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Information Literacy Competencies and Research Skills of Research Scholars: An Indian Perspective

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ABSTRACT

This study examines the efficacy of information literacy (IL) training in enhancing the research skills of doctoral scholars in two universities in Mumbai Regeion. i.e. University of Mumbai and Shreemati Nathibai Thackesey University (SNDT). A descriptive survey was conducted among 385 research scholars using a structured questionnaire. The findings show that 66.8% had attended IL training, largely through university libraries. Respondents reported a high overall level of information literacy competency (M = 3.61), although challenges remained in source evaluation, database identification, advanced searching, and reference management. Among trained scholars, 79.0% perceived IL training as making a high or very high contribution to their research skills, particularly in literature reviewing, citation management, source evaluation, and ethical writing. The study highlights the need for more regular, advanced, and research-oriented information literacy programmes in universities.

KEYWORDS: *Information literacy; Research skills; Research Scholars Information literacy training; University libraries.*

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1. INTRODUCTION

The Scholarly Information environment has become very complex with the advent of technology. There are several formats of information sources and methods for their retrieval. Hence, scholars who seek to get primary information on their field fo research have to be skilled enough to cope with the situation. Information literacy (IL) has emerged as an essential competency for research scholars to dwell in the complex ecosystem of information. While being in doctoral research, scholars have to identify appropriate information needs, formulate effective search strategies, locate relevant and credible sources, critically evaluate information, manage references, and use scholarly information ethically. These competencies together are called as Information Literacy.

2. Review Of related Literature

The emergence of electronic databases, digital libraries, open-access resources, research discovery platforms, and artificial intelligence-based research tools has made the scenario more complex. These developments have improved access to scholarly information for sure. But, at the same time, they have also increased the need for researchers to possess the skills necessary to identify, evaluate, organize, and appropriately use information throughout the research process. “Acquiring information literacy skills is no longer an option; it has become essential for university students to thrive academically and in various practical aspects of their lives” (Akter & Ahmed, 2024). “Academic libraries are key stakeholders in the integration of information literacy at universities. They are responsible not only for providing appropriate information resources, but also for guiding how they can be used to sufficiently meet the educational, recreational, and research needs of the university community” (Aviamu et al., 2024).

Information Literacy programs conducted by the university libraries play an important role in developing these competencies. Library orientations, Database-searching workshops, Reference-management training, Plagiarism-awareness sessions, and other research-support services also enhance the IL skills of scholars. “Academic libraries play a

pivotal role in enhancing research literacy through structured instruction, faculty collaboration, and specialized research support services" (Sohail et al., 2026). Such training enable research scholars to search for scholarly literature more systematically, evaluate the reliability and relevance of information sources, prepare comprehensive literature reviews, manage citations and references efficiently, and adhere to principles of academic integrity. However, participation in these programs alone does not necessarily ensure that researchers acquire or effectively apply these competencies in their academic work. Assessing the effectiveness of such training is therefore important. It determines whether information literacy initiatives actually contributed to the improvements in researchers' knowledge, skills, confidence, and ability to conduct independent scholarly research. "Academic librarians have been traditionally responsible for the topic of information literacy in higher education" (Akakpo et al., 2025).

Information Literacy (IL) is a widely discussed concept in Higher Education. But the body of existing research mostly focusses on awareness of students, information-seeking behaviour, use of library resources, or general perceptions of information literacy programs. Less attention was given to research studies on evaluating the extent to which IL training equips research scholars with competencies specific for research, particularly within the Indian university context. Studies comparing trained and non-trained research scholars based on their competencies of literature searching, source evaluation, reference management, formulation of research questions, and the ethical use of information are rare. Addressing this gap, the present study examines the effectiveness of information literacy training in enhancing the research skills of research scholars in two Indian universities. It investigates scholars' exposure to information literacy training, assesses its perceived contribution to key research activities, and examines whether participation in such programs is associated with higher levels of information literacy competence and research capability. The findings are expected to provide evidence to help university libraries and research-support units design more focused, outcome-oriented, and researcher-centered information literacy programs.

