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# Information literacy competency of researchers in social sciences: An assessment from diverse perspectives

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## Abstract

Information literacy (IL) provides essential proficiency for academics and research in the networked digital information landscape. The present study is an empirical assessment of information literacy competency (ILC) levels of researchers in social sciences from varied frames of reference i.e. gender, age groups, periods of research, subjects and universities. The data collected from 520 researchers were processed and analyzed using various techniques of descriptive and inferential statistics to identify IL competent and incompetent researchers on different variables. The descriptive statistics included frequency distribution, percentage distribution, etc. and was aided by computing mean, standard deviation, and range. Inferential statistics consisted of various tools like One-way analysis of variance, F-ratio, and Post-Hoc test using list significant differences (LSD). On the competency scale around 81.5% of the total researchers consisting of 9.6% 'Outstanding', 26.5% 'Excellent', 25.0% 'Very Good' and 20.4% 'Good' were found IL competent and rest 18.5% of researchers comprising 11.2% 'Baseline', 5.0% 'Minimal' and 2.3% 'Very Low' lacked similar competency. The study suggests measures for improvement in current IL practices to further improve researchers' ILC.

## Keywords

Information literacy, information literacy skills, information literacy competency, assessment and evaluation, social science researcher

## Introduction

The easy accessibility to enormous amounts of information has caused difficulties in finding, evaluating, and using it ethically. Skills and abilities essential to properly contextualize information have become important in the current environment of overload, saturation, and misinformation. Information Literacy (IL) as a "set of abilities requiring individuals to recognize when information is needed and have the ability to locate, evaluate and use effectively the needed information" (ACRL, 2000: 2) has become a ubiquitous topic (Detmering et al., 2019). Academic libraries the world over are actively engaged in IL instructions and conduct different activities and programs for inculcating the "set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning" (ACRL, 2015: 3). The articulated goal of IL is to help learners develop critical, analytical, and reflective modes of thinking. It provides essential proficiency for academic success and lifelong learning in the networked digital information landscape (Folk, 2019; Pieterse et al., 2018). A higher level of competency is a principal consideration in IL. It "is the competency that empowers one with the required knowledge about information, its nature and available formats; skills to fetch the relevant information by sifting the irrelevant, and attitude for consuming and sharing information, by ethical means and practices" (Koneru, 2010: 23). IL aims to make the learners' information literate by equipping them with skills and abilities to determine the information need, identify and access information from various sources and formats and then critically evaluate, comprehend and use information in knowledge creation in an ethical way. Hence, it is imperative to assess the learning outcomes of students and the efficacy of IL programs and activities.

Periodic assessment of learners is essential as it provides a continuous impetus and helps to remediate for student areas of need, weaknesses, deficits, and so on (Baum et al., 2014; Krutkowski, 2017). Assessment of competency in IL skills is equally important. The ACRL report calls upon academic librarians to assess their practice, particularly in terms of student success, to articulate explicitly the value they add to their institutions (ACRL, 2010). IL assessment is a method and process to ascertain the

level of ILC in a learner. It is used to evaluate the impact or success of IL instruction at the class, programmatic or institutional level (Detmering et al., 2019). It helps to diagnose the current level of knowledge and competence of the target group, provide actual feedback for improvements in IL instruction practices and; determine the actual learning outcome and overall success of the IL program. It also serves as a tool for increasing IL efficacy of learners (Lerdpornkulrat et al., 2019). In a nutshell, IL assessment programs serve three primary functions: “feedback to learners”, “feedback to instructors”, and “justify the value to administrators” and other stakeholders (Erlinger, 2018; Kaplowitz, 2014; Lerdpornkulrat et al., 2019; Sobel and Sugimoto, 2012). Assessment is vital for all types of IL programs and activities, whether formal or informal, and continues to be a predominant topic. Countless presentations and publications, including several entire books on the subject, attest to the continued relevance of assessment as a central focus of IL instruction (Mackey and Jacobson, 2010). Realizing its importance, academic librarians engaged in IL instructions are dedicated to assessment and employ a wide variety of methods and tools to assess learning outcomes, sometimes to great success (Erlinger, 2018).

