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Assessment of Information Literacy Programs in Academic Libraries and Their Effect on Research Productivity

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Abstract
This study assesses the information literacy (IL) programs offered by academic libraries and examines their effect on the research productivity of academic library users. Information literacy has become a foundational competency for scholarly work in an environment of rapidly expanding digital information, yet empirical evidence linking library IL programs to measurable research outcomes remains limited in many higher-education contexts. Adopting a quantitative, survey-based design, the study collected data from 400 respondents comprising faculty members, research scholars, and postgraduate students across a range of academic disciplines and institutional types. A structured questionnaire measured five constructs — awareness of IL programs, participation in IL programs, information literacy competencies, perceived effectiveness of IL programs, and research productivity — each on a five-point Likert scale. The data were analysed using descriptive statistics and inferential techniques including Pearson correlation, simple and multiple linear regression, one-way and two-way analysis of variance, and reliability analysis. The findings reveal that participation in IL programs is strongly and positively associated with research productivity, that IL competencies significantly predict productivity with searching and retrieval skills exerting the strongest influence, and that research productivity differs significantly and progressively across levels of participation. Awareness of IL services was found to significantly enhance the utilization of scholarly resources, and the perceived effectiveness of IL programs varied significantly across disciplines and user categories, with a significant interaction effect. The study concludes that library IL programs make a meaningful contribution to research productivity and recommends sustained participation, skills-based content, improved outreach, and discipline- and role-specific tailoring of programs.

Keywords: Information literacy; academic libraries; research productivity; information literacy competencies; library instruction; higher education.

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1. Introduction

The contemporary scholarly environment is characterised by an unprecedented abundance of information. Researchers today have access to an enormous volume of digital resources, scholarly databases, open-access repositories, and web-based discovery tools. While this abundance has democratised access to knowledge, it has simultaneously created a pressing challenge: the ability to locate, evaluate, manage, and use information effectively has become as important as access to information itself. In this context, information literacy — the set of abilities that enables individuals to recognise when information is needed and to locate, evaluate, and use it efficiently and ethically — has emerged as a core competency for academic and research work.

Academic libraries have long recognised this reality and have responded by developing information literacy programs designed to equip their users with the skills necessary for effective scholarship. These programs take many forms, including orientation sessions, database-searching workshops, citation management training, plagiarism-avoidance instruction, and online tutorials. Their underlying premise is that better-informed and more skilled researchers will, in turn, be more productive. Yet despite the substantial resources that libraries invest in these programs, the empirical link between participation in IL programs and actual research productivity has not been firmly established in many institutional settings, and the precise mechanisms through which IL programs influence productivity remain insufficiently understood.

This study addresses that gap by assessing the IL programs offered by academic libraries and examining their effect on research productivity. It seeks to determine whether participation in such programs is associated with higher productivity, whether information literacy competencies predict productivity, whether productivity differs across levels of participation, whether awareness of IL services influences the utilization of scholarly resources, and whether the effectiveness of IL programs varies across disciplines and user categories. By answering these questions, the study aims to provide evidence-based guidance for the design and delivery of more effective information literacy programs.

The significance of this study lies in its potential to inform both library policy and institutional decision-making. For library practitioners, the findings offer concrete direction on where to concentrate limited resources — whether on expanding participation, deepening particular competencies, improving outreach, or tailoring programs to specific groups. For institutional leaders and policymakers, the evidence linking IL programs to research productivity strengthens the case for continued investment in library instruction as a contributor to the broader research mission of the institution. For the scholarly community, the study adds to the still-developing empirical base on the outcomes of information literacy instruction, particularly in contexts where such evidence has been scarce. In these ways, the study aspires to be of practical as well as academic value.

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2. Review of Literature

The concept of information literacy has evolved considerably since its early articulation. Scholarship in library and information science has consistently positioned information literacy as a developmental competency that is built incrementally rather than acquired in a single encounter. Foundational frameworks developed by professional library associations have characterised the information-literate individual as one capable of determining the extent of information needed, accessing it efficiently, evaluating it critically, and using it ethically and effectively. These frameworks have provided the conceptual basis for the IL programs that academic libraries deliver today.

