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Information evaluation skills of social science researchers: an assessment

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To assess the information evaluation skills of social science researchers, data was collected using questionnaires from 520 respondents belonging to 4 universities in Delhi. Analysis of data shows that 66.9% of researchers had information evaluation skills (IES). Among the institutions studied, researchers from Jawaharlal Nehru University, and those from the field of economics, and those respondents having less than one-year research experience were found to have a higher level of information evaluation skills.

Keywords: Information evaluation; Evaluation of information; Information skills, Information literacy; Social science researchers; University of Delhi, Jamia Millia Islamia; Jawarharlal Nehru University; Indira Gandhi National Open University

Introduction

The internet provides access to a large variety of information ranging in its accuracy, authenticity, and value. The quality of online information varies, and all online sources are not uniformly accurate, reliable and valuable for academic purposes. The critical evaluation of online information and its source is essential. The onus lies on end-users to evaluate the information retrieved in terms of its authenticity and reliability. Researchers today are information privileged[1]. The vast "collection of information is strategically important to a scholar's research work and, by nature, requires complete interaction with the information"[2]. While researchers may have the sound technological understanding to manage and use different devices, many a time they lack critical thinking skills while accessing information to differentiate between reliable and unreliable sources of information. A thorough understanding of information handling skills, especially information evaluation is important for researchers in a digitally networked information environment. Information and communication skills constitute necessary digital information skills for the digital natives of today[3].

According to Karim et al., (2018)[4], information "search and use hold a key to knowledge building process in higher learning". Tewell (2018)[5], and Downey (2016)[6] have outlined that critical thinking and approach underpins how information is used in any information-related behaviour and thinking. Researchers "with abilities to evaluate and analyze appropriate information are likely to have competencies that help them in the formulation of research questions and in their ability to use information, as well as in understanding the ethical and legal issues surrounding information" [7]. However, recent studies show issues in skills for evaluation of online information and incompetency in applying evaluation yardsticks like relevance, accuracy, currency, authority, and purpose[8]. Many users found the evaluation of bias or untrustworthy information quite exigent[9-11]. Thus, it is crucial to identify ways and means to galvanize students for active engagement in critical evaluation practices[12] and develop researchers' competencies to enable them to evaluate online information critically[13].

As part of their endeavour to uphold the library as an intrinsic segment of academic life, academic libraries plan and execute a wide variety of training and skill enhancement programs. Information literacy (IL) programmes conducted by libraries educate and train users in information handling skills. IL is a "multidimensional concept that includes maintaining and nurturing a positive attitude towards learning and assessing the veracity of information"[14]. It has been proclaimed as a foundational literacy of the twenty-first century. It is 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"[15]. It is

information about information and its sources. 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"[14].

IL "helps in critical information analysis and balanced decision making paving the way for knowledge creation, learning, and innovation"[16]. It is a necessary and vital competency among the "Google generation" researchers who have "easy access to an abundant growth of questionable quality online information"[17]. It has become a basic set of skills in research work, given a vast amount of unfiltered, unsupported, and unreliable information. The encumbrance lies largely on libraries and information centres "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"[18].

A higher level of information evaluation skills (IES) is essential in networked digital information landscape for survival in academics and research. The present study empirically assesses the IES of social science researchers. It attempts to identify and inform the skill levels of researchers and suggests means and ways for improvement.

Review of literature

Assessment of learners is not only the method of evaluation, but it is also the means for learning. An "effective assessment can help to understand students' abilities and perceptions, measure the effectiveness of practices, develop criteria and standards, inform, change, and more"[19]. Thus, the periodic assessment of IES has become imperative. "The primary goal of the assessment process has been to find the value of the library in translating the IL assessment findings into actionable results and improve library IL services."[20] It provides a genuine portrayal of the learners' competency levels and identifies areas that require refinement.

