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Assessing the Impact of Digital Literacy Programmes on Student Readiness and Academic Success in Higher education: A Study of a Private Institution

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Abstract

Digital literacy in higher education has emerged as an essential competency for academic success, yet the effectiveness of digital literacy programs in preparing students for their academic journey remains underexplored. This research study aimed to assess the impact of digital literacy programmes on student readiness and academic achievement, bridging the gap between the expertise of educational technologists and information specialists. Using a quantitative research design, we evaluated current digital literacy programmes and identified key skills that correlate with academic achievement. Data collected from survey questionnaires across various brands of institutions provided a comprehensive understanding of student engagement, perceptions, and the effectiveness of these programmes. The findings have contributed to the development of a more robust framework for designing and implementing digital literacy initiatives undertaken by the Information Centre.

The research has underscored the importance of digital literacy in tertiary education and has provided strategic recommendations to enhance student readiness and success in a rapidly evolving digital academic context. Every student is different; this study provides guidelines and emphasises the need to equip students, especially first-year students, with sufficient technical skills to support them in their academic endeavours and to build confidence in interpreting the academic systems they need to utilise.

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Introduction

Wood and Roberts (2025) highlight that, from a human sciences perspective, students develop a broad range of skills and competencies essential for academic success. Khan et al. (2022) emphasise the importance of integrating digital literacy into higher education curricula, highlighting that it lays the foundation for effective communication, professional engagement,

and lifelong learning. They further argue that digital literacy equips graduates with the necessary capabilities to excel in sustainable, innovation-driven sectors. Similarly, Klarare et al. (2022) caution that a common oversight in higher education institutions is the assumption that all students possess academic literacy. They emphasise the need for structured support in areas such as academic writing, critical thinking, referencing, and understanding plagiarism to ensure student success. While digital competencies are increasingly emphasised, many higher education institutions overlook a critical parallel challenge: the assumption that students possess adequate academic literacy from the outset.

Klarare et al. (2022) contend that before students can effectively engage with module objectives, institutions must ensure the proper integration of academic support, rather than assuming students are academically literate from the outset. Prioritising both academic and digital literacy before the formal curriculum begins is essential in higher education. Students who lack these foundational literacies are at a disadvantage, as modern pedagogical approaches rely heavily on digital platforms such as learning management systems.

Öncül (2020) demonstrates that first-year students in higher education often require support in developing higher-order digital literacy skills. He further emphasises that academic and digital literacy are interdependent and mutually reinforcing. Considering that academic institutions increasingly rely on technological platforms to deliver educational content, students need to acquire digital literacy before engaging in academic instruction. The integration of both literacies has become indispensable in higher education. However, Mavutha and Mabotja (2024) caution that students from rural schools are frequently disadvantaged in this regard, often entering higher education without the necessary digital competencies, thereby leaving them at risk of exclusion from practical learning experiences. This challenge is particularly acute for students from rural and under-resourced backgrounds, who often enter university with limited access to digital tools, as emphasised by Mavutha and Mabotja (2024).

Mavutha and Mabotja (2024) further elaborate on the challenges faced by students from rural schools as they transition into higher education. These students often come from under-resourced environments where access to essential tools, such as computers and electricity, is limited. Entering urban, technologically advanced institutions presents a significant barrier to academic progress, as they must quickly adapt to digital learning environments and academic expectations without prior exposure or adequate preparation. Recognising these disparities, several scholars have called for structured institutional interventions to monitor and support students at risk due to low digital and academic literacy.

Uleanya and Rugbeer (2020) propose that every institution of higher learning establish a dedicated office, operating under the direct supervision of the Dean of Students, to monitor students' readiness and progress in academic and digital literacy. These students should be identified as 'at-risk' and provided with targeted support to build their confidence and enhance their academic performance. While existing research has explored academic and digital literacy in higher education, the authors argue that more attention must be given to foundational levels of education and to government efforts to improve under-resourced schools. Engaging in such discussions and implementing relevant initiatives could significantly strengthen current systems, ensuring that learners are better equipped to navigate the structures, procedures, and academic demands of higher education. To effectively address these challenges, researchers must adopt clear conceptual frameworks that map the complex relationships among digital literacy, institutional support, and academic readiness.

Grounded in these insights, the current study examines the influence of digital literacy programmes on students' readiness and academic success at a private higher education institution. This study aims to assess the impact of digital literacy programmes on student readiness and academic success in higher education, with a particular focus on a private institution. It seeks to evaluate how these initiatives influence students' preparedness for academic tasks, engagement with educational technologies, and their overall academic performance.

Research Objectives:

1. To evaluate the baseline digital and academic literacy levels of students entering higher education.

2. To assess the effectiveness of institutional digital and academic literacy interventions in enhancing student confidence and competence.
3. To examine the relationship between students' digital literacy and their academic readiness and performance.
4. To investigate students' awareness of and access to institutional support services, including educational technologists and information specialists.
5. To explore students' perceptions of the relevance of digital and academic literacy for both academic success and professional development.
6. To recommend strategies for improving the delivery of digital and academic literacy programmes to better meet the diverse needs of the student population.

Research Gap

Although digital literacy in higher education has received considerable scholarly attention, important gaps remain. Much of the existing literature treats digital literacy as a general technological skill set, often measured through self-reported proficiency or platform usage metrics. Fewer studies clearly distinguish between digital literacy as technological navigation and academic literacy as participation in disciplinary writing, referencing, and research practices. This conceptual conflation limits understanding of how different forms of literacy influence academic readiness.

In addition, prior research frequently examines digital literacy in large public universities, with comparatively limited attention to private higher education institutions and their institutional support ecosystems. Variations in communication strategies, accessibility of support services, and programme integration may shape literacy development differently across institutional types.

Theoretically, the Technology Acceptance Model, the Academic Literacies framework, and the Digital Divide perspective are often applied independently rather than integrated into a single analytical framework. Consequently, technological acceptance, academic discourse participation, and structural access are seldom examined as interrelated dimensions of student readiness.

