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Digital Literacy and Academic Readiness: Insights from First-Year Education Students from a South African University

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Abstract: The rapid integration of digital technologies in higher education has elevated digital literacy from a supplementary skill to a critical determinant of academic readiness, especially for first-year students transitioning from unequal schooling contexts. This paper examines first-year education students' perceptions of how their computer skills shape their engagement within a technology-enhanced learning environment at a South African university. Drawing on Van Dijk's digital divide theory, digital inequality is conceptualised as extending beyond access to include differentiated capacities for effective use. A qualitative approach was employed using an online questionnaire consisting of open-ended questions administered to 325 purposively selected participants and was analysed thematically. Findings indicate that digital competence functions as a differentiation mechanism, enabling or constraining academic participation. It appears that digitally competent students manage academic tasks effectively, navigate online platforms independently, and remain engaged. Therefore, confidence in using digital tools emerged as a stronger determinant of academic readiness than technical proficiency alone, highlighting its mediating role in translating competence into performance. While students with limited digital proficiency experienced barriers such as restricted platform access, reduced performance, and emotional strain, including anxiety and frustration, which reinforced inequalities. Despite these challenges, students showed a strong willingness to improve their skills, indicating a high level of motivational access. The authors argue that persistent inequalities are shaped by pre-university digital preparedness. Therefore, higher education should integrate compulsory digital literacy development, embedding digital skills across first-year curricula to promote equity, inclusion, and student success.

Keywords: Academic readiness, computer skills, digital divide, digital literacy, South African first-year students.

1. Introduction

The rapid advancement of digital technologies has fundamentally transformed higher education globally, reshaping the processes of teaching, learning, and knowledge production. Consequently, universities increasingly rely on digital platforms, online learning management systems, and technology-enhanced pedagogies to facilitate student engagement, promote flexible learning, and develop critical 21st-century competencies such as digital literacy, collaboration, and problem-solving (Ismuni et al., 2024; Marrero-Sánchez & Vergara-Romero, 2023). Within this evolving landscape, digital literacy has emerged not merely as a complementary skill but as a foundational requirement for academic success and lifelong learning (Maka, 2026; Mokhtari, 2023). However, despite the widespread integration of technology in higher education, students' readiness to participate effectively in digitally mediated learning environments remains uneven, particularly in contexts marked by historical and structural inequalities.

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In South Africa, these disparities are deeply rooted in the legacy of apartheid, which continues to shape the education system through unequal access to resources, infrastructure, and opportunities (Vandeyar & Mohale, 2022; Timaeus et al., 2012). Although the school quintile system was introduced to redress inequality by allocating resources based on socioeconomic status, it has had limited success in addressing systemic disparities, particularly in Quintiles 1–3 schools serving the most disadvantaged communities (Ngobeni et al., 2023; Amin & Mahabeer, 2021). As a result, learners from these schools often experience limited access to computers, unreliable internet connectivity, and inadequate exposure to information and communication technologies (ICTs), resulting in significant gaps in digital skills development (Landa et al., 2021; Robertson & Graven, 2018). Importantly, these inequalities extend beyond mere access to include disparities in the ability to use digital tools effectively, a phenomenon often conceptualised as the "second-level digital divide" (Fang et al., 2018; Owens et al., 2023).

As students transition to higher education, these inequalities are further amplified. First-year students enter universities with vastly different levels of digital preparedness. While some students are equipped with advanced digital competencies gained from well-resourced educational environments, others, particularly those from Quintile 1–3 schools, face significant challenges in navigating technology-enhanced learning systems (Faloye et al., 2020). These challenges include limited proficiency in basic computer applications, difficulties accessing online learning platforms, and a lack of confidence in engaging with digital academic tasks. Consequently, as higher education institutions increasingly assume a baseline level of digital competence, students who lack these skills are at risk of academic exclusion, underperformance, and heightened psychological stress (Werfhorst et al., 2022; Makoe & Olcott, 2021).

Given these challenges, the digital divide must be understood as a multifaceted phenomenon that encompasses not only access to technological infrastructure but also the skills, motivation, and support required to use technology effectively (Resta & Laferrière, 2008; van Dijk, 2005). In this context, digital literacy extends beyond operational competence to include information literacy, critical thinking, ethical use of technology, and the ability to apply digital tools meaningfully within academic settings (Marrero-Sánchez & Vergara-Romero, 2023; Mokhtari, 2023). Consequently, the persistence of digital inequalities underscores the need for a more nuanced understanding of how students experience and navigate digital learning environments, particularly during the critical transition to university.

Despite these insights, existing literature on the digital divide in South Africa has largely concentrated on schooling contexts, particularly the structural and systemic challenges faced by Quintile 1–3 schools (Chohan & Hu, 2020; Mathevula & Uwizeyimana, 2014). While these studies provide valuable insights into issues of access, infrastructure, and policy, they offer limited understanding of how these pre-university inequalities translate into students' academic readiness for higher education. Specifically, little attention has been given to students' perceptions of their digital competencies and how these perceptions influence their confidence, engagement, and performance in technology-enhanced learning environments.

Against this background, this study seeks to bridge this gap by examining the relationship between digital literacy and academic readiness among first-year education students at a South African university. In doing so, it addresses two central questions:

- How do first-year education students perceive the influence of their basic computer skills on their ability to succeed academically and complete coursework in a technology-enhanced learning environment?
- Furthermore, in what ways do students' computer skills shape their academic readiness, including their preparedness to engage with new modules and their overall academic performance?

Guided by van Dijk's digital divide theory, the study integrates insights from digital divide literature with students' lived experiences to provide a holistic perspective that considers both structural inequalities and individual competencies. Specifically, it examines how disparities in motivation, material resources, and access to technology shape students' academic preparedness and engagement. In this way, the study contributes to ongoing debates on digital inclusion and equity in higher education and offers evidence-based insights to inform institutional strategies that foster inclusive, supportive, and digitally enabled learning environments.

2. Methodology

This paper qualitatively examines digital literacy and academic readiness among first-year education students to provide an in-depth understanding of students' lived experiences and perceptions. A qualitative research design was therefore employed to explore students' perspectives on how their computer skills influence their academic readiness, academic performance, and engagement within a technology-enhanced learning environment. By doing so, the study advances beyond measuring preparedness to understanding the lived experiences underpinning it. This approach enabled the capture of nuanced, context-specific insights that may not be fully accessible through quantitative measures alone.

The study was underpinned by Van Dijk's theory of the digital divide, which conceptualises digital access as a cumulative, multidimensional process comprising motivational access, physical access, skills access, and usage access. The theory posits that structural and individual inequalities, such as disparities in socioeconomic status, educational background, and prior exposure to technology, shape individuals' levels of digital engagement, thereby reproducing broader patterns of social exclusion. In this study, the framework provided a lens through which to interpret how differences in digital skills influence students' academic participation and readiness.

2.1 Data collection

Qualitative data were collected during the first semester of the 2025 academic year (14 April to 12 June 2025) through an online questionnaire consisting of open-ended questions. The questionnaire was distributed via a secure survey link to 325 purposively selected first-year education students at the University of the Free State. The instrument explored multiple dimensions of digital access, including basic computer skills, motivational access, material access, skills access, and usage access, as well as how these forms of access influence students' academic readiness, in alignment with Van Dijk's digital divide theory. This qualitative instrument was specifically designed to measure students' perceptions related to motivation, skills, and usage, making it well-suited to address the specific research questions. Particular care was taken to simplify the completion process of the survey (e.g., a clickable link, mobile friendliness, and avoidance of jargon), considering that these participants are first-year students and that the study aims to assess digital perceptions. Additionally, participants were invited to provide recommendations on how lecturers could better support the development of students' basic computer skills and their effective use of educational technologies.

Purposive sampling was employed to ensure representation across diverse schooling backgrounds, particularly reflecting variations in prior exposure to digital technologies. This approach was critical in capturing a wide range of experiences associated with the digital divide in the South African context. The focused sample of first-year education students at the University of the Free State provided an opportunity to gain insights into the realities of the digital divide for students in South African higher education. Although 325 participants may be considered larger than typical for a qualitative study, the self-reported nature of the data facilitated the collection of rich feedback. The demographics of the respondents were as follows:

Table 1: *Demographics of respondents*

Demographic Variable	Category	Number of Respondents (n)	Percentage (%)
Age	18–19 years	182	56.2%
	20–21 years	102	31.5%
	22 years and above	40	12.3%
Gender (n = 324)	Female	222	68.5%
	Male	98	30.2%
	Prefer not to say	3	0.9%
	Non-binary	1	0.3%
Ethnicity	Black African	305	93.8%
	Coloured	12	3.7%
	White	8	2.5%
Type of High School Attended	Rural public school	185	56.9%
	Urban public school	121	37.2%
	Urban private school	6	1.8%
	Rural private school	3	0.9%
	Unsure	7	2.2%
	Other	2	0.6%
	Homeschool	1	0.3%
Highest Level of Education Before University (n = 323)	Grade 12 / Matric	320	99.1%
	Other	2	0.6%
	TVET	1	0.3%
	Diploma/Certificate		
University Campus	Qwaqwa Campus	161	49.5%
	Bloemfontein Campus	124	38.2%
	South Campus	37	11.4%

Participants were furnished with explicit instructions and a detailed explanation of the study's purpose, with participation being entirely voluntary. Respondents were encouraged to complete the questionnaire at their own pace, thereby facilitating thoughtful and reflective responses. The open-ended nature of the questions allowed participants to articulate their experiences, challenges, and perceptions of their digital competencies and how these factors influenced their academic journeys.