### **Review of literature**

The literature review shows that a variety of methods and tools have been evolved and used to assess IL skills and competency at the organizational, national and international levels (Rozzi-Ochs, et al. 2012). These include rubrics, performance measures, authentic assessment, focus groups, surveys, classroom assessment, multiple-choice tests, fill-in-the-blanks, matching questions, and so on (Erlinger, 2018). Researchers employed appropriate methods depending on various requirements of condition and context. Chang et al. (2012), Foo et al. (2017), Ngo et al. (2019) and Soleymani (2014) used multiple-choice tests and Walsh (2009) used self-assessment method. Many studies have also carried pre-instruction and post-instruction IL assessment. Oakleaf (2008) identified three primary IL assessment approaches (1) fixed-choice tests, (2) performance assessments, and (3) rubrics. Walsh (2009) reviewed the existing literature and found that over one-third of studies use multiple-choice questions to measure IL competency. The standards and guidelines developed by ACRL, AASL, CAUL, CILP and SCOUNL entail measurement as a means to assess performance against the standards (Majid et al., 2016). Uribe-Tirado and Munoz (2012) analyzed prominent IL standards and guidelines and identified three core IL skills: access, evaluation and the use of information. Based on standards and guidelines of ALA, SCOUNL, and CILIP, DaCosta (2010) identified a group of competencies like recognition of information needs, identification of the source of information, search strategy formulation, evaluation of information, and creation of new knowledge. Saunders (2012) identified location, access, and evaluation of information as baseline IL competencies. Dubicki (2013) used five ACRL standards to identify parameters and assess IL skill levels of students in determination, access, evaluation, use, and use ethics of information.

The literature is replete with IL assessment studies. Ngo et al. (2019) explored IL capabilities of learners in Vietnam using IL competency-level assessment toolkit of USA. The questionnaire was developed with multiple choice questions and served as a real-time IL assessment tool. The ILC of students was measured for the formulation of search strategies, evaluation of information sources and ethical use of information. The study identified deficiencies in students' ILC and gender differences in IL capabilities. Squibb and Zanzucch (2020) used surveys and interviews to investigate upper-division students' research competencies. The focus of the study was dispositions, challenges, and developments of the respondents. Authors found library instructions capable of inculcating foundational skills for information handling. Walters et al. (2020) studied students' test performance, written coursework, and comments on library instruction sessions to diagnose their IL capabilities. The authors found a linkage between IL instruction and assessment and emphasized the importance of evidence-based measures. Foo et al. (2017) assessed the IL skills of students in terms of identifying information needs, selecting sources of information, retrieving, synthesizing and using information.

Limited IL assessment studies are made for social science students. In India, many of the university libraries are actively engaged in IL instructions and are conducting different activities and programs. Periodic assessment of these activities in terms of effectiveness and learning outcomes is essential. There are established differences in Indian society and the rest of the world. Hence, there is a need to assess the

ILC levels of researchers engaged in social research in India. The present study is an attempt in this regard and aims to fill the vacuum.

### Objectives

- To gauge the ILC levels of social science researchers across gender, age groups, the period of research, subjects and universities.
- To identify the segment of researchers requiring improvements in ILC.
- To suggest measures for improvement of ILC.

### Hypothesis

H<sub>1</sub>: There is difference in the ILC levels of researchers from different perspectives i.e. gender, age groups, periods of research, subjects and universities.

H<sub>0</sub>: There is no difference in the ILC levels of researchers from different perspectives.

### Scope

The present study aims to gauge the ILC level of researchers in social sciences across different frames of reference. The study population consisted of 3443 full-time researchers enrolled for Ph.D. at Indira Gandhi National Open University (IGNOU), Jamia Millia Islamia (JMI), Jawaharlal Nehru University (JNU) and University of Delhi (DU) in the Departments of Economics, Geography, History, Law, Political Science and Sociology. The study is limited to the researchers enrolled during 2015-2017. The population was stratified by discipline, gender, and institution for sampling. The online Sample Size Calculator of Creative Research Systems (2012) was used to find out the accurate sample size of 511 on a 95% confidence level and 4% confidence intervals. The questionnaire schedule was rendered to 960 researchers thus selected for the study and a total of 520 questionnaires complete in all respect have been used, which is higher than the accurate sample size.

### Methodology

Reviewing the standards, guidelines and frameworks of ACRL (2000, 2015), AASL (1998, 2018), ANCIL (2011) and SCONUL (2011) five parameters of ILC were identified as Information Need, Information Access, and Information Evaluation, Information Use, and Information Use ethics. Each of these parameters was transformed into a set of ten empirical questions to develop a questionnaire schedule consisting of 50 questions. It was posed to the respondents to collect relevant data to test and measure the ILC levels. The responses were manually evaluated and two marks were allotted to each correct answer. The test scores were again manually tabulated on selected parameters from each questionnaire. The data thus collected was further processed and analyzed using various techniques of descriptive and inferential statistics to identify IL competent and incompetent researchers on different variables. The descriptive statistics included frequency distribution, percentage distribution, etc. and was aided by computing mean, standard deviation and range. Inferential statistics consisted of various tools like One-way Analysis of Variance (ANOVA), F-ratio, and Post-Hoc test using LSD. The competency levels of respondents were measured based on the self-explanatory Performance and Competency Scale (Singh and Kumar, 2019) given in Table 1.