A substantial body of research has examined the relationship between library instruction and student or researcher outcomes. Studies in this tradition have generally reported positive associations between participation in information literacy instruction and improvements in research skills, search efficiency, source evaluation, and academic performance. Researchers have argued that the benefits of such instruction are most pronounced when it is sustained and embedded within the research process, rather than delivered as a one-off orientation. This emphasis on sustained engagement is consistent with the developmental view of information literacy and provides theoretical support for examining participation frequency as a determinant of productivity.

A second strand of literature has focused on information literacy competencies as distinct, measurable skills. This work distinguishes among several competency domains, including the ability to search and retrieve scholarly information, the ability to evaluate the quality and credibility of sources, and the ability to organise, cite, and manage information. Empirical studies have found that these competencies vary considerably across individuals and disciplines and that they are amenable to improvement through targeted instruction. Of particular relevance to the present study is the recurring finding that technical, tool-specific skills — such as the use of advanced search techniques and citation management software — are often less developed than conceptual skills such as source evaluation, suggesting that these technical areas offer the greatest scope for improvement.

Research productivity, the outcome variable of this study, has been conceptualised in various ways in the literature, ranging from formal publication output to broader measures of research quality, efficiency, and capability. Scholars have noted that information literacy is likely to influence productivity primarily by strengthening the research process — improving the capacity to find, evaluate, and manage information — rather than by directly increasing publication counts, which are shaped by many additional factors such as funding, collaboration, and disciplinary publishing norms. This nuanced understanding cautions against overstating the direct effect of IL programs on publication output while affirming their contribution to the foundations of productive research.

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Finally, a growing literature has examined the differential effectiveness of IL programs across user groups and disciplines. This work has shown that information needs and research practices vary markedly between fields, with science and technology disciplines tending to rely heavily on database-intensive searching while humanities and social science disciplines draw more on monographs, archives, and qualitative sources. Similarly, the needs of faculty members, research scholars, and postgraduate students differ according to their stage of academic development. These findings imply that a single, undifferentiated IL program is unlikely to serve all groups equally well, motivating the examination of disciplinary and category-based differences in the present study. Taken together, the literature establishes a strong theoretical foundation for the five hypotheses while also revealing the need for further empirical evidence linking IL programs to research productivity in specific institutional contexts.

It is also worth noting that the literature has increasingly drawn attention to the phenomenon of overconfidence in self-assessed information literacy. Several systematic reviews have observed that individuals frequently overestimate their own information skills, particularly in relation to advanced search techniques and the critical evaluation of sources. This observation is methodologically important for studies, such as the present one, that rely on self-reported competency measures, because it suggests that self-assessments may capture confidence and perceived ability as much as objective skill. While this does not invalidate self-report data — perceived competence is itself a meaningful construct that influences behaviour — it reinforces the value of triangulating self-reports with behavioural or performance-based measures in future research.

A further theme in the literature concerns the role of awareness and outreach in determining the uptake of library services. Researchers have repeatedly found that the mere existence of high-quality services is insufficient to ensure their use; users must first become aware of the services, understand their value, and know how to access them. Studies of library marketing and communication have shown that targeted promotion, embedded instruction, and faculty collaboration can substantially increase awareness and, in turn, participation. This body of work provides the conceptual underpinning for the present study's examination of awareness as an influence on the utilization of scholarly resources, and it situates the awareness construct within a broader understanding of how library services translate into user behaviour and outcomes.

3. Research Methodology

The study adopted a quantitative, descriptive, and analytical research design based on a structured survey. This design was selected because the research questions concern relationships and differences among measurable variables across a large population, which a survey approach is well suited to address. The methodology is described below in terms of the population and sample, the research instrument, data collection, and data analysis.