2.2 Data analysis

The qualitative data were thematically analysed using NVivo software, in accordance with Braun and Clarke's (2006) six-phase framework. Data familiarisation involved repeated readings of participants' responses to identify initial patterns. Codes were subsequently generated inductively by systematically identifying meaningful segments of text related to digital skills and academic readiness. These codes were organised into broader categories to develop preliminary themes. The themes were reviewed and refined to ensure alignment with the dataset and clarity among the themes. Each theme was then clearly defined and named in relation to the study's focus. Finally, illustrative excerpts were selected and integrated into the report, with findings interpreted in relation

to the theoretical framework and existing literature. This hybrid deductive-inductive coding strategy enabled the study to engage with the theoretical lens of the digital divide (Van Dijk) and student-generated insights, thereby enriching the overall interpretation of the results.

While themes emerged organically from the data, the process was also guided by Van Dijk's digital divide framework to ensure alignment with the study's conceptual grounding. This dual approach facilitated the identification of patterns grounded in participants' lived experiences while situating the findings within a broader theoretical context.

Five key themes were identified:

- Digital Skills as an Academic Enabler
- Digital Skills and Academic Confidence/Readiness
- Limited Skills as a Barrier to Academic Performance
- Emotional and Psychological Impact of Skill Gaps
- Growth and Willingness to Improve

These themes collectively elucidate the multifaceted role of digital literacy in shaping students' academic engagement, performance, confidence, and self-efficacy within a technology-mediated learning environment.

2.3 Ethical considerations

Ethical clearance was obtained through the UFS ethical clearance process, under the code UFS-HSD2024/1948/5. All ethical protocols were strictly adhered to throughout the study. Participation was voluntary, and informed consent was obtained from all participants prior to data collection. Respondents were assured of their right to withdraw at any stage without penalty. To ensure confidentiality and anonymity, no personally identifiable information was collected, and all data were securely stored. Participants were informed that their responses would be utilised solely for research purposes. Furthermore, measures were implemented to minimise bias and to uphold the integrity and trustworthiness of the data throughout the research process.

3. Presentation of Findings

This section presents the qualitative findings, focusing specifically on the perceptions of first-year Education students regarding their digital skills and academic readiness. The findings are derived from a thematic analysis of open-ended questionnaire responses and are interpreted through the lens of Van Dijk's digital divide theory. This framework facilitates an understanding of how disparities in motivational, material, and skills access influence students' engagement with technology-enhanced learning. The results are organised into five interrelated themes that encapsulate both enabling and constraining dimensions of digital literacy within the context of students' academic experiences. These findings aim to address the question, "How do you think your basic computer skills affect your ability to succeed in your studies and complete your coursework?"

3.1 Theme 1: Digital skills as an academic enabler (skills access leads to usage access)

The first finding indicates that participants perceive digital skills as essential for academic engagement and success in a technology-enhanced university environment. This encompasses a variety of access components. Thus, digital skills serve as a means of access, enabling effective use of technology for academic purposes. Most participants described their competence in computer skills as foundational tools that support routine academic tasks such as completing online assessments, conducting research, preparing assignments, and communicating with peers and lecturers. For these students, digital competence was not merely an additional skill but a necessary requirement for effective participation in university learning activities. As one participant explained,

> "*Seeing that we do online tests and tasks, it helps me navigate information quickly and expand my knowledge on using the computer more" (FYS4).*

This highlights how engagement with digital tools supports both learning and skill development. Students consistently associated basic computer skills with increased efficiency, organisation, and independence in their studies. Proficiency in common applications, such as Microsoft Word and online research platforms, enabled them to format assignments correctly, locate credible sources, and submit work in accordance with institutional requirements. One student reflected on the role of basic computer skills in shaping academic success, stating:

> *"Basic computer skills significantly impact academic success, enabling students to efficiently research, create documents, and stay organised" (FYS2).*

At the same time, another emphasised the importance of properly formatting assignments and accessing reliable academic sources online. For example, a participant shared,

