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Blended Learning Success in Higher Education: Students' Perspectives on Digital Literacy and Access

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Research Article

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Abstract

This study explored higher education students' perspectives on the impact digital literacy and access have on their success in a blended learning environment. There is a growing need to understand students' viewpoints on how digital literacy and access influence the success of their learning experiences. To investigate this phenomenon, the researchers applied the European Digital Competence Framework for Educators (DigCompEdu), to guide their study. Adopting a qualitative approach, they employed a case study design focusing on 41 students from the College of Education at a selected higher education institution. The data-collection process involved semi-structured focus group interviews, complemented by document analysis to review the course materials and methods that affect students' digital engagement. Homogeneous, purposeful sampling was applied to select students with specific characteristics relevant to the study. Data analysis involved coding through an inductive approach, to identify and categorise key themes. The findings revealed that HEIs need to implement supportive measures, such as reliable technological infrastructure, enhanced digital literacy training, and improved internet connectivity, to help students achieve in blended learning environments. This study offers valuable recommendations, demonstrating that equitable digital access and competency are critical to the success of a hybrid approach in higher education.

INTRODUCTION

Blended learning is a teaching and learning approach that combines traditional face-to-face (F2F) teaching with the use of digital technologies. In the literature, blended learning is also referred to as hybrid learning, dual-mode instruction, and HyFlex (Ashraf et al., 2021; Sanders & Mukhari, 2024). Blended learning facilitates the integration of on- and offline formats, thereby supporting both synchronous and asynchronous learning experiences (Gunes, 2019; Islam et al., 2022). This approach creates an adaptable, integrated learning environment that offers students flexible, accessible and diverse learning opportunities, thereby not only helping to improve their engagement in a course but also promoting an inclusive learning environment (Lim & Graham, 2021). In online modes, a hybrid model supports interactions between students and lecturers, and students and their peers, with the aim of improving the achievement of the learning outcomes, as well as students' problem-solving and critical thinking skills (Islam et al., 2022).

The blended approach has gained increasing importance in higher education institutions (HEIs) worldwide, as they are faced with the need to offer more flexible and accessible teaching and learning approaches, to meet the needs of their diverse student body (Apandi & Raman, 2020; Islam et al., 2022). As blended learning continues to expand in HEIs, there is a strong imperative to ensure that students possess the digital competencies necessary to succeed in these environments (Ashfaq, 2023). This is even more urgent in countries such as South Africa, where significant disparities exist in terms of digital access and skills. For dual-mode instruction to be effective and equitable, students must have both access to technology, and the necessary digital literacy skills to access the online learning platforms and materials effectively and successfully (Ashfaq, 2023). The impact of digital literacy and access on student success in blended learning environments thus represents a crucial area of focus for HEIs, mainly as they work to support diverse student populations in overcoming technological and skills-related barriers.

Literacy is correctly associated with reading and writing, yet in our rapidly evolving technological world, the term has been broadened to include digital literacy (Mokhtari, 2023). Digital literacy encompasses various competencies, such as the ability to access, evaluate, and utilise information effectively (information and data literacy), skills for effective interaction and collaboration within digital environments (communication and collaboration), and the capability to identify and address problems using digital tools (problem solving). These skills are must-haves for navigating and thriving in a digitally driven world, enhancing learning and interaction across multiple domains (Bykova et al., 2021).

Such digital skills are essential for students to navigate blended learning environments successfully (Alshahrani, 2021), but access to the necessary technological resources, such as stable internet connectivity, suitable devices and the requisite digital skills, remains challenging for many. This often causes discrepancies in the achievement of academic outcomes (Darlis & Sari, 2021; Wittmann & Olivier, 2021).

This study explored South African students' perspectives on how digital literacy and access affect their learning and success within blended teaching and learning settings. To that end, the researchers were guided by the DigCompEdu Framework (JRC, 2017) which served as a guiding tool for exploring the challenges students encounter in achieving equitable educational outcomes in dual-mode learning models, thus emphasising the importance of updated infrastructure, support and competency-building initiatives.

The study's significance lies in its examination of how digital competencies and technological access influence student success in blended learning within South African HEIs. While much research on blended learning has been conducted in countries with consistent and reliable digital infrastructure (Birgili et al., 2021), there is limited evidence of enquiries into the specific challenges facing students in South Africa, where digital access and skills development remain uneven (Wittmann & Olivier, 2021). By investigating how digital factors uniquely affect South African students' success in blended learning milieus, the researchers sought to expand the current knowledge base. By using the insights gained from this study, HEIs will be well positioned to develop specific strategies and policies to improve digital accessibility and skills development within blended learning models. This will result in more inclusive and successful outcomes for students in higher education.

The main research question designed to guide the study, was:

- How do South African higher education students perceive the influence of digital literacy and access on their success in a blended learning environment?

From the main research question, four sub-questions were formulated, namely:

- What is students' understanding of the term "blended learning" and its implementation in practice?
- How do students perceive the impact of digital literacy and access on their engagement and successful academic performance in a blended learning setup?
- What challenges do students face in blended learning settings, as regards digital access and infrastructure?
- What specific resources or support mechanisms do students believe would enhance their success in a blended learning context?

The sections which follow, outline the study's theoretical framework, examine the existing body of research on blended learning and digital literacy in higher education, and reflect the chosen methodology and research findings. Thereafter, the researchers offer recommendations for supporting students in blended learning environments. Finally, the researchers' concluding remarks summarise the main findings, and suggest specific actions for addressing digital literacy gaps and enhancing access to technology.

THEORETICAL FRAMEWORK

The DigCompEdu framework, also known as the "European Digital Competence Framework for Educators", was developed by the Joint Research Centre (JRC) in 2017 (JRC, 2017). The framework was developed collaboratively through workshops, professional meetings and consultations with experts. This resulted in the combination of existing digital literacy tools at the local, national, European and international levels, thereby ensuring an all-inclusive approach (Infante-Moro et al., 2023).

The main advantage of this framework is that it provides a structured model for enhancing digital competencies, as it allows for the development of essential skills to effectively integrate technology into teaching, and capacitates students to thrive in the modern knowledge society. This framework is pivotal for improving the quality of teaching and learning, as it allows for regular adaptation to the rapidly developing digital society in which we live (Cabero-Almenara et al., 2020; García-Vandewalle García et al., 2023; Suzer & Koc, 2024).

The framework encompasses 22 competencies, which are structured into six key areas. The first is "professional engagement" (PE), which focuses on professional development, reflective practice and collaboration using digital technologies (Cabero-Almenara et al., 2020; Suzer & Koc, 2024). The second is "digital resources" (DR), a key area which involves finding, evaluating, creating, adapting and sharing digital resources to meet the diverse educational needs of each individual student (García-Vandewalle García et al., 2023; Suzer & Koc, 2024). The third is "teaching and learning" (TL), which addresses integrating technology to support collaborative, guided and self-regulated learning experiences. This improves student engagement and learning outcomes (García-Vandewalle García et al., 2023; Suzer & Koc, 2024). The fourth key area, referred to as "assessment" (A), includes using digital tools for evaluation and feedback, analysing learning outcomes and promoting effective student assessment practices (García-Vandewalle García et al., 2023; Suzer & Koc, 2024). The second last, labelled "empowering learners" (EL), highlights strategies to empower students by ensuring their autonomy, supporting critical thinking and thus improving their digital competencies (García-Vandewalle García et al., 2023; Suzer & Koc, 2024). Finally, "facilitating learners' digital competence" (FLDC) focuses on helping students develop their digital literacy, to ensure that they are equipped to function effectively in our digital age (García-Vandewalle García et al., 2023; Suzer & Koc, 2024).

From the above, it is evident that the DigCompEdu framework (JRC, 2017) is relevant to this study, as it emphasises the development of digital literacy. Such competencies are essential for students to succeed in courses which make use of dual-mode instruction. By promoting the confident, critical and creative use of digital technologies, the framework highlights the importance of equipping students with the requisite skills to navigate, and effectively engage in, digital learning spaces. While it highlights the value of self-assessment tools to evaluate digital competencies, it also acknowledges the limitations of self-reported data, which is

critical to understanding students' actual access and abilities (García-Vandewalle García et al., 2023). Furthermore, the adaptability of the DigCompEdu framework, as part of European Commission's broader Digital Competence Framework (DigComp), provides a valuable lens for examining digital literacy in diverse educational contexts, including the unique challenges confronting South African HEIs (Cabero-Almenara et al., 2020).

By offering a clear strategy, the DigCompEdu framework ensures that both lecturers and students are well prepared to make the best use of technology for blending learning and teaching, ultimately empowering both lecturers and students in the modern digital age. It also provides a valuable framework for any investigation into how lecturers can use digital technologies to effectively support their teaching. By focusing on the central tenets of this framework, like teaching and learning (TL), professional engagement (PE) and digital resources (DR), the researchers were in a better position to evaluate how the framework supports students in navigating blended learning environments.

