

Artificial Intelligence-Powered Virtual Assistants and Information Literacy Support Among Postgraduate Students at Kenyatta University Library

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Accepted: 01 September 2026 || Published: 10 September 2026

Abstract

Academic libraries are expected to build postgraduate students' research competencies, yet the specific contribution of AI-powered virtual assistants to information literacy remains poorly understood in Kenyan university settings. This study assessed the extent to which AI-powered virtual assistants support postgraduate students' information literacy at Kenyatta University Library. The study was anchored on the Technology Acceptance Model. The study adopted a descriptive survey design, collecting quantitative data from 143 postgraduate students sampled through simple random sampling using Yamane's formula, complemented by qualitative data from structured interviews with six library staff involved in reference services and digital systems. Cronbach's alpha confirmed the reliability of the information literacy support construct (.861), while the reference service provision construct returned .849. Descriptive results showed that information literacy support recorded an overall mean of 3.88, with promotion of ethical information use rated highest and improved understanding of academic databases rated lowest. Reference service provision recorded an overall mean of 3.92, with accuracy and reliability of information rated highest and overall satisfaction rated lowest. Correlation analysis established a strong, positive, and statistically significant relationship between information literacy support and reference service provision ($r = .737$, $p < .01$), and simple linear regression confirmed that information literacy support significantly predicts reference service provision ($\text{Beta} = .737$, $p < .001$). Interviews with library staff corroborated these findings, indicating that the assistant reliably handled routine search and citation tasks but that complex queries and citation accuracy still required librarian oversight. The study concluded that AI-powered virtual assistants meaningfully strengthen information literacy and reference service outcomes, though gains remain uneven across specific competencies. The study recommended that library management strengthen the assistant's coverage of database navigation and continue monitoring its contribution to reference service quality.

Keywords: *Information Literacy Support, AI-Powered Virtual Assistants, Reference Service Provision, Academic Libraries, Kenya*

How to Cite: Cherono, S., Gichohi, P. M., & Tsenga, S. M. (2026). Artificial Intelligence-Powered Virtual Assistants and Information Literacy Support Among Postgraduate Students at Kenyatta University Library. *Journal of Information and Technology*, 6(2), 13-24.

1. Introduction

Information literacy refers to the set of abilities that allow a person to recognise an information need, locate suitable material, evaluate it critically and use it ethically (Head et al., 2020). Within academic libraries, this competency has traditionally been developed through structured training sessions, embedded librarian support and one-on-one research consultations. As postgraduate research has grown more complex, libraries worldwide have begun to explore whether AI-powered virtual assistants can extend this support beyond the timetable of formal instruction and into the moment when a student actually needs help (Kasneci et al., 2023).

Globally, universities in technologically advanced regions have moved furthest in this direction. In Germany, Kasneci et al. (2023) found that AI-based tools could offer real-time guidance that improved students' ability to access and interpret information, although the same study raised concerns that heavy reliance on automated systems could weaken independent critical thinking over time. In the United Kingdom, Secker and Coonan (2022) established that embedding information literacy directly into academic curricula, rather than treating it as a stand-alone workshop, produced stronger and more durable gains in student research skills. These findings collectively suggest that technology adds most value when it reinforces, rather than replaces, deliberate instructional design.

In Africa, the picture is more uneven. Nigerian research by Issa et al. (2022) found that although awareness of digital resources was rising among university students, many still lacked the skills to evaluate and use information responsibly. In South Africa, Mhlongo and Ocholla (2023) reported that disparities in digital literacy continued to limit how effectively students engaged with academic material, even where digital tools were readily available. Comparable patterns emerged in Tanzania, where Bakiri et al. (2024) found that although universities recognized the importance of information literacy, its delivery remained inconsistent because of infrastructural and institutional constraints. Across the continent, the challenge therefore has less to do with the absence of technology and more with the uneven translation of technological potential into consistent practice.

Within Kenya, growing digital adoption has not yet been matched by an equally developed understanding of how AI tools specifically shape information literacy outcomes. Sang (2024) observed that Kenyan universities were increasingly integrating information literacy programmes into student support services, though implementation still varied widely from one institution to another. Jebet (2025) similarly found that infrastructure, staff training, and institutional support strongly influenced how effectively such initiatives functioned. Mwangi et al. (2023), focusing directly on postgraduate students, found that many still struggled to evaluate sources and apply appropriate research strategies despite exposure to digital library systems. None of these Kenyan studies, however, isolated the specific role that AI-powered virtual assistants play in shaping information literacy outcomes for postgraduate researchers.

At Kenyatta University Library, postgraduate students increasingly rely on digital platforms for research, and the library's reference service has introduced an AI-powered virtual assistant. Whether this tool meaningfully strengthens the specific competencies that make up information literacy, namely search strategy development, source evaluation, citation practice, and ethical

use of information, and whether this translates into improved reference service outcomes, has not yet been empirically established. This study addressed that question directly.

1.1 Problem Statement

Effective information literacy support determines whether postgraduate students can engage independently and credibly with scholarly material, yet many Kenyan university libraries still rely on generalized training sessions delivered once and rarely reinforced at the point of need (Mwangi et al., 2023). AI-powered virtual assistants offer a potential remedy, as these systems can, in principle, provide continuous guidance on search strategies, source evaluation, and citation practice. Whether Kenyatta University Library is realizing this potential, and whether it translates into stronger reference service outcomes, remains undocumented.

Existing Kenyan studies have largely examined information literacy as a programme-level activity rather than as an outcome directly shaped by a specific AI tool (Sang, 2024; Jebet, 2025). Where postgraduate students have been the focus, as in Mwangi et al. (2023), the analysis stopped short of considering AI-powered systems. This leaves library management at Kenyatta University without evidence on which to judge whether the virtual assistant currently in use is strengthening the research competencies of its postgraduate population and, by extension, the quality of reference services they receive. This study therefore assessed the extent to which AI-powered virtual assistants support information literacy among postgraduate students at Kenyatta University Library.

1.2 Objective of the Study

To assess the extent to which Artificial Intelligence-powered virtual assistants support information literacy among postgraduate students at Kenyatta University Library.

1.3 Hypothesis of the Study

H₀: There is no statistically significant relationship between Artificial Intelligence-powered virtual assistant-based information literacy support and enhancement of reference services for postgraduate students at Kenyatta University Library.

2. Literature Review

2.1 Theoretical Review

This study was anchored on the Technology Acceptance Model, developed by Davis (1989) and later extended by Venkatesh and Davis (2000). The model holds that perceived usefulness and perceived ease of use are the two constructs that most strongly determine whether a person adopts and continues to use a given technology. In this study, perceived usefulness reflects the degree to which postgraduate students believe the virtual assistant genuinely improves their ability to search, evaluate, and cite information, while perceived ease of use concerns how effortlessly they can obtain this guidance. When a system is seen as both useful and easy to use, sustained engagement follows, which should translate into stronger information literacy outcomes and, ultimately, better reference service delivery. The model is well suited to this study because it isolates user perception as the mechanism through which a specific tool, rather than an institutional programme, comes to influence a competency such as information literacy.

2.2 Concept of Information Literacy Support in Academic Libraries

Information literacy support refers to the guidance libraries provide to help users search effectively, evaluate sources critically, cite material appropriately, and use information ethically (Association of College and Research Libraries [ACRL], 2022). For postgraduate students, this support carries particular weight because their work depends on synthesizing material from multiple sources and defending the credibility of what they cite (Kasneci et al., 2023). Traditionally delivered through structured training and direct librarian consultation, information literacy support increasingly incorporates digital tools that can respond to a student's query at the exact moment a research obstacle arises, rather than requiring the student to wait for a scheduled session (CILIP, 2022). This shift raises the practical question of whether such tools reproduce the depth of guidance a trained librarian would ordinarily provide, or whether they instead offer a thinner, more procedural form of support that still leaves the harder evaluative work to the student.