There are plenty of IL assessment studies. IL instructions in the US were surveyed by Julien et al. (2018)[21] with a clear aim to provide "best practices". The study focused on the use of pedagogical, assessment and evaluation methods; technology inclusion in instruction; target audience; common challenges faced; and collaborative approach of librarian, faculty and administration. Williams[22] (2017) enumerated strategies used in the quantitative and qualitative assessment of student learning outcomes in IL activities at Belk Library, Appalachian State University. It suggests possible IL methodologies, data measurement tools for assessment and measurement of student learning into the syllabus of academic institutions. The development of the IL assessment process was outlined by Pinkley and Hoffmann (2017)[23]. The study attempted to find the success of the California State University Library in improving IL services by "translating the assessment findings into actionable results". Squibb and Zanzucch[24] (2020) explored the research competencies of upper-division students through surveys and interviews. The study focused on dispositions, challenges, and developments of the respondents. It found that library instructions inculcate a foundation of information handling skills and research competency increases as students learn.

Hess (2020)[25] recommends that library leaders should "offer intentional, data-driven support for academic librarians in developing teaching identities while offering high-quality instruction for learners". Walters et al. (2020)[26] evaluated IL capabilities of students through their "written coursework, their test performance, and their comments on library instruction sessions". Authors found that instruction and assessment are intricately linked and highlighted the importance of evidence-based measures. The standards and guidelines developed by ACRL, AASL, CAUL, CILIP, and SCONUL entail measurement to assess performance against the standards[27]. A plethora of instruments has been designed to gauge IL skills and competency levels at institutional, national and international levels. Chang et al. (2012)[28], Soleymani (2014) [29], Foo et al. (2017) [17] and Ngo et al. (2019)[30] used multiple-choice tests and Walsh[31] (2009) used self-assessment method. The "self-assessment method is criticized for the overestimation of actual performance by respondents".[20]

However, there is no study on the IES assessment of social science researchers from India. ACRL has recently transited to the *Framework for Information Literacy for Higher Education*[32] from the Standards. "Much of the literature on outcomes-based information literacy instruction is tied to the Standards".[20] Universities and other higher educational institutions in India are engaged in promoting IL skills and abilities based mostly on the *Information Literacy Competency Standards for Higher Education*[15]. Hence, standards have been used in the present study.

Objectives of the study

- To assess information evaluation skills of social science researchers of select central universities; and
- To identify reasons for the lack of information evaluation skills, if any and suggest measures for enhancement.

Study hypotheses

H_{01}: There is no significant difference in the IES levels of researchers across gender.

H_{02}: There is no significant difference in the IES levels of researchers across different periods of research.

H_{03}: There is no significant difference in the IES levels of researchers across different subjects.

H_{04}: There is no significant difference in the IES levels of researchers across different institutions.

Population of study

The study population consisted of 3443 full-time research scholars of the four central universities in Delhi, viz., Indira Gandhi National Open University (IGNOU), Jamia Millia Islamia (JMI), Jawaharlal Nehru University (JNU) and University of Delhi (DU). Since the population under study was similar to a closed group, 960 researchers were selected for the study. The stratification of the sample was by gender, discipline, and institution. The actual representative sample was drawn on a 4% confidence intervals and 95% confidence level. The sample size of 511 was decided based on the total population using the Creative Research System's (2012)[33] sample size calculator. A total of 520 complete responses were received from the selected 960 researchers, which is higher than 511.

Scope of the study

This study is segment of a more extensive assessment study and attempts to assess the IES level of researchers enrolled for PhD in the Department of Economics, Geography, History, Political Science, Law and Sociology at Indira Gandhi National Open University (IGNOU), Jamia Millia Islamia (JMI), Jawaharlal Nehru University (JNU) and University of Delhi (DU). The central universities in the national capital are reputed higher educational institutions and represent the national character in terms of students' representations from different parts of the country.

Methodology

The questionnaire was used to gather the required data for the study. Questions were framed to test the IES levels of respondents for authenticity and reliability of information and its sources. A set of ten questions was developed on the basis of the ACRL Standard III, its performance indicators and outcomes. The responses were manually evaluated, and the correct answers were allotted two marks. For data analysis, two statistical techniques: descriptive and inferential, were applied. "The descriptive statistics included frequency distribution, percentage, bar graph, etc. and was aided by computing mean, standard deviation and range. Inferential statistics consisted of a variety of tools like One-way ANOVA, F-ratio, and Post-Hoc test using LSD".[20] The self-explanatory Seven Point "Performance and Competency Scale", given in Table 1, was used to measure the test performance and identify IES levels[34].

Profile of respondents

The details of respondents such as institutions, subject areas of research and gender are presented in Table 2.

Overall, out of the total 520 (100.0%) respondents, there were 42 (8.1%) outstanding performers scoring 20 marks, 98 (18.8%) excellent performers with 18 marks, 94 (18.1%) very good performers with 16 marks, 114 (21.9%) good performers with 14 marks, and 72 (13.8%) fair performers scoring 12 marks. A total of 44 (8.5%) respondents performed below average by scoring ten marks, and 56 (10.8%) of the respondents failed in the IES assessment test.

The details of test performance on IES across gender (count of % within gender) are depicted in Figure 1. On the performance and competency scale, there were overall 66.9% of the IES competent respondents consisting of 30.0% female and 36.9% male. It included 21.9%'Good', 18.1%'Very Good', 18.8% 'Excellent', and 8.1% 'Outstanding'. The rest 33.1% of the respondents consisting 14.6% females

Table 1 — Seven-point performance and competency scale

Percentage 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

Table 2 — Profile of respondents

University enrolled		Subject area of research						Gender		Total
		History	Political Science	Economics	Sociology	Geography	Law	Male	Female	
DU	No. of respondents	20	20	20	20	20	22	78	44	122
	% of respondents	16.4%	16.4%	16.4%	16.4%	16.4%	18.0%	63.9%	36.1%	100.0%
JMI	No. of respondents	20	28	16	16	20	20	74	46	120
	% of respondents	16.7%	23.3%	13.3%	13.3%	16.7%	16.7%	61.7%	38.3%	100.0%
JNU	No. of respondents	22	24	22	24	24	26	62	80	142
	% of respondents	15.5%	16.9%	15.5%	16.9%	16.9%	18.3%	43.7%	56.3%	100.0%
IGNOU	No. of respondents	24	24	36	24	14	14	74	62	136
	% of respondents	17.6%	17.6%	26.5%	17.6%	10.3%	10.3%	54.4%	45.6%	100.0%
Total	No. of respondents	86	96	94	84	78	82	288	232	520
	% of respondents	16.5%	18.5%	18.1%	16.2%	15.0%	15.8%	55.4%	44.6%	100.0%

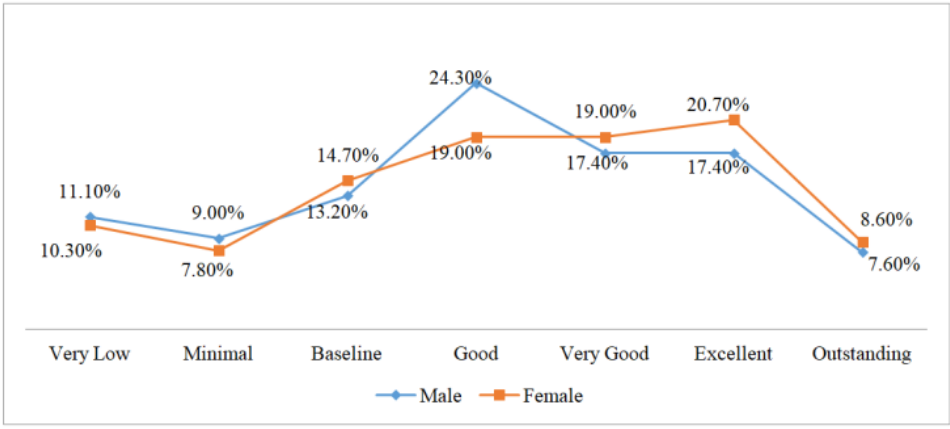

Fig. 1 — Performance assessment on IES across genders

and 18.5% males did not have competency in IES. The IES incompetent respondents included 10.8% 'Very Low', 8.5% 'Minimal' and 13.8% 'Baseline'.

The overall mean score of gender on IES is 14.19. Male respondents recorded a lower mean score of 14.07 compared to female respondents who had a mean score of 14.35. The mean plots and mean score suggest that compared to female respondents, male respondents possessed slightly lower IES levels.

Hypothesis testing

To examine the difference between IES levels of researchers across gender, One-way ANOVA was performed. The results F (1, 518) = 0.659, p= 0.417 indicate that there was no significant difference. Further, Post Hoc analysis could not be performed because there were fewer than three groups, and the p-value of 0.417 is not of statistical significance. Hence, it is concluded that the mean score difference between the two groups is by chance, and the hypothesis is accepted.

IES levels across the period of research

The details of test performance on IES across the period of research (count of % within the period of research) are presented in Figure 2. The total 66.9% of the respondents competent in IES included a maximum of 28.1% respondents from 1-2 years period of research, followed by 24.6% from less than one-year period of research, 8.1% from 2-3 years period of research and 6.2% from more than three years period of research. The rest 33.1% of the respondents lacking competency in IES consisted of maximum 10.4% respondents from 1-2 years period of research, followed by 9.6% from 2-3 years period of research, 6.9% from more than three years period of research and 6.2% from less than one-year period of research.

Statistically, researchers having less than one year period of research have scored a higher mean score of 15.20, followed by researchers having 1-2 years period of research with a mean score of 14.72,

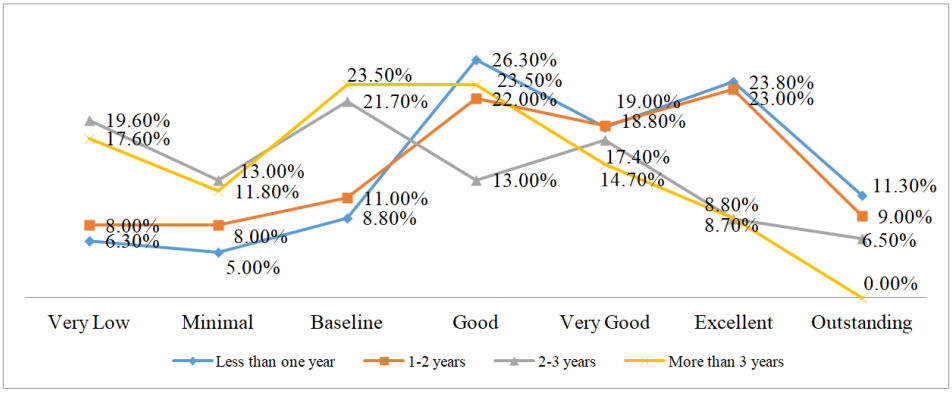

Fig. 2 — Performance Assessment on IES across the period of research

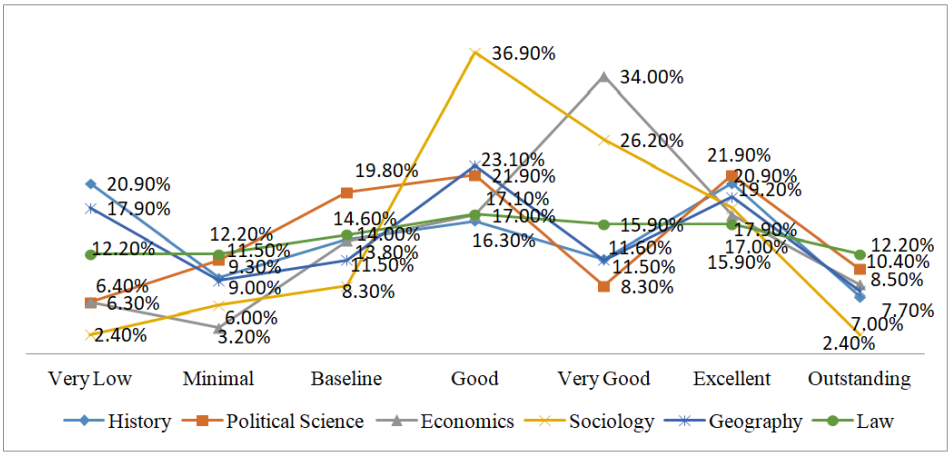

Fig. 3 — Performance assessment on IES across subjects

researchers having 2-3 years period of research with a mean score of 12.70 and researchers having more than three years period of research with a mean score of 12.29. The overall mean score is 14.19. The mean plots and mean score suggest that researchers having less than the one-year period of research possessed higher IES followed by researchers having a 1-2 years period of research, researchers having 2-3 years period of research and researchers having more than three years period of research.

Hypothesis Testing

To examine the difference between IES levels of researchers across the period of research, One-way ANOVA was performed. The results F (3, 516) = 16.446, p= 0.000 show that there were significant differences. Further, Post-Hoc analysis using LSD shows significant differences in IES levels of researchers of different periods of research except between less than one year and 1-2 years, 2-3 years and more than three years period of research.