This study addresses these gaps by analytically distinguishing digital and academic literacy, situating findings within an integrated theoretical framework, and examining literacy interventions within a private higher education context. In doing so, it provides a contextually grounded evaluation of how institutional literacy initiatives shape perceptions of academic readiness.

Theoretical and Conceptual Framework

A conceptual framework is an essential tool for guiding research inquiry by providing a structured approach to understanding relationships between variables. As Van der Waldt (2020) argues, a well-defined framework serves as a roadmap, reinforcing the researcher's key ideas while ensuring alignment between the problem, research questions, and analytical focus.

This study is underpinned primarily by the Technology Acceptance Model (TAM) (Davis, 1989), which posits that users' engagement with digital systems is shaped by two main perceptions: usefulness and ease of use. In the context of higher education, TAM helps explain how students perceive and adopt digital literacy interventions such as learning management systems (LMS), academic support services, and digital literacy workshops. Perceived usefulness, in this study, refers to students' belief that digital tools and training enhance their academic success. Perceived ease of use relates to their experience navigating these tools with minimal effort or frustration. These perceptions collectively influence their attitudes toward digital learning and their behavioural intention to engage with such tools, ultimately shaping actual usage patterns (Hesari et al., 2022; Jo, Jeong & Ahn, 2025). While TAM provides a robust explanatory lens for digital literacy and engagement, it is complemented by two additional conceptual perspectives to address the academic and social dimensions of student readiness.

First, Academic Literacy Theory (Nieminen & Carless, 2023) offers a critical lens to understand the academic readiness dimension. This theory challenges the view of academic literacy as a neutral, technical skillset and instead frames it as a socially situated practice involving genre, discourse, identity, and power. In this study, academic literacy refers

to students' capacity to interpret academic texts, understand referencing norms, and engage in critical writing, skills that digital literacy training often seeks to support. By acknowledging academic literacy as a broader cultural and epistemological engagement, the study accounts for the fact that students from diverse schooling backgrounds may have unequal familiarity with academic conventions.

Second, the Digital Divide Framework (Fisk et al., 2023) is incorporated to foreground equity and access concerns, particularly relevant in the South African higher education context. This framework goes beyond the simplistic binary of access/no access to technology. It emphasises three key dimensions: (1) physical access to devices and the internet, (2) skills access, the ability to use technology effectively, and (3) usage access, which refers to the capacity to apply digital tools meaningfully in education and work. These layers of disparity are especially salient for students from rural or under-resourced communities who may enter higher education without sufficient exposure to digital environments (Mavutha & Mabotja, 2024; Masenya, 2021). The framework informs the study's emphasis on identifying gaps in student readiness not only from a usage perspective but also from socio-economic and infrastructural standpoints.

Although digital literacy and academic literacy are interrelated, this study treats them as analytically distinct constructs.

Digital literacy refers to students' ability to navigate digital platforms, operate learning management systems, access online databases, and use technological tools effectively for academic purposes. It is operationalised through measures of platform navigation, assignment submission competence, perceived ease of use, and perceived usefulness of digital systems, consistent with the Technology Acceptance Model (Davis, 1989).

Academic literacy, in contrast, refers to students' ability to engage in discipline-specific academic practices, including referencing, critical reading, structured academic writing, understanding plagiarism, and interpreting scholarly sources. In line with the Academic Literacies Model (Nieminen & Carless, 2023), this construct extends beyond technical skill to include epistemological and discourse competence.

While digital literacy may facilitate academic literacy by enabling access to scholarly tools and resources, the two constructs represent distinct domains of competence. Accordingly, this study differentiates between digital literacy confidence and academic literacy confidence in both measurement and analytical interpretation.

This integrated conceptual framework enables a multidimensional analysis of how digital literacy programmes affect student preparedness and academic success. TAM explains students' behavioural interactions with digital tools; Academic Literacy Theory accounts for their academic engagement and identity formation; and the Digital Divide Framework situates these experiences within broader contexts of structural inequality. The framework thus enables the study to assess not only the functionality of digital interventions but also their accessibility, relevance, and academic alignment across a diverse student population.

Integrated Conceptual Model of Digital Literacy and Academic Success

Drawing on the Technology Acceptance Model, the Academic Literacies Model, and the Digital Divide Framework, this study proposes an integrated conceptual model that explains how institutional digital literacy interventions influence academic readiness and academic success.

Digital literacy workshops and support structures function as institutional interventions designed to strengthen students' technological and academic competencies. However, these interventions do not directly produce academic success. Several interrelated mechanisms mediate their influence.

First, consistent with the Technology Acceptance Model (Davis, 1989), students' perceived usefulness and perceived ease of use of digital platforms shape their willingness to engage with academic technologies. When students perceive digital tools as accessible and beneficial, they are more likely to actively participate in learning.

Second, academic confidence and academic literacy competence operate as cognitive mediators.

Drawing on the Academic Literacies Model (Nieminen & Carless, 2023), literacy is not merely the acquisition of technical skills but participation in academic discourse practices. As students gain confidence in referencing, research practices, and digital navigation, they become more academically engaged.

Third, structural access conditions, as articulated in the Digital Divide Framework (Fisk et al.,2023), moderate the impact of interventions. Students' prior exposure, infrastructural access, and socio-economic background influence how effectively they benefit from institutional support.

The conceptual model, therefore, positions digital literacy interventions as foundational drivers that indirectly influence academic success through psychological, cognitive, and structural mediators.

Figure 1 presents this integrated conceptual model.