> *"I can use programs like Microsoft Word to write and format assignments properly, and I can use the internet to do research quickly and find reliable sources" (FYS190).*

These responses suggest that digital literacy underpins academic conventions and expectations, particularly in an environment where assessment and learning management systems are predominantly online. Beyond merely completing tasks, students perceived that their digital skills enhanced the quality of their academic output. Several participants explained that being able to type assignments independently, edit documents, and conduct effective online research improved both their confidence and academic performance. For example, one student reflected that computer skills had enabled them to type assignments independently for the first time, marking a shift toward greater academic autonomy:

> *"Computer skills have shaped me. Now I can type an assignment on my own" (FYS57).*

Others reported that digital competence reduced the stress associated with online assessments and submissions, allowing them to focus more on content and learning rather than on technical challenges. As one participant explained, improved computer skills:

> *"With strong computer skills, I'm more confident and ready to tackle new challenges, which helps me do better academically" (FYS285).*

Students also highlighted how digital skills streamlined their academic workflow, enabling them to manage multiple tasks more effectively. Efficient navigation of learning management systems facilitated their awareness of module requirements, deadlines, and feedback, while the capacity to submit assignments electronically ensured timely submission. One participant remarked that digital skills allowed them to complete tasks more rapidly and to utilise tools such as plagiarism checkers to enhance the quality of their work:

> *"I can complete my assignments faster and use tools to check plagiarism to improve quality" (FYS191).*

Within Van Dijk's framework, these findings demonstrate how skills access enables meaningful usage access, allowing students to translate their access to technology into effective academic participation. For example, students perceive that computer literacy enhances academic productivity by enabling them to complete tasks more efficiently, accurately, and professionally. These skills also contribute to improved academic performance, reduced stress, and fewer submission-related difficulties. Additionally, in alignment with Van Dijk's digital divide theory framework, digital skills function as a critical form of skills access that mediates students' ability to benefit from material and motivational access to technology. For students who possess these digital skills, tools act as academic enablers that support success and engagement, reinforcing the importance of embedding digital literacy development across the first-year curriculum.

3.2 Theme 2: Digital skills and academic confidence/readiness (skills access + motivational access = success)

Significantly, the findings further reveal a robust relationship between students' digital skills and their academic confidence and readiness to engage with university studies. Thus, this theme reflects the interaction between skills access and motivational access, with particular reference to confidence, self-efficacy, and preparedness for academic engagement. Students who perceived themselves as digitally competent consistently articulated feeling more prepared to commence new modules, manage academic responsibilities, and meet institutional expectations with assurance. Digital literacy empowered these students to approach their studies with enhanced self-confidence, thereby reducing the uncertainty and anxiety often associated with technology-mediated learning environments. One participant described how strong computer skills facilitated improved academic performance, ultimately increasing their confidence and readiness to confront new challenges:

> *"With strong computer skills, I'm more confident and ready to tackle new challenges, which helps me do better academically" (FYS285).*

This confidence appears to extend beyond mere technical ability, influencing students' self-perception as capable and autonomous learners within a digital academic environment. Participants highlighted that robust computer skills enabled them to engage comfortably with digital platforms, access learning materials independently, and complete academic tasks efficiently. One student remarked that proficiency in fundamental computer skills enhances confidence in utilising digital tools and resources:

> *"Strong computer skills boost confidence in using digital tools and resources," adding that such proficiency allows for the efficient completion of tasks like research, note-taking, and assignments (FYS194).*

Similarly, another participant explained that their computer skills enhanced their readiness to start new modules by making it easier to navigate digital platforms and manage academic communication, which in turn improved their overall academic performance:

> *"My computer skills boost my confidence and readiness to start new modules by enabling me to navigate digital platforms and access learning materials easily" (FYS207).*

These responses indicate that confidence in digital environments is closely tied to students' perceived ability to function effectively within the educational system. Moreover, digital competence also appeared to reduce stress and cognitive overload during online learning. Students reported that being able to access course materials, participate in online discussions, and complete digital assessments without technical difficulties alleviated anxiety, particularly during the early stages of new modules. As one participant reflected, the ability to complete digital tasks smoothly enhances my confidence and reduces stress when starting something new:

> *"efficiently access course materials, participate in online discussions, and complete digital assignments without technical difficulties," thereby reducing stress and enhancing their confidence when engaging with new academic content (FYS230).*

First-year students' confidence in their digital abilities demonstrates motivational access, which, within Van Dijk's digital theory, constitutes the willingness and readiness to engage with digital technologies. This motivational access suggests that digital skills play a protective role, easing the emotional and psychological demands associated with academic transitions in technology-rich environments. Therefore, motivational access functions in cooperation with skills access to facilitate the transformation towards academic readiness. Collectively, these findings confirm that digital literacy serves as a key determinant of academic readiness in first-year university contexts. Students who possess adequate digital skills enter new modules with confidence in their ability to access, navigate, and engage meaningfully with learning content. Within Van Dijk's digital divide framework, this reflects the importance of skills access as a functional capacity to act as a mediator

between material access to technology and meaningful academic participation. Digital competence not only equips students with the tools required for academic tasks but also fosters psychological readiness (motivational access), enabling them to engage with learning more confidently, efficiently, and independently in technology-enhanced classrooms (meaningful usage access), which are important components that impact student learning. This means that although a student might have the necessary skill set, without the confidence to use technology, they would struggle to engage sufficiently with the technology.

3.3 Theme 3: Limited skills as a barrier to academic performance

This theme represents the core of the study, namely that skills access is a core determinant of academic performance, which confirms Van Dijk's main argument that digital skills, not digital access alone, enable meaningful academic participation. Conversely, many participants reported that limited computer proficiency significantly impeded their educational progress. These students described a range of challenges, including slow typing speeds, difficulty using essential software, and unfamiliarity with online submission platforms. Collectively, these limitations constrained their ability to complete coursework efficiently and meet academic expectations in a technology-mediated learning environment.

Several students emphasised how fundamental operational difficulties, such as slow typing and limited software knowledge, negatively affected their ability to meet deadlines and manage multiple assignments. One participant explained that typing slowly made it challenging to meet deadlines:

> *"I type slowly; therefore, I find it difficult to meet deadlines since there are many assignments I have to cover" (FYS1).*

At the same time, another participant simply stated, *"I struggle with work that needs the computer"* (FYS11). These accounts illustrate how even fundamental deficits in digital skills can have cascading effects on students' academic productivity and time management.

Other participants linked their struggles to a lack of prior computer exposure, often stemming from disadvantaged educational backgrounds. They described entering university with minimal foundational computer skills, which left them feeling unprepared to engage with digitally mediated academic tasks. One student noted that despite their motivation to succeed, they struggled because they lacked a foundational understanding of computers due to their disadvantaged background:

> *"Even if I want to complete my work on time, I struggle because I do not have a foundation of the computer due to a disadvantaged background" (FYS18).*

These responses highlight how pre-university inequalities in access and exposure continue to shape students' academic experiences at the higher education level. Difficulties with online platforms and digital submission processes further exacerbate these challenges. Several students reported struggling to submit assignments, navigate learning management systems, or access required academic platforms. One participant noted that they sometimes find it challenging to submit their work online:

> *"Sometimes I struggle to submit my assignment and all other online academics" (FYS115).*

Students also described how limited digital skills hindered their ability to complete academic tasks to the required standard. Challenges included creating and editing documents, formatting assignments correctly, conducting online research, and using basic digital functions such as copying and pasting or creating presentations. One participant expressed frustration at not knowing how to correct formatting or convert documents, explaining that once an assignment had been converted to PDF, they were unsure how to change it back to Word to make corrections:

> *"If I made a mistake on my essay and already converted the page to PDF, I will not know how to change it back to Word" (FYS269).*

Another noted that uncertainty about font type and spacing affected their confidence, as they were unsure whether their work met academic requirements:

> *"Sometimes, not knowing what font or spacing to use really does affect me when completing my tasks because I don't know whether I did them right" (FYS260).*

These findings suggest that limited digital literacy undermines not only task completion but also students' confidence in the quality and correctness of their work. They demonstrate that digital illiteracy directly correlates with perceived lower academic performance and unequal learning outcomes. Students with limited computer skills are thus disadvantaged in modules that assume digital competence as a baseline requirement. Within Van Dijk's digital divide framework, these challenges reflect gaps in skills access that prevent students from fully benefiting from material access to technology. Without adequate digital skills, students are unable to participate meaningfully in academic activities, reinforcing existing inequalities and highlighting the urgent need for structured, inclusive digital skills support in first-year university contexts. Consequently, skills access constitutes the critical dividing line between the inclusion and exclusion of first-year students. This study further confirms Van Dijk's argument that skills, rather than access alone, determine meaningful academic participation and engagement.

3.4 Theme 4: Emotional and psychological impact of skill gaps

This fourth theme elucidates the consequences of unequal access, particularly when such access is insufficient. In addition to the practical challenges associated with limited digital skills, students also articulated a significant emotional and psychological burden resulting from their inability to engage confidently with technology-mediated academic tasks. These difficulties frequently impacted students' self-esteem and emotional well-being, especially when they perceived themselves as unable to keep pace with academic demands or reliant on others for assistance.