**Table 1: Performance and Competency Scale**

<b>% of Marks</b>	<b>Grade</b>	<b>Performance Grading</b>	<b>Competency Level</b>
91 and above	'O'	Outstanding	Outstanding
81 to 90	'E'	Excellent	Excellent
71 to 80	'A'	Very Good	Very Good
61 to 70	'B'	Good	Good
51 to 60	'C'	Fair	Baseline
41 to 50	'D'	Below Average	Minimal
Below 40	'F'	Failed/Not Responded	Very Low

## Profile of respondents

The details of respondents across gender, age group, the period of research and subject area of research from each university are depicted in Table 2.

**Table 2: Profile of Respondents**

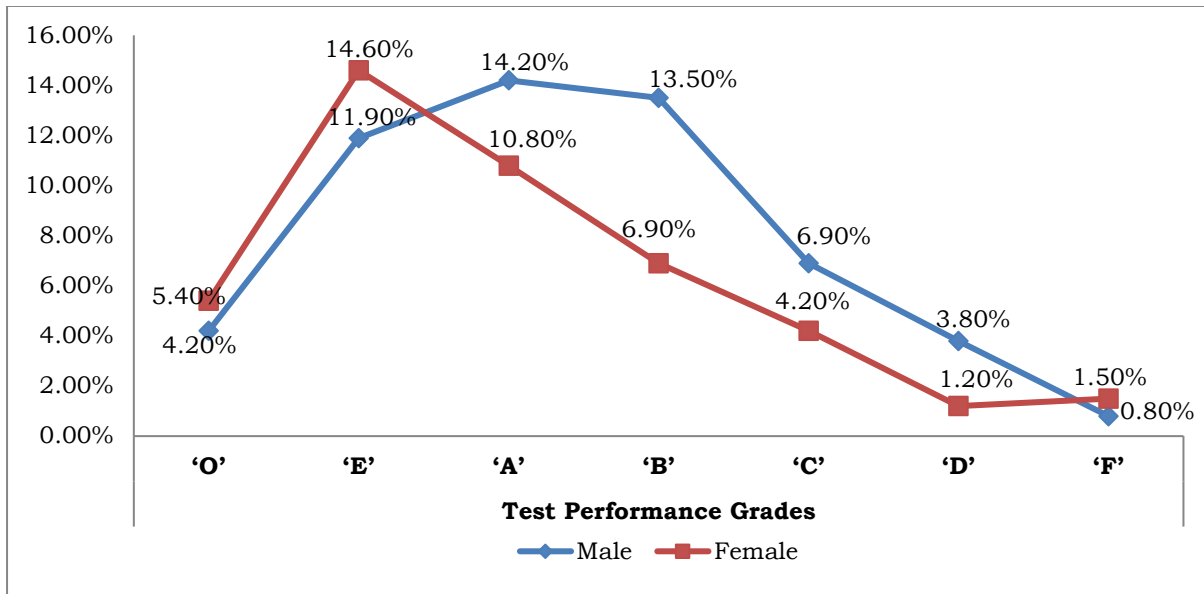
University Enrolled		Gender		Age Group (in years)				Period of Research (in years)				Subject Area of Research					Total	
		Male	Female	21-25	26-30	31-35	36 & above	< 1	1-2	2-3	> 3	History	Political Science	Economics	Sociology	Geography		Law
<b>DU</b>	Number of Respondents	78	44	6	82	28	6	22	44	22	34	20	20	20	20	20	22	122
	% of Respondents	63.9%	36.1%	4.9%	67.2%	23.0%	4.9%	18.0%	36.1%	18.0%	27.9%	16.4%	16.4%	16.4%	16.4%	16.4%	18.0%	100.0%
<b>JMI</b>	Number of Respondents	74	46	6	64	48	2	20	40	32	28	20	28	16	16	20	20	120
	% of Respondents	61.7%	38.3%	5.0%	53.3%	40.0%	1.7%	16.7%	33.3%	26.7%	23.3%	16.7%	23.3%	13.3%	13.3%	16.7%	16.7%	100.0%
<b>JNU</b>	Number of Respondents	62	80	20	64	48	10	48	68	26	0	22	24	22	24	24	26	142
	% of Respondents	43.7%	56.3%	14.1%	45.1%	33.8%	7.0%	33.8%	47.9%	18.3%	0.0%	15.5%	16.9%	15.5%	16.9%	16.9%	18.3%	100.0%
<b>IGNOU</b>	Number of Respondents	74	62	10	66	58	2	70	48	12	6	24	24	36	24	14	14	136
	% of Respondents	54.4%	45.6%	7.4%	48.5%	42.6%	1.5%	51.5%	35.3%	8.8%	4.4%	17.6%	17.6%	26.5%	17.6%	10.3%	10.3%	100.0%
<b>Total</b>	Number of Respondents	288	232	42	276	182	20	160	200	92	68	86	96	94	84	78	82	520
	% of Respondents	55.4%	44.6%	8.1%	53.1%	35.0%	3.8%	30.8%	38.5%	17.7%	13.1%	16.5%	18.5%	18.1%	16.2%	15.0%	15.8%	100.0%

## Results

The ILC levels of researchers were assessed on different parameters selected. However, the focus of the present paper is to discuss the overall test results from different perspectives. On the competency scale around 81.5% of the total researchers consisting of 9.6% 'Outstanding', 26.5% 'Excellent', 25.0% 'Very Good' and 20.4% 'Good' were found IL competent and rest 18.5% of researchers including 11.2% 'Baseline', 5.0% 'Minimal' and 2.3% 'Very Low' lacked similar competency. The test results of researchers' ILC are presented on selected perspectives.

## Gender

The minutiae description of respondents' ILC levels is given in Figure 1. On the competency scale, 81.5% of the respondents (43.8% male and 37.7% female) were found competent in IL. The rest 18.5% of the respondents (11.5% male and 6.9% female) displayed incompetency in IL skills.

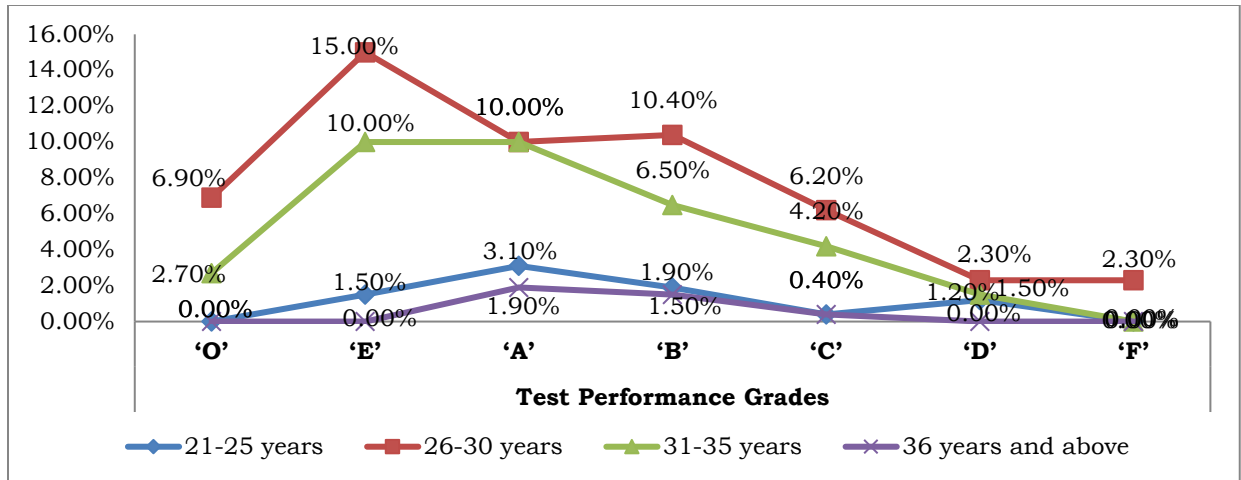


**Figure 1: Performance Assessment of ILC – Gender**

The responses reflect different mean scores and the female researchers had a higher mean score of 75.90 compared to the male researchers with a mean score of 71.93. The overall mean score is 73.70. The mean score and mean plot suggest that female researchers possess higher ILC compared to male researchers at the four select central universities in Delhi. The one-way ANOVA results:  $F(1, 518) = 9.639, p = 0.002$  indicate that there were statistically significant differences at 0.05 level. Further, despite the results being of statistical significance, Post Hoc analysis could not be performed because there are fewer than three groups. Hence, the hypothesis that there is significant difference in the ILC levels of researchers between gender is accepted.

## Age groups

The details of ILC levels of respondents across different age groups are given in Figure 2. Overall 81.5% of the IL competent respondents consisted of a maximum 42.3% respondents from 26-30 years age group followed by 29.2% from 31-35 years age group, 6.5% from 21-25 years age group and 3.5% from 36 years and above age group. The rest 18.5% of the IL incompetent respondents included a maximum of 10.8% of respondents from 26-30 years age group followed by 5.8% from 31-35 years age group 1.5% from 21-25 years age group and 0.4% from 36 years and above age group.