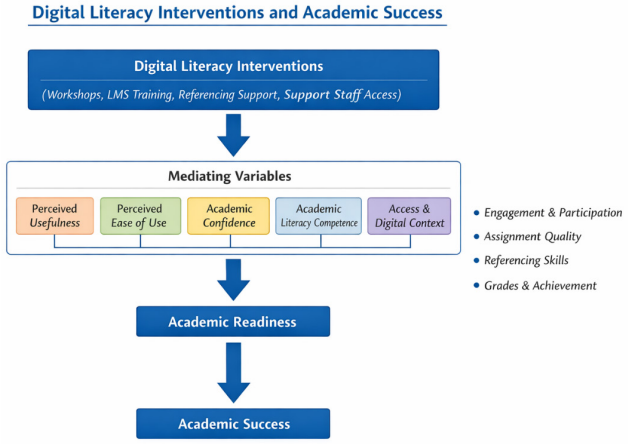

Fig.1: Integrated conceptual model.

Research Methodology

This study employed a quantitative, cross-sectional survey design to investigate the impact of digital literacy programmes on student readiness and academic success within a private higher education institution. A quantitative approach was selected because it enables systematic data collection and structured comparisons across a relatively large participant group, yielding measurable insights into students' perceptions, digital engagement patterns, and reported academic confidence (Bryman, 2016). The cross-sectional design enabled data collection at a single point in time, capturing students' reflections on both baseline digital familiarity and post-intervention experiences (Creswell, 2014). While the study aimed to explore relationships between digital literacy exposure and academic readiness, it was designed primarily as an exploratory institutional evaluation rather than a causal modelling study. As such, it focused on identifying patterns and trends within the data.

The target population comprised undergraduate and postgraduate students enrolled at the institution who had been exposed to digital and academic literacy workshops. A non-probability purposive sampling technique was employed to ensure inclusion of respondents with direct experience of the interventions under investigation (Cohen et al., 2017). This approach was appropriate given the study's evaluative nature.

A total of 428 students completed the baseline components of the questionnaire. Of these, 256 provided post-workshop confidence responses. Although response rates varied across items, the achieved sample size exceeds minimum thresholds typically recommended for descriptive institutional survey research. For exploratory quantitative studies in higher education contexts, samples of 200 or more respondents are generally sufficient to yield stable descriptive estimates and identify meaningful patterns across subgroups.

However, it is acknowledged that the discrepancy between baseline (n = 428) and post-workshop (n = 256) responses limits direct longitudinal comparability and restricts inferential pre-post analysis. This limitation is discussed further below.

Instrument Design and Construct Alignment

Data were collected using a structured, self-administered online questionnaire aligned with the study's integrated theoretical framework. The instrument included closed-ended questions (Likert scale, multiple-choice, yes/no) and open-ended responses to capture contextual insights (Babbie, 2020).

1. The questionnaire was structured into four main domains:

1. Demographic and contextual variables
2. Baseline digital familiarity
3. Workshop awareness and accessibility of support services
4. Post-workshop confidence and perceived usefulness

Operationalisation of Digital and Academic Literacy

To ensure conceptual clarity, digital literacy and academic literacy were treated as related but analytically distinct constructs.

Digital literacy was operationalised quantitatively through:

- Baseline self-rated familiarity with basic computer and technological skills (5-point Likert scale)
- Post-workshop confidence in navigating digital academic platforms
- Perceived accessibility of the Educational Technologist
- Awareness of institutional literacy workshops

These measures align with the Technology Acceptance Model (Davis, 1989), particularly the constructs of perceived usefulness and perceived ease of use.

Academic literacy, by contrast, was examined primarily through qualitative indicators. Although the post-workshop confidence item combined digital and academic literacy in a composite self-assessment, academic literacy development was identified through open-ended responses addressing referencing competence, understanding of plagiarism, academic writing confidence, and scholarly database use. These responses were thematically analysed in line with the Academic Literacies Model (Nieminen & Carless, 2023).

This dual analytical approach enabled differentiation between technological competence and academic discourse competence, while acknowledging partial overlap in students' self-perceptions.

Explicit Theoretical Mapping

The development of the survey instrument was explicitly informed by the study's integrated theoretical framework, incorporating constructs derived from the Technology Acceptance Model (Davis, 1989), the Academic Literacies Model (Nieminen & Carless, 2023), and the Digital Divide Framework (Warschauer, 2003). Rather than treating these frameworks as abstract conceptual lenses applied retrospectively, specific questionnaire items were designed to reflect core theoretical dimensions.

Within the Technology Acceptance Model, perceived usefulness was captured through items assessing whether students believed digital literacy workshops enhanced their academic preparedness and whether digital literacy was important for both academic success and future career development. These items reflect students' evaluations of the instrumental value of digital systems in achieving academic outcomes. Perceived ease of use was operationalised through measures of baseline technological familiarity and reported accessibility of institutional digital support structures, including the Educational Technologist and engagement with the Learning Management System. Together, these indicators reflect students' perceived effort and comfort in interacting with institutional digital platforms.

The Academic Literacies Model informed items relating to referencing competence, understanding of plagiarism, academic writing confidence, and use of scholarly databases. Although these dimensions were not measured through a standalone quantitative scale, they were explored through structured open-ended responses and post-workshop feedback. This approach allowed the study to examine academic literacy as a socially situated practice rather than merely a technical skill.

The Digital Divide Framework guided the inclusion of demographic and contextual variables such as geographic location, prior educational background, and awareness of institutional support services. These variables enabled analysis of structural and access-related factors that may influence digital readiness and academic participation.

Through this construct-level alignment, the instrument operationalised theoretical constructs in a transparent manner, ensuring coherence between the conceptual framework, research objectives, and empirical analysis.

Objective Academic Performance Indicators

The study relied primarily on self-reported measures of confidence and perceived preparedness. No objective academic performance indicators (such as assignment grades) were collected due to ethical and institutional constraints on data access.

While self-reported confidence measures are widely used in educational evaluation research, it is acknowledged that they may not directly equate to measurable academic performance outcomes. As such, findings should be interpreted as indicative of perceived academic readiness rather than confirmed performance gains.

Future research may benefit from integrating institutional academic performance data to enable stronger causal inferences.

Data Collection Procedure

The questionnaire was distributed electronically over four weeks via institutional email and QR codes. Two reminder notifications were issued to enhance response rates. Data collection occurred partly during semester break, which may have influenced participation levels and contributed to variation in post-workshop responses.

