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NAVIGATING DIGITAL TRANSFORMATION: CHALLENGES FACED BY PRESERVICE TEACHERS IN HIGHER EDUCATION

Thuthukile Jita¹ and Mamosa Thaanyane^{2*}

¹University of the Free State

²University of the Free State

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Corresponding Author: Mamosa Thaanyane
(Thaanyane.M@ufs.ac.za)

ABSTRACT

The integration of digital technologies has gained momentum during and after the COVID-19 pandemic, prompting universities to adopt blended and online learning platforms. Literature shows a growing push towards using learning management systems (LMSs), digital content delivery, and virtual collaboration tools to enhance flexibility, accessibility, and learner engagement. Several interrelated trends that have also emerged as central to this transformation are not only reshaping educational delivery but also influencing the structures, roles, and objectives of higher education institutions. Despite the promising trends, several persistent challenges have been identified that higher education institutions in Lesotho are still facing in effectively adopting and sustaining these trends. Hence, the study aimed to explore challenges brought about by digital trends that transform teaching and learning in higher education in Lesotho. The study focuses on identifying systemic and institutional barriers to transformation while providing insights that can inform policy development, academic practice, and capacity-building efforts in higher education. This is a qualitative study with multiple case studies of higher education institutions. The study population consisted of three universities and a sample of two students from each institution purposively selected to be part of the study. Semi-structured interviews were conducted with the students at a time convenient to them at their own institution. Data were transcribed immediately and analysed, yielding five challenges as themes for discussion. Ethical clearance was also obtained, and participants were informed about the purpose of the study and their rights. The following challenges emerged as themes from the data analysis: digital divide and inequalities; pedagogical readiness and confidence; infrastructure and costs constraints; access to device and connectivity; support and effective dimensions. The findings provide a new understanding of the challenges brought about by digital trends while transforming teaching and learning in higher education.

KEYWORDS: Digital Trends; Equity, Preservice Teachers; Higher Education, Digital Divide.

1. INTRODUCTION

The rapid advancements in digital technologies have transformed how education is delivered and experienced (Bozkurt et al., 2020; OECD, 2025). These advancements have foregrounded the intensive use of learning management systems (LMSs), artificial intelligence, and blended learning models that personalise learning experiences and extend access beyond traditional classroom boundaries (Mnisi et al., 2024; Mhlanga & Moloi, 2020). This has also given rise to learner-centred pedagogies, competency-based education, and the increasing relevance of inclusive and culturally responsive teaching (Nkhi et al., 2023; Seotsanyana, 2015; Zou et al., 2025). The developments also include shifting the function of the lecturer from knowledge transmitter to that of a facilitator of learning (Maringe and Ojo, 2017; Thomas et al., 2025). It is also regarded as a new type of professional development that focuses on digital fluency, reflective practices, and pedagogies that preservice teachers must develop (Chere-Masopha, 2022). Literature shows that there is a growing push towards using digital tools, where digital content delivery methods and virtual collaboration tools are being adopted to enhance flexibility, accessibility, and learner engagement in higher education spaces (Zou et al., 2025). As such, the increasing integration of digital content delivery methods and virtual collaboration tools in higher education are transforming the learning experience by enhancing flexibility, accessibility, and engagement. These digital platforms allow preservice teachers to access learning materials synchronously and collaborate virtually, thus accommodating diverse schedules and geographical locations (Nketekete and Mojalefa, 2021). Such tools also foster inclusivity by providing alternative formats and accessible resources that support varied needs (Chere-Masopha, 2022). Moreover, interactive features embedded in digital environments can increase student participation and motivation, while enabling global connections and lifelong learning opportunities (Nketekete and Mojalefa, 2021; Thomas et al., 2025). However, these advancements also raise challenges related to the digital divide, quality of pedagogy, and learner well-being, underscoring the need for institutions to implement digital strategies thoughtfully to maximise educational outcomes (Mofana and Nkhi, 2024; Muchith, 2023).