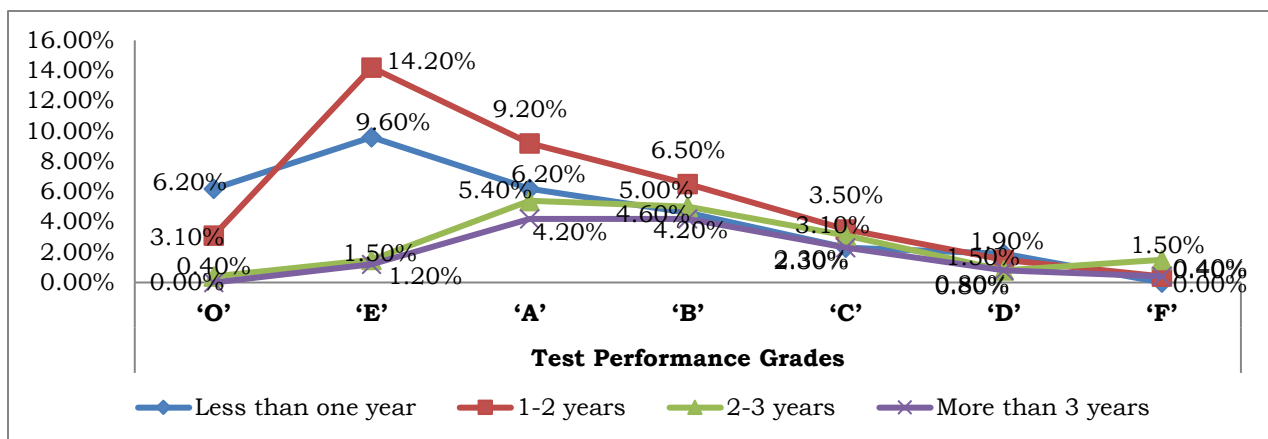


**Figure 2: Performance Assessment of ILC – Age groups**

The responses reflect different mean scores for different age groups of researchers under study. Researchers in 31-35 years age group had the highest mean score of 74.75, followed by 26-30 years age group with a mean score of 73.71, 21-25 years age group with a mean score of 71.33, and 36 years and above age group with the lowest mean score of 69.00. The overall mean score is 73.70. The mean score and mean plots suggest that researchers in 31-35 years age group possess the highest ILC followed by 26-30 years of age group, 21-25 years age group, and 36 years and above age group. Statistically the differences were not significant at 0.05 level in one-way ANOVA results:  $F(3, 516) = 1.374, p = 0.250$ . Further, Post Hoc analysis was not performed because the results are not of statistical significance. Hence, the null hypothesis that there is no difference in the ILC levels of researchers across different age groups is accepted.

### Research periods

The ILC test performance results of respondents across the different periods of research are depicted in Figure 3. The total of 33.1% of respondents from 1-2 years period of research, 26.5% from less than one year period of research, 12.3% from 2-3 years period of research and 9.6% from more than 3 years period of research constituted the 81.5% of IL competent respondents. Similarly, a total of 5.4% of respondents both from 1-2 years period of research and 2-3 years period of research, 4.2% from less than one year period of research and 3.5% from more than 3 years period of research constituted 18.5% of IL incompetent respondents.



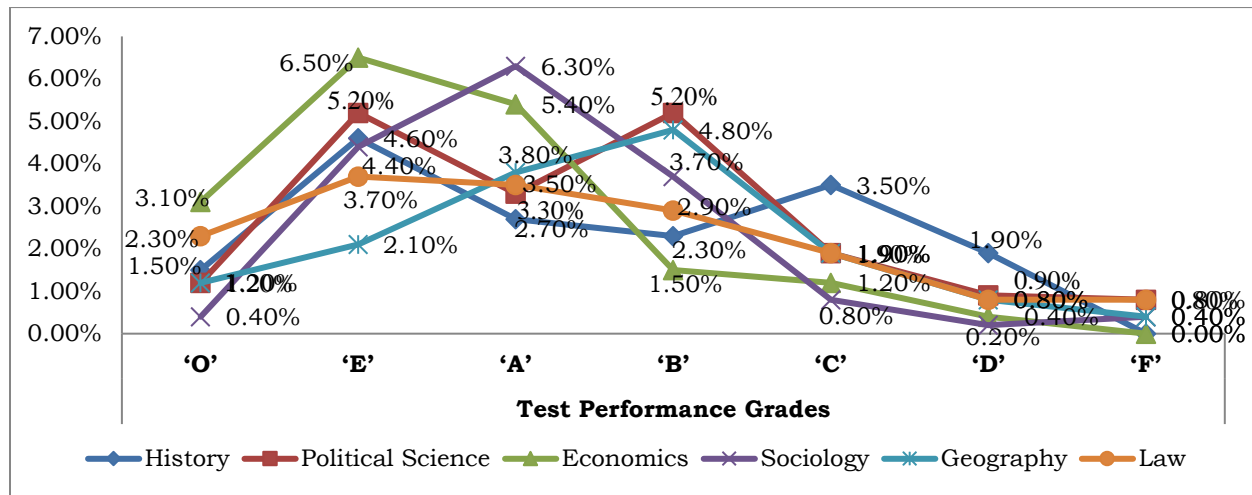
**Figure 3: Performance Assessment of ILC – Research Periods**



