Assessment of Information Literacy Competence of Researchers

Taruna Joshi

Abstract

ACRL's Information Literacy Standards for Science, Engineering, and Technology were used to develop questionnaire to assess the information literacy competence of doctoral researchers in science of central universities in Delhi, and IIT Delhi. The findings are baseline assessment of such researchers, which could be used to guide the development of information literacy programme.

Keywords: Information Literacy

1. Introduction

"Information literacy in science, engineering, and technology disciplines is defined as a set of abilities to identify the need for information, procure the information, evaluate the information, and subsequently revise the strategy for obtaining the information, to use the information and to use it in an ethical and legal manner, and to engage in lifelong learning". (ACRL)

Based on the ACRL Information Literacy Competency Standards for Higher Education, five standards and twenty-five performance indicators were developed for information literacy in Science & Engineering/ Technology. Each performance indicator is accompanied by one or more outcomes for assessing the progress toward information literacy of students in these disciplines at all levels of higher education.

As reported in the literature, tools have been developed for assessing information literacy, based on ACRL Standards. Rhodes and Ralph (2010) reported "needs assessment" of doctoral students at Southeastern Louisiana University. Catalano (2010) reported use of ACRL Standards for assessing graduate education students.

2. Statement of the Problem

Although information literacy is practiced and researched in many countries, still it is in its infancy (Bruce, 1997). In India no such study appears to have been done on the assessment of information literacy competence of science doctoral students.

Information literacy is a crucial skill. At the central universities in Delhi and Indian Institute of Technology, Delhi (IITD), it has not reached a stage expected of a doctoral student. In order to implement information literacy programmes for the researchers in these central universities and IITD, it is essential to determine the baseline skills of these researchers. The assessment will help in finding the gaps in information literacy competence of the researchers, which can be used by librarians and faculty members in information literacy programmes.

3. Scope

The study covered the science doctoral researchers of all the following universities:

1. Jamia Millia Islamia (JMI)
2. University of Delhi (DU)
3. Jawaharlal Nehru University (JNU)
4. Indian Institute of Technology Delhi (IITD)

4. Limitations

The study covered the science doctoral researchers of central universities of Delhi and IITD who were on roll during 2009-11 only.

5. Methodology

The data was collected by conducting a sample survey using questionnaire. The response rate for DU, IITD, JMI, and JNU was 25%, 63%, 54% and 25% respectively. The questionnaire contained a few demographic questions in addition to questions based on ALA/ ACRL Information Literacy Standards for Science, Engineering / Technology. The learning outcomes in the Standards were used to inspire the development of the questions. A numerical score was assigned to the questions which were designed to measure information literacy competence. The questions which were assigned scores were collated as per ACRL Standards. Thus finally the scores were arranged in five categories, i.e., percentage scores for Standard One, Standard Two, Standard Three, Standard Four, and Standard Five. SPSS software version 16 was used for analysing data.

6. Data Analysis and Findings

6.1 Description of Sample

A total of 671 doctoral researchers from different streams in sciences pursuing research at central universities in Delhi and IITD, responded to the questionnaires. Doctoral researchers were chosen because they are expected to conduct the most exhaustive and sophisticated level of research projects among all students. Additionally, the research these individuals conduct and the findings they publish have a significant impact on scholarly communication and the academic community (Brahme, 2010). This research work aims to establish the baseline information literacy competence of doctoral researchers, which could be used for addressing the shortcomings in the level of information literacy competence expected from them.

6.2 Distribution of Researchers by University

Out of a total of 671 researchers, 245 were from DU, 196 from IITD, 114 from JMI and 116 from JNU. Thus 36.5% researchers were from DU, 29.2% from IITD, 17% from JMI and 17.3% from JNU, as presented in Table 1 and Figure 1.

University/Institute	Number of researchers	Percentage of researchers
DU	245	36.5%
IITD	196	29.2%
JMI	114	17.0%
JNU	116	17.3%
Total	671	100.0%

Table 1. Distribution of Researchers

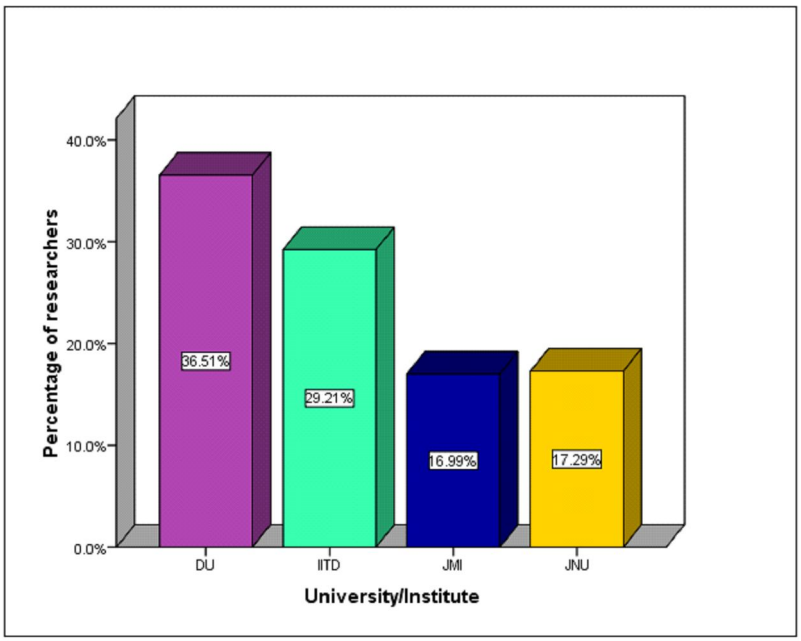

Figure 1. Distribution of Researchers

Mean information literacy scores of researchers from different universities and IITD are presented in Table 2 and Figure 2.

6.3 Information Literacy Scores in Standard One

The researchers from IITD scored significantly higher than the researchers from other universities. The researchers from DU scored significantly higher than the researchers from JMI and JNU. There is no significant difference between the scores of JMI and JNU, as shown in Table 3.

Thus, IITD researchers are better in determining the nature and extent of the information needed, followed by DU researchers.

Table 2. Information Literacy Scores by ACRL Standards

	University/Institute			
	DU	IITD	JMI	JNU
	Mean	Mean	Mean	Mean
Percentage Score Standard One	44.60	66.14	35.73	37.70
Percentage Score Standard Two	33.09	46.66	27.60	35.68
Percentage Score Standard Three	30.56	42.54	18.09	37.72
Percentage Score Standard Four	45.64	48.07	50.82	50.05
Percentage Score Standard Five	49.71	66.84	38.51	57.84

6.4 Information Literacy Scores in Standard Two

IITD researchers scored significantly higher than the researchers from other universities. The researchers from DU and JNU scored significantly higher than the researchers from JMI. There is no significant difference between the scores of researchers from DU and JNU.

Thus, IITD researchers are better in acquiring the needed information effectively and efficiently, followed by DU and JNU researchers.

6.5 Information Literacy Scores in Standard Three

IITD researchers scored significantly higher than the researchers from other universities. JNU researchers scored significantly higher than DU and JMI researchers. DU researchers scored significantly higher than those from JMI.

Thus, IITD researchers are better in critically evaluating the procured information and its sources, and as a result, deciding whether or not to modify the initial query and/or seek additional sources and whether to develop a new research process, followed by JNU researchers, who were followed by DU researchers.

6.6 Information Literacy Scores in Standard Four

JMI and JNU researchers scored significantly higher than DU researchers. There was no significant difference in the scores of DU and IITD researchers.

Thus, JMI and JNU researchers are better in understanding the economic, ethical, legal, and social issues surrounding the use of information and its technologies and either as an individual or as a member of a group, using information effectively, ethically, and legally to accomplish a specific purpose.