Studies have shown that inclusivity has also emerged as a guiding principle in the transformation of higher education. Higher education institutions need to create learning environments that are accessible and responsive to the needs of all students,

including those with disabilities and those from disadvantaged socio-economic backgrounds and remote or underserved communities (Crawford et al., 2020; Kurata et al., 2024; Ngcobo and Makumane, 2023). Research has revealed that institutional policies and teaching practices are gradually evolving to reflect these commitments, but substantial work remains to be done in bridging equity gaps and ensuring consistent implementation (Nketekete and Mojalefa, 2021; Nkhi et al., 2023). Despite the increasing global emphasis on transformative teaching and learning practices, HEIs are still facing significant challenges in effectively adopting and sustaining these trends. Hence, the study aimed to explore key challenges brought about by digital trends that are transforming teaching and learning in the context of HEIs. It aimed to provide a nuanced understanding of the challenges facing HEIs as they navigate this transformation, and to offer evidence-based recommendations that can strengthen teaching and learning in ways that are inclusive, sustainable, and future-ready (Alenezi et al., 2023). Therefore, understanding these digital trends is vital to HEIs in Lesotho as they can play a key role in national development. Addressing these barriers can transform higher education, expand access, improve quality, and enhance relevance in developing HEI programmes.

The following research questions guided the study:

1. What challenges do academic staff and students encounter in the adoption of digital trends?
2. What strategies can be employed to strengthen and sustain transformative teaching and learning practices in Lesotho's higher education sector?

2. LITERATURE REVIEW

The transformation of teaching and learning in higher education has been the subject of extensive global and regional scholarship. In recent years, several interrelated trends have emerged as central to this transformation: digitalisation, learner-centred pedagogy, competency-based education, and inclusive teaching (Mnisi, 2024; Kolo and Molise, 2023). These trends not only transform educational delivery but also influence the structures, roles, and objectives of HEIs. The digitalisation of education has gained significant momentum, especially after the COVID-19 pandemic, which forced institutions worldwide to transit rapidly to online and hybrid learning models (Bozkurt et al., 2020). In sub-Saharan Africa, this shift has highlighted not only disparities

in digital infrastructure and access but also innovation in content delivery and assessment methods (Maringe and Ojo, 2021; Ravi et al., 2025). Research has shown that universities have begun integrating LMSs and mobile learning tools, though challenges remain in connectivity, device availability, and digital literacy (Alenezi et al., 2023; Mhlanga & Moloi, 2022). This means that preservice teachers could not succeed in a valuable programme without digital literacy since locating information, producing content, even communicating with others cannot effectively happen if this challenge is not solved (Chere-Masopha, 2022). Despite these constraints, there is increasing acknowledgment of the potential of educational technology to support lifelong learning, increase access, and enhance academic performance when properly supported.

Consequently, preservice teachers often struggle to effectively integrate digital technologies into their pedagogical practices (Crawford et al., 2020). Although most of them are digital natives, their familiarity with technology tends to be oriented towards social and personal use rather than instructional design. They subsequently encounter difficulties in selecting appropriate tools aligned with learning outcomes, designing technology-enhanced lesson plans that promote active and inclusive learning, and balancing digital and traditional methods to ensure pedagogical coherence. The lack of adequate staff training and confidence in digital pedagogy has implications for the quality of teaching and learning experiences (Kirkwood and Price, 2014). When preservice teachers are not sufficiently equipped to design engaging and interactive online content, digital platforms are used primarily for content delivery rather than transformative learning. This limits preservice teachers' exposure to innovative pedagogical approaches, reducing their readiness to integrate technology effectively into their future classrooms (Gudmundsdottir and Hatlevik, 2018). The implication is that sustained and systematic professional development in digital pedagogy is essential for fostering competent, adaptive, and digitally literate teacher educators. This gap reveals a need for more structured digital pedagogy training within teacher education curricula.

Although strong institutional frameworks are necessary for digital transformation, many colleges are still undergoing this process. According to studies, preservice teachers receive insufficient institutional support for technical assistance and troubleshooting. Effective learning is hampered by antiