6-9-2021

# User Satisfaction about Information Literacy Skills and Training Needs among University Students of Islamabad, Pakistan

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**Abstract**

The information age has compelling reasons for university students to seek information literacy (IL) skills. IL skills are more challenging for students at the undergraduate level when they are prone to academic and scholarly literature. This study examined the students' satisfaction level with their IL skills. The study also investigated the importance of IL programs as perceived by the students. Undergraduate and postgraduate students, currently enrolled at engineering universities in Pakistan, participated in this research. A quantitative research approach was adopted to conduct this study and the data were collected from 352 participants using a self-administered structured questionnaire. Data were analyzed using SPSS version 27. The findings of this study indicate that engineering students have an average level of information literacy skills. There was no mean difference found based on gender in satisfaction level of IL skills of the student. Findings show that engineering students graded IL programs necessary to strengthen their IL skills. Moreover, participants expressed a need for structured and focused IL programs.

***Keywords:*** *Information Literacy Skills (ILS), university students, engineering students, training needs, HEC, Islamabad.*

## Introduction

In the digital information landscape, the challenge of information literacy has become crucial. The concept of an 'information society,' in which easy access to knowledge leads to improved societal, life, and environmental management, increasingly requires information literate communities (Khan et al., 2018). For the education sector and especially for students, it is no longer enough to have access to information merely; they must also have the capability to evaluate information sources and online data (Ayre, 2016). Although IL is not a novel phenomenon and has endured over centuries, the issue is now more severe with the spread and the viral nature of social media and the internet (Watts et al., 2021). The phrase “information literacy” was first used by Zukowaski (1974), which gained global dominance and promoted new sets of skills among information literate students. In the library and information science context, the term refers “to be information literate; a person must be able to recognize when information is needed and have the ability to locate, evaluate and use the needed information effectively” (American Library Association, 1989).

IL challenges have become a major social and political issue in the global lexicon, with the now-famous term "fake news". Information overload is helping shape a 'post-truth society, in which many people cannot discern fact from fiction and are consuming information that reaffirms their beliefs' (Lor et al., 2021; Pantzar, 2006). A common understanding that a society not being able to identify, locate, assess, organize, and communicate information has a strong fear of being eroded from the global information infrastructure slowly (Batool et al., 2021).

For decades the role of librarians is “to provide members of their communities with access to information" (Agosto, 2018). With the widespread usage of smartphones, laptops, and the internet's power, academia's major problem has switched from access to information to assessing and deciding the accuracy and relevance of that information (Khan et al., 2018). The way people obtain news and information has a significant impact on information literacy difficulties. According to the Pew Research Center, most adults acquire their news from internet sources instead of print media (Brooke & Anderson, 2021).

With special reference to Pakistan, the concept of IL for library practitioners and researchers is relatively new (Ameen & Ullah, 2016). Although Higher Education Commission

(HEC), an administrative unit for universities in Pakistan, has placed great emphasis on information literacy and is providing funds to make sure the provision of all digital and online resources, the problem of capacity building of students still exists (Ameen & Ullah, 2016). Recent research shows that there are visible developments in IL; however, little research has focused the IL skills in academic institutes of Pakistan. It is estimated that only 27 research publications have been published from Pakistan on the subject from 2009 to 2020. The majority of them (16 out of 27) have been published in the last five years, demonstrating that IL's topic is attracting the interest of researchers in Pakistan, particularly scholars in the discipline of library & information sciences.

Notwithstanding the fact of an emerging trend and IL scope within Pakistani academic institutes, it is surprising that research on IL skills of students has not been given due attention so far. Keeping in view the current scenario regarding IL scope and research in Pakistan, the present study explores IL skills among students to inform the recent research and practice in the IL area. This study, therefore, intends to highlight IL need and satisfaction level of engineering students among recognized private sector universities in Pakistan.

**Literature Review**

In the current era of information explosion, individuals need information literacy (IL) skills to access, discover, analyze, and utilize information (Ranaweera, 2006). Considering the importance of IL skills, many national and international researchers have investigated the current status and made suggestions to enhance students' IL skills (Blake et al., 2017; Gowri & Padma, 2018; Kousar & Mahmood, 2013, 2015; Malanga, 2017; Nyarigoti, 2020; A. Rafique & Mahmood, 2015; Safdar & Idrees, 2021; Zeeshan et al., 2020).

Nyarigoti (2020) assessed the undergraduate students' IL skills at United States International University, Africa. The study's findings revealed that students prefer to use Google as the primary source of information instead of the library and its resources, showing the low level of students' IL skills to use library resources. Considering the study's findings, the researcher suggested that faculty and librarian collaborate to arrange the literacy sessions to enhance the literacy skills of students. Majid et al., (2020) evaluated the IL skills of secondary school students of 14 institutions of Singapore and indicated that the students' IL skills were moderate. The study

suggested that it is necessary to revise the IL curriculum to enrich students' IL skills from moderate to high.

Ayyanar & Thirunavukkarasu (2019) investigated the engineering students' IL skills at "Alagappa Chettiar Government College of Engineering". The findings of the study demonstrated that participants have the IL skills to meet their research needs. The study results also indicated a need to arrange training to enrich engineering students' internet and information searching skills. Another study also evaluated the engineering students' IL skills at "PSR Engineering College, Virudhunagar district, Tamilnadu State, India" (Gowri & Padma, 2018). The study results showed that students could identify the information need better, find out information gap and use the retrieval tools effectively. The study also indicated that students were not skilled in synthesizing information, using new information tools, and evaluating themselves and other research results.

Malanga (2017) was surveyed to examine the IL skills of students at "Livingstonia University" in a study and revealed that students have a high level of awareness of various forms of information sources. Despite this, they are usually unable to complete tasks requiring them to locate different information sources that showed their moderate competence level. They comprehend the need to cite and reference research work to avoid plagiarism, but they lack the necessary abilities to reference and cite various information sources properly. A comprehensive study was conducted by Blake et al., (2017) to assess the students' IL skills to check the efficacy of the IL instruction program being offered at 12 universities of the US. The study results showed that students who participated in IL instruction performed well in educational success compared to those who did not join IL teaching.

Recently in Pakistan, Safdar & Idrees (2021) investigated the IL skills of undergraduate and postgraduate students. Another objective of the study was to ascertain what the students thought about the need for an IL program. The students' IL skills were reported to be low in the study's findings. The results also indicated most of the participants considered the IL program essential to fulfill their research need. Likewise, Zeeshan et al., (2020) conducted a study to know the IL skills of students at the "Lahore University of Management Sciences" (LUMS). The study's findings depicted that respondents have the skills to explore the needed information and possible information sources to search and retrieve information. The researcher further pointed out that

students considered IL skills essential for their educational success; so, IL training sessions must organize to enrich the students' IL skills.

Rafique & Khan (2017) investigated the management science students' IL skills. The researchers highlighted outstanding IL skills of management students because of their consistent ability to accurately identify needed information, obtain it from various sources and successfully use the information collected. The study also discovered that individuals prefer internet sources instead of traditional library sources while seeking knowledge. Hamid et al. (2015) conducted a study with the purpose to learn about the IL instructional methods utilized by ISD information professionals at Riphah International University, the frequency of IL sessions, and the students' perceptions about the IL program. According to the findings, the lecture technique is the most commonly employed, and students frequently attend seminars/workshops to enhance their literacy skills. IL sessions are also held once a month for an hour. The study results showed that the IL programs helped them to enhance their searching abilities and make better usage of the digital resources. According to participants, the IL sessions also help them in using the OPAC to find and identify library resources.