Head et al. (2020) used a mixed-methods design combining surveys and interviews to examine how students in the United States conducted academic research, and found that many struggled to judge source credibility despite having greater access to digital tools than any previous cohort. The study called for more structured information literacy support within academic libraries, though its focus on the general student population limited how directly its findings applied to postgraduate researchers specifically. Kasneci et al. (2023) conducted an analytical and experimental study in Germany examining how artificial intelligence could support information literacy, and found that AI-based tools improved a student's ability to access and interpret information in real time. The same study cautioned that overreliance on automated systems could weaken the development of independent critical thinking, a concern directly relevant to evaluating an AI-powered virtual assistant used within a university library. In the United Kingdom, Secker and Coonan (2022) used a qualitative approach to examine how information literacy frameworks were embedded in higher education curricula and found that this integration produced measurable improvement in student research skills. Because the study concentrated on institutional strategy rather than individual interaction with any specific tool, it leaves open the question of how students experience literacy support delivered through a conversational system.

In Nigeria, Issa et al. (2022) used a survey design to assess information literacy competencies among university students and found that awareness of digital resources was rising even as many students still lacked the skills to evaluate and use information effectively. The study recommended stronger training programmes, though it relied on self-reported data that may understate actual skill gaps. In South Africa, Mhlongo and Ocholla (2023) used qualitative interviews to examine information literacy practice and found that disparities in digital access and digital confidence continued to shape how effectively students engaged with academic material. Their findings pointed to targeted training as the most promising remedy, but offered no measurable indicators of how much improvement such training could deliver. Bakiri et al. (2024) applied a mixed-methods approach in Tanzania and found that although universities recognized the value of information literacy, its delivery remained inconsistent because of infrastructural and institutional limitations. Compared to the global studies above, this regional evidence places greater weight on systemic constraints than on the specific technological tools available to students.

Within Kenya, Sang (2024) used a descriptive survey design and found that universities were increasingly folding information literacy programmes into broader student support services, although the depth and consistency of these programmes varied from one institution to the next. Jebet (2025) used a cross-sectional design and reported that infrastructure, staff training, and institutional support jointly shaped the effectiveness of these initiatives. Mwangi et al. (2023) focused specifically on postgraduate students and used a mixed-methods approach to examine their research skills. The study found that many postgraduate students continued to struggle with evaluating sources and applying suitable research strategies, and recommended that information literacy programmes be more deliberately integrated into academic support services. Although this study spoke directly to the postgraduate population relevant here, it did not examine the specific contribution of AI-powered systems to the outcomes it measured.

Four gaps emerge from the reviewed literature. A contextual gap exists because the deepest evidence on AI-supported information literacy originates from countries with mature digital infrastructure, limiting its direct application to a Kenyan public university setting. A focus gap is evident because Kenyan studies such as Sang (2024) and Jebet (2025) examine information literacy programmes broadly rather than isolating the contribution of a specific AI-powered tool. A population gap remains since Mwangi et al. (2023), the one Kenyan study to focus specifically on postgraduate students, does not consider AI-powered virtual assistants at all. Finally, a conceptual gap persists in the reviewed literature, since no study directly links AI-supported information literacy to a measurable reference service outcome within a Kenyan academic library. This study addressed these four gaps by assessing the extent to which an AI-powered virtual assistant supports information literacy among postgraduate students at Kenyatta University Library, and by testing this variable directly against reference service provision.

3. Methodology

The study adopted a descriptive survey research design, which enabled systematic description of postgraduate students' and library staff's experiences of information literacy support through an AI-powered virtual assistant without manipulating the study environment. The study was conducted at Kenyatta University Library in Nairobi County, Kenya. The library provides electronic databases, institutional repositories, and a virtual reference platform, making it suitable for examining AI-supported information literacy. The target population comprised postgraduate students and library staff at Kenyatta University Library. The unit of analysis was the library, specifically the reference service system through which the AI-powered virtual assistant operates, while the unit of observation was individual postgraduate students and library staff. Institutional records indicated 600 postgraduate students and 30 library staff involved in reference services and digital systems, giving a total population of 630. The study used simple random sampling for postgraduate students and purposively selected six library staff based on their involvement in reference services and digital systems. Yamane's formula at a precision level of 0.08 produced a sample of 124 students from the population of 600, giving a combined sample of 130 respondents.