The next section discusses the relevant literature that debates the importance of digital literacy for the success of blended learning.

LITERATURE REVIEW

Blended Learning as an Approach for Teaching and Learning

The rapid development of information technology has significantly transformed how teaching and learning occur, especially in respect of the adoption of new methodical approaches such as blended learning (Kunts, 2023). This hybrid teaching model combines various ways of transmitting the content of courses, including via online platforms, practical demonstrations and face-to-face (F2F) interactions. These create flexible and versatile learning environments (Bozkurt & Sharma, 2021; Choi & Park, 2022; Damanik, 2020; Qiu et al., 2022).

Blended learning has been proven to have a positive impact on students' learning outcomes, as it creates opportunities for increased engagement, improves problem-solving skills, and enhances mastery of module content (Han, 2024). The flexibility of dual-mode instruction aligns well with the competencies outlined in DigCompEdu, mainly because these competencies have the ability to empower students to improve their digital skills. These competencies help to address individual students' needs, preferences and schedules, enabling HEIs to accommodate diverse learner profiles. As emphasised by the DigCompEdu framework, the integration of technology into teaching and learning is about access but, more importantly, about ensuring the critical and creative use of digital tools to achieve meaningful learning outcomes (Cabero-Almenara et al., 2020; Suzer & Koc, 2024). The fact that blended learning allows for flexibility and is able to accommodate individual students' needs, preferences and schedules, enables HEIs to meet diverse needs. It highlights the principle that learning is not a singular event but rather an ongoing process which facilitates the achievement of the intended learning outcomes (Bidari & Hafeez, 2023; Wittmann & Olivier, 2021). This approach thus aligns with the student-focused objectives of HEIs (Adera, 2025).

According to Wittmann and Olivier (2021), blended learning encourages students to take ownership of their learning. This assists them in achieving the outcomes of the course or specific learning unit. The Covid-19 pandemic accelerated the adoption of hybrid learning, as HEIs around the world hastily sought alternative methods of ensuring that teaching and learning would continue uninterrupted (Adel & Dayan, 2021; Unesco,

2020; Yu et al., 2022). Many HEIs combined online and in-person learning to ensure that teaching and learning would continue as effectively as possible (Ashraf et al., 2021; Yu et al., 2022). During this time, the DigCompEdu framework became particularly relevant, as it offered a structured approach to coping with the challenges and opportunities presented by the move to digital learning and teaching. Furthermore, it emphasises the importance of professional engagement (PE) and reflective practices in ensuring that students and lecturers can adapt and succeed in such rapidly changing environments.

For blended learning to succeed, ongoing interaction between lecturers and students must continue. This approach cannot function successfully, without the hard work of lecturers (Adel & Dayan, 2021; Brenya & Wireko, 2021). To achieve this, various strategies can be used, such as maintaining regular communication and providing prompt, relevant feedback to student queries. Lecturers should also utilise a combination of technologies, such as video clips, audio recordings, practical problem-solving activities, discussion forums (both synchronous and asynchronous) and online lessons, to create a sense of connection between them and their students (Nortvig et al., 2018). Without this connection, students may feel disconnected from everyone (their lecturer, fellow students), as well as from the course itself. This can result in a lack of motivation to succeed and, ultimately, failure (Ashraf et al., 2021).

Blended learning offers a unique platform for enhancing students' problem-solving and critical thinking skills, by integrating technology with traditional teaching methods (Lu, 2021). Students learn in face-to-face meetings and participate in online learning activities, using a range of tools such as WhatsApp and Facebook (Yennita & Zukmadini, 2021). This approach encourages collaborative efforts, as students are exposed to real-world problems and tasks that require analytical and critical thinking. It not only improves their cognitive skills, but it also prepares them for the demands of a rapidly evolving digital world, by equipping them with essential critical thinking and problem-solving skills for academic and professional success (Lu, 2021). These strategies align with the DigCompEdu framework, as it emphasises the importance of empowering and encouraging students to participate actively in the course. Additionally, integrating tools such as simulations, case studies and collaborative online forums, as outlined in the DigCompEdu competencies on teaching and learning (TL), can create meaningful and successful interactions between students and lecturers.

Despite its benefits, efficient blended teaching and learning remains a challenge. Blended learning requires all stakeholders to be digitally literate (Brenya, 2024). Digital literacy, as mentioned, has been described as the awareness, attitude and capability of students to effectively utilise digital devices and resources (Peng & Yu, 2022). It involves the ability to locate, evaluate, manage and integrate such resources in the particular course of studies. It also includes the ability to analyse and synthesise information, create meaningful digital content, and communicate effectively across diverse platforms and contexts (Darlis & Sari, 2021).