Kousar & Mahmood (2015) designed a survey to learn about teachers' views on postgraduate students' IL abilities. The study's participants were teachers at the “National University of Science and Technology” who were engaged to teach postgraduate engineering students. The findings showed that Ph.D. students had a greater degree of IL skills than MS or MPhil students. The study results highlighted that students' literacy skills gradually improve as their level of academic year progress. The researchers recommended that librarians collaborate with teachers to develop IL programs to strengthen students' IL capabilities. Rafique & Mahmood (2015) assessed engineering students' information literacy capabilities. The study's second aim was to see how information literacy skills are associated with gender, age, English language proficiency, and degree level. The study's findings revealed a substantial disparity in gender, age groupings, and English language competency. The researchers argued, like in other Pakistani studies, that information literacy teaching programs are highly required. At Air University in Pakistan, Kousar & Mahmood (2013) evaluated first-year engineering students' IL skills. The study's findings showed that undergraduates have insufficient IL skills. The data revealed that participants had an inadequate understanding of how to cite a source in their writing. In the study,

there was no significant difference was found in both genders' IL abilities. The researchers concluded that the students' IL capabilities were low and that an IL instruction program should be designed to empower students' IL skills.

The review of the literature highlighted that very few studies have been conducted to assess the IL skills of students in Pakistan. However, only 3 studies have been carried out to assess the IL skills of engineering students in Pakistan since 2020 (Kousar & Mahmood, 2013, 2015; Rafique & Mahmood, 2015). But no study seems to be conducted to examine the perception of engineering students regarding the need of IL programs in Pakistan. Therefore, it urges a necessity of research to fill this research gap to know the perception of the engineering students about the need of IL program as well as to know the student's satisfaction level about their IL skills. As a result, the findings of the study will help institutions, faculty, and information professionals to comprehend students' IL capabilities and take necessary actions in this regard.

**Research Questions**

Based on extensive literature review, researchers have formulated the following research questions for this study:

**RQ1:** What is the perception of engineering students about the needs of IL skills?
**RQ2:** What is the satisfaction level of engineering students regarding their IL skills?
**RQ3:** What is the mean difference in satisfaction level of students regarding IL skills based on academic qualification and gender?

**Research Hypothesis**

According to the third research question, the following null hypotheses were proposed.

**$H_0$1:** There is no significant mean difference in student's satisfaction level of IL skills based on gender.
**$H_0$2:** There is no significant mean difference in student's satisfaction level of IL skills based on academic qualification.

**Methodology**

The objective of the current study was to know the perceptions of the students currently enrolled in engineering universities in Pakistan about IL training needs. The study also attempted

to examine the participants' satisfaction level with their information literacy skills. To attain these objectives, researchers of the current study opted to deploy a quantitative method using a questionnaire to collect and analyze data. At the time of data collection, there were 4500 engineering students registered in various universities. Following a rule of thumb proposed by Connaway & Powell (2010), a sample size of 352 participants was drawn from the total population.

The data collection instrument, structure questionnaire, was developed using an extensive literature review on information literacy studies around the globe. A total number of 11 items of the questionnaire comprised of demographics, perceptions regarding IL training need and satisfaction level regarding information literacy skills of the participants. The questionnaire was comprised of three major sections. Section one covered the demographic information. Section two was about the participants' perceptions regarding the need for information literacy skills. Section three measured the satisfaction level of students about their information literacy skills, respectively. The first author distributed the printed questionnaire among the population using a stratified random sampling technique.

A total of 352 questionnaires were circulated among participants, out of which 300 were returned, indicating an 85% response rate. All questionnaires returned were filled and no questionnaire was incomplete. The collected data were analyzed using SPSS. It involved descriptive and inferential statistics. Descriptive analysis included frequency and percentage, whereas, in inferential statistics, independent samples t-test was used to test hypotheses.

## Results of the Study

### Demographic Information

The researcher gathered demographic information, namely gender and level of education, to get an overview of the participants. Table 1 showed that a total of 300 respondents participated in the study. However, the male respondents were n=220, 73.3%, whereas the female respondents were n=80, 26.7%. As a result, the majority of those who participated in the study were male. Table 1 also indicates the proportion of the participants of the study based on their academic level, i.e., postgraduate and undergraduate. The results showed that the undergraduate respondents were n=169, 56.3%, whereas postgraduate respondents were n=131, 43.7%. The undergraduate respondents were in the majority.

***Table1:*** *Demographic Information (n=300)*

| Variables | frequency | Percent |
|---|---|---|
| ***Gender*** | | |
| Male | 220 | 73.3 |
| Female | 80 | 26.7 |
| Total | 300 | 100.0 |
| ***Academic Qualification*** | | |
| Postgraduate | 131 | 43.7 |
| Undergraduate | 169 | 56.3 |
| Total | 300 | 100.0 |

***Students' perception about needs of IL skills***

Table 2 represents the respondents' perceptions about the needs of IL skills. The findings revealed that most students n= 187, 62.3% "agreed" that the IL program is essential to improve their IL skills and less than n=24, 8.0% "disagreed" with it. Moreover, n=151, 50.3% of respondents "agreed" that the maximum number of information literacy sessions for engineering students should be organized to enhance their IL skills and only n=12, 4.0% respondents "disagreed" with it.

Table 2 further highlighted that n=135, 45% of students "agreed" that IL sessions are necessary to access the research databases to fulfill their information need and n=1, 0.3% "strongly disagreed" with this statement. In addition, students were asked for their perception of introducing the quality-based IL program, and the majority of the students, n=136, 45.3% "strongly agreed" to raise the quality-based IL program and a very few participants, n=8, 2.7% "disagreed" with it.

**Table 2:** Distribution of the respondents according to their perception about the needs of IL skills

| Statements | Strongly Disagree | | Disagree | | Neutral | | Agree | | Strongly agree | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Ƒ | % | *f* | % | *f* | % | Ƒ | % | Ƒ | % |
| The information literacy program is necessary for engineering students to improve information literacy skills | 2 | 0.7 | 24 | 8.0 | 20 | 6.7 | 187 | 62.3 | 67 | 22.3 |

| Statements | Strongly Disagree | | Disagree | | Neutral | | Agree | | Strongly agree | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Ƒ | % | *f* | % | *f* | % | Ƒ | % | Ƒ | % |
| There should be a maximum number of information literacy sessions for engineering students | 6 | 2.0 | 12 | 4.0 | 26 | 8.7 | 151 | 50.3 | 105 | 35.0 |
| A literacy session is necessary for accessing research databases | 1 | 0.3 | 22 | 7.3 | 22 | 7.3 | 135 | 45.0 | 120 | 40.0 |
| Quality based Information literacy program should be introduced for engineering students | 6 | 2.0 | 8 | 2.7 | 23 | 7.7 | 127 | 42.3 | 136 | 45.3 |

Scale: *5 = Strongly agree, 4 = Agree, 3 Nautral, 2 = Disagree, 1 = Strongly disagree

**Descriptive Statistics regarding the needs of IL skills**

The statistics given in Table 3 represent that respondents “agreed” with the statement that the quality-based Information literacy program should be introduced for engineering students, the literacy session is necessary for accessing research databases, and there should be a maximum number of information literacy sessions for engineering students; IL program is important for engineering students to improve IL skills with means, i.e., 4.26, 4.17, 4.12, 3.97 respectively.

Therefore, it is clear from the results that quality-based information literacy programs should be introduced for engineering students. Moreover, literacy sessions are essential for accessing research databases.

***Table 3:*** Mean, standard deviation, and rank order of the respondents' perception about the needs of IL skills

| Respondents' perceptions about the need of information literacy skills | Mean | Std. Dev. | Rank |
|---|---|---|---|
| Quality based Information literacy program should be introduced for engineering students | 4.26 | .86 | 1 |
| A literacy session is necessary for accessing research databases | 4.17 | .87 | 2 |
| There should be a maximum number of information literacy sessions for engineering students | 4.12 | .87 | 3 |
| The information literacy program is necessary for engineering students to improve information literacy skills | 3.97 | .82 | 4 |

Scale: *5 = Strongly agree, 4 = Agree, 3 Nautral, 2 = Disagree, 1 = Strongly disagree

SD* = Standard Deviation

**Satisfaction level of engineering students regarding their IL skills**

In this section, the participants rated their satisfaction level with their IL skills. The results in table 4 revealed that the significant number of participants, n=153; 51% "agreed" that they are satisfied with their ability to identify the appropriate source of information and only n=6; 2% of respondents "strongly disagreed" with the statement mentioned above. Likewise, most participants n=154; 51.3% "agreed" against the statement that they are satisfied with their ability to prepare, present, share and display the collected information and only n=19; 6.3% "strongly disagreed."