Data Analysis

Quantitative data were analysed using both descriptive and inferential statistical techniques. Descriptive statistics, including frequencies, percentages, and measures of central tendency, were computed to summarise baseline digital familiarity, workshop awareness, perceived importance of digital literacy, post-workshop confidence, and accessibility of institutional support services. These descriptive analyses provided an overview of response distributions across key variables.

To examine associations between selected variables, Pearson correlation analyses were conducted using matched responses for baseline digital familiarity, post-workshop literacy confidence, and perceived accessibility of support personnel. Correlation coefficients were calculated to assess the strength and direction of relationships, and statistical significance was evaluated at conventional thresholds ($p < .05$; $p < .01$; $p < .001$). Given the cross-sectional design and absence of matched longitudinal data, inferential analyses were interpreted as indicative of association rather than evidence of causality.

Regression modelling was not undertaken due to the partially unmatched nature of baseline and post-workshop responses and the absence of objective academic performance indicators. As such, inferential analysis focused on identifying statistically significant relationships between perceived digital familiarity, institutional support accessibility, and reported literacy confidence.

Open-ended responses were analysed using thematic content analysis to identify recurring patterns relating to academic literacy development, referencing competence, research skills, and workshop impact. This qualitative analysis complemented the quantitative findings by providing contextual insight into students' perceived learning experiences.

Methodological Limitations

Several methodological limitations should be considered when interpreting the findings of this study.

First, the research relied primarily on self-reported measures of confidence and perceived preparedness. Although self-perception is widely used in educational research as an indicator of readiness and engagement, it does not necessarily correspond directly to objective academic performance. The study did not incorporate institutional performance metrics such as grade point averages, assignment scores, or progression data, largely due to ethical and data-access constraints. Consequently, the findings reflect perceived academic impact rather than verified performance outcomes.

Second, while inferential analyses examined associations among selected variables, the cross-sectional design limits causal inference. The observed correlations between baseline digital familiarity, institutional support accessibility, and post-workshop confidence indicate statistically significant associations; however, they do not establish directionality or causation. Baseline and post-workshop responses were not matched at the individual level, which constrains the ability to model longitudinal change.

Third, variation in item-level response rates resulted in differing sample sizes across analyses. While 428 respondents completed the initial components of the survey, only a subset provided post-workshop confidence ratings. This discrepancy limits direct comparison between baseline and post-intervention measures and introduces the possibility of response bias, as students with stronger experiences may have been more likely to complete later sections of the questionnaire.

Finally, the use of non-probability purposive sampling restricts the generalisability of findings beyond the institutional context studied. The results should therefore be interpreted as context-specific insights into literacy development within a private higher education environment rather than universally generalisable conclusions.

Despite these limitations, the study provides exploratory evidence on the interrelationships among digital familiarity, institutional support structures, and perceived academic literacy development. Future research incorporating validated multi-item literacy scales, matched longitudinal designs, and objective academic performance indicators would enable more robust modelling of causal pathways and comparative institutional analysis.

Ethical Considerations

Ethical clearance for the study was obtained from the IIE Ethics Committee under approval number R.0002066 [REC]. The study was conducted in accordance with institutional and national ethical guidelines for research involving human participants. Before participation, all respondents were presented with a digital informed consent form that clearly explained the purpose of the study, the voluntary nature of their involvement, and their right to withdraw at any time without negative consequences.

To protect participant privacy, no personal identifiers were collected through the survey. All responses were anonymised before analysis, and the raw data were stored securely on password-protected devices accessible only to the principal investigator. The study involved no deception, physical intervention, or psychological risk, and all participants were treated with respect and transparency. By adhering to these ethical standards, the study ensured that the rights, dignity, and confidentiality of all participants were fully protected throughout the research process.

Findings

This section presents the study's findings, which aimed to assess the impact of digital and academic literacy programmes on student readiness and academic success at a private higher education institution. The data were collected through an online, structured questionnaire targeting students who had participated in literacy interventions. The questionnaire gathered quantitative and limited qualitative data concerning students' backgrounds, perceptions of digital and academic preparedness, workshop experiences, access to support services, and overall confidence in engaging with academic digital systems.

The analysis focused on identifying patterns in students' reported levels of digital and academic literacy before and after attending workshops, as well as evaluating institutional support structures such as the availability of educational technologists and information specialists. The findings are organised thematically and aligned with the study's objectives. Where relevant, supporting interpretations are provided to contextualise the data and highlight implications for institutional practice. Descriptive statistics are used to present quantitative findings, supplemented by selected qualitative responses to give depth and insight into student experiences.

Demographic Profile of Respondents

Understanding the sample's demographic composition is critical to interpreting this study's findings, as factors such as age, educational background, and access to institutional resources can significantly influence students' digital and academic literacy levels.

Age Distribution

The age profile of respondents was diverse, though the largest segment fell within the traditional undergraduate range. As shown in the survey data, 60 respondents (approximately 38%) were aged 21 to 23, followed by 45 respondents (28%) aged 18 to 20.

A smaller number of students fell into older age brackets, with 30 respondents (19%) aged 24 to 26, and 15 respondents (10%) aged 27 and above.

These figures suggest that most participants were likely at the early stages of their higher education journey, particularly at the undergraduate level. The relatively high proportion of students aged 21-23 aligns with the typical age of second- and third-year undergraduates. However, the presence of older students, those aged 24 and above, highlights the diversity of the student body, including non-traditional learners, adult students returning to study, or those pursuing postgraduate qualifications.

Educational Qualifications

Regarding educational attainment, the majority of respondents reported either being currently enrolled in or having completed an undergraduate degree (n = 70), accounting for approximately 44% of the total sample. This was followed by 35 respondents (22%) who held or were pursuing a diploma, and 25 respondents (16%) who had achieved postgraduate qualifications. An additional 20 students (13%) had completed only high school education, indicating a smaller group of students at the entry-level of higher education, such as those enrolled in higher certificates or foundation programmes.