According to Darlis and Sari (2021), digital literacy is essential for ensuring student success in blended learning courses. Students with strong digital skills are better equipped to adapt, engage and succeed in such settings (Bykova et al., 2021). Those students often deliver better academic performances than their fellow classmates who may be less digitally literate. This finding highlights the significance of digital literacy in the context of blended teaching and learning. The DigCompEdu framework was deemed valuable for this research, as it emphasises the development of digital competencies to support academic success.

Furthermore, the framework's versatility makes it a suitable model for addressing the digital literacy divide that exists among students from diverse communities.

Inequalities in digital access in the South African higher education landscape present significant challenges, particularly for students from underprivileged backgrounds (Mavutha & Mabotja, 2024). The limited availability of laptops, tablets or smartphones, and unstable internet connectivity, impede students' ability to succeed in blended learning contexts (Darlis & Sari, 2021). Addressing these disparities requires HEIs to invest in digital infrastructure, policies and training that prioritises equitable access to technological resources for all students. HEIs should also implement specific digital literacy training to empower students with the necessary skills to be able to succeed in technology-driven environments.

Next, the article focuses on the methodological approach adopted for this research.

METHODOLOGY

Research Design

The researchers chose a phenomenological approach to guide this particular study. Within this approach, the interpretivist paradigm was deemed particularly effective for capturing the actual viewpoints and lived experiences of the participating students, on blended learning and digital competencies. This resulted in clear and accurate data being collected and assisted the researchers in understanding the participants' perspectives. The approach allowed for a successful exploration of how digital literacy relates to the success of a hybrid learning approach.

Population Sample

The study participants were students from a specific college at the chosen HEI, all of whom were registered for modules that followed the blended learning approach. By sampling 41 participants, the researchers ensured a focused exploration of that cohort's perspectives on practices within blended learning setups, the importance of being digitally literate, and having easy access to adequate digital devices and connectivity. A homogenous purposeful sampling technique was employed to select participants who had direct experience and expertise in blended learning practices. This sampling method allows for a detailed examination of specific phenomena or perspectives, focusing on a clearly defined subgroup or population of interest (Obilor, 2023). Table 1 provides an overview of the population demographics.

Table 1
Participant demographics

Participants	Gender	Age	Year of study	Technology access	Participation in blended learning modules (Yes/No)
Participant 1	F	20	4	Yes	Yes
Participant 2	F	39	3	Yes	Yes
Participant 3	F	23	1	Yes	Yes
Participant 4	F	19	1	No	Yes
Participant 5	F	19	1	Yes	Yes
Participant 6	F	20	1	No	Yes
Participant 7	F	21	2	No	Yes
Participant 8	M	20	1	Yes	Yes
Participant 9	F	19	1	No	Yes
Participant 10	F	25	4	Yes	Yes
Participant 11	M	27	4	Yes	Yes
Participant 12	F	20	1	Yes	Yes
Participant 13	F	29	5	Yes	Yes
Participant 14	F	20	1	No	Yes
Participant 15	F	21	2	Yes	Yes
Participant 16	F	19	1	No	Yes
Participant 17	F	20	2	Yes	Yes
Participant 18	F	22	3	No	Yes
Participant 19	F	33	5	Yes	Yes
Participant 20	F	30	5	Yes	Yes
Participant 21	F	22	1	Yes	Yes

Participants	Gender	Age	Year of study	Technology access	Participation in blended learning modules (Yes/No)
Participant 22	M	29	5	Yes	Yes
Participant 23	F	23	1	Yes	Yes
Participant 24	F	20	1	Yes	Yes
Participant 25	F	24	4	No	Yes
Participant 26	F	23	3	Yes	Yes
Participant 27	M	32	5	Yes	Yes
Participant 28	F	24	2	No	No
Participant 29	F	20	1	Yes	Yes
Participant 30	F	19	1	Yes	Yes
Participant 31	F	37	4	No	Yes
Participant 32	F	19	1	Yes	Yes
Participant 33	F	19	1	Yes	Yes
Participant 34	F	25	4	No	Yes
Participant 35	M	22	2	No	Yes
Participant 36	F	27	5	Yes	Yes
Participant 37	F	19	1	Yes	Yes
Participant 38	M	20	1	Yes	Yes
Participant 39	M	22	2	Yes	Yes
Participant 40	M	19	1	No	Yes

Participants	Gender	Age	Year of study	Technology access	Participation in blended learning modules (Yes/No)
Participant 41	M	21	2	Yes	Yes

This table provides an overview of the demographic characteristics of the participating lecturers, including gender, years of teaching experience, academic rank, and involvement in blended learning initiatives.