Meanwhile, engineering students were asked to show their satisfaction level regarding their ability to explore resources and information to reduce knowledge gaps. The total number was n=116; 38.7% "agreed" with it whereas n=108;36% "disagreed."

Table 4 further indicating that majority of the students n=181; 60.3%, "agreed" with the statement that "I am satisfied with my ability to use the information ethically", and n=50; 16.7% "disagreed". Similarly, a good number of respondents n=176; 58.7 % "agreed" that they are satisfied with their capability to assess the information critically, and few of them n=36; 12% "disagreed".

***Table 4:*** *Distribution of the respondents according to their Satisfaction level regarding their IL skills*

| **Statements** | **Strongly Disagree** | | **Disagree** | | **Neutral** | | **Agree** | | **Strongly agree** | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Ƒ** | **%** | ***f*** | **%** | ***f*** | **%** | ***f*** | **%** | **Ƒ** | **%** |
| I am satisfied with my ability to identify the appropriate source of information | 6 | 2.0 | 89 | 29.7 | 23 | 7.7 | 153 | 51.0 | 29 | 9.7 |
| I am satisfied with my ability to explore resources and information to reduce knowledge gaps | 11 | 3.7 | 108 | 36.0 | 31 | 10.3 | 116 | 38.7 | 34 | 11.3 |
| I am satisfied with my ability to prepare, present, share and display the collected information. | 19 | 6.3 | 51 | 17.0 | 33 | 11.0 | 154 | 51.3 | 43 | 14.3 |
| I am satisfied with my ability to use the information ethically | 14 | 4.7 | 50 | 16.7 | 22 | 7.3 | 181 | 60.3 | 33 | 11.0 |
| I am satisfied with my ability to Evaluate the information critically | 12 | 4.0 | 36 | 12.0 | 46 | 15.3 | 176 | 58.7 | 30 | 10.0 |

Scale: *5 = Strongly agree, 4 = Agree, 3 Nautral, 2 = Disagree, 1 = Strongly disagree

**Descriptive Statistics about the satisfaction level of engineering students regarding their IL skills**

The statistics given in Table 5 showed that respondents “agreed” that they were satisfied with the statements, i.e., they could evaluate the information critically, ability uses the information ethically, and ability to prepare, present, share and display the collected data with means, i.e., 3.58, 3.57 & 3.50 respectively. However, the statements, i.e. (ability to identify the appropriate source

of information and ability to explore resources and information to reduce knowledge gaps) were opined as neutral with means as 3.37 and 3.18.

***Table 5:*** *Mean standard deviation and rank order of the respondents' satisfaction level regarding IL skills.*

| **Respondents' satisfaction level regarding their IL skills** | **Mean** | **Std. Dev.** | **Rank** |
|---|---|---|---|
| I am satisfied with my ability to Evaluate the information critically | 3.58 | 0.96 | 1 |
| I am satisfied with my ability to use the information ethically | 3.57 | 1.03 | 2 |
| I am satisfied with my ability to prepare, present, share and display the collected information. | 3.50 | 1.12 | 3 |
| I am satisfied with my ability to identify the appropriate source of information | 3.37 | 1.06 | 4 |
| I am satisfied with my ability to explore resources and information to reduce knowledge gaps | 3.18 | 1.14 | 5 |

Scale: *5 = Strongly agree, 4 = Agree, 3 Nautral, 2 = Disagree, 1 = Strongly disagree

SD* = Standard Deviation

**Independent Samples Test for Hypothesis 1**

The following null hypothesis depicts that:

***$H_0$*1:** There is no significant mean difference in student's satisfaction level of IL skills based on gender.

The hypothetical analysis shows that the proposed significant value is 0.05%, whereas the significant 2 tailed value is 0.001% which is less than 0.05% which means that our hypothesis is rejected. Hence, the results show a significant mean difference in students' satisfaction level of IL skills based on gender.