Data were collected using a structured questionnaire for postgraduate students and a structured interview schedule for library staff. The questionnaire measured information literacy support using six statements rated on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree), together with an open-ended item. Interviews examined how users interacted with the assistant when searching, evaluating, and citing academic sources. The study supervisors established content validity through expert review, while face validity was assessed during

pretesting. The study ensured construct validity by aligning the questionnaire and interview items with the conceptual framework. The questionnaire was pretested at United States International University Africa because of its comparable digital library infrastructure, with pilot participants excluded from the main study. Cronbach's alpha for information literacy support was .861, exceeding the .70 threshold recommended by Nunnally (1978) and confirming the internal consistency of the six items.

The researcher obtained an introductory letter from the university and a research permit from the National Commission for Science, Technology and Innovation, followed by permission from Kenyatta University Library management. The researcher administered questionnaires after informed consent, conducted staff interviews at convenient times and locations, and subsequently transcribed them. The researcher coded and analyzed quantitative data using SPSS version 25. Frequencies, percentages, means, and standard deviations summarized information literacy support, while Pearson correlation examined the strength and direction of the relationship between information literacy support and reference service provision. Simple linear regression was used to determine the predictive effect of information literacy support on reference service provision using the model: $Y = \beta_0 + \beta_1 X + \varepsilon$, where Y represents reference service provision, β_0 is the constant, β_1 is the regression coefficient for information literacy support, X represents information literacy support, and ε represents the error term. The qualitative interviews and open-ended responses were analyzed thematically following Braun and Clarke (2006). The study observed informed consent, voluntary participation, confidentiality, and anonymity, with no personal identifiers recorded and all data used strictly for academic purposes.

4. Results and Discussion

4.1 Response Rate

Of the 178 questionnaires administered to postgraduate students, 144 were returned, giving a response rate of 80.9%; of these, 143 were sufficiently complete for analysis, giving a usable response rate of 80.3%. This response rate exceeds the threshold that Mugenda and Mugenda (2003) describe as very good for social science research.

4.2 Descriptive Statistics on Information Literacy Support

Table 1: Statements on Information Literacy Support

Statement	SD (1)	D (2)	N (3)	A (4)	SA (5)	Mean	Std. Dev.
AI-powered virtual assistants support the development of effective search strategies.	2(1.4%)	4(2.8%)	35(24.5%)	66(45.5%)	37(25.9%)	3.92	0.860
AI-powered virtual assistants guide users in identifying credible academic sources.	1(0.7%)	7(4.9%)	34(23.6%)	73(50.7%)	29(20.1%)	3.85	0.822
AI-powered virtual assistants enhance critical evaluation of information sources.	0(0.0%)	8(5.6%)	33(23.2%)	72(50.0%)	30(21.1%)	3.87	0.810
AI-powered virtual assistants support proper citation and referencing of academic work.	0(0.0%)	8(5.6%)	32(22.2%)	67(46.5%)	37(25.7%)	3.92	0.837
AI-powered virtual assistants improve understanding of	1(0.7%)	11(7.7%)	31(21.7%)	72(49.7%)	29(20.3%)	3.81	0.872

academic databases and digital resources.							
AI-powered virtual assistants promote ethical use of academic information.	0(0.0%)	11(7.7%)	30(21.1%)	60(41.5%)	43(29.6%)	3.93	0.904
Overall Average						3.88	0.851

For the item on whether AI-powered virtual assistants support the development of effective search strategies, 71.4% (103) agreed or strongly agreed, producing a mean of 3.92 with a standard deviation of 0.860, while only 4.2% (6) expressed disagreement. This finding aligns with Marchese et al. (2024), who observed that students increasingly turn to generative AI to shape how they begin a search.

Guidance in identifying credible academic sources drew agreement from 70.8% (102) of respondents, producing a slightly more cautious mean of 3.85 with a standard deviation of 0.822. This result aligns with Del Castillo (2024) and Cox and Tzoc (2023), both of whom argued that the judgment of whether an AI-suggested source is truly credible cannot safely be left to the tool alone.