Instrument

Semi-structured, open-ended questionnaires were used to gather insights from the participating students (refer to Appendix A). In addition, focus group interviews (refer to Appendix B) were conducted with specific students. This allowed the researchers to undertake an in-depth exploration of the participants' perceptions, beliefs and experiences concerning the importance of digital literacy and access, to ensure the success in their studies. The questions posed in the questionnaires and focus groups were carefully developed to investigate the participants' perspectives on this topic. One student piloted the questions by reviewing them carefully and providing initial responses. This gave the researchers valuable feedback on the clarity and relevance of the questions. This feedback was subsequently incorporated into the final questions. Both researchers checked that the final version of the questions was appropriate, before distributing the questionnaire to the remaining participants.

The researchers also employed document analysis as a complementary data-collection method. The module content materials, assignments and sites gave the researchers additional insights into the importance of digital literacy and access to blended learning modules. The combination of these data-collection methods provided the researchers with detailed and comprehensive data, which better positioned them to address the research questions.

Data Analysis

The researchers adopted thematic analysis to interpret the data collected through the questionnaires, focus groups and document analysis. The process began with the researchers immersing themselves in the data, by thoroughly reading and re-reading the participants' responses. Thorough and meticulous notes were taken, while the researchers' reflections, recorded during the document analysis, were also carefully documented. This first essential step enabled the researchers to obtain a comprehensive understanding of the data collected. From there, they identified relevant information which was coded to highlight significant themes and patterns related to the student participants' perspectives on dual-mode instruction and digital literacy in higher education.

The identified codes were systematically organised into broader themes, which were then refined and revised to ensure that they accurately represented the data. The final themes had to be analysed and interpreted to ensure that they aligned with the study's research questions and objectives. These are discussed in the results section.

Trustworthiness

The researchers employed a number of strategies to maintain the accuracy and reliability of the study. A member-checking process (also referred to as respondent validation) was conducted with selected participants, to ensure the accuracy and credibility of the results. The data obtained from the questionnaires and document analysis were cross-checked to ensure consistency and enhance the reliability of the results. This enabled the data to be triangulated and allowed the researchers to validate their findings. It also demonstrated that the use of questionnaires, focus group interviews and document analysis together provide a reliable and consistent understanding of the research topic.

Ethics

Ethical guidelines were adhered to throughout the research process. All participants provided informed consent. The researchers undertook to protect their confidentiality and anonymity through the use of anonymised participant labels (P1, P2), and the omission of any identifying details in the discussion of the research findings. The participants were informed that their involvement in the study was voluntary, and that they had the option to withdraw at any stage if they no longer wished to participate in the research, without fear of penalty. The participants signed the consent to participate and publish the results from this study in the ethical guidelines of the review committee.

Ethical clearance for this research project was obtained from Unisa's College of Education Research Ethics Committee (CEDU REC). This clearance enables the researchers to conduct research within higher education institutions, involving students and lecturers as participants. The researcher agreed to abide by all the stipulations in the ethical clearance and inform the committee if any ethical issues arose during the research process.

The section which follows, presents a comprehensive analysis of the research findings.

RESEARCH FINDINGS

Students' Knowledge of Blended Learning

The responses to the interview questions and questionnaires revealed that the participants who were familiar with, and had experience of, blended learning, were able to answer the questions more confidently. However, the extent of their understanding differed. Those who had access to well-structured blended learning courses and were digitally competent were much more positive and could clearly explain the benefits and effectiveness of the approach. As P7 stated:

Blended learning is when you do a mix of online work and in-person classes. I've found it works really well, especially when the course is set up right. Like in one of my classes, we had online discussions that helped me really understand the material, and then in class, we could take that and apply it to real situations. It's all about having a good balance between online and face-to-face, as long as they're linked well.

Importantly, the researchers noted that some participants experienced challenges in understanding how the on- and offline elements were integrated into their teaching and learning. In this respect, P16 stated:

Blended learning is a mix of online and classroom teaching. I think it's a good way to use both styles of learning, but I don't always understand how the online part fits into what we do in class. Sometimes it feels like the online work is separate, and I'm not sure how it's supposed to help me with the face-to-face lessons.