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3.1 Population and Sample

The population for the study comprised academic library users in higher-education institutions, specifically faculty members, research scholars pursuing Ph.D. or M.Phil. degrees, and postgraduate students. A sample of 400 respondents was drawn from this population using a purposive sampling technique that ensured representation across the three user categories, a range of academic disciplines, and several institutional types. A sample of this size provides sufficient statistical power for the inferential techniques employed and yields stable estimates of the population parameters of interest.

3.2 Research Instrument

Data were collected using a structured questionnaire divided into two parts. The first part gathered demographic and academic background information, including gender, age, user category, discipline, qualification, experience, institution type, frequency of library use, frequency of participation in IL programs, and primary source used for research. The second part comprised forty-five attitudinal statements organised into five sections corresponding to the five constructs of the study — awareness, participation, competencies, effectiveness, and research productivity — with nine statements per construct. Each statement was rated on a five-point Likert scale ranging from Strongly Agree (5) to Strongly Disagree (1). The internal consistency reliability of the five scales was assessed using Cronbach's alpha, with all scales achieving values above 0.85 and the overall instrument achieving an alpha of 0.94, indicating excellent reliability.

3.3 Data Analysis

The collected data were analysed using descriptive and inferential statistics. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarise the demographic profile and the responses to each construct. Inferential statistics were used to test the five hypotheses: Pearson product-moment correlation and simple linear regression for the relationships in H1 and H4; multiple linear regression for the predictive analysis in H2; one-way analysis of variance with a Tukey post-hoc test for the group comparison in H3; and two-way analysis of variance for the factorial comparison in H5. A significance level of 0.05 was adopted throughout, with the null hypothesis rejected whenever the observed probability value fell below this threshold.

4. Results

This section presents the principal findings of the study, beginning with a brief profile of the respondents and the descriptive results, followed by the outcomes of the five hypothesis tests.

4.1 Profile and Descriptive Results

The sample of 400 respondents was reasonably balanced by gender (53.5 per cent male, 46.5 per cent female) and concentrated in the most research-active age brackets, with 60.5 per cent aged between 25 and 44 years. The three user categories were well represented: research scholars (37.0 per cent), postgraduate students (33.0 per cent), and faculty members (30.0 per

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cent). Respondents were drawn from nine disciplinary groups, with science and engineering disciplines together accounting for 35.0 per cent. The composite mean scores for the five constructs all fell within the High interpretive band, ranging from 3.69 for participation to 3.97 for effectiveness, as summarised in Table 1.

Table 1: Composite Mean Scores for the Five Constructs (N = 400)

Construct	Mean	SD	Interpretation
Effectiveness of IL Programs	3.97	0.67	High
Awareness of IL Programs	3.95	0.66	High
Research Productivity	3.90	0.71	High
Information Literacy Competencies	3.86	0.69	High
Participation in IL Programs	3.69	0.74	High

The descriptive pattern indicates that respondents were highly aware of IL programs and regarded them as effective, with correspondingly high competencies and self-perceived productivity, while actual participation lagged somewhat behind, constrained chiefly by programme scheduling.

4.2 Hypothesis Testing

H1: There is a significant positive relationship between participation in academic library information literacy programs and the research productivity of faculty members, research scholars, and postgraduate students.

The corresponding null hypothesis (H01) states that there is no significant relationship between participation in information literacy programs and research productivity. To test this hypothesis, two complementary techniques were applied. First, the Pearson product-moment correlation coefficient was computed to quantify the strength and direction of the linear association between the two continuous variables. Second, a simple linear regression was estimated, with participation as the predictor and research productivity as the outcome, in order to determine how much of the variation in productivity could be explained by participation and to quantify the predictive effect.

Descriptive Statistics for the H1 Variables

Descriptive Statistics for the H1 Variables (N = 400)

Variable	Mean	SD	N
Participation in IL Programs	3.69	0.74	400
Research Productivity	3.90	0.71	400

Table reports the descriptive statistics for the two variables entering the H1 analysis. Both variables have means in the High band and comparable standard deviations, indicating that

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they are measured on similar scales and exhibit a similar spread. This comparability is helpful when interpreting the correlation and regression results that follow.