***Table 6:*** *Independent Samples Test for Hypothesis 1*

| Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | 95% Confidence Interval of the Difference | |
| **F** | **Sig.** | **T** | **Df** | **Sig. (2-tailed)** | **Mean Difference** | **Std. Error Difference** | **Lower** | **Upper** |
| 5.173 | .024 | 3.277 | 298 | .001 | .278 | .085 | .111 | .445 |
| | | 2.993 | 120.038 | .003 | .278 | .093 | .094 | .462 |

**Independent Samples Test for Hypothesis 2**

The following null hypothesis shows that:

***$H_0$*2:** There is no significant mean difference in student's satisfaction level of IL skills based on academic qualification.

The hypothetical analysis shows that the proposed significant value is 0.05%, whereas the significant 2 tailed value is 0.938% which is slightly greater than 0.05% which means that our hypothesis is accepted. Hence, the results show no significant mean difference in students' satisfaction level of IL skills based on academic qualification.

***Table 7:*** *Independent Samples Test for Hypothesis 2*

| Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | 95% Confidence Interval of the Difference | |
| **F** | **Sig.** | **t** | **Df** | **Sig. (2-tailed)** | **Mean Difference** | **Std. Error Difference** | **Lower** | **Upper** |
| .639 | .425 | -.078 | 298 | .938 | -.006 | .077 | -.157 | .145 |
| | | -.077 | 270.654 | .939 | -.006 | .078 | -.159 | .147 |

**Discussion**

The study results revealed that engineering students considered IL program necessary to improve their IL skills and access the research databases and want quality-based IL program should be introduced for engineering students. The study's findings align with those of a recent survey by Safdar & Idrees (2021) and Zeeshan et al. (2020), which indicated that most students considered the IL program essential to fulfill their research and information need. Another study

by Ayyanar & Thirunavukkarasu (2019) also recommended that training should be arranged to enrich engineering students' IL skills. The previous studies conducted by Kousar & Mahmood (2013, 2015) and Rafique & Mahmood, 2015 recommended that there is a dire need to organize the IL instruction programs to enhance engineering students' literacy skills.

In addition, the study's findings revealed that engineering students possessed the average level of information literacy skills to evaluate the information critically and to use it ethically, which are supporting the results of Rafique & Mahmood (2015), who stated that engineering students IL skills were good to evaluate the needed information and to use it ethically. However, students' satisfaction level regarding identifying the appropriate source of information and exploring resources and information to reduce knowledge gaps was a little bit low. The findings contradict the findings of Gowri & Padma (2018), who stated that engineering students were better to identify the information need, find out information gap and use the retrieval tools effectively.

The results depicted a significant mean difference in students' satisfaction level of IL skills based on gender, which meant that male engineering students were more satisfied with their level of IL skills than female students.

However, the findings indicated no significant mean difference in engineering students' satisfaction level of IL skills based on academic qualification, which showed that the satisfaction level of undergraduate and postgraduate engineering students regarding their IL skills was the same. The results echo Rafique & Mahmood, (2015) study findings as he stated that the level of IL skills of undergraduate and postgraduate engineering students is equal.

**Conclusion**

The findings showed that engineering students consider information literacy programs necessary to enhance their IL skills and access the research databases. Moreover, the hypothetical analysis indicates no mean difference in satisfaction level of IL skills based on the level of education. In contrast, there was a significant mean difference in satisfaction level of IL skills based on gender. Furthermore, respondents were satisfied with their ability to evaluate the information critically.

## Recommendations

The following recommendations have been derived from the findings of the study:

- LIS professionals with the coordination of faculty should arrange maximum and quality-based IL sessions for engineering students.
- It is recommended that HEC take the initiative to incorporate quality-based information literacy courses in undergraduate and postgraduate curricula.
- Students should be encouraged to attend training, seminars, and workshops related to information literacy.

## Declaration

The authors declare no conflict of interest.

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