A DIAGNOSIS OF INFORMATION LITERACY CORE COMPETENCY LEVELS OF RESEARCHERS IN ECONOMICS AT CENTRAL UNIVERSITIES IN DELHI

Rajesh Singh
Shailendra Kumar

Dr. Rajesh Singh
University Librarian, Central Library, University of Delhi, Delhi, 110007,
E-mail: librarian@du.ac.in

Dr. Shailendra Kumar
Professor and Head, Department of Library and Information Science, University of Delhi, Delhi, 110007, E-mail: shail3@yahoo.com
(Corresponding author)

The study diagnoses information literacy core competency (ILCC) levels of research scholars in Economics. The diagnosis is conducted on five parameters based on five ACRL Standards: Need, Access, Evaluation, Use, and Use Ethics of Information. The empirical data was collected through questionnaire method and analyzed. In the networked digital information landscape, researchers should possess a reasonably good level of ILCC for survivance in research and academia. The diagnosis reveals that there were large numbers of incompetent researchers. On selected parameters maximum incompetent researchers were 33% in information access, followed by 23.5% in information evaluation, 12.8% in information need, 10.7% in information use and the lowest of 8.5% in information use ethics. The findings call for urgent attention from all the stakeholders. The study also discusses the means and ways of promoting and enhancing the ILCC of researchers.

Keywords: ACRL Standards, Assessment, Core Competency, Information Literacy, Researchers in Economics, Survey.

INTRODUCTION

Information literacy (IL) refers to a set of information handling abilities and expertise imperative in the digital information landscape. Association of College and Research Libraries (ACRL, 2000) defined IL as a set of skills and abilities enabling individuals to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information" (p. 2). The new *Framework for Information Literacy for Higher Education* further "envisions information literacy as extending the arc of learning throughout students' academic careers and as converging with other academic and social learning goals," and expands the definition of IL to include "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, 2016, p. 3). Further "it

concerns the application of the competencies, attributes and confidence needed to make the best use of information and to interpret it judiciously. It incorporates critical thinking and awareness, and an understanding of both the ethical and political issues associated with using information"(CILIP, 2018, p. 3). Thus, IL is a "set of modern skills needed to discover access, verify, and correctly interpret information in an age of abundant misinformation on the internet" (Parrott, 2018, p. 18). It extends excellent help in analyzing information critically and making balanced decisions. It paves the way for creating knowledge, innovation and learning (Forster, 2017). It has been proclaimed as a foundational literacy of the twenty-first century (Lloyd, 2011). It is crucial and requisite competency among our millennial age "Google generation" students having "easy access to an exponential growth of questionable quality online information" (Foo, Majid & Chang, 2017, p. 335). An ability to find and use information contributes to students' academic success, and they feel confident in their skills for locating resources for coursework (Squibb & Zanzucch, 2020).

The concept of core competency refers to the capabilities that are crucial in a business to achieve a competitive advantage. It consists of a pool of exceptional skills, knowledge, strategies and technical expertise that makes a distinction between a leader and an average player in the same business. Core competency leads to excellence and provides an advantage over others. Its diagnosis helps to gauge and determine the levels of performance in individuals or groups. Thus,

Information Literacy Core Competency (ILCC) is a combination of observable and measurable knowledge, skills, abilities and attributes to operate confidently in the networked digital information landscape. Core competency levels are useful as they help to differentiate in between individuals having basic skills and those who are experts.

Economics is a social science that studies the use of resources by society. As a branch of knowledge, it deals with production, distribution and consumption of products and services and is concerned with the transfer of wealth. Researchers in economics not only require up-to-date and extensive information but also need extensive access to various datasets. With the online availability of a large amount of information and datasets, researchers have become information privileged (Hare & Evanson, 2018) and researches are mostly done on the Internet. "It 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 & Damyanov, 2017, p. 204). Researchers in Economics should also become "data information literate" and perceive numeral notion as "an integral component of information literacy for these disciplines" (Stephenson & Caravello, 2007, p. 535).