Researchers having less than one year period of research had the highest mean score of 77.60, followed by those with 1-2 years period of research with a mean score of 76.66, those with more than 3 years of research with a mean score of 66.76 and those with 2-3 years of research with the lowest mean score of 65.61. The overall mean score is 73.70. The mean score and mean plots suggest that researchers having less than one year period of research possess higher ILC followed by those with 1-2 year of research, those with more than 3 years of research and those with 2-3 years of research. The one-way ANOVA results:  $F(3, 516) = 23.865, p = 0.000$  indicate that there were statistically significant differences at 0.05 level. The Post Hoc analysis using LSD also reveals that differences were significant across researchers with different periods of research except between researchers with less than one year and 1-2 years, and researchers with 2-3 years and more than 3 years period of research. Hence, the hypothesis that there is significant difference in the ILC levels of researchers across different period of research is accepted.

### Subjects

The overall 81.5% of the IL competent respondents included a maximum of 16.5% of respondents from Economics followed by 14.8% from both Political Science and Sociology, 12.3% from Law, 11.9% from Geography and 11.2% from History. The rest 18.5% of the IL incompetent respondents included a maximum of 5.4% of respondents from History followed by 3.7% from Political Science, 3.5% from Law, 3.1% from Geography, 1.5% from Economics and 1.3% from Sociology. The test details of ILC levels of respondents across different subjects are given in Figure 4.



**Figure 4: Performance Assessment of ILC – Subjects**

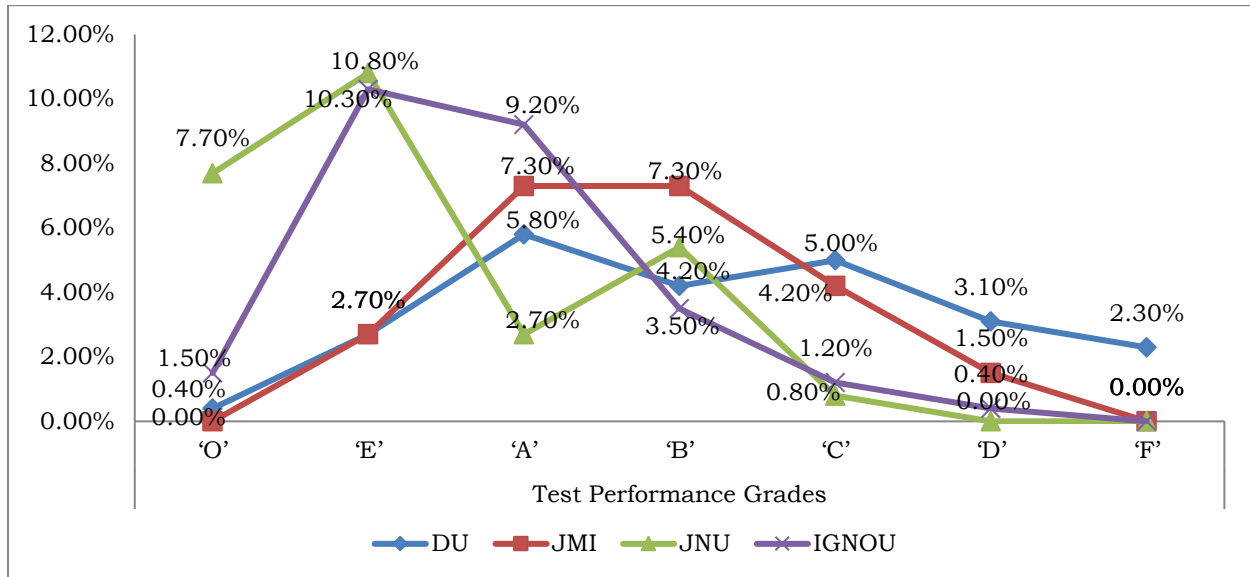
The responses reflect different mean scores for subjects under study. Researchers in Economics had a higher mean score of 79.81, followed by Sociology with a mean score of 75.05, Law with a mean score of 72.93, History with a mean score of 71.81, Political Science with a mean score of 71.54, and Geography with a mean score of 70.44. The overall mean score is 73.70. The mean score and mean plots suggest that researchers from Economics possess higher ILC followed by researchers from Sociology, Law, History, Political Science, and Geography. The results of one-way ANOVA indicate statistically significant differences at 0.05 level:  $F(5, 514) = 5.166, p = 0.000$ . Further, Post Hoc analysis using LSD was performed. It reveals that differences were not significant in the ILC levels of researchers across different subjects, except between Economics and Geography, Economics and History, Economics and Political Science, Economics and Sociology, Economics and Law, and Sociology and Geography. Hence, the null hypothesis that there is no difference in the ILC levels of researchers across different subjects is rejected.