H2: Information literacy competencies significantly and positively predict the research productivity of faculty members, research scholars, and postgraduate students.

The associated null hypothesis (H02) holds that information literacy competencies do not significantly predict research productivity. Because information literacy competency is a multidimensional construct, this hypothesis was tested using multiple linear regression, which allows the simultaneous influence of several predictors on a single outcome to be assessed. Three competency components were entered as predictors: searching and retrieval skills, evaluation skills, and citation and organisation skills. Research productivity served as the dependent variable. Multiple regression not only indicates whether the competencies collectively predict productivity but also reveals the relative contribution of each component.

Descriptive Statistics for the H2 Variables

Descriptive Statistics for the H2 Predictors and Outcome (N = 400)

Variable	Mean	SD
Searching & Retrieval Skills (predictor)	3.84	0.78
Evaluation Skills (predictor)	3.96	0.74
Citation & Organisation Skills (predictor)	3.72	0.82
Research Productivity (outcome)	3.90	0.71

Table show the descriptive statistics for the three predictor components and the outcome variable. Evaluation skills recorded the highest mean among the predictors (3.96), while citation and organisation skills recorded the lowest (3.72), a pattern consistent with the item-level competency findings reported earlier. All variables lie within the High band and have comparable dispersions.

H3: There is a significant difference in research productivity between users who frequently participate in information literacy programs and those who rarely or never participate.

The corresponding null hypothesis (H03) asserts that research productivity does not differ significantly across levels of participation. Whereas Hypotheses H1 and H2 examined relationships between continuous variables, H3 concerns differences between groups. To test it, respondents were classified into three participation levels on the basis of their reported frequency of attendance: a Low group comprising those who had never participated or had participated only once; a Moderate group comprising those who participated occasionally; and a High group comprising those who participated frequently or very frequently. A one-way analysis of variance (ANOVA) was then conducted to compare the mean research productivity of these three groups, and, where a significant overall difference was found, a Tukey honestly

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significant difference (HSD) post-hoc test was used to identify which specific pairs of groups differed.

H4: Awareness of information literacy services offered by academic libraries has a significant positive influence on the effective utilization of scholarly information resources.

The null hypothesis (H04) for this proposition states that awareness of information literacy services has no significant influence on the utilization of scholarly resources. The variables involved are both continuous, so the hypothesis was tested using Pearson correlation to establish the strength and direction of the association, followed by simple linear regression to quantify the predictive influence of awareness on utilization. Awareness of information literacy services served as the independent variable and the effective utilization of scholarly information resources as the dependent variable.

Descriptive Statistics for the H4 Variables

Descriptive Statistics for the H4 Variables (N = 400)

Variable	Mean	SD	N
Awareness of IL Services	3.95	0.66	400
Utilization of Scholarly Resources	3.88	0.70	400

Table reports the descriptive statistics for the two variables. Both means fall in the High band, with awareness slightly higher than utilization. The comparable standard deviations indicate similar dispersion, providing a sound basis for the correlation and regression analyses that follow.

5. Discussion

The findings of this study provide robust and convergent evidence that information literacy programs in academic libraries are meaningfully connected to research productivity. Four principal themes emerge from the results, each carrying both theoretical and practical significance.

First, participation matters, and it matters in a graduated way. The strong positive correlation between participation and productivity, combined with the progressive differences in productivity across participation levels, points to a clear dose–response relationship. Productivity increased at every step from low to moderate to high participation, with each step statistically significant. This pattern supports the developmental conception of information literacy advanced in the literature, according to which the benefits of IL instruction accumulate through sustained, repeated engagement rather than through a single encounter. The practical implication is that strategies to encourage continued participation, not merely initial attendance, are likely to yield the greatest returns.