Several participants reported experiencing feelings of frustration, anxiety, and discouragement arising from challenges in accessing information and navigating digital platforms. One student conveyed that their studies had been "badly affected" due to their struggles in locating or utilising platforms that necessitated computer proficiency:

> *"It has badly affected my studies as I am struggling with finding or using other platforms that require knowledge of computers" (FYS14).*

Another described how being unable to access information undermined both motivation and performance, noting that the experience left them discouraged and reluctant to study:

> *"I cannot access the information I want. This will have a negative impact on my performance because I don't even feel like studying; I will be discouraged because I cannot access the information" (FYS19).*

These illustrate how limited digital competence not only disrupts task completion but also erodes students' motivation and engagement with their studies. Conversely, dependence on peers emerged as a particularly distressing experience for some students. Participants reported feeling stressed and disempowered when compelled to rely on others to complete academic tasks. One student explained that it was "stressful" to constantly ask others for help and that delays occurred when peers were unavailable, preventing them from completing assignments within expected timeframes:

> *"It is stressful that I have to always beg other students, and if they are busy with their work, I have to wait and not complete my assignments at the time I expect to" (FYS20).*

This reliance on others contributed to feelings of loss of autonomy and heightened anxiety, further compounding academic pressure.

For some students, limited computer skills were experienced as deeply personal and emotionally damaging. Feelings of humiliation and diminished self-worth were evident in several responses. One participant stated:

> *"I don't know how to use a computer. Not only is it humiliating, but it is also discouraging" (FYS240).*

At the same time, another reflected that their academic experience would have been better had they possessed basic computer skills, but that they were currently feeling discouraged

> *"If I knew how to use a computer, I'm sure my experience would've been better, but as of currently, I'm discouraged" (FYS241).*

These narratives highlight how digital skill gaps can negatively shape students' academic identities, fostering feelings of incompetence and inadequacy. The pressure of operating within digitally intensive academic environments seemed to intensify these emotional responses. Students who lacked the necessary skills often felt overwhelmed and helpless, particularly when confronted with repeated technical difficulties.

These findings indicate that gaps in digital skills have ramifications that extend beyond academic performance to encompass significant emotional and psychological impacts. The emotional experiences articulated by students reflect the effects of insufficient access to skills, which negatively influence motivational factors, including confidence, engagement, and willingness to participate. Within Van Dijk's digital divide framework, these experiences demonstrate how inadequate access to skills can undermine not only meaningful participation in digital environments but also students' sense of agency and belonging within the academic space—factors that compromise motivation and sustained engagement. In the absence of targeted support, such emotional barriers may further entrench existing inequalities, highlighting the necessity for holistic digital skills interventions that address both technical competence and students' emotional well-being in first-year university contexts.

3.5 Theme 5: Growth and willingness (motivational access leads to potential skills access development)

This theme aligns with motivational access. Despite limited digital skills, many students demonstrated a clear growth mindset and a strong desire to improve their competencies. Rather than viewing their skills gaps as fixed limitations, these students described themselves as resilient learners who were gradually building confidence through practice, peer support, and self-directed learning. Their responses suggest that, with appropriate institutional support and continued exposure to digital tools, students can overcome digital barriers and enhance their academic engagement.

Several participants reflected on proactive strategies they were already using or planned to adopt to improve their digital skills. These strategies included regular practice, online tutorials, and support from peers and lecturers. One student indicated that overcoming digital challenges required sustained effort, explaining that by practising regularly, using online resources, and asking for help when needed, students could enhance their productivity, efficiency, and overall academic success:

> *"Students can practice regularly, utilise online tutorials, and seek help when needed. By developing these skills, students can enhance their productivity, efficiency, and overall academic success" (FYS2).*

This response reflects an awareness of digital skills as learnable competencies that improve over time through deliberate engagement. Other students acknowledged ongoing struggles but expressed optimism in their ability to improve. One participant remarked,

> *"Since I'm not yet best at it, I still struggle here and there, but it'll get better" (FYS17).*

This illustrates a belief in gradual progress rather than immediate mastery. Such responses indicate that students recognise their current limitations while maintaining a positive outlook toward future development, a key characteristic of a growth mindset.