3. Research Problem

Information literacy is an essential competency for research scholars, as successful research requires the ability to identify information needs, locate relevant and reliable scholarly sources, critically evaluate information, manage references and citations, and use information ethically. University libraries seek to develop these competencies through information literacy training programs such as library orientation, database-searching workshops, reference-management training, plagiarism-awareness sessions, and guidance on scholarly information resources. However, participation in such programs does not necessarily indicate that scholars have acquired the competencies required for effective research. It is therefore important to assess both the extent of participation in information literacy training and the level of information literacy competency among research scholars.

Although information literacy has received considerable attention in higher education, many studies have focused primarily on awareness of information resources, information-seeking behaviour, or use of library services. Comparatively little attention has been paid to examining the contribution of information literacy training to the research skills required of research scholars, particularly in the Indian university context. Skills such as conducting effective literature searches, evaluating scholarly information, preparing literature reviews, managing citations and references, and using information ethically are central to doctoral research. But the empirical evidence regarding the role of IL training in enhancing the information skills of doctoral researchers are relatively very limited.

The present study examines the impact of IL training among research scholars in two universities in Mumbai. The study investigates the extent and nature of participation of scholars in IL training and assesses their level of information literacy competency. It also examines their perception on the influence of such training to the development of their research skills.

4. Objectives of the Study

- To examine the extent of participation of research scholars in information literacy training programmes and the nature of training received.
- To assess the information literacy competencies of research scholars in relation to locating, evaluating, managing, and ethically using scholarly information.
- To examine the perceived contribution of information literacy training to the development of research skills among research scholars**.**

5. Research Questions

- To what extent have research scholars participated in information literacy training programmes?

- What is the level of information literacy competency among research scholars in locating, evaluating, managing, and ethically using scholarly information?
- To what extent do research scholars perceive information literacy training as contributing to the development of their research skills??

6. Research Methodology

Descriptive survey research was used to examine the participation of research scholars in IL training, their information literacy competencies, and the perceived contribution of such training to improve the research skills. Data were collected from 385 doctoral research scholars from the University of Mumbai and SNDT Women's University. The researcher used a structured questionnaire. The collected data was then analysed using SPSS Software.

7. Analysis of Data

7.1. Profile of the Respondents

A total of 385 doctoral research scholars participated in the survey. The profile of the respondents was examined in terms of gender, age, university affiliation, research subject area, research experience, current stage of research, and prior exposure to research through an academic degree. Frequencies and percentages were used to describe the characteristics of the respondents.

Table 1. Gender and Age group of respondents

Gender	Age groups				Total
	Below 25 Years	25–30 Years	31–35 Years	Above 35 Years	
Male	0 (0.0%)	12 (8.6%)	26 (18.7%)	101 (72.7%)	139 (100.0%)
Female	4 (1.6%)	20 (8.1%)	22 (8.9%)	200 (81.3%)	246 (100.0%)
Total	4 (1.0%)	32 (8.3%)	48 (12.5%)	301 (78.2%)	385 (100.0%)

Table 1 presents the age distribution of respondents by gender. Among the 139 male research scholars, the majority (72.7%) were above 35 years of age. A further 18.7% were in the 31–35-year age group, while 8.6% were in the 25–30-year age group. No male respondents were below 25 years of age. A similar pattern was observed among the 246 female research scholars, although the concentration in the higher age group was even more pronounced. More than four-fifths (81.3%) of the female respondents were above 35 years of age, while 8.9% were aged 31–35 years and 8.1% were aged 25–30 years. Only 1.6% of female respondents were under 25 years old.

Overall, 78.2% of the respondents were above 35 years of age, indicating that the survey predominantly represents mature research scholars. The proportion of respondents aged 35 and above was higher among females (81.3%) than among males (72.7%). In contrast, a comparatively larger proportion of male respondents belonged to the 31–35-year age group (18.7%) than of female respondents (8.9%).

7.2. Association between Research Experience and Current Stage of Research

The descriptive cross-tabulation indicated a progressive shift from the initial stages of research towards data analysis and research writing as research experience increased. Several studies also have suggested this. "Findings also showed that students with research experience had higher IL self-efficacy, especially in tasks like writing research papers and preparing bibliographies" (Tasmim & Atikuzzaman, 2025). But gaining experience in research skills through multiple years of research is not a good way for gaining the research skills. The initial stages of research itself need a lot of research skills as the scholar gets involved in literature search and review at this time. The lack of such skills can cause the scholar missing a relevant literature, which can sabotage the entire quality work done by the researcher at a later stage.