To conclude, the mean score, F-ratio and Post-Hoc analysis of the responses of researchers from different periods of research for IES are different and statistically significant at the 0.05 level. Hence, the hypothesis is rejected. Further, there were significant differences across researchers of different periods of research except between less than one year and 1-2 years, 2-3 years and more than three years period of research.

IES levels across subjects

The details of test performance on IES across subjects (count of % within-subject) are depicted in Figure 3. The total 66.9% of the IES competent respondents consisted of 9.2% respondents from both History and Geography, 9.6% from Law, 11.5% from political Science, 13.4% from Sociology and the maximum of 13.8% from Economics. The rest 33.1% of the respondents lacking competency in IES included maximum 7.3% of respondents from History, followed by 6.9% from Political Science 6.2% from Law, 5.8% from Geography, 4.2% from Economics and 2.7% from Sociology.

Statistically, researchers from Economics scored a higher mean score of 15.09, followed by Sociology

with a mean score of 14.83, Political Science with a mean score of 14.19, Law with a mean score of 13.98, Geography with a mean score of 13.59, and History with a mean score of 13.35. The overall mean score is 14.19. The mean plots and mean score suggest that researchers from Economics possessed higher IES level followed by researchers of Sociology, Political Science, Law, Geography, and History.

Hypothesis Testing

To examine the difference between IES levels of researchers across subjects, One-way ANOVA was performed. The results F (5, 514) = 2.792, p= 0.017 indicate that there were significant differences. Further, to identify the difference in IES level between the subjects, Post-Hoc analysis with LSD was performed. It shows no significant differences across researchers of the different subject areas except between History and economics, History and sociology, sociology and geography, and economics and geography.

The mean score, F-ratio and Post-Hoc analysis of the researchers from the different subjects are significant at the 0.05 level. Hence, the hypothesis is rejected. Further, there were significant differences between History and Economics, History and Sociology, Economics and Geography, and Sociology and Geography.

IES Levels across institutions

The details of test performance on IES across institutions (count of % within the university) are depicted in Fig. 4. On the competency scale, overall, the maximum of 23.8% of respondents from JNU followed by 21.5% from IGNOU, 11.9% from JMI and 9.6% from DU constituted the total 66.9% of the researchers competent in IES to critically evaluate information and its sources. The rest 33.1% of the respondents lacking competency in IES included a maximum of 13.8% of respondents from DU followed by 11.2% from JMI, 4.6% from IGNOU and 3.5% from JNU.

Statistically, the researchers from JNU scored the highest mean score of 16.87, followed by researchers from IGNOU with a mean score of 15.09, researchers from JMI with a mean score of 13.13 and researchers from DU with the lowest mean score of 11.11. The overall mean score is 14.19. The mean plots and mean score suggest that researchers from JNU possessed the highest IES, followed by the researchers at IGNOU, JMI, and DU.

Hypothesis Testing

To examine the difference between IES levels of researchers across Institutions, One-way ANOVA was performed. The results F (3, 516) = 79.295, p= 0.000 show that there were significant differences. Further, Post-Hoc analysis with LSD shows significant differences in the IES levels of researchers across different institutions.

The mean score, F-ratio and Post-Hoc analysis of the different institutions for IES are different and statistically significant at the 0.05 level. Hence, the hypothesis is rejected.

Discussions

In the networked digital environment, the evaluation of information and its sources has become vital. The researchers should be skilful at examining authority, objectivity, coverage, accuracy, and currency of online information. "Accessing and evaluating information" is described by Fraillon et al., (2014)[35] as the "investigative processes that enable a person to find, retrieve, and make judgments about the relevance, integrity, and usefulness of computer-

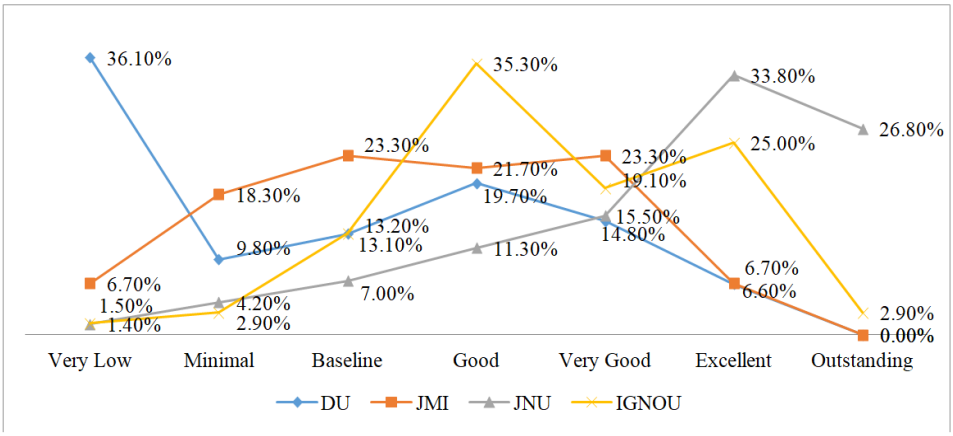

Fig. 4 — Performance Assessment on IES- Across Institutions

based information". The doctoral students "frequently need comprehensive information, particularly for thesis research, and therefore need strong information seeking and use skills to accomplish their research goals" [36]. A higher level of competency in information evaluation skills is vital in research.

The findings of the present study are supported by earlier studies by Buzzetto-Hollywood (2017)[37], Dixon (2017)[38], and Mishra et al. (2015)[39]. These studies show deficiencies in information handling skills among students. The studies on information evaluation skills by Parsazadeh et al. (2015)[40], Wertz et al. (2013)[41] and Walraven, et al. (2013)[42] show incompetency in students' abilities in evaluating information and its sources. Further, Biddix et al., (2011)[43], and Hatlevik (2016)[44] found an inconsistency in trust and use of online sources by students. Mason et al. (2014)[45] found students facing difficulties in handling conflicting information on the web and determining the authentic and reliable websites. Reading[46] (2016) found that social science researchers were struggling with "relevant basic competencies include searching for and finding resources, understanding resources, evaluating them in terms of scholarship and suitability to the question and referencing". Readers rarely bother for quality of content while engaging in an online inquiry[12].

The skill for critical evaluation of online information is essential and required to be developed[43], and for conducting evaluations, students should be given appropriate training and instruction criteria[45]. The findings indicate that 33.1% of the researchers did not have competency in IES. The researchers from JNU, Economics, and having less than a one-year period of research possessed a higher level of competency in IES. However, 3.5% of researchers from JNU, 4.2% from Economics, and 6.2% from less than a one-year period of research were missing skills in the proper evaluation of information. This level of skills among researchers is a severe challenge. These findings indicate a requirement of focused instructions to enhance further researchers' skills and abilities for critical evaluation of online information.

Further, a study by Selwyn, (2016)[47] has established that the new generation students do not develop required information skills without deliberate instruction. Previous studies have shown that effective IL education and training can be provided by integrating it into the teaching and learning process[48]. However, many times, "incorporating IL into the curriculum becomes challenging. Some familiar challenges include lack of understanding about IL, no space in the curriculum, equating IL with computer literacy, and misconception of millennial students". [20] The findings of the present study reinforce the need for close collaboration between librarians, teaching faculty and administrators. Collaboration is the need of the hour. The ACRL Framework also calls for more extensive collaborations *"to redesign instruction sessions, assignments, courses, and even curricula; to connect information literacy with student success initiatives; to collaborate on pedagogical research and involve students themselves in that research; and to create wider conversations about student learning, the scholarship of teaching and learning, and the assessment of learning on local campuses and beyond."* UK libraries have identified "online tutorials" as one of the most common methods for promoting IL[49]. University libraries should develop and promote online IL tutorials.

Conclusion

Information evaluation skill is essential and plays a critical role in today's research activities. The researchers must enhance their abilities to decide relevance, accuracy, and overall credibility of information and its sources. They assume a larger obligation of assessing the quality of online information and are expected to analyze online scholarly sources critically. The researchers enrolled in the selected universities under study hail from various parts of the country and provided a pan India representation. Hence, the findings of the present study could be fruitfully utilized by other universities in the country to plan and organize multiple IL programs and activities to enhance the researchers' competency in IES. Academic libraries are needed to play a more proactive role in imparting information handling skills emphasizing more on IES.

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