### Universities

The ILC test performance details of respondents across universities are presented in Figure 5. Of the total 81.5% of IL competent respondents the maximum, 26.5% of respondents were from JNU followed by 24.6%



from IGNOU, 17.3% from JMI and 13.1% from DU. The remaining 18.5% of the IL incompetent respondents were a maximum of 10.4% from DU followed by 5.8% from JMI, 1.5% from IGNOU and 0.8% from JNU.



**Figure 5: Performance Assessment of ILC – Universities**

The researchers from JNU had a higher mean score of 83.32, followed by IGNOU with a mean score of 78.32, JMI with a mean score of 68.20 and DU with the lowest mean score of 62.75. The overall mean score is 73.70. The mean score and mean plots suggest that researchers at JNU possess the highest ILC followed by the researchers at IGNOU, JMI and DU. Statistically significant differences at 0.05 level was found in the one-way ANOVA results:  $F(3, 516) = 77.309, p = 0.000$ . Further, Post Hoc analysis using LSD also shows significant differences in the ILC level of researchers across different universities. Hence, the hypothesis that there is significant difference in the ILC levels of researchers across different universities is accepted.

## Findings

- The test performance indicates that a total of 81.5% of the respondents consisting of 9.6% 'Outstanding', 26.5% 'Excellent', 25.0% 'Very Good' and 20.4% 'Good' were found information literate and competent in IL skills. 20.4% of the researchers having 'Good' level of ILC need to further improve their ILC.
- The rest 18.5% of the respondents consisting of 11.2% 'Baseline', 5.0% 'Minimal' and 2.3% 'Very Low' was found incompetent in IL skills. They do not possess information handling skills to operate in the digital information landscape.
- The mean score and mean plot suggested a higher level of ILC compared to others in different categories of researchers such as female researchers, researchers in 31-35 years age group, researchers having less than one year period of research, researchers from Economics, and researchers at JNU.
- The study found no significant differences in the ILC levels of researchers in different age groups. Hence, the null hypothesis is accepted here.
- The study has found significant differences in researchers' ILC levels between male and female, age groups, different periods of research, subjects, and universities. However, differences were not

significant in researchers' ILC level between less than one year and 1-2 years, and 2-3 years and more than 3 years period of research.

## Discussions

IL is a vital prerequisite for “Google generation” students having “easy access to an exponential growth of questionable quality online information” (Foo et al., 2017: 335). It is an important skill central for functioning in the twenty-first century. The present study has diagnosed the ILC levels of researchers and identified 18.5% of researchers as IL incompetent. The segments of IL incompetent researchers have also been identified in different frames of reference. These researchers were weak to determine the extent and articulating the information needs, identify the appropriate source and access precise information, apply evaluation yardsticks like relevance, accuracy, currency, authority, and purpose, understand and properly contextualize information for a specific purpose, and in writing proper citations. Scrutiny of responses revealed that researchers were mostly unfamiliar with the effective use of Boolean connectors and many of them used odd combinations of connectors. Congruous to the findings of the present study, several previous studies have found users weak in information handling skills. They particularly face trouble in using Boolean operators, fail to organize literature and to locate appropriate sources of information (Maurer et al., 2017; Skipton and Bail, 2014).

Previous studies have found that many times students pretend to have adequate IL skill competency and exhibit overconfidence in their abilities to find information (Mercer et al., 2020; Michalak and Rysavy, 2016). They must be gradually helped to evolve as information literate students having a higher level of ILC. Deficiencies in ILC as identified by the present study hamper the process of learning and research. An appropriate level of ILC “is important for education majors to have the ability to search, collect and process information and approach it critically and systematically as well as the skills to use the design tools for media information and the capacity to access, search and use Internet-based services, especially in the context of their future activities and opportunities for continuous professional qualification” (Tsankov and Damyanov, 2017: 204).

## Implications

The present study has found significant differences in the ILC level of researchers across different frames of reference, except age. Further studies may be conducted to identify the reasons for differences in ILC levels. The focus of study is to identify IL incompetent researchers and suggest measures for improvement. The findings are very important for all the stakeholders engaged in planning and promoting IL activities in university setup. It suggests larger implications in libraries, IL course and instruction and faculty librarian relationship.