Table 2. Research Experience and the stages of research

Research Experience	Initial Literature Review	Data Collection	Data Analysis	Writing Thesis/Papers	Total
Less than 1 year	39 (66.1%)	8 (13.6%)	8 (13.6%)	4 (6.8%)	59 (100.0%)
1–3 years	55 (40.4%)	34 (25.0%)	24 (17.6%)	23 (16.9%)	136 (100.0%)
4–6 years	11 (18.0%)	15 (24.6%)	27 (44.3%)	8 (13.1%)	61 (100.0%)
Above 6 years	12 (9.3%)	16 (12.4%)	74 (57.4%)	27 (20.9%)	129 (100.0%)
Total	117 (30.4%)	73 (19.0%)	133 (34.5%)	62 (16.1%)	385 (100.0%)

To determine whether this pattern was statistically significant, a Pearson chi-square test of independence was conducted to examine the association between research experience and current stage of research.

Table 3. Association between Research Experience and Current Stage of Research

Statistical Measure	Value
Pearson Chi-square (χ^2)	104.011
Degrees of freedom (df)	9
p-value	< .001
Cramer's V	0.3
Number of respondents	385

The chi-square test revealed a statistically significant association between research experience and the current stage of research, $\chi^2(9, N = 385) = 104.01$, $p < .001$**.** Thus, the distribution of respondents across the stages of research varied significantly with their level of research experience. The Cramer's V value of 0.300 indicates a moderate association between the two variables.

7.3. Participation in Information Literacy Training

The first objective of the study was to understand the extent of participation by research scholars in IL training programs.

The findings indicate that there was enough exposure to IL training. Almost two-thirds of respondents (66.8%) reported that they have attended an information literacy training program or workshop. As much as 33.2% had never participated in such a training. It was also found that 64.4% of scholars have attended IL training session specifically offered by their university library.

As much as 61.3% of respondents were of the opinion that their university library offered IL training sessions. A considerable proportion (25.2%) were unsure whether such programs were offered in their universities. 13.5% of the sample reported that their library did not provide such training. The relatively large proportion of scholars who were uncertain about the availability of training suggests that greater marketing of IL enhancement programs may be necessary.

Table 4. Participation in and Availability of Information Literacy Training

Aspect	Response	Frequency	Percentage (%)
Ever attended a training/workshop on information literacy	Yes	257	66.80%
	No	128	33.20%
The university library offers information literacy training	Yes	236	61.30%
	Not sure	97	25.20%
	No	52	13.50%
Ever attended information literacy training provided by the library	Yes	248	64.40%
	No	137	35.60%
Note: N = 385.			

The data on the type of training received indicates that a strong emphasis was given on the practical skills required to access and ethically use scholarly information. Most frequently covered topic was the use of Databases. As much as 75.4% of the participants expressed this opinion. Other topics followed it plagiarism detection and ethical publishing (72.6%), This indicates that much consideration was given to the aspects of academic integrity and responsible scholarly communication.

Table 5. Topics Covered in Information Literacy Training attended by Research Scholars

Topics Covered	Frequency	Percentage of Participants (%)	Rank
Database usage (e.g., Scopus, JSTOR)	187	75.4	1
Plagiarism detection and ethical publishing	180	72.6	2
Advanced search techniques (e.g., Boolean operators)	160	64.5	3
Literature review strategies	122	49.2	4
Note: Multiple responses were permitted. Percentages are calculated based on the 248 respondents who reported attending library-provided information literacy training; therefore, percentages do not total 100.			

Another area which was given importance was the use of advanced search techniques, including the use of Boolean operators, reported by 64.5% of the participants. Thus, while university libraries appear to give considerable attention to database searching, search techniques, and the ethical use of information, training in the systematic organization and synthesis of literature appears comparatively less prominent.

The findings based on the first research question indicate that a substantial majority of the research scholars surveyed have attended information literacy training. Nearly two-thirds have participated in such programs. In most universities, it is their libraries constitute the channel for delivering this training. However, the programs are offered largely on an occasional basis. They mostly focus on database use, literature search, plagiarism prevention, and ethical publishing. The comparatively low coverage of literature review strategies suggests an area where information literacy programs for doctoral researchers could be further strengthened.

