

Table 4: Computer literacy needs

Statements	Mean	SD
Use word processing with Microsoft Word	4.28	.760
Use PowerPoint	4.18	.835
Understand database applications with Microsoft Access	4.12	.921
Run operating systems (Windows, Linux)	4.06	1.03
Ability to troubleshoot technical issues	4.02	1.11

Scale: (Strongly Disagree=1, Disagree=2, Undecided=3, Agree=4, Strongly Agree=5)

5. Impact of education and age on literacy needs

Impact of age and education show that there is a positive correlation between the age and their level of education with various aspects of information and digital literacy needs. Results indicate that age is positively but with weak correlation with both information management literacy ($r = .155$, $p = .050$) and internet and information retrieval literacy ($r = .157$, $p = .051$). This implies that the increase in age, they want more help to handle and retrieve information. This could be ascribed to more academic exposure, research experience and exposure to knowledge of information systems overtime. Nevertheless, computer literacy needs is not significantly associated with age ($r = .065$, $p = .419$) but there is also positive correlation.

On the other hand, education level (MPhil vs PhD) does not show any statistically significant relationship (Information management literacy needs ($r = .059$, $p = .465$), computer literacy ($r = .015$, $p = .851$) and internet literacy ($r = .052$, $p = .521$) with any of the three literacy needs but the relationship of education is positive with literacy needs. The higher education has made students more conscious about learning information literacy skills and they expressed their need to get more guidance.

Table 5: Impact of education and age

Statements	Age		Education	
	Pearson correlation	Sig.	Pearson correlation	Sig.
Information management literacy	.155*	.050	.059	.465
Computer literacy	.065	.419	.015	.851
Internet information retrieval literacy	.157*	.051	.052	.521

6. Impact of gender and subject on literacy needs

The discussion of the gender and subject differences is an interesting concept about the information literacy needs of students. The means of the scores show that the male students slightly score higher than the female students in the three areas namely, Information Management Literacy (Male = 4.22, Female = 4.08) Computer Literacy (Male = 4.23, Female = 4.08) Internet and Information Retrieval Literacy (Male = 4.16, Female = 4.11). This implies that male want more literacy as compared to female but the results are not significant.

Subject influences significantly one domain Internet and Information Retrieval Literacy have a statistically significant difference ($p = .009$). Students in Chemistry (Mean = 4.24) scored higher than Sociology (Mean = 3.95) in this domain. This implies that science students are more interested to learn information and internet literacy as compared to social science students. It may be because they have been more exposed to databases, journals, and other research tools during scientific investigations. No meaningful differences were however observed in Information Management Literacy ($p = .640$) Computer Literacy ($p = .386$) which indicates that both literacy needs are the same across disciplines.

Table 5: Impact of gender and subject

Variables	Gender			Subject		
	Male Mean	Female Mean	Sig.	Chemistry Mean	Sociology Mean	Sig.
Information Management Literacy	4.22	4.08	.221	4.11	4.16	.640
Computer Literacy	4.23	4.08	.690	4.17	4.07	.386
Internet and information retrieval literacy	4.16	4.11	.120	4.24	3.95	.009

Findings

According to the analysis of the data, it is possible to outline the following key findings:

1. The demand of information management, internet and computer literacy needs is high

Students pleaded immensely on the necessity of every aspect of information literacy, such as management of information, internet searching and computer literacy. The

large means of scores show that there is a positive attitude to learning these competencies. The mean scores in all information literacy dimensions are very high showing that students strongly feel that they need to go through the competencies. Students indicated clearly that they would like to receive training on information management, internet searching and computer literacy, implying that they do not have all their learning needs met by the institutional support systems. It coincides with prior studies that have shown that students tend to value information literacy yet do not have the required abilities to accomplish the complex academic tasks successfully (Head, 2013). In terms of needs assessment, it can be stated that there is an absolute gap in the higher education system, in which students advance in academic stages without systematic training in information literacy. This result corresponds to Mahmood (2016) who points to the lack of formal information literacy training in Pakistani higher education.

2. There is positive correlation of education and age with literacy needs of students.

There is a positive but weak correlation of age with both information management literacy and internet and information retrieval literacy. Increase in age of students has enhanced their need of literacy. There was a positive correlation of education with literacy needs. The higher education has made students more conscious about learning information literacy skills and they expressed their need to get more guidance.

3. There is impact of gender and subject on literacy needs of students.

Gender does not considerably impact IL competencies but the slight variations in mean shows that male express higher desire for literacy needs as compared to female. The science students (Chemistry) score much higher on internet and information retrieval literacy needs as compared to the social science (Sociology) students. This implies exposure to research tools and databases which are discipline based.

Conclusion

The results of this research yield valuable information on the information searching and managing literacy requirements of students in universities. The results are more about outlining substantial areas where students need a structured support as well as training and instructional intervention. The information searching and management literacy need is a key requirement amongst university learners. According to the findings it is clear that the perception of the students concerning literacy needs is strong at a number of dimensions of information literacy such as information management, searching on the internet and computer literacy. The findings demonstrate that demographics play a minor role in determining the general information literacy requirements. This underscores a significant disparity in higher education, the growing academic pressure appears to be unmet by a relative lack of

corresponding gains in information literacy ability of students. It is on the basis of these findings that it becomes crucial to establish systematic and curriculum-based information literacies programs in the universities. Academic departments and libraries need to work together to develop specific interventions which will close the learning gaps. These programs need not only be technical oriented but also based on critical thinking and ethical handling of information as well as research management practices. To conclude, this study restates the relevance of needs-based approach to information literacy in higher education. By recognizing the unique learning needs of students and fulfilling these needs, institutions can improve their academic performance, foster research and equip students to be productive members of the knowledge society.

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