Academic libraries and librarians own major responsibility to inculcate and enhance IL skills among students. Libraries are "partners in the educational mission of the institution to develop and support information-literate learners who can discover, access, and use information effectively for academic success, research, and lifelong learning" (ACRL, 2018). Academic librarians are vital in developing IL skills and they are embracing their role as educators on campus (Erlinger, 2018). Students enjoy better academic success after completing a course with integrated IL instructions given by librarians (Gaha et al., 2018). Findings of the present study suggest further improvements in the role of librarians. There is a “need for effective instructional practice on the part of librarians, as well the important role of course instructors in the attainment of IL competencies” (Walker and Whitver, 2020: 9). When planning instructional priorities, librarians should address both students' current questions and a broader understanding of IL's core concepts (Squibb and Zanzucch, 2020).

Library conducted IL “workshop is meeting student needs and has a lasting effect” (McCartin et al., 2019). However, such one-shot instructional sessions are delivered only once per semester and fail to effectively serve the purpose. Libraries should offer multi-shot sessions and introduce a longer credit-bearing IL

course. IL is not a generic skill applicable across disciplines and contexts. It is more discipline specific. The IL course should be revised incorporating discipline specific content. A growing trend has been seen in integrating IL competency into different academic disciplines (Mullins, 2014; Seeber, 2013). However, incorporating IL into curriculum many a time becomes challenging. These challenges include equating IL with computer literacy, lack of understanding about IL, the misconception of millennial students, and no space in the curriculum (Rosman et al., 2016). Collaboration between librarians and faculty is essential in developing successful IL programs and incorporating IL into curriculum. Without a clear faculty mandate, collaboration becomes harder for librarians (Yu et al. 2019). IL teaching in a collaborative way is likely to affect positively in future for imbibing IL skills for lifelong learning. The three most frequently recurring themes that motivated faculty to work with librarians are skill development, librarian expertise, and access to resources (Perez-Stable et al., 2020). As teaching and learning collaborators, academic librarians should encourage and help course instructors to apply established pedagogical approaches that promote transparent teaching practices concerning the development of IL.

Worldwide, there is a steady increase in student enrolment in higher education. However, there is no corresponding increase in infrastructure and staff. Online delivery of instructions and content has emerged as an efficient and sustainable method. The Internet has emerged as the fastest and strong platform for numerous online academic activities. Large numbers of teaching and learning tools are available on the Internet and many training programs and courses are being imparted online. Facebook, a social networking tool, has gained popularity as a useful platform for “enhancing learning, increasing participation and engagement, content dissemination, improving pedagogy and information sharing” (Chugh and Ruhi, 2018: 613). Students were found appreciating the access of academic content via Facebook (Gonzalez-Ramirez et al., 2015), access resources, and support posted on Facebook groups (Chen, 2018), and use of Facebook to access and post links (Dolan, 2014). Online IL tutorials have been identified as the most common method for promoting IL in the UK (Ellis et al., 2017). Academic libraries should fruitfully utilize the Internet and its tools, like Facebook, as a platform for promoting IL skills. It should develop and keep updated specifically designed comprehensive 'Online Information Literacy Course', create a dedicated IL Facebook page and IL groups. Such efforts are likely to be of great help in penetrating the library clientele to develop and enhance all-round competency in information skills.

## **Conclusion**

IL, also referred to as critical thinking skills, has evolved as a vital set of skills essential in academics and research. Researchers need to have a higher level of information handling skills to operate successfully in the digital information landscape. While they may have sufficient knowledge and skills to operate and manage different technological devices, many a time they do not know how exactly to identify, locate, retrieve and evaluate information and its sources available to them and sometimes lack critical thinking skills. Worldwide, academic libraries are conscious of these facts and are striving to inculcate and enhance competency in IL skills through various educational and training activities. Periodic assessment of all IL programs, both formal and informal, is essential to identify students' mastery of skills and knowledge, determining the efficiency of IL programs and increase students' efficacy. It provides helpful feedback and demonstrates the value of library services. This goal can be achieved through the application and reporting of quality assessment practices. The present assessment study has identified the segment of IL incompetent researchers across gender, age groups, periods of research, subjects and universities. Despite large scale efforts libraries are not always successful because of a lack of awareness and motivation among users and the incompatibility of IL programs and activities. Lack of collaboration and the time and efforts required to collaborate have been identified as the biggest barrier in IL instruction. The study findings will be highly beneficial to all the stakeholders, especially libraries, to plan and redesign their efforts in IL. Instruction is integral to librarians' professional identity. They should develop a collaborative relationship with teaching faculty to support IL given their subjective values, perceptions, and opinions.

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