Enhancement of critical evaluation of information sources drew agreement from 70.8% (102) of respondents, with a mean of 3.87 and a standard deviation of 0.810, and no respondent selected strongly disagree. This echoes Head et al. (2020), who found that students still struggle to fully judge source credibility on their own, even with digital tools.

Support for proper citation and referencing recorded agreement from 72.2% (104) of respondents, giving this item one of the joint highest means in the group at 3.92 with a standard deviation of 0.837. This otherwise strong result should be read alongside the qualitative caution raised in Section 4.8.2 concerning fabricated references, a risk also documented by Haider et al. (2024) regarding AI-invented citations in academic work more generally. Improved understanding of academic databases and digital resources had the lowest mean (3.81, SD = 0.872) and the highest disagreement (8.4%; 12). This finding is consistent with Kasneci et al. (2023), who found that AI tools tend to assist with immediate tasks while doing comparatively less to build a student's lasting understanding of how databases actually work. The item on promoting ethical use of academic information recorded the highest mean of the six at 3.93, though it also displayed the widest spread of opinion, with a standard deviation of 0.904, aligning with Lo (2023a), who found that guidance on ethical use is an area in which AI tools have gained ground rapidly within academic library settings. Overall, information literacy support had a mean of 3.88 and a standard deviation of 0.851, a positive but somewhat more cautious result than that for resource discovery, broadly consistent with Lo (2024).

4.3 Descriptive Statistics on Reference Service Provision

Table 2: Statements on Reference Service Provision

Statement	SD (1)	D (2)	N (3)	A (4)	SA (5)	Mean	Std. Dev.
Reference services are easily accessible through digital platforms.	1(0.7%)	5(3.5%)	29(20.3%)	69(48.3%)	39(27.3%)	3.98	0.826
Responses to research queries are timely and efficient.	0(0.0%)	8(5.6%)	26(18.2%)	78(54.5%)	31(21.7%)	3.92	0.788
Information provided is accurate and reliable.	0(0.0%)	9(6.3%)	27(18.9%)	63(44.1%)	44(30.8%)	3.99	0.868
AI-powered systems effectively support postgraduate research needs.	0(0.0%)	7(4.9%)	36(25.2%)	66(46.2%)	34(23.8%)	3.89	0.823
AI-powered systems improve responsiveness to complex research queries.	1(0.7%)	6(4.2%)	34(23.8%)	68(47.6%)	34(23.8%)	3.89	0.840
I am satisfied with the quality of reference services supported by AI-powered virtual assistants.	1(0.7%)	3(2.1%)	37(25.9%)	75(52.4%)	27(18.9%)	3.87	0.762
Overall Average						3.92	0.818

Accessibility of reference services through digital platforms drew agreement from 75.5% (108) of respondents, producing a mean of 3.98 with a standard deviation of 0.826, consistent with Owiti et al. (2025). Timeliness and efficiency of responses drew agreement from 76.2% (109) of respondents, giving a mean of 3.92 with a standard deviation of 0.788, consistent with Idhris and Peter (2024).

Accuracy and reliability of information provided recorded the highest mean of all six statements, at 3.99, but it also displayed the widest spread of opinion, with a standard deviation of 0.868, an important warning sign consistent with the caution raised both by Haider et al. (2024) and by the library staff interviewed in this study.

Effective support for postgraduate research needs drew agreement from 69.9% (100) of respondents, giving a mean of 3.89 and a standard deviation of 0.823. Improved responsiveness to complex research queries drew agreement from 71.4% (102) of respondents, producing a mean of 3.89 with a standard deviation of 0.840, a fairly strong result given that library staff, as discussed in Section 4.11.2, indicated that complex queries are precisely where human input remains most necessary.