REVIEW OF LITERATURE

With the availability of more and more information in e-format, particularly on the web, researchers need additional skills and knowledge to identify, locate, evaluate, use and communicate the information effectively and efficiently. The information needs of doctoral students are very comprehensive for their thesis research. Hence, they need high-level information seeking and use skills (Barry, 1997). Academic libraries have always been proactive in meeting the users' demands by playing a variety of roles in response to the needs of researchers and faculties. They have developed a new way of training the users called 'information literacy'. Scholars, associations and libraries have framed and revised many IL standards, guidelines and programs and regularly conducting a variety of IL activities to promote and enhance IL competency level of the users. As information literacy is vital in the information rich landscape, so is the assessment of information literacy competency. A well-designed assessment and measurement process not only assists the learners in identifying improvements in learning and areas for further developments but also contributes to the learning process itself. Assessment closely linked to teaching and learning is most useful (Walters et al., 2020). It helps the instructors identify the success in teaching, determine the efficacy of instruction, and contribute to overall development. It demonstrates the value of IL programs and helps to justify the need for administrators, parents, and learners themselves. The primary goal of the assessment process has been to find the value of the library in translating the IL assessment findings in actionable results and improve library IL services. It provides an actual picture of the learners' competency and identifies areas which require improvement. IL assessment depicts three primary functions: feedback to learners; feedback to instructors; and feedback on the value of IL activities to the authorities (Oakleaf, 2009; Sobel & Sugimoto, 2012). Assessment data are generally more reliable and more convincing if multiple techniques yield similar results (Walters et al., 2020).

For assessing information literacy competencies, from time to time, several standards and guidelines have been developed. In most of these standards and guidelines focus is more on five essential components: Need, Access, Evaluation, Use and Use Ethics of Information. The study by Uribe Tirado and Castano Munoz (2012) presents a beautiful integration of IL standards and core competencies. The standards and guidelines developed by ACRL, AASL, CAUL, CILP and SCONUL entail measurement as a means to assess performance against the standards (Majid, Chang & Foo, 2016). However, Walters et al., (2020) claimed that locally developed instruments, such as brief exercises and quizzes, can also provide a more nuanced and sometimes more appropriate alternative to standardized tests. Plenty of tools have been developed to diagnose IL skills and competency at the organizational, national and international levels. Chang et al. (2012), Soleymani (2014), Foo, Majid and Chang, (2017) and Ngo, Pickard and Walton, (2019) used multiple-choice tests, and Walsh (2009) used

self-assessment method. The self-assessment method is criticized for overestimation of actual performance by respondents. Exercise or task method is yet another approach for IL assessment.

IL assessment continues to be a predominant topic. Several articles outline efforts to assess programs, strategies, concepts and more. A bibliographic investigation of IL assessment was conducted by Pinto (2015) for the period 2000-2011. The study identified significant areas of research. Ackermann (2015) discussed 27 cases of IL assessment in higher learning institutions in the US and Canada. Garrison and Exner (2019) investigated the information-seeking behaviour of undergraduate economics students. The study sought to discover the learning process of students as to how they find and use data. It also determined students' efficacy in finding sets of data for assignments on multiple regression analysis. Squibb and Zanzucch (2020) explored the research competencies of upper-division students through surveys and interviews. The study was focused on dispositions, challenges, and developments of the respondents. It found that library instructions inculcate a foundation of information handling skills and research competency increase as students learn. Pinkley and Hoffmann (2017) outlined the evolution of the IL assessment process at California State University Library to find the value of the library in translating the IL assessment findings in actionable results and improve library IL services. Walters et al. (2020) studied the IL assessment program at Manhattan College in Riverdale, New York. They evaluated IL capabilities of students through their written coursework, their test

performance, and their comments on library instruction sessions. They found that instruction and assessment are closely linked and highlighted the importance of evidence-based measures. The focus of the survey study, conducted by Julien, Gross & Latham (2018) on IL instructions in the US, was pedagogical methods used; target audience; inclusion of technology in instruction; assessment and evaluation methods used; common challenges faced; and collaboration among faculty, administration, and librarian. It aimed to provide the best practices in these areas. However, there is no diagnostic study of ILCC levels of Economics researchers from India. This study is an attempt to fill this gap and ascertain the levels of ILCC. Findings of this discipline-specific assessment study will prove vital for all the stakeholders.

OBJECTIVES OF THE STUDY

- To diagnose the ILCC level of researchers in Economics concerning Need, Access, Evaluation, Use and Use Ethics of information.

- To identify reasons behind ILCC incompetency, if any, and insinuate measures for improvement.

SCOPE OF THE STUDY

The present paper is a segment of an extensive study. It was conducted among the researchers in Economics at Indira Gandhi National Open University (IGNOU), Jamia Millia Islamia (JMI), Jawaharlal Nehru University (JNU), and University of Delhi (DU). The study is confined to the researchers enrolled during 2015-2017. The stratified random sampling

method was used select the representative sample. The sampling was stratified by subject, gender and institution and was drawn on a 95% confidence level and 4% confidence intervals.

METHODOLOGY

In this empirical study, questionnaire method has been used to collect relevant data. ACRL's transition from the Standards to the Framework is still relatively recent; much of the literature on outcomes-based information literacy instruction is tied to the Standards. Universities and other higher educational institutions in India are engaged in promoting IL skills and abilities based mostly on the Standards, and hence the Standards have been used for the present study. A set of 50 questions was prepared based on 05 Standards, 22 performance indicators and 87 outcomes of the Standards to test the ILCC level of researchers. The following five key concepts were selected respectively on Standard I to V.

I.   Information Need: consisting of abilities to determine the extent and precisely articulate information needs; identifying forms and formats of information, and selecting appropriate information sources and places.

II. Information Access: including skills and abilities to browse and search information; use various search engines, and formulate specific search strategy for precise and relevant information retrieval.

III. Information Evaluation: consisting of expertise in the evaluation of information available from various sources and in multiple forms and formats for its accuracy, currency and trustworthiness.

IV. Information Use: consisting of understanding of information communication formats, information methodologies, information analysis and inferences.

V.   Information Use Ethics: encompassing skills and expertise for referencing, citation and plagiarism.

All the responses were manually evaluated, and two marks each were assigned to correct answers. The ILCC levels of respondents were diagnosed based on the self-explanatory Performance and Competency Scale (Singh & Kumar, 2019) given in Table 1.

Table 1: Performance and Competency Scale

% of Marks	Grade	Performance Grading	Competency Level
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 the Respondents

The details of the respondents are given in Table 2.

Table 2: Profile of the Respondent

University Enrolled	Description	Number & Percentage
University of Delhi (DU)	No. of Respondents % of Respondents	20 21.3%
Jamia Millia Islamia (JMI)	No. of Respondents % of Respondents	16 17%
Jawaharlal Nehru University (JNU)	No. of Respondents % of Respondents	22 23.4%
Indira Gandhi National Open University (IGNOU)	No. of Respondents % of Respondents	36 38.3%
Total		94 100.0%

RESULTS AND DISCUSSIONS

The description of ILCC levels of research scholars in Economics is given in Table 3 and depicted in Figure 1. As good as 74.4% of the respondents consisting of 36.2% 'Outstanding', 25.5% 'Excellent' and 12.8% 'Very Good' possessed ILCC to identify and articulate precise '*Information Need*' and locate appropriate sources and places. A total of 12.8% of respondents at the 'Good' level of competency may determine the extent and express their *'Information Need'* but need to brush-up their abilities and expertise. The rest 12.8% of the respondents were missing similar competency levels. Incompetence to determine and express a precise need for information is a serious challenge. Previous studies support the reasons identified. While researchers may have the sound technological understanding to manage and use different devices, sometimes they fail to comprehend how, where and what to locate, search and retrieve required information from various sources and in multiple formats available to them (Bloom, & Deyrup, 2013). The study by Dalal, Kimura, and Hofmann (2015) reported that most of the respondents were not able to identify and make precise use of relevant keywords and failed to define their information needs and articulate the same.