The dominance of undergraduate respondents suggests that the findings are highly representative of the core student population targeted by institutional digital literacy programmes. The presence of diploma and postgraduate students provides comparative insight into how digital literacy support is perceived across educational levels. Students at earlier stages, particularly those entering from high school, may require more foundational training, whereas postgraduate students might expect

Literacy Levels Before and After Digital Literacy Interventions

Baseline Digital Readiness

Following the demographic profile, the first substantive analysis examines students' baseline digital familiarity upon entering higher education.

Baseline Digital Familiarity (n = 423)

A total of 423 respondents completed the item assessing their familiarity with basic computer and technological skills at the beginning of their academic journey. Responses were recorded on a five-point Likert scale, where 1 indicated very limited familiarity, and 5 indicated high familiarity.

The distribution of responses revealed moderate to strong baseline digital readiness across the sample. Specifically, 29.1% of respondents rated their familiarity at level 4, and a further 29.1% rated it at level 5. Combined, 58.2% of respondents reported high levels of prior digital familiarity. In contrast, 5.7% rated themselves at level 1 and 8.3% at level 2, indicating that 14.0% of students entered higher education with limited digital confidence. A further 27.9% rated their familiarity at level 3, reflecting moderate competence but not advanced proficiency.

These findings demonstrate heterogeneity in digital readiness at institutional entry. While the majority of students reported strong baseline technological familiarity, a meaningful subset began their studies with limited digital exposure. This variation reinforces concerns raised in digital divide scholarship, which emphasises that students do not enter higher education with uniform access to technological resources or prior training.

Importantly, this baseline measure captures digital familiarity rather than academic literacy competence. As such, it provides insight into students' technological starting point but does not measure preparedness in academic writing, referencing, or research conventions.

Table 1: Baseline Digital Familiarity at Entry (n = 423)

Rating	Frequency	Percentage (%)
1	24	5.7
2	35	8.3
3	118	27.9
4	123	29.1
5	123	29.1

Perceived Importance of Digital Literacy

Perceived Importance of Digital Literacy for Academic and Career Success (n = 406)

A total of 406 respondents provided valid responses to the item assessing whether digital

literacy is important for academic success and future career development. The overwhelming majority of respondents (89.2%) explicitly affirmed the importance of digital literacy, with responses beginning with "Yes" or a similar affirmation. Only a small minority provided responses that did not clearly endorse its importance.

These findings indicate strong recognition among students of the central role digital competence plays in both academic engagement and professional readiness. Students frequently linked digital literacy to their ability to conduct research, navigate institutional systems, complete assessments, and remain competitive in technology-driven work environments. The high level of endorsement reflects alignment with the perceived usefulness construct of the Technology Acceptance Model (Davis, 1989), wherein individuals are more likely to engage with digital systems when they believe such engagement enhances performance outcomes.

Notably, the strong consensus transcended demographic differences, suggesting that digital literacy is widely perceived as a foundational competency rather than a supplementary skill. Students' qualitative elaborations often extended beyond immediate academic tasks to broader employability concerns, indicating an awareness of the evolving technological demands of contemporary professional environments.

This finding reinforces the argument that digital literacy initiatives are not merely institutional support mechanisms but strategic investments in long-term graduate preparedness.

Table 2: Perceived Importance of Digital Literacy (n = 406)

Response Category	Frequency	Percentage (%)
Affirmed Importance ("Yes" and variations)	362	89.2
Other responses	44	10.8

Awareness of Digital and Academic Literacy Workshops

Awareness of Institutional Literacy Interventions (n = 421)

A total of 421 respondents provided valid responses to the item assessing awareness of the institution's digital and academic literacy workshops. The results indicate an almost equal distribution between those who were aware of the workshops and those who were not. Specifically, 50.1% (n = 211) reported awareness of the institutional literacy interventions, while 49.9% (n = 210) reported being unaware of such offerings.

This near-even split reveals a significant communication gap within the institutional ecosystem. Although digital literacy workshops are presented as structured support mechanisms, approximately half of the surveyed students reported being unaware of their existence. This finding suggests that the impact of literacy interventions may be constrained not only by participation levels but also by visibility and outreach effectiveness.

From a theoretical perspective, this pattern intersects with the Digital Divide Framework (Warschauer, 2003), which emphasises that access is not limited to technological infrastructure but includes informational and institutional access. Even when support services are available, students may not benefit if awareness and communication strategies are insufficient.

The findings therefore point to the importance of strengthening institutional communication channels and integrating literacy training more systematically into academic programmes, rather than relying solely on optional workshop participation.

Table 3: Awareness of Digital and Academic Literacy Workshops (n = 421)

Response	Frequency	Percentage (%)
Yes	211	50.1
No	210	49.9

Post-Workshop Literacy Confidence

Post-Workshop Digital and Academic Literacy Confidence (n = 256)

A total of 256 respondents completed the post-workshop item assessing their confidence in digital and academic literacy following participation in institutional workshops. Responses were recorded on a five-point Likert scale, with 1 indicating very low confidence and 5 indicating very high confidence.

The distribution of responses shows that 28.5% of respondents rated their confidence at level 4 and 24.2% at level 5. Combined, 52.7% reported high levels of post-workshop confidence. In contrast, 12.9% rated their confidence at level 1 and 6.2% at level 2, indicating that 19.1% of respondents continued to report low confidence even after exposure to literacy interventions. A further 28.1% selected the midpoint rating of 3, indicating moderate, but not strong, confidence.

These findings indicate that while a majority of participating students perceived meaningful gains in confidence following workshop engagement, a notable proportion remained uncertain in their digital or academic competence. This suggests that workshop exposure may not be uniformly transformative and that additional or differentiated support mechanisms may be required for certain student groups.