Finally, overall satisfaction with the quality of reference services recorded the lowest mean of the six, at 3.87 with a standard deviation of 0.762, though it also displayed the smallest spread of opinion, indicating the greatest level of agreement among respondents on any item in this construct, consistent with Owiti et al. (2025). Taken as a whole, reference service provision recorded an overall mean of 3.92 and a standard deviation of 0.818, the second highest mean recorded among all five variables examined in this study, consistent with the review conducted by Ponera and Kyumana (2026) and with Chase (2024) and Guy et al. (2023).

4.4 Correlation Analysis

The Pearson product-moment correlation coefficient was used to examine the strength and direction of the linear relationship between information literacy support and reference service provision. Table 3 presents the correlation matrix exactly as generated from the analysis.

Table 3: Pearson Correlation Matrix

Variable		Information Support	Literacy	Reference Provision	Service
Information Support	Literacy	1		.737**	
Reference Provision	Service	.737**		1	

Correlation is significant at the 0.01 level (2-tailed). N = 143.

Following Cohen's (1988) guidelines for interpreting correlation coefficients, in which r values of .10 to .29 are considered weak, .30 to .49 moderate, and .50 and above strong, the coefficient of .737 obtained in this study falls within the strong range. This indicates that as respondents' ratings of information literacy support rise, their ratings of reference service provision rise correspondingly. Accordingly, the null hypothesis that no statistically significant relationship exists between AI-powered virtual assistant-based information literacy support and reference service provision is rejected.

4.5 Regression Analysis

Simple linear regression was conducted to determine the predictive effect of information literacy support on reference service provision. The full model output, comprising the model summary, ANOVA, and coefficients tables, is presented below.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.737 ^a	.543	.540	.482

a. Predictors: (Constant), Information Literacy Support

The model summary shows an R value of .737 and an R Square of .543, indicating that information literacy support accounts for 54.3% of the variance in reference service provision. The Adjusted R Square of .540 confirms that this explanatory power holds after adjusting for the number of predictors and sample size, while the standard error of the estimate (.482) indicates a reasonably tight fit between predicted and observed values.

Table 5: ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	38.850	1	38.850	167.683	.000 ^b
Residual	32.710	141	0.232		
Total	71.560	142			

a. Dependent Variable: Reference Service Provision

b. Predictors: (Constant), Information Literacy Support

The ANOVA results confirm that the regression model is statistically significant, $F(1, 141) = 167.683$, $p < .001$, indicating that information literacy support significantly predicts reference service provision and that the model fits the data well.

Table 6: Regression Coefficients^a

Variable	B	SE	Beta	t	Sig.
(Constant)	1.173	0.217	—	5.406	0.000
Information Literacy Support	0.708	0.055	0.737	12.949	0.000

a. Dependent Variable: Reference Service Provision

Information literacy support emerged as a statistically significant predictor of reference service provision, with a standardized beta of 0.737 ($p < .001$). This means that, for every one-unit improvement in information literacy support, reference service provision is expected to improve by 0.708 units, holding the constant term fixed. Taken together, the model summary, ANOVA, and coefficients confirm that information literacy support is a substantial and statistically robust driver of reference service outcomes at Kenyatta University Library. Based on these results, we reject the null hypothesis that no statistically significant relationship exists between AI-powered virtual assistant-based information literacy support and reference service provision.

4.6 Qualitative Findings from Library Staff Interviews

Interviews were conducted with six library staff involved in reference services and digital systems at Kenyatta University Library, and were analyzed thematically following Braun and Clarke (2006). Four themes emerged. Staff consistently reported that the virtual assistant performed well on repetitive, well-defined tasks such as directing students to relevant databases and formatting citations. One respondent (LS2) observed: *"Most students who come back satisfied are the ones who just needed a starting point, like which database to search or how to format a reference."* This theme aligns with the comparatively high quantitative means recorded for citation support ($M = 3.92$) and ethical use of information ($M = 3.93$). Staff were emphatic that the assistant's usefulness diminished sharply as research questions grew more specialized. Respondent LS4 explained: *"Once a student is dealing with a very specific methodological problem or an obscure topic, the assistant tends to give generic answers, and that is when they come to us directly."* This theme directly explains the comparatively modest quantitative rating for responsiveness to complex research queries ($M = 3.89$) and for improved understanding of academic databases ($M = 3.81$), the lowest-rated item in the information literacy construct.