7.4. Information Literacy Competencies of Research scholars

The second objective of the study was to assess the information literacy competencies of research scholars. Respondents were asked to indicate their level of understanding of five major components of information literacy on a five-point scale. For analysis, the responses were scored from 1 = No understanding to 5 = Expert-level understanding. The five items demonstrated excellent internal consistency, with a Cronbach's alpha of 0.964, indicating that they can reasonably be treated as components of an overall information literacy competency measure.

Information Literacy Competencies of Research scholars

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Table 6. Level of Understanding of Information Literacy Components

Information Literacy Component	No Understanding	Limited Understanding	Basic Understanding	Good Understanding	Expert-level Understanding	Mean	SD	Rank
Identifying the need for information	16 (4.2%)	46 (11.9%)	64 (16.6%)	193 (50.1%)	66 (17.1%)	3.64	1.03	1
Locating reliable information sources	24 (6.2%)	38 (9.9%)	64 (16.6%)	188 (48.8%)	71 (18.4%)	3.63	1.08	2
Using information ethically and effectively	24 (6.2%)	46 (11.9%)	58 (15.1%)	179 (46.5%)	78 (20.3%)	3.63	1.12	3
Evaluating the quality and relevance of information	24 (6.2%)	46 (11.9%)	66 (17.1%)	174 (45.2%)	75 (19.5%)	3.6	1.12	4
Managing references and citations	24 (6.2%)	53 (13.8%)	59 (15.3%)	186 (48.3%)	63 (16.4%)	3.55	1.11	5
Note: N = 385. Mean scores are based on a five-point scale ranging from 1 to 5.								

It can be inferred that the research scholars generally possess a relatively good level of information literacy competency. Among the various competencies, Identifying the need for information received the highest mean score (M = 3.64, SD = 1.03). As much as 67.2% of respondents reported that they possess either good or expert-level understanding. This indicates that most scholars were confident in recognizing the need for information.

The ability to locate reliable information sources ranked second (M = 3.63, SD = 1.08) in the analysis. The ethical and effective use of information recorded a very similar mean (M = 3.63, SD = 1.12). More than two-thirds of the respondents reported good or expert-level understanding in both areas. The ability to evaluate the quality and relevance of information recorded a slightly lower mean of 3.60. But, 64.7% of the respondents still indicated good or expert-level understanding.

Among the five facets studied, managing references and citations recorded the lowest mean score (M = 3.55, SD = 1.11). Although nearly two-thirds of respondents demonstrated good or expert-level understanding, approximately one-fifth reported either no understanding or only limited understanding. Reference and Citation

Management represented a comparatively weaker area within overall information literacy competency of the sample of scholars studied.

7.5. Overall Information Literacy Competency

A composite Information Literacy Competency Score was calculated by averaging the five competency items. The resulting overall mean was 3.61 (SD = 1.02).

For descriptive interpretation, the mean scores were classified using equal intervals as follows:

- 1.00–1.80 = Very Low
- 1.81–2.60 = Low
- 2.61–3.40 = Moderate
- 3.41–4.20 = High
- 4.21–5.00 = Very High

Table 7. Overall Level of Information Literacy Competency

Competency Level	Frequency	Percentage (%)
Very Low	28	7.3
Low	42	10.9
Moderate	59	15.3
High	181	47
Very High	75	19.5
Total	385	100

The Table 7 suggests that nearly half of the respondents (47.0%) demonstrated a high level of IL competency. Another 19.5% were grouped under very high level of competency. Altogether, 66.5% of research scholars fell within the high or very high IL competency categories. A moderate level was observed among 15.3%, while 18.2% were classified as having low or very low information literacy competency.

The overall mean score of 3.61 is an indication of a high level of information literacy competency of the sample of respondents. At the same time, a sizeable group with moderate or lower levels of competency also is available in the sample. This is an indication that information literacy training support remains necessary, particularly for scholars who may require more specialized assistance at different stages of their research.

7.6. Areas of Information Literacy Found Challenging

Respondents were also asked to identify the most challenging information literacy skills for them. The responses are tabulated as Table 8.

The IL Competency of the sample under study was actually the rating by them only. In other words, the scores are basically self-reported only. The findings suggest the important areas in which the scholars continue to experience difficulty. A majority of them (55.1%) find evaluating the credibility of information sources was a challenge. This was closely followed by the skills of identifying relevant databases or information sources (53.8%) and effective searching using Boolean operators and advanced search techniques (49.4%).