It is important to emphasise that the baseline digital familiarity responses (n = 423) and the post-workshop confidence responses (n = 256) were not matched at the individual level. Consequently, any comparison between baseline familiarity and post-workshop confidence reflects aggregate trends rather than longitudinal change within the same participants. The findings, therefore, indicate directional patterns in perceived confidence but do not constitute causal evidence of improvement.

Table 4: Post-Workshop Digital and Academic Literacy Confidence (n = 256)

Rating	Frequency	Percentage (%)
1	33	12.9
2	16	6.2
3	72	28.1
4	73	28.5
5	62	24.2

Accessibility of Institutional Support Structures

Accessibility of the Educational Technologist (n = 401)

A total of 401 respondents evaluated the accessibility of the institution's Educational Technologist using a five-point scale, where 1 indicated very low accessibility, and 5 indicated very high accessibility.

The findings reveal generally positive perceptions of accessibility. Specifically, 25.4% of respondents rated accessibility at level 4 and 38.7% at level 5. Combined, 64.1% of respondents reported high accessibility to the Educational Technologist. In contrast, only 9.9% rated accessibility at levels 1 or 2, indicating limited access concerns among a relatively small subset of students. A further 25.9% selected the midpoint rating of 3, suggesting moderate accessibility.

These findings suggest that institutional digital support personnel are largely perceived as available and reachable. From a Technology Acceptance Model perspective, accessibility of support services may contribute to perceived ease of use, thereby facilitating engagement with digital platforms.

Table 5: Educational Technologist Accessibility (n = 401)

Rating	Count	%
1	15	3.7%
2	25	6.2%
3	104	25.9%
4	102	25.4%
5	155	38.7%

High accessibility (4–5) = **64.1%**

Low accessibility (1–2) = **9.9%**

Accessibility of the Information Specialist (n = 406)

Similarly, 406 respondents assessed the accessibility of the institution's Information Specialist. The results demonstrate strong positive perceptions. A total of 26.6% rated accessibility at level 4, while 42.6% rated it at level 5. Combined, 69.2% of respondents reported high accessibility to information support services.

Only 7.6% of respondents reported low accessibility (ratings of 1 or 2), while 23.2% indicated moderate accessibility (rating of 3).

The slightly higher high-accessibility rating for Information Specialists compared to Educational Technologists may reflect the perceived centrality of research and referencing support in students' academic progression. High levels of reported accessibility suggest that institutional support structures are

structurally available, although awareness and participation rates remain areas for further improvement, as indicated in earlier sections.

Table 6: Information Specialist Accessibility (n = 406)

Rating	Count	%
1	14	3.4%
2	17	4.2%
3	94	23.2%
4	108	26.6%
5	173	42.6%

High accessibility (4–5) = **69.2%**
Low accessibility (1–2) = **7.6%**

Inferential Analysis of Relationships Between Key Variables

To examine the relationships between baseline digital familiarity, institutional support accessibility, and post-workshop literacy confidence, Pearson correlation analyses were conducted using matched responses across relevant variables.

A statistically significant positive correlation was observed between baseline digital familiarity and post-workshop literacy confidence ($r = .37$, $p < .001$). This moderate association suggests that students who entered higher education with greater technological familiarity were more likely to report higher levels of confidence after participating in literacy workshops. While the cross-sectional design does not permit causal inference, the strength and significance of this relationship indicate that prior digital competence may shape students' perceived benefit from institutional interventions.

Perceived accessibility of the Educational Technologist was also positively and significantly associated with post-workshop confidence ($r = .37$, $p < .001$). This finding suggests that students who found institutional digital support accessible reported higher literacy confidence. The magnitude of this association is comparable to that observed for baseline familiarity, underscoring the potential importance of visible and reachable support personnel in shaping students' academic readiness.

A smaller but statistically significant positive correlation was identified between perceived accessibility of the Information Specialist and post-workshop confidence ($r = .29$, $p < .001$). Although weaker in magnitude, this relationship remains meaningful, indicating that access to research and information support contributes to students' perceived development of academic literacy.

These findings provide inferential support for the interconnected role of prior digital familiarity and institutional support accessibility in shaping literacy confidence. The observed relationships align with the Technology Acceptance Model, particularly the perceived ease of use construct, and reinforce the importance of structural and contextual access conditions as emphasised in Digital Divide scholarship. However, given the cross-sectional nature of the study, these associations should be interpreted as correlational rather than causal.

Academic Literacy Development: Thematic Analysis with Illustrative Quotations

Qualitative responses were subjected to thematic analysis to identify recurring patterns relating to academic literacy development following participation in digital literacy workshops. Several

Table 7: Pearson Correlations Among Key Variables

Variable	1	2	3	4
1. Baseline Digital Familiarity	—	.37***	.16*	.20**
2. Post-Workshop Confidence		—	.37***	.29***
3. Educational Technologist Accessibility			—	.63***
4. Information Specialist Accessibility				—
***p < .001 **p < .01 *p < .05				

dominant themes emerged, reflecting both perceived skill enhancement and areas requiring further institutional attention.

Theme 1: Referencing and Plagiarism Awareness

A prominent theme across responses was improved understanding of referencing conventions and plagiarism. Many students indicated that workshops clarified citation practices and institutional expectations regarding academic integrity. One respondent noted:

"I now understand how to reference properly and avoid plagiarism. Before the workshop I was not confident with citations."

Another commented:

"The session helped me see where I was going wrong with referencing. It made my assignments stronger."

These statements illustrate that academic literacy development extended beyond formatting mechanics to increased awareness of disciplinary norms and integrity standards. Consistent with the Academic Literacies Model, referencing was experienced not merely as a technical skill but as a gateway into legitimate academic participation.

Theme 2: Research and Information Retrieval Skills

Students frequently referenced improved ability to navigate research databases and identify credible academic sources. For example:

"I learned how to use the library databases and find proper academic articles."

Another respondent explained:

"The workshop showed me how to search smarter and not just use Google."