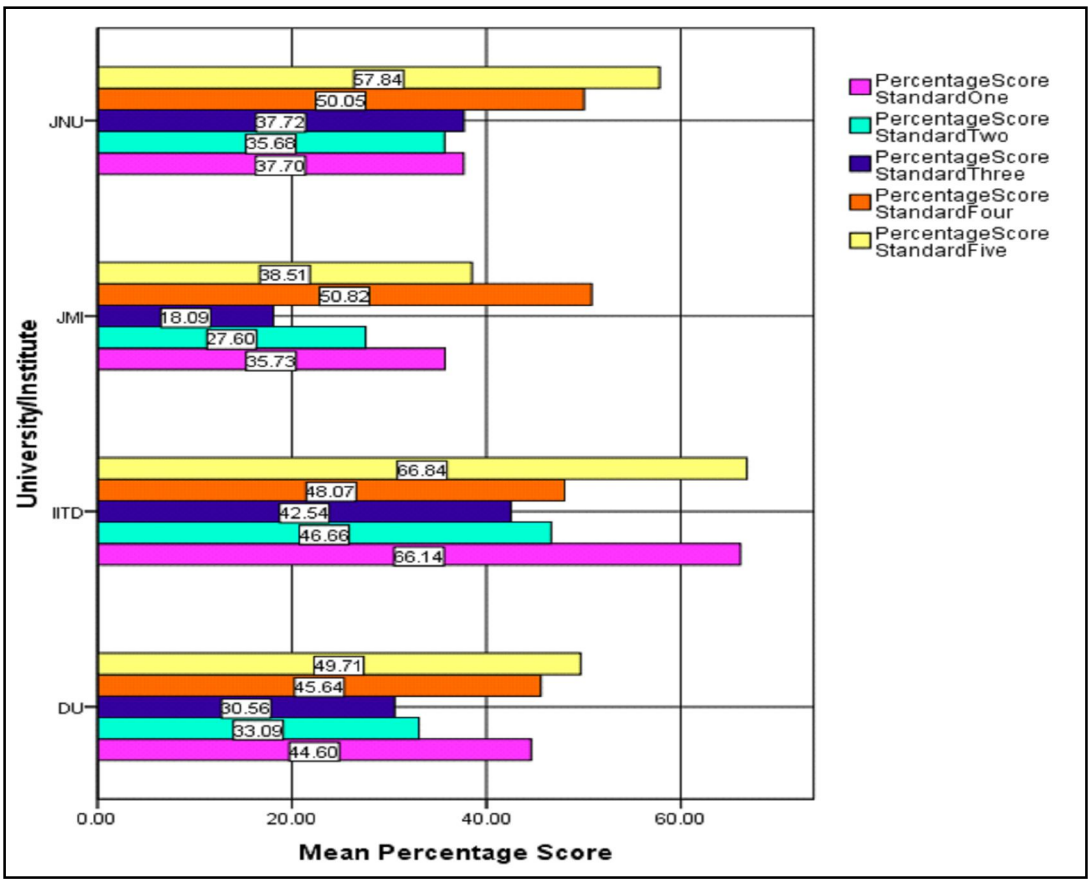

Figure 2: Information Literacy Scores by University

Table 3. Comparison of Column Means of Information Literacy Scores by University

	University			
	DU	IITD	JMI	JNU
	(A)	(B)	(C)	(D)
Percentage Score Standard One	C D	A C D		
Percentage Score Standard Two	C	A C D		C
Percentage Score Standard Three	C	A C D		A C
Percentage Score Standard Four			A	A
Percentage Score Standard Five	C	A C D		A C
Results are based on two-sided tests assuming equal variances with significance level 0.05. For each significant pair, the key of the smaller category appears under the category with larger mean.				
a. Tests are adjusted for all pair-wise comparisons within a row of each innermost sub-table using the Bonferroni correction.				

6.7 Information Literacy Scores in Standard Five

IITD researchers scored significantly higher than the researchers from other universities. JNU researchers scored significantly higher than DU and JMI researchers. DU researchers scored significantly higher than JMI researchers.

Thus, IITD researchers are better in understanding that information literacy is an ongoing process and an important component of lifelong learning and recognising the need to keep current regarding new developments in his or her field.

7. Total Information Literacy Scores

The mean total percentage of information literacy scores, of IITD researchers, was 54.05%, which was the highest among all the researchers. JNU researchers scored 43.8%, which was the second highest score. DU researchers scored 40.72%, which was the third highest score. JMI researchers scored 34.15%, which was the lowest score, as shown in Table 4 and Figure 3.