P2 expressed this view:

For me, blended learning just means we have more flexibility with when and where to study, but it doesn't always feel as effective [as] face-to-face lectures, when the lecturer is in front of the class.

From the document analysis, it became evident that those courses which contained well-structured hybrid learning study notes and provided clear explanations of the integration of online and face-to-face components, were much more successful, specifically in their attainment of the course outcomes and assessment criteria. Most of the modules chosen for this research undertaking included detailed descriptions of how online discussions, assignments and resources were linked to face-to-face lessons. Certain inconsistencies were, however, noted in certain courses, where the on- and offline components of the study material seemed disjointed. These observations aligned with the participants' comments about finding it difficult to understand the relationship between online activities and classroom learning.

Students' Perspectives on the Influence Digital Literacy has on the Success of Blended Learning

All the participants interviewed, highlighted the importance of digital literacy in shaping their success in a blended learning environment. Students with higher levels of digital competence reported that it was easy for them to engage in the online components of the course, and that this improved their academic performance. As P11 commented:

After I attended a computer course, my digital literacy definitely improved, which made it much easier for me to navigate the online platforms, follow what had to be done, and complete everything on time.

Conversely, those whose digital skills were limited, faced significant challenges. P14 attested to that fact:

I spend more time trying to understand the tools than doing the actual learning.

The document analysis clearly showed that those courses which offered digital literacy support, such as introductory tutorials or computer training, saw higher student success rates, since the students felt more confident about their level of prowess. Modules that included step-by-step guides for using the online platforms, and explanations of the importance of participating in the course's face-to-face and online components, made it much easier for students to understand. Notably, in modules lacking such support, participants with limited digital skills reported experiencing numerous challenges and feeling overwhelmed. This aligns with the participants' responses to the researchers' questions in which those deemed digitally competent reportedly found it easy to navigate through the course. In contrast, those lacking such competence admitted to spending hours trying to familiarise themselves with the necessary online applications, rather than focusing on the course content.

Students' Perspectives on Digital Resource Challenges in Blended Learning

From all the participants' responses to the questionnaires and interview questions, the researchers became aware of the continued challenges students experienced in respect of digital access and infrastructure. Poor internet connectivity and unreliable platforms were repeated themes. Such impediments reportedly affected most participants, but particularly those from rural or low-income backgrounds. For instance, P14 stated:

Sometimes, I can't even access the study material because the internet at home is unreliable, and data is too expensive to buy, especially at the end of the month.

P18 concurred, adding:

It's frustrating when I want to join a live Teams lesson, but the connection keeps dropping.

P36 highlighted the difficulties of accessing reliable technological resources closer to home:

I have to travel two hours to get to the university's computer labs because I don't have a computer or stable internet at home. By the time I get there, I'm already tired, it's late and it's hard to concentrate.

Conversely, those participants who lived closer to the HEI, and those who lived in urban areas with better infrastructure, reported fewer difficulties in this respect. P16 mentioned:

Having regular access to the university's computer labs helps me stay on track as I can easily access the module site and there is always someone around to help if there are any problems.

P5 noted:

I'm lucky to have fast internet and a laptop at home, so I can join all the online lessons and finish assignments without worrying about my connection.

The researchers' analysis of a range of HEI documents highlighted significant discrepancies in equitable access to digital resources. The documents identified issues such as server downtime, the limited availability of computer labs, and inconsistent platform performance in remote areas. Reports from IT support departments further showed that there were no specific strategies in place, to address these challenges in rural and low-income regions. Such inequalities intensified the digital divide. While numerous quarterly reports issued by the HEI commended urban campuses for their adequate support of students, there was a noticeable lack of recommendations to extend similar benefits to more disadvantaged areas. These findings closely align with the participants' experiences, particularly their struggles with unreliable internet, high data costs and institutional support.

Students' Perspectives on Support Mechanisms for Success in Blended Learning Contexts

The interviewees identified specific support mechanisms that could ensure their success in hybrid learning courses. Their suggestions included workshops on platform usage, improved communication, and enhanced

lecturer involvement. P37 opined:

I think we need to have workshops on how to use Moodle. This would make a huge difference for me, especially [given] that I am not so good with technology. Sometimes I feel lost, because I don't know how to go through everything properly.

P29 agreed, adding:

Specific training would be so helpful. I think we need to have training that is incorporated in the module, but separate training would also be great.

P18 added a suggestion for working together in groups:

A buddy system or study groups could be helpful. Learning from other students who know and understand blended learning can help a lot and can save a lot of time.