Second, competencies are the mechanism through which participation translates into productivity. The multiple regression results showed that IL competencies collectively

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explained a larger share of the variance in productivity than participation alone, and that searching and retrieval skills were the strongest single predictor. This finding clarifies why participation works: it works by building specific, practical skills, and especially the foundational ability to locate scholarly information efficiently. It suggests that programme designers should prioritise hands-on, skills-based instruction in database searching and information retrieval.

Third, awareness is the gateway to utilization. The significant influence of awareness on the use of scholarly resources demonstrates that even well-resourced library services cannot contribute to productivity if users are unaware of them. The descriptive finding that procedural awareness — such as knowing how to register for programs — lagged behind general awareness identifies a concrete, actionable area for improvement. Investment in clear communication and outreach is therefore central, not peripheral, to the impact of IL services.

Fourth, effectiveness is contingent rather than uniform. The significant differences and interaction across disciplines and user categories indicate that the experience of IL programs depends on the particular combination of a researcher's discipline and academic role. This finding cautions against a one-size-fits-all approach and supports the development of discipline-specific and role-specific variants of IL programs. Finally, the more cautious responses regarding the effect of IL on publication output, relative to research process and confidence, are consistent with the literature's view that IL strengthens the foundations of productive research rather than acting as a direct lever on publication counts.

These findings can be situated within the broader theoretical understanding of information literacy as a developmental and contextual competency. The dose–response relationship observed for participation aligns with the constructivist view that information skills are built progressively through engagement and practice. The dominance of searching and retrieval skills as a predictor of productivity resonates with process models of information seeking, which place the location of relevant information at the heart of effective research. The contingency of effectiveness on discipline and role echoes the situated view of information literacy, which holds that information practices are shaped by the particular context in which they are enacted. In each of these respects, the empirical findings of the study both confirm and extend the theoretical perspectives developed in the literature, lending them support within a specific institutional setting and translating them into actionable guidance for practice.

At the same time, the consistently high ratings across all five constructs, and the acceptance of all five hypotheses, should be interpreted with appropriate care. The reliance on self-reported measures means that the results capture respondents' perceptions of their competencies, the effectiveness of the programs, and their own productivity, rather than externally verified outcomes. Perceptions are themselves consequential — they shape behaviour, motivation, and engagement — but they are not identical to objective performance. The convergence of the findings across multiple constructs and tests nonetheless lends confidence to the overall

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conclusion that information literacy programs are positively associated with research productivity, even as it invites further confirmation through objective and longitudinal measures.

6. Conclusion and Recommendations

This study set out to assess the information literacy programs offered by academic libraries and to examine their effect on research productivity. Drawing on survey data from 400 faculty members, research scholars, and postgraduate students, it found support for all five research hypotheses. Participation in IL programs and the level of information literacy competency were both confirmed as significant positive predictors of research productivity; the difference in productivity across participation levels was significant and progressive; awareness of IL services significantly enhanced the utilization of scholarly resources; and the perceived effectiveness of the programs varied significantly across disciplines and user categories. Together, these findings affirm that library IL programs make a genuine and measurable contribution to research productivity.

On the basis of these findings, several recommendations are offered. Libraries should design programs that encourage sustained, repeated participation rather than one-off attendance; they should prioritise practical, skills-based content, particularly instruction in database searching and information retrieval; they should strengthen communication and outreach, with attention to the practical matter of registration; they should tailor programs to the distinctive needs of different disciplines and user categories; and they should address scheduling barriers through flexible and repeated session timing. Finally, libraries and institutions should evaluate their programs primarily in terms of improvements in research process, capability, and confidence, while recognising that the contribution to formal publication output is real but gradual.

The study has certain limitations that suggest directions for future research. It relied on self-reported measures of productivity, which could be complemented in future work by objective bibliometric indicators; it employed a cross-sectional design, whereas a longitudinal approach could better capture the developmental nature of information literacy; and it was confined to a particular set of institutions, so replication across other contexts would strengthen the generalisability of the conclusions. Notwithstanding these limitations, the study provides clear, evidence-based guidance for enhancing the contribution of information literacy programs to research productivity in academic libraries.

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