These responses reveal the intersection between digital and academic literacy. While database navigation involves technological competence, evaluating and selecting credible scholarly material reflects deeper epistemological engagement. This distinction reinforces the analytical separation between digital skills and academic discourse practices.

Theme 3: Increased Academic Confidence

A recurring pattern across responses was enhanced confidence in academic work. Several students explicitly linked workshop participation to reduced anxiety and improved preparedness:

"After attending the workshop I felt more prepared to complete my assignments."

Another respondent reflected:

"It gave me confidence because I now know how to approach my research and structure my work."

However, not all responses were uniformly positive. A small subset of students indicated continued uncertainty, particularly in more advanced writing tasks. This suggests that while workshops build foundational confidence, additional scaffolded support may be necessary for sustained academic literacy development.

Theme 4: Institutional Enhancement and Integration

Students also provided constructive recommendations regarding the structure and delivery of literacy interventions. Rather than rejecting the workshops, respondents generally advocated for deeper institutional integration and broader reach. Some suggested that sessions be "made compulsory in first year," while others proposed "more advanced workshops for postgraduate students." Several respondents emphasised the need for improved communication, noting that "many students are not aware of the workshops" and recommending stronger promotion through modules and learning platforms. These responses indicate that students value literacy interventions but advocate for a more systematic, embedded approach to implementation. This finding aligns with earlier awareness data, which showed that approximately half of respondents were unaware of the workshop offerings. Institutional impact, therefore, may depend not only on the quality of content but also on strategic integration within programme structures.

Integrative Interpretation

The qualitative findings indicate that digital literacy workshops extend beyond technological navigation to support academic literacy practices, particularly referencing, research skills, and academic confidence. While quantitative data reflect general confidence patterns, qualitative evidence provides richer insight into the specific competencies students perceive as having improved.

Importantly, these findings reinforce the distinction between digital literacy as technological competence and academic literacy as disciplinary participation. Although interrelated, the two domains operate through different mechanisms and require differentiated pedagogical strategies.

Discussion

This study examined students' baseline digital familiarity, awareness of institutional literacy interventions, post-workshop confidence, and perceived accessibility of support services within a private higher education institution. The findings reveal a complex pattern: while the majority of students report moderate to high baseline digital familiarity and strong perceived importance of digital literacy, workshop awareness remains evenly split, and post-intervention confidence levels are not uniformly high. These results suggest that institutional literacy initiatives operate within a heterogeneous landscape of student preparedness rather than a uniform technological environment.

Baseline Digital Readiness and the Digital Divide

More than half of respondents (58.2%) reported high levels of baseline digital familiarity. However, 14% reported low familiarity upon entering higher education. This heterogeneity aligns with Digital Divide scholarship, which emphasises that access disparities persist even within technologically equipped institutions (Fisk et al.,2023). Similar studies in higher education contexts have found that, while many students identify as "digitally competent," gaps often exist in the functional use of academic technology (Tinmaz et al., 2022; van Deursen & van Dijk, 2023).

The present findings reinforce the argument that digital readiness cannot be assumed at institutional entry. Even within a private higher education context, a non-trivial proportion of students may require structured digital orientation to avoid marginalisation.

Perceived Usefulness and the Technology Acceptance Model

An overwhelming majority of respondents (89.2%) affirmed the importance of digital literacy for academic and career success. This finding strongly reflects the perceived usefulness construct of the Technology Acceptance Model (Davis, 1989). According to TAM, individuals are more likely to engage with technological systems when they perceive them as performance-enhancing.

Prior research has demonstrated that perceived usefulness significantly predicts engagement with learning management systems and digital academic tools (Lin & Yu, 2023). The present findings are consistent with this literature, suggesting that students conceptually recognise the instrumental value of digital competence. However, recognition of importance does not automatically translate into awareness or participation, as evidenced by the near-even split in workshop awareness.

Awareness and Institutional Access

Approximately half of respondents reported being unaware of institutional literacy workshops. This finding reveals a structural gap in institutional communication and echoes findings in higher education research that support services often remain underutilised due to limited visibility rather than limited availability (Lemon et al., 2025).

From a Digital Divide perspective, informational access constitutes a critical dimension of participation. Institutional interventions cannot generate impact if students are unaware of their existence. This suggests that the effectiveness of literacy initiatives depends not only on content quality but also on systemic integration within curricula and programme structures.

Post-Workshop Confidence and Academic Literacies

Among respondents who completed the post-workshop item, 52.7% reported high confidence levels. While this suggests a positive perceived impact, nearly one-fifth of respondents continued to report low confidence. Because baseline and post-workshop responses were not matched, these results indicate directional patterns rather than confirmed improvement.

Qualitative findings provide deeper insight into the nature of reported gains. Students frequently reported improvements in referencing accuracy, pla-

giarism awareness, and use of research databases. These competencies align with the Academic Literacies Model, which conceptualises literacy as participation in disciplinary discourse rather than mere technical skill (Nieminen & Carless, 2023). Similar findings have been reported in studies demonstrating that structured academic literacy interventions can enhance confidence and assignment quality, particularly in first-year cohorts (Nallaya et al., 2022).

However, the persistence of moderate and low confidence ratings suggests that literacy development is iterative rather than event-based. One-off workshops may provide foundational orientation but may not suffice for sustained academic mastery.

Accessibility of Support Services and Perceived Ease of Use

High accessibility ratings for both Educational Technologists (64.1% high accessibility) and Information Specialists (69.2% high accessibility) suggest that institutional support structures are structurally available. These findings align with the perceived ease of use construct of TAM, as accessible support reduces perceived technological effort.

Prior research indicates that visible and accessible support services increase digital engagement and reduce the risk of academic attrition (Rawlinson, 2025). However, accessibility alone does not guarantee utilisation, particularly if awareness remains inconsistent.

Recommendations for Institutional Practice

Based on the findings, several recommendations emerge. These are presented as short-term and long-term institutional reforms to ensure strategic implementation.