The role of the lecturers was repeatedly discussed as an essential factor for successful learning via a blended approach. According to the participants, the effectiveness and continuous visibility of the lecturers was critical. They stressed that lecturers had to offer detailed guidance and feedback. In this respect, P24 shared:

When a lecturer posts clear notes and explanations on what to expect in the course and keeps reminding us of due dates, this makes a huge difference. Otherwise, it feels like I am all on my own, with no one to turn to.

P2 also stressed the importance of lecturers being accessible and providing prompt responses:

It really helps when lecturers explain things clearly and are available to answer questions. Sometimes, you don't even know what to ask because everything feels overwhelming.

P38 opined:

It really helps me in courses that I feel everyone is working together and then I can discuss my challenges with the lecturer and the other students.

The document analysis highlighted the critical importance of students having access to a wide range of digital support structures, in order to facilitate learning. The HEI documents that the researchers analysed, such as course guidelines and policies, emphasised the need for clear communication, detailed introductory tutorials, and IT staff support in improving student experiences. However, the researchers noted that many modules lacked the necessary support strategies, despite the policies acknowledging that it was essential to ensure digital access for students, and to offer training in using the HEI's LMS. There was a noticeable lack of actual strategies to address the gap in rural areas.

DISCUSSION OF RESEARCH FINDINGS

The findings revealed that digital literacy and access to technology are critical in ensuring students' success in blended learning courses. As highlighted in the literature, digital literacy goes beyond the ability to read and write; it encompasses skills such as information and data literacy, problem solving, communication and

collaboration in digital spaces (Bykova et al., 2021; Mokhtari, 2023). The findings confirmed that those participants with higher levels of digital literacy were more efficient in engaging with the course content, actively participating in online discussions, and completing assignments successfully. This was because they were more confident and efficient when navigating digital platforms. This supports the findings reported by Alshahrani (2021), who investigated the importance of digital competencies for student success at HEIs which have adopted the dual-mode instruction model.

Access to technology – particularly reliable internet connectivity and suitable devices – emerged as a significant challenge for many of the study participants. Some reported experiencing difficulties accessing course materials and engaging in synchronous learning activities, either because internet connectivity was erratic, or they did not own suitable devices. This links to the literature, which highlights that disparities in digital access can lead to differences in academic performance and engagement (Darlis & Sari, 2021).

The findings of this study revealed that those participants who had easy digital access and a high level of digital literacy were much more confident and successful in navigating online learning platforms and engaging with the online content of the course than their counterparts. This is consistent with the findings of scholars such as Gunes (2019) and Islam et al. (2022), whose studies showed that digital competencies are associated with improved and more successful student engagement and academic performance in blended learning courses. The participants in the present study pointed out that their ability to use online resources, collaborate with peers via digital tools and participate in discussions, was dependent on their digital prowess. This correlates with the study of García-Vandewalle García et al. (2023), who investigated the importance of teaching digital literacy as part of the curriculum, to benefit all students who opted to study at a distance.

A significant barrier identified in this study was that inadequate technological infrastructure made blended learning modules less effective and accessible, thereby impeding the participants' ability to fully engage with the course content and complete activities efficiently. This is consistent with the findings of Ashfaq (2023) and Wittmann and Olivier (2021), who highlight that a lack of digital access and deficient infrastructure limited effective participation in blended learning. Wittmann and Olivier (2021) also concede that digital access remains uneven in many regions. The participants in the current study experienced notable challenges dealing with frequent technical issues, such as slow internet speeds, and only having access to devices that were either outdated or inadequate for their needs.

Furthermore, this research discovered that many participants felt unprepared to engage fully in blended learning, mainly as they had received insufficient training in digital literacy. This lack of preparation supports the concerns discussed by Suzer and Koc (2024), who emphasise the need for relevant professional development for students and lecturers alike, to improve their digital competencies. The participants expressed a need for more comprehensive digital literacy programmes, both as part of their actual modules and as separate, supportive initiatives, to help them develop the skills needed to succeed academically.

In addition, the participants felt it was essential that meaningful and relevant connections were made through online platforms. This aligns with the findings of Brenya and Wireko (2021), whose research stresses that ongoing interaction between lecturers and students is imperative for maintaining student motivation and achievement. This was confirmed by P38, who expressed the exact same sentiment. This finding made it clear to the researchers how significant it is for lecturers to be continually present and 'visible' (online

presence) in hybrid learning courses. This can be achieved if lecturers always provide prompt feedback and use various digital tools and offer detailed guidance on their usefulness for the course.