Table 8. Information Literacy Skills considered most challenging

Challenging Skill in IL	Frequency	Percentage (%)	Rank
Evaluating the credibility of sources	212	55.1	1
Identifying relevant databases or sources	207	53.8	2
Searching effectively using Boolean operators and advanced search techniques	190	49.4	3
Avoiding plagiarism	173	44.9	4
Managing and citing references	115	29.9	5

Note: Multiple responses were permitted; therefore, percentages do not total 100.

Avoiding plagiarism was a challenging skill for 44.9% of respondents. As much as 29.9% reported difficulties in managing and citing references. These findings are very important. They demonstrate that an overall competency score does not necessarily indicate deficiency in skills. Scholars may perceive themselves that they are information-literates in its broader sense. But they may lack one or two specific skills within the IL Competency. That scenario points to the need for targeted assistance with advanced searching, source evaluation, academic integrity, and reference management.

7.7. Perceived Contribution of Information Literacy Training to Research Skills

The next objective of the study was to examine the perceived effect of information literacy training in developing research skills among scholars. Accordingly, this analysis was restricted to the 257 respondents who had attended information literacy training or workshops.

Respondents rated the impact of information literacy training on the various skills of the research process. The responses were coded on a five-point Likert scale. They are, 1 = Not at all helpful, 2 = Not helpful, 3 = No comments, 4 = Helpful, and 5 = Extremely helpful. The questionnaire used "No comments" as the midpoint response, which was assigned a score of 3 for calculating mean scores.

The five training-contribution items demonstrated an excellent internal consistency (Cronbach's $\alpha = 0.954$). This indicated that they measure a highly coherent underlying construct related to the perceived contribution of information literacy training to research skills.

Table 9. Perceived Contribution of Information Literacy Training to Research Skills

Research Skill	Helpful / Extremely Helpful n (%)	Mean	SD	Rank
Conducting an effective literature review	218 (84.8%)	3.98	0.79	1
Managing references and citations efficiently	211 (82.1%)	3.93	0.86	2
Evaluating the credibility and relevance of information sources	207 (80.5%)	3.9	0.82	3
Avoiding plagiarism through ethical writing practices	199 (77.4%)	3.89	0.89	4
Identifying and formulating research questions	202 (78.6%)	3.79	0.89	5

Note: N = 257 research scholars who had attended information literacy training. Mean scores are based on a five-point scale.

An overall positive perception was found to the contribution of information literacy training to the enhancement of research skills., Conducting an effective literature review received the highest mean score (M = 3.98, SD = 0.79) among the five areas examined. A substantial 84.8% of the trained respondents regarded information literacy training as either helpful or extremely helpful in developing their ability to conduct literature reviews. This finding indicates that information literacy programs play an important role in developing the literature-searching and reviewing competencies. These skills are very fundamental in doctoral research.

Managing references and citations efficiently (M = 3.93, SD = 0.86) was the second-highest rated contribution opted by 82.1% of respondents. They were of the opinion that the trainings were helpful or extremely helpful. Another positively perceived skill was that of evaluating the credibility and relevance of information sources (M = 3.90, SD = 0.82), with 80.5% of participants reporting a favourable contribution.

IL Training was similarly considered useful for avoiding plagiarism through ethical writing practices (M = 3.89, SD = 0.89). More than three-fourths (77.4%) of participants perceived training as helpful or extremely helpful in this area. Although identifying and formulating research questions received the lowest mean among the five areas, its mean score remained comparatively high (M = 3.79, SD = 0.89), and 78.6% of respondents still reported that information literacy training had been helpful or extremely helpful.

7.8. Overall Perceived Contribution of Information Literacy Training

Since the five items demonstrated high internal reliability, an overall Information Literacy Training Contribution Score was calculated by averaging the five responses. The overall mean score was:

$$M = 3.90, SD = 0.78$$

For descriptive interpretation, the overall scores were classified into five equal categories.