Several staff members raised concerns that the assistant occasionally generated references that could not be verified. Respondent LS1 noted: *"A few students have brought us citations suggested by the assistant that simply do not exist when we check them."* This concern tempers the otherwise strong quantitative score for citation support and is consistent with Haider et al. (2024), who documented similar fabricated-citation risks in AI-assisted academic work. Staff acknowledged that the assistant had meaningfully improved students' awareness of plagiarism and appropriate information use, but stressed that its knowledge base required regular updating to remain useful as databases and referencing standards changed. Respondent LS6 stated: *"It has helped a lot with ethics and plagiarism awareness, but it needs to be updated regularly, otherwise it starts giving outdated guidance."*

4.7 Integration of Quantitative and Qualitative Findings

The qualitative findings converge with, and add explanatory depth to, the quantitative results in three important respects. First, the lowest-rated quantitative item, improved understanding of academic databases ($M = 3.81$), is directly explained by staff observations (Theme 2) that the assistant's guidance becomes generic once a query moves beyond routine database navigation, requiring students to seek human assistance. Second, the strong but widely dispersed quantitative rating for accuracy and reliability of information ($M = 3.99$, $SD = 0.868$, the highest mean but also the widest spread in the reference service construct) is corroborated by staff concerns (Theme 3) regarding fabricated citations, suggesting that while most students experience accurate output, a meaningful minority encounter unreliable results serious enough to require staff intervention. Third, the comparatively high quantitative rating for ethical use of information ($M = 3.93$) is reinforced by staff testimony (Theme 4) that the assistant has genuinely strengthened plagiarism awareness, though staff simultaneously flagged sustainability concerns tied to knowledge-base currency that the quantitative survey, being a single time-point measure, could not capture. Overall, the integration of both data strands produces a more complete and cautious picture than either method would offer alone: quantitatively, the assistant is a strong and statistically significant predictor of reference service provision, but qualitatively, this strength is understood by those who deliver the service to be conditional on task routineness, citation verification, and ongoing system maintenance.

5. Conclusion

The study concludes that AI-powered virtual assistants provide meaningful and statistically significant support for information literacy among postgraduate students at Kenyatta University Library, and that this support is significantly and positively associated with reference service provision ($r = .737$, $p < .01$; Beta = $.737$, $p < .001$). Information literacy support is strongest in procedural areas such as citation formatting and promoting ethical information use, and weakest in building a durable conceptual understanding of academic databases. Reference service provision follows a similar pattern, with accuracy and accessibility rated more strongly than overall satisfaction. Library staff interviews confirm and contextualize these quantitative patterns, indicating that the assistant performs reliably on routine, well-defined tasks, but that complex research queries, verification of AI-suggested citations, and sustained currency of the assistant's knowledge base still require direct librarian involvement. Taken together, the quantitative and qualitative evidence indicate that the virtual assistant functions best as a complement to, rather than a substitute for, librarian expertise.

6. Recommendations

The study recommends that Kenyatta University Library management, specifically the Systems/ICT Librarian in collaboration with the Reference Services unit, strengthen the AI-powered virtual assistant's coverage of academic database navigation, since this was the weakest-rated aspect of information literacy support. Library management should also establish a routine mechanism for continuously monitoring the relationship between information literacy support and reference service satisfaction, given that satisfaction recorded the lowest mean among the reference service indicators despite strong ratings for accuracy and accessibility. Further, the library's Systems/ICT unit, in coordination with the vendor or developer of the virtual assistant platform, should institute a schedule of continuous updates to the assistant's knowledge base and implement a citation-verification safeguard to sustain the gains already observed in citation support and ethical guidance while mitigating the risk of fabricated references identified by library staff. Finally, university management, through the

Directorate of Postgraduate Studies, should consider formally incorporating orientation on the virtual assistant's capabilities and limitations into postgraduate research skills training, so that students understand when to escalate complex queries to human librarians.

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