Notably, some students explicitly identified structured learning opportunities as a means of enhancing their digital competence. One participant articulated their intention to consider enrolling in an introductory computer skills course or seeking guidance from instructors and peers to access relevant support and resources:

> *"To overcome these challenges, I'm considering taking a basic computer skills course or seeking guidance from instructors or peers who can provide support and resources to help me improve" (FYS288).*

This student linked skills development to increased confidence and proficiency, suggesting that targeted intervention could significantly enhance their ability to use technology to achieve academic goals. These reflections demonstrate the role of institutional support in transforming students' motivation into tangible skill development.

This theme highlights students' willingness to learn, adapt, and improve despite initial disadvantages. Within the context of Van Dijk's digital divide framework, this finding aligns with the concept of motivational access, where learners show a desire to engage with technology even when access to skills is limited. The presence of a growth mindset among students indicates that structured digital skills training, scaffolded learning opportunities, and ongoing support could significantly enhance both academic readiness and success. Rather than being passive recipients of disadvantage, many students position themselves as capable learners who, given the right conditions, can and want to develop the digital competencies required to thrive in technology-enhanced higher education environments. Thus, students' willingness to improve reflects strong motivational access, which is critical for overcoming digital inequalities. Their proactive strategies suggest that, when supported, motivational access can lead to improved skills access and, ultimately, more effective usage access.

4. Discussion of Findings

This study examined the influence of first-year education students' computer skills on their academic readiness and performance within a technology-enhanced learning environment. Guided by Van Dijk's digital divide theory, the research aimed to elucidate how disparities in access to digital skills shape students' engagement with academic tasks, confidence, emotional well-being, and overall preparedness for university study. The findings indicate that digital skills play a crucial role in shaping academic experiences, functioning simultaneously as enablers of success and, in their absence, as barriers that reinforce inequality.

The findings demonstrate that students possessing adequate digital skills perceive these competencies as significant academic enablers. Participants who reported confidence in using computers described enhanced efficiency, independence, and organisation in completing academic tasks such as researching, typing assignments, formatting documents, navigating learning management systems, and submitting assessments online. These results align with previous research that positions digital literacy as a foundational academic skill rather than a supplementary competence. Consistent with existing studies, students in this research perceived digital proficiency as essential for meeting institutional expectations, managing workload demands, and enhancing the quality of their academic output. Importantly, digital competence was also associated with reduced stress and improved academic confidence, resonating with findings that link digital readiness to smoother transitions into higher education and greater student persistence.

A key finding of this study is the robust relationship between digital skills and academic confidence and readiness. Students who perceived themselves as digitally competent consistently reported

feeling more prepared to embark on new modules, engage with online content, and meet assessment requirements. Digital skills alleviated anxiety regarding the navigation of unfamiliar technologies, allowing students to concentrate cognitive effort on learning rather than on technical problem-solving. This finding corroborates earlier research that underscores digital competence as both a psychological and functional resource, enabling students to cultivate a sense of self-efficacy and academic belonging within digitally mediated learning environments. Within Van Dijk's framework, this underscores the significance of skills access in converting material access to technology into meaningful academic participation.

Many students reported that limited computer skills significantly impeded their academic performance. Participants described fundamental operational challenges, including slow typing, difficulty with essential software, unfamiliarity with online platforms, and issues with assignment submission. These difficulties often resulted in missed deadlines, technical errors, and lower-quality academic work. These findings are consistent with the literature that identifies deficits in digital skills as a major contributor to unequal learning outcomes in higher education, particularly for students from under-resourced schooling backgrounds. The findings reaffirm that assuming digital competence as a baseline requirement disadvantages students whose prior educational experiences did not provide adequate exposure to technology.

Notably, the findings reveal that the impact of limited digital skills extends beyond practical challenges to encompass significant emotional and psychological consequences. Students reported feelings of frustration, anxiety, humiliation, and discouragement when they encountered difficulties in completing digitally mediated academic tasks. Dependence on peers for assistance further undermined students' sense of autonomy and confidence. These emotional responses align with studies that highlight how digital exclusion can adversely affect students' academic identities and motivation. In this study, recurrent technical difficulties contributed to diminished engagement and, in some cases, avoidance of digital tasks. This supports Van Dijk's assertion that skills access is critical not only for participation but also for sustaining motivation and meaningful engagement with technology.

Despite these challenges, an important and potentially transformative finding is the strong evidence of a growth mindset and a willingness to improve among students with limited digital skills, reflecting a point of agency. Many participants expressed resilience, optimism, and a desire to enhance their competencies through practice, peer support, online resources, and formal training opportunities. Students recognised digital skills as learnable rather than fixed and articulated clear strategies for improvement. This finding aligns with research emphasising the role of motivational access in bridging digital divides and suggests that deficits in skills access can be mitigated through structured, supportive institutional interventions. The presence of motivation and a willingness to learn indicates that students are not resistant to technology but rather constrained by limited opportunities and support.