The ILCC levels of researchers were abysmal in *'Information Access'*. Only 33% of respondents including of 4.3% 'Outstanding', 11.7% 'Excellent' and 17% 'Very Good' possessed competency to browse and access relevant and precise information by using a variety of search tools and formulating precise search strategies. As many as 34% of respondents were identified having 'Good' level of ILCC to access information. These researchers may operate in the digital information landscape; however, they require improvising their IL skill competency in '*Information Access*'. The rest 33% of the researchers were found missing similar skill competency**.** Navigating through the vast amounts of information on the web is generally confusing and often an overwhelming task (D'Couto, & Rosenhan, 2015). The majority of researchers today are exposed to ICT and the Internet from a young age. They have accustomed to easy access to a large amount of information and are generally reluctant to invest significant effort and time to locate, search and retrieve required information (D'Couto & Rosenhan, 2015). Students are mostly unfamiliar with effective use of Boolean connectors and tend to use odd combinations of connectors (Dempsey & Valenti, 2016), and usually, a small fraction of students use AND operator in their information searches (Bloom & Deyrup, 2015).

Evaluation of information for its authenticity and reliability is vital and crucial in the networked digital information landscape. This understanding of the information resources is not only in terms of its capability to answer the question, but also its intrinsic trustworthiness. The total of 59.50% of the respondents consisting of 8.5% 'Outstanding', 17% 'Excellent' and 34% 'Very Good' were found having competency for the same. As good as 17% of respondents possessed 'Good' level of ILCC to assess the reliability of information and its sources critically. They may operate in the digital information landscape but

need to brush up their competency in 'Information Evaluation'. However, as good as 23.5% of the respondents, including 13.8 'Baseline', 3.2% 'Minimal' and 6.4% 'Very Low' were found incompetent in 'Information Evaluation'. In the present context, where information is available in various forms and type of sources, expertise in the evaluation of information for its "authenticity, accuracy, currency, value and bias" has become essential. Evaluation of information for its trustworthiness has become challenging for many users (Tseng, 2018; Kiili et al., 2018; Perez et al., 2018). The study by Paul et al. (2017) found that users scrutinize the quality of online information infrequently. In light of these findings, more instructions and training are essential to promote the skills and abilities of researchers for critical evaluation of online information. Libraries should find ways and means to encourage and inspire students for active engagement in information evaluation practices (Paul et al., 2017).

The 28.7% 'Outstanding', 27.7% 'Excellent' and 19.1% 'Very Good' respondents constituted a total of 75.5% of respondents competent in the specific use of information by applying prior and new information in the process of designing and production of a specific information product or performance. They were competent in determining information methodology, analyze and draw inferences from information, and use multiple communication formats and channels. The total of 13.8% of the respondents identified having 'Good' level of ILCC for 'Information Use' could operate in the digital environment, but need to further strengthen their concerned skills.

The rest 10.7% of the researchers were missing similar skill competency. In the digital environment information is available in abundance. The users of information, especially, the researchers should possess the necessary skills to use the information to accomplish a specific purpose effectively. An individual having information use skills "organizes the content; integrates the new and prior information, including summary, quotations and paraphrasing in a manner that supports the purposes; uses a range of information technology applications in creating the product or performance; communicates the product or performance effectively to others; communicates clearly and with a style that supports the purposes" (ACRL, 2000, p. 13).

The maximum of 86.2% of the respondents, including 11.7% 'Outstanding', 46.87% 'Excellent' and 27.7% 'Very Good' have shown ILCC in use ethics of information. They were found competent in the citation, referencing, and multiple facets of plagiarism. An insignificant total of 5.3% of respondents were found having 'Good' level of ILCC. They were identified as capable in the ethical use of information, but still require further improvising their ILCC. The rest 8.5% of the respondents were missing similar IL skill competency. The digital networking has garnered multiple information handling opportunities along with severe ethical issues to humankind. Along with the benefits of the digitally networked world, many challenges of information abuse and misuse have also surfaced (UNESCO, 2019). Findings indicate the incompetence of a good number of researchers

in *'Information Use Ethics'*. MacLennan (2018) identified a few issues of the students in avoiding plagiarism. These include understanding the need for citation, synthesis of information and proper formatting of references. Jereb et al. (2018) and Singh and Kumar (2019) reported differences in the awareness of plagiarism between male and female students. Both studies highlighted that female student have a better awareness of plagiarism than male students.