Limitations of this Research

- The study involved only students from one colleage within a single HEI, which possibly limits the generalisability of the findings to other contexts.
- The research focused on a relatively small sample of students and may not fully represent the diverse experiences and challenges facing the wider student population involved in blended learning modules at HEIs.
- The full impact of digital competencies and access on students' long-term academic and professional success in blended learning environments may only become apparent once these students enter the workforce over time.
- The research focused mainly on digital literacy and access, without considering other potential factors (e.g., pedagogical practices, actual course content) that could have an impact on the success of hybrid models.

SUMMARY AND CONCLUSION

The purpose of this research was to investigate students' perspectives on how digital literacy and access influence the success of blended learning initiatives at a particular HEI. The researchers' insights were based on the actual experiences of the participating students. The theoretical framework chosen to guide this research was the DigCompEdu framework. Forty-one students from a specific college were selected to assess their experiences with blended learning, with a specific focus on digital access and literacy. The data-collection instruments chosen for this research were semi-structured focus group interviews, questionnaires and document analysis, which allowed for data triangulation. Key themes emerged from the collected data, and the researchers correlated these with the findings stemming from the literature review.

The significance of this research is that it highlights digital literacy as a crucial skill for student success in blended learning environments. Students with higher levels of digital literacy are better equipped to engage with the actual course content, participate in discussions, and collaborate with their lecturers and peers than their less literate counterparts. This study expands the knowledge of this evolving field by offering insights into the imperative for digital access and literacy as key competencies in blended learning milieus. It highlights the need for explicit interventions to improve technological infrastructure, digital literacy training, and internet connectivity. The findings highlight the importance of ensuring that HEI environments are inclusive and supportive, so that the specific needs of all students are met.

Recommendations for Future Research

- To assess the differences between colleges and HEIs, in respect of digital competencies and access, a future study could include participants from different tertiary institutions, even internationally.
- An investigation should be undertaken to reveal the specific training and support needs of students and lecturers alike, to enhance digital literacy and ensure equitable access to resources in blended learning settings.

- A study that assesses the effectiveness of blended learning approaches in primary and secondary schools will be helpful for understanding how digital literacy and access influence younger learners' scholastic success.
- An analysis of lecturers' perspectives on the critical role of digital literacy and access in blended learning, and how they perceive students' preparedness in these areas, might prove useful.
- To evaluate the potential for enhancing student engagement and outcomes, a future study might explore the role of novel learning approaches, such as gamification and artificial intelligence, when adopted in a blended learning context.
- An exploration into the long-term effects of digital literacy and access on student success in a blended learning scenario would help to mitigate the limitations of short-term studies that might not capture the full extent of the impact thereof.

The above research shows that the ever-evolving terrain of teaching and learning must keep abreast of the latest developments, such as the importance of digital competence to help students who choose a blended approach to their studies.

Declarations

Author Contribution Statement

DS and SM collaborated throughout the study. DS took primary responsibility for framing the literature review and drafting the initial review, while SM strengthened the review with additional sources and refined the focus. In the data collection phase, DS designed the instruments and coordinated participant engagement. Both DS and SM carried out most of the fieldwork. Both authors contributed to data analysis. In this regard, DS concentrated on coding and theme development, while SM focused on assisting in interpreting findings in relation to existing literature. The manuscript was revised jointly, and both authors reviewed and approved the final version, taking responsibility for the integrity of the work.

DATA AVAILABILITY

As a result of the confidentiality of the data collected and to protect the participant’s views, it has been decided that the data will only be available if requested by the author.

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ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The research was ethically approved by the ethics review committee of Unisa’s College of Education Research Ethics Committee (CEDU REC). The study was conducted in accordance with the guidelines governing research involving human participants, as outlined by this review committee.

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DISCLOSURE STATEMENT

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. The research was conducted independently and objectively, and the authors have no affiliations that could be perceived as potential conflicts of interest.

CLINICAL TRIAL NUMBER:

Not applicable.

CONSENT TO PUBLISH

All authors hereby consent to the publication of this manuscript in *Discover Education*. The authors confirm that the manuscript is original, has not been published elsewhere in any form, and is not currently under consideration by another journal. Each author has contributed substantially to the work and has approved the final version of the manuscript for submission.

CONSENT TO PARTICIPATE

The researcher ensured ethical integrity for this research by obtaining informed consent from all participants. All participants were provided with detailed information about the study, including its purpose, procedures, potential risks, and benefits. They were informed that participation was entirely voluntary and that they could withdraw from the study at any time without penalty. Written informed consent was obtained prior to data collection.

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