The mean total score percentage of the researchers from universities and IITD is below 60% even when PhD is one of the highest level of education provided by the universities and IITD. This has also been noted by Pilerot while reporting, "One of the common problems encountered by many PhD students is the belief that one has control over the amount of information that had been collected, only to experience difficulties at a later stage when the information is to be retrieved and placed in context". Pilerot mentioned that Genoni and Partridge in an article on the personal research information management of PhD students stated that "many students who undertake postgraduate research are poorly prepared for the personal research information management tasks which await them". They also came to the conclusion that "even after a period of research many students have not acquired the skills necessary to conceptualize their research data in such a way that it can be efficiently stored and retrieved" (Pilerot).

Table 4. Estimated Marginal Means of Total Percentage Score

University/Institute	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
DU	40.722	.642	39.461	41.982
IITD	54.049	.718	52.640	55.459
JMI	34.150	.941	32.302	35.997
JNU	43.797	.933	41.965	45.629

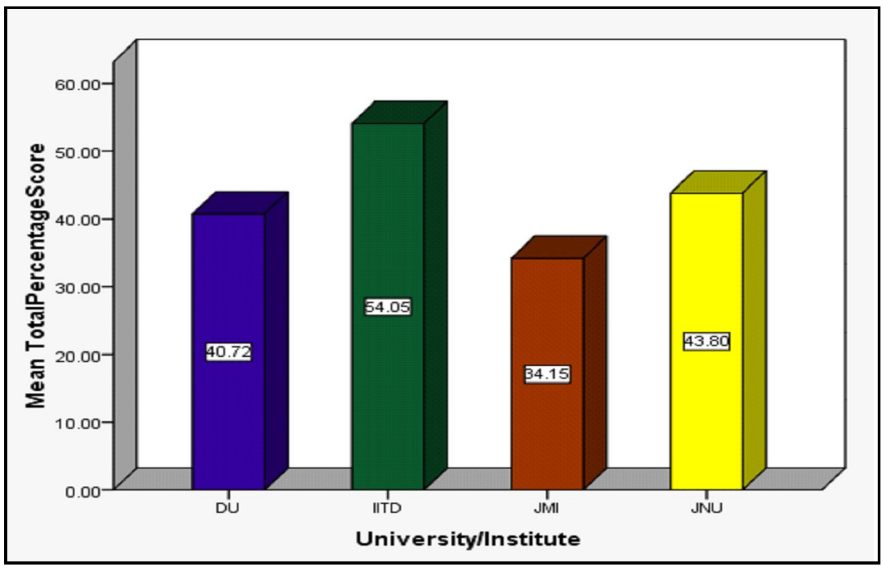

Figure 3. Total Information Literacy Score

The information literacy scores of IITD ranged from 52% to 55%. The scores of JNU researchers ranged from 41% to 45%. The scores of DU researchers ranged from 39% to 41%. The scores of JMI researchers ranged from 32% to 35%. These differences in information literacy scores might be due to the support those researchers receive from supervisors, fellow researchers, other faculty members, or their library.

8. Conclusion

IITD researchers are significantly better than the researchers from other universities in Standard One, Two, Three, and Five. In Standard Four, IITD researchers lag behind JMI and JNU researchers, while their score does not differ significantly from DU researchers.

JNU researchers scored significantly higher than DU and JMI researchers in Standard Three and Five. They scored significantly higher than JMI researchers in Standard Two and DU in Standard Four. The score of JNU researchers in Standard One do not differ significantly from JMI researchers.

DU researchers scored significantly higher than JMI and JNU researchers in Standard One. They scored significantly higher than JMI researchers in Standard Two, Three, and Five. In Standard Four, score of DU researchers did not differ significantly from that of IITD researchers.

JMI researchers scored significantly higher than DU researchers in Standard Four.

Thus, IITD researchers are the most information literate, followed by the researchers from JNU, DU, and JMI. Still, the information literacy skills of the doctoral researchers are much below the standards. The researchers from all the universities and IITD have learnt their existing skills by themselves. These researchers have not participated in any information literacy programme because no such comprehensive or tailor made

programme for doctoral researchers, exists in these universities and IITD. Base on these results effective tailor made programmes should be initiated in these universities especially for researchers.

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About Author

Ms. Taruna Joshi, Librarian, Ramjas College, University of Delhi, Delhi - 110007
E-mail: tjnssvcl@yahoo.com