Short-Term Institutional Strategies

In the immediate term, institutions should prioritise improving communication and visibility of literacy interventions. Workshop information should be embedded directly within learning management systems and programme orientation materials. Academic staff should be required to announce and reinforce literacy sessions within modules. Institutional marketing teams should coordinate targeted campaigns at the beginning of each semester.

Responsibility for implementation should lie jointly with academic programme managers, educational technologists, and institutional communication units. A structured academic calendar mapping literacy workshops across semesters would enhance predictability and participation.

Additionally, differentiated workshop streams should be introduced. Foundational workshops should target first-year students, while advanced sessions should be tailored to postgraduate cohorts focusing on research design, advanced referencing, and academic publishing skills.

Long-Term Institutional Reform

Long-term reform requires integrating digital and academic literacy into curricula rather than relying on optional workshops. Literacy components should be embedded within core modules and assessed through structured formative tasks. This approach aligns with embedded academic literacies models, which demonstrate stronger learning outcomes than standalone sessions (Nallaya et al., 2022).

Institutions should consider developing a literacy progression framework that maps digital and academic competencies across qualification levels. Such frameworks enable scaffolded development and measurable progression.

Resource Implications

Effective implementation requires adequate staffing, infrastructure, and funding. Increasing workshop frequency and curriculum integration may necessitate additional Educational Technologist and Information Specialist appointments. Institutions may also need to invest in digital analytics systems to track participation and literacy development trends.

Funding allocation should recognise literacy development as central to academic quality assurance rather than peripheral student support. Long-term budgeting must incorporate personnel development, platform upgrades, and training materials.

Implications for Online-Only Institutions

For fully online institutions, the implications are particularly significant. In digital-only learning environments, literacy and technological competence are inseparable from academic participation. Institutions

operating entirely online must ensure that digital orientation is compulsory, integrated, and continuously reinforced throughout programme delivery.

Online institutions should leverage learning analytics to identify students who exhibit low engagement or technological difficulties and provide proactive intervention. Virtual drop-in sessions, embedded tutorial videos, and peer mentoring networks may enhance both digital and academic literacy development.

Pedagogical Implications for Digital and Blended Higher Education

The findings of this study carry important pedagogical implications for institutions operating in digitally mediated and hybrid learning environments. First, the heterogeneity observed in baseline digital familiarity suggests that digital competence cannot be assumed, even within technologically equipped institutions. Educators should therefore integrate structured digital orientation activities into first-year modules rather than relying on optional workshop attendance. Embedding foundational digital tasks within coursework ensures that literacy development becomes a pedagogical priority rather than an auxiliary support function.

Second, the statistically significant associations between institutional support accessibility and post-workshop confidence underscore the importance of visible, integrated support structures. Teaching staff should actively collaborate with Educational Technologists and Information Specialists to embed research literacy, referencing instruction, and digital tool training within assessment design. Co-teaching models and embedded research tutorials may enhance the perceived usefulness and ease of use of academic technologies.

Third, the persistence of moderate and low confidence levels among a subset of students highlights the need for scaffolded literacy progression across programme levels. In blended and fully online environments, digital literacy intersects directly with assessment literacy. Students must navigate online submission platforms, interpret automated feedback systems, and increasingly engage with AI-supported academic tools. Pedagogical strategies should therefore move beyond technical orientation to include critical digital judgement, ethical AI use, and information evaluation competencies.

For online-only institutions, the implications are particularly pronounced. In fully digital ecosystems, technological and academic participation are inseparable. Compulsory digital literacy modules, analytics-informed early intervention systems, and synchronous virtual support clinics may enhance student retention and academic confidence.

Collectively, these findings suggest that digital literacy should be conceptualised as a core pedagogical competency embedded across curricula rather than a peripheral workshop-based intervention. Sustainable literacy development requires alignment between curriculum design, assessment practice, institutional support services, and technological infrastructure.

Conclusion

This study examined digital and academic literacy development within a private higher education institution using an integrated theoretical framework that combines the Technology Acceptance Model, the Academic Literacies Model, and the Digital Divide perspective. The findings reveal a heterogeneous landscape of digital readiness, strong perceived recognition of the importance of digital literacy, uneven awareness of institutional interventions, and statistically significant associations between baseline digital familiarity, institutional support accessibility, and post-workshop literacy confidence.

The results indicate that prior technological familiarity and visible institutional support structures are positively associated with students' perceived literacy confidence. While the cross-sectional design precludes causal inference, the observed relationships reinforce the interconnected roles of technological preparedness, structural access, and participation in academic discourse in shaping student readiness. Importantly, the distinction between digital literacy as technological competence and academic literacy as disciplinary participation provides conceptual clarity often absent in prior research.

The study contributes to higher education scholarship in three ways. First, it offers a contextually grounded evaluation of literacy interventions within a private institutional setting, an area comparatively

underexplored in digital education research. Second, it integrates multiple theoretical lenses to examine literacy development as a multidimensional phenomenon encompassing perceived usefulness, perceived ease of use, discourse competence, and structural access. Third, by incorporating inferential analysis alongside thematic interpretation, it provides empirical evidence of statistically significant associations that strengthen the understanding of institutional literacy ecosystems.

From a pedagogical perspective, the findings underscore the need for curriculum-embedded literacy development, enhanced communication strategies, and sustained scaffolded support across programme levels. In increasingly hybrid and AI-mediated learning environments, digital literacy cannot be treated as an optional add-on; it must be embedded in teaching, assessment, and institutional strategy.

Future research should build upon this exploratory foundation by employing longitudinal designs, validated multi-item literacy scales, and objective academic performance indicators to examine causal pathways more rigorously. Comparative studies across institutional types and delivery modes would further illuminate how digital and academic literacy interventions function within diverse higher education ecosystems.

In an era defined by accelerated digital transformation, evolving assessment modalities, and expanding AI integration, literacy development remains central to equitable academic participation. Institutions that strategically embed digital and academic literacy within curricular and support structures are better positioned to foster student confidence, preparedness, and sustained academic engagement.

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