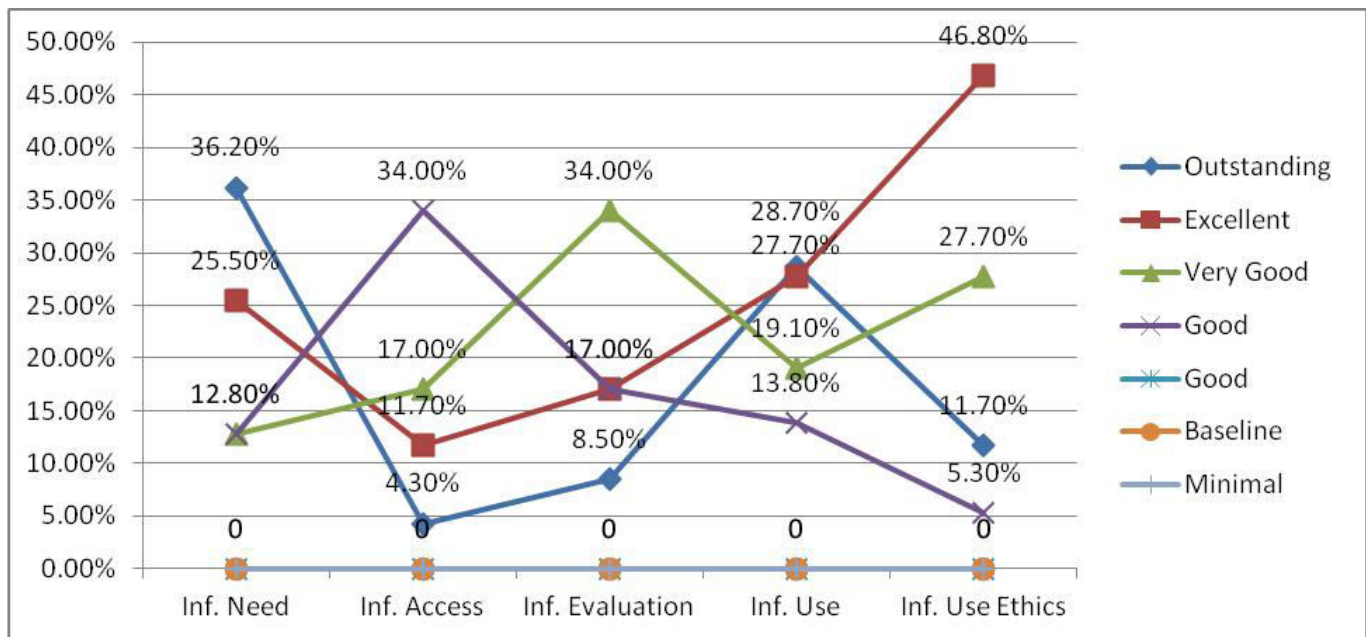| Table 3: ILCC Assessment and Mapping of Researchers in Economics								
IL Concepts	**ILC Levels**							**Total**
	Outsta-nding	**Excellent**	**Very Good**	**Good**	**Baseline**	**Minimal**	**Very Low**	
Information Need	34	24	12	12	11	1	0	94
	36.2%	25.5%	12.8%	12.8%	11.7%	1.1%	0.0%	100.0%
Information Access	4	11	16	32	16	7	8	94
	4.3%	11.7%	17.0%	34.0%	17.0%	7.5%	8.5%	100.0%
Information Evaluation	8	16	32	16	13	3	6	94
	8.5%	17.0%	34.0%	17.0%	13.8%	3.2%	6.4%	100.0%
Information Use	27	26	18	13	6	4	0	94
	28.7%	27.7%	19.1%	13.8%	6.4%	4.3%	0.0%	100.0%
Information Use Ethics	11	44	26	5	3	3	2	94
	11.7%	46.8%	27.7%	5.3%	3.2%	3.2%	2.1%	100.0%

Figure 1: ILC Assessment and Mapping of Researchers in Economics

Figure 2 depicts the clusters of competent researchers. The axis X represents the number and axis Y IL competency levels. The cluster of IL competent researchers on each parameter is indicated.
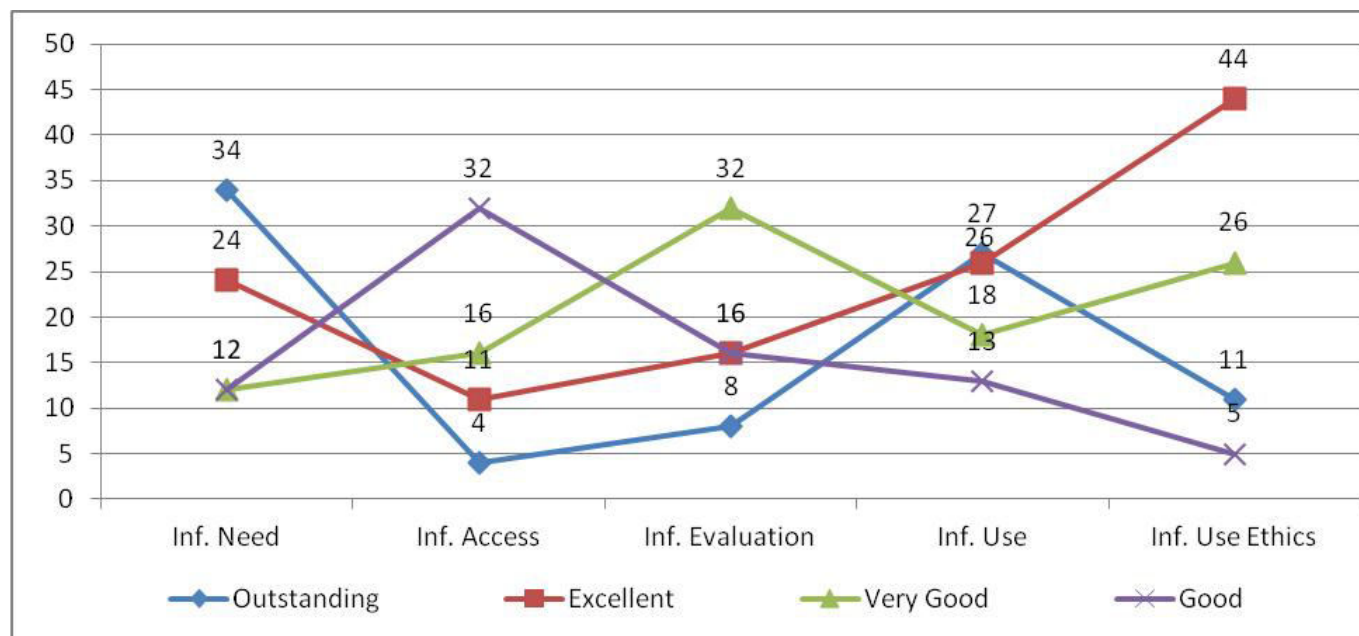
Figure 2: Clusters of ILC Competent Researchers in Economics