This study extends existing literature by emphasising confidence as a stronger predictor of academic readiness than technical proficiency alone. While prior research frequently concentrates on measurable digital skills, the findings presented here indicate that students' belief in their ability to utilise digital tools effectively plays a crucial role in shaping academic behaviour and engagement. This suggests that interventions focused solely on technical training may be inadequate if they do not also address students' confidence, emotional well-being, and sense of belonging within digital learning environments.

The findings of this study demonstrate that digital skills are central to first-year students' academic readiness and success in technology-enhanced higher education contexts. Adequate digital competence fosters efficiency, confidence, and meaningful engagement with academic tasks, while limited skills create practical, emotional, and psychological barriers that undermine performance and

perpetuate inequality. Concurrently, students exhibited a willingness to improve, highlighting the potential impact of inclusive, scaffolded digital skills development initiatives. The study underscores the importance of embedding digital literacy as a transversal skill across the first-year curriculum and providing compulsory, structured support that addresses both technical competence and student confidence. These implications are firmly grounded in the study's findings and indicate the necessity for institutional strategies that extend beyond merely providing access to technology, focusing instead on holistically developing students' digital skills, confidence, and academic readiness.

5. Limitations of the Study

This study presents several limitations that should be considered when interpreting the findings. Firstly, the research was conducted at a single institution, which restricts the transferability of the results to other higher education contexts within South Africa or internationally. Secondly, the focus on first-year education students implies that the findings may not be generalisable to students in other disciplines, such as STEM or humanities fields, where digital demands may vary significantly. Thirdly, the study relied on self-reported data, which reflects students' perceptions of their digital skills rather than objective measures of competence. Additionally, the online questionnaire format may have excluded students with very limited digital access or low levels of digital literacy. The absence of detailed demographic variables, such as schooling background (e.g., quintile), home language, socioeconomic status, and prior exposure to computers, further restricts a more nuanced analysis of inequality. Finally, the cross-sectional nature of the study means that it captures student perceptions at a single point in time and does not account for how digital skills and confidence may evolve throughout the first year of study.

6. Conclusions and Recommendations

This study investigates the perceptions of first-year education students regarding their digital literacy skills and the utilisation of educational technologies, as well as the relationship between these perceptions and their academic readiness in a technology-enhanced learning environment. The findings reveal that many first-year students, particularly those from historically disadvantaged backgrounds, experience feelings of underpreparedness and anxiety when engaging with digital tools in academic contexts. Concurrently, students exhibit strong motivational readiness and recognise the value of educational technologies in supporting their learning.

While educational technologies are generally perceived as beneficial, unequal prior exposure continues to shape students' levels of engagement, with some reporting difficulties in adapting to the fast-paced, digitally mediated university environment. These findings underscore the necessity for more structured and inclusive approaches to digital skills development in higher education. Furthermore, some students expressed feelings of being left behind by the rapid pace of technology-enhanced classrooms, highlighting the need for more inclusive and scaffolded approaches to digital learning support within higher education institutions. In response, this study emphasises the importance of structured institutional developmental strategies for first-year students transitioning into university-level digital environments. At the University of the Free State, such an approach could build upon the existing Digital Skills and Competencies pathway offered by the Centre for Teaching and Learning, which is currently designed to support foundational digital development. This pathway may be conceptualised as a scalable institutional model for first-year support, irrespective of students' prior educational backgrounds. It is currently structured around five core themes: ICT proficiency; digital citizenship; information, data and media literacy; digital creation (including problem-solving, creativity, and innovation in digital environments); and Artificial Intelligence (AI) literacy. For replication and adaptation, the pathway is typically delivered through a structured sequence of workshops and/or online modules aligned to these themes, with each component targeting specific competencies and progressively building students' digital capabilities.

Assessment may include practical tasks, applied projects, or competency-based evaluations to ensure skill acquisition.

Within the broader first-year experience, such a model can be integrated either as a credit-bearing module or a co-curricular requirement, supported by ongoing academic and technical assistance. From a broader policy perspective, the rationale for such interventions is grounded in advancing social justice in South African higher education by addressing persistent digital inequalities and promoting equitable access to digital skills development. Building on this, the findings indicate that strengthening digital readiness necessitates a coordinated institutional response that combines targeted support programmes with curriculum-level integration to promote more inclusive and equitable student success in digitally enhanced learning environments.

7. Declarations

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