Table 10. Overall Perceived Contribution of Information Literacy Training

Level of Perceived Contribution	Frequency	Percentage (%)
Very Low	4	1.6
Low	20	7.8
Moderate	30	11.7
High	145	56.4
Very High	58	22.6
Total	257	100

Note: Classification used for descriptive interpretation: 1.00–1.80 = Very Low; 1.81–2.60 = Low; 2.61–3.40 = Moderate; 3.41–4.20 = High; 4.21–5.00 = Very High. Percentages may not total exactly 100 due to rounding.

The overall results reinforce the positive assessment of information literacy training. More than half of the trained respondents (56.4%) reported a high level of perceived contribution, while another 22.6% reported a very high contribution. Thus, approximately 79.0% of the trained research scholars perceived information literacy training as making a high or very high contribution to their research skills. Only 9.4% fell within the low or very low categories.

The overall mean score of 3.90 further indicates that information literacy training was perceived as making a substantial contribution to the research process. However, the findings reflect scholars' perceptions of the usefulness of training and should not be interpreted as direct experimental evidence of improved research performance.

7.9. Research Skills Reported as Improved through Information Literacy

Respondents were further asked to identify the specific research skills that had improved as a result of their information literacy knowledge. Multiple responses were permitted.

The most frequently reported improvement was in the ability to locate relevant literature quickly, identified by 64.2% of the trained respondents. This supports the central role of information literacy in improving scholars' ability to navigate the scholarly information environment and retrieve information efficiently.

Information literacy was also perceived to improve scholars' abilities to organise and manage research data and write and publish research papers, each reported by 58.8% of respondents. More than half (51.8%) also reported an improvement in their ability to critically analyze information sources. The findings therefore suggest that the perceived benefits of information literacy extend beyond information searching to broader competencies involved in organizing, evaluating, communicating, and publishing research.

Table.11. Research Skills Improved through Information Literacy

Research Skill Improved	Frequency	Percentage (%)	Rank
Locating relevant literature quickly	165	64.2	1
Organizing and managing research data	151	58.8	2
Writing and publishing research papers	151	58.8	2
Critically analysing information sources	133	51.8	4

Note: N = 257 trained respondents. Multiple responses were permitted; therefore, percentages do not total 100.

The findings provide a clear answer to the third research question. It was found that Research scholars had good opinion about the IL Training sessions. According to them, the the trainings were making a substantial contribution in their research skills. Its strongest perceived contribution was towards conducting effective literature reviews, followed by reference and citation management, evaluation of scholarly information, ethical writing, plagiarism avoidance, and formulation of research questions.

The overall training-contribution score (M = 3.90) and the finding that 79.0% of participants reported a high or very high level of perceived contribution demonstrate a broadly favourable assessment of information literacy training. The reported improvements in locating literature, research data management, scholarly writing and publication, and critical source analysis further indicate that information literacy programs are perceived to support multiple stages of the doctoral research process.

Conclusion

The present study was an attempt to examine the perception of research scholars about their participation in information literacy training and the improvements they got in their research skills. The findings show that a substantial proportion of the respondents had attended information literacy trainings. It was also found that the university libraries play an important role in delivering such programs. Trainings were commonly given on the topics of database use, plagiarism detection, ethical publishing, advanced search techniques, and literature review strategies. But the frequency of such sessions was mostly semester-based or occasional. This indicates that information literacy enhancement sessions are still delivered more as a periodic intervention, rather than as continuous component of doctoral research support.

It was also found that research scholars generally possessed a high level of information literacy (self-reported) competency. They reported comparatively strong competence in identifying information needs, locating reliable information sources, and using information ethically. At the same time, certain areas remained challenging, particularly evaluating the credibility of information sources, identifying appropriate databases, applying advanced search techniques, and managing references and citations. These findings suggest that information literacy

programs need a thorough revamping. They should be more than introductory library orientation and basic database demonstrations and move towards more advanced, research-specific competency training.

The research scholars who had participated in information literacy training perceived contribution of training to research skills was strongly positive. They considered training as helpful in conducting literature reviews, managing references and citations, evaluating scholarly information, and avoiding plagiarism through ethical writing practices.

The study, therefore, concludes that information literacy training can play an important supportive role in strengthening the research capabilities of research scholars when it is appropriately designed and aligned with the demands of the research process. University libraries should consider offering more regular and advanced training in critical source evaluation, sophisticated search strategy development, reference and citation management, literature review techniques, ethical scholarly communication, and emerging research tools.

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