DISCUSSIONS

An adequate level of ILCC among researchers is indispensable in the digital information landscape. The findings of the study place greater responsibilities in academic libraries. In a university setup, all departments and centres engaged in doctoral research provide some sort of training and guidance to the researchers. However, in many cases, these do not necessarily include IL skills, or if they, it is limited only to lecture-style orientation or a single session on IL skills (Yevelson-Shorsher & Bronstein, 2018). For developing and promoting reasonable level of ILCC, more efforts are required. Academic libraries have to shoulder this obligation "to empower the students, researchers and faculty members to seek, evaluate, use and create information effectively and efficiently to achieve their educational, social, occupational and

personal goals" (Singh & Kumar, 2018, p. 139). University libraries have the stupendous task of planning and promoting a higher level of IL skills among all the academicians, especially the researchers. Based on the findings of this research, it is suggested that university libraries should develop and regularly run multiple information literacy programs targeting a different kind of user groups. It may consist of programs for specific subject and course, a program for specific groups like undergraduate students; postgraduate students; research scholars, faculty members etc. Such small but specific programs will help the libraries to penetrate deep in the academic community and reach out to every member of the community. They should develop and maintain "a full-time IL centre/ cell/ unit" "with proper staff and other infrastructure facilities" (Singh & Kumar, 2019,

p. 106). They need to structure and restructure multiple IL programs and activities in light of these findings. When planning instructional priorities, librarians should address both students' current questions and a broader understanding of information literacy's core concepts (Squibb & Zanzucch, 2020). The UGC Guidelines (2009) has mandated PhD course work. Components of IL may successfully be integrated into it. It will provide an appropriate platform for imparting IL instruction. A curriculum integrated credit-bearing IL course will also prove crucial in this endeavour. However, many times, incorporating IL into the curriculum becomes challenging. Some common challenges include lack of understanding about IL, no space in the curriculum, equating IL with computer literacy, and misconception of millennial students (Rosman, Mayer & Krampen, 2016).

Discipline-specific curricula have been found crucial in promoting ILCC. The ACRL Standards and the Framework have also emphasized discipline-specific IL instruction. According to Secker and Coonan (2013), understanding of discipline-specific content must also be included in IL curricula along with generic skills and research practices. The discipline-specific context is beneficial to students as it provides an authentic setting for students' motivation and allows self-reflective learning (Farrell & Badke, 2015). Large number of training programs and courses are being imparted online. Online tutorials have been identified as the most common method for promoting IL in the UK (Ellis et al., 2017). The Massive Open Online Courses (MOOCs) are viewed as an important

platform for student learning (Gore, 2014; Massis, 2013). University libraries should develop specifically designed comprehensive 'Online Information Literacy Tutorials' and MOOCs to promote IL skills and enhance the competency of researchers. Such online tutorials will have a far-reaching impact on developing all-round information skill competency.

Collaboration among teaching faculty, library professional and administration is essential for successful planning and execution of a variety of IL programs and activities. Lombard (2016) identified "collaboration and commitment" as two essential segments of IL. Such collaboration is necessary for incorporating IL into the higher education curriculum (Perez-Stable et al., 2020). IL integration into the curriculum has gone beyond the purview of libraries. It has evolved as a crucial issue to be addressed by faculty, administration and accrediting agencies. Teaching faculty members are one of the important links between the library and the users. In the case of research scholars, the supervisors' roles become further important. Concern for developing students' searching skills and helping them learn how to access credible resources were priorities with faculty, and faculty viewed librarians as having the knowledge important for helping students develop IL (Perez-Stable et al., 2020). Pinto (2016) concluded that "a deeper understanding of faculty members' relationship with IL is required, especially from the point of view of their subjective values, perceptions and opinions" (p. 245). The three most frequently recurring themes that motivated faculty to work with librarians were skill development, librarian expertise, and access to resources (Perez-Stable et al., 2020).

CONCLUSION

In the information-rich landscape, IL has evolved as a crucial prerequisite for researchers to operate successfully with abundant digital content. Researchers are the biggest consumer as well as producer of information. They should develop the competency to identify and articulate their information need, locate and retrieve specific and relevant information from available sources, evaluate it in terms of bias or trustworthiness, and use it ethically for a specific purpose. Researchers in Economics need additional skills and abilities of data literacy. The research findings have affirmed that a segment of researchers is incompetent in different aspects of ILCC. The existing programs and activities have proved insufficient to develop the required levels of ILCC. It is suggested that all the stakeholders should work in close collaboration and structure and restructure IL activities and programs to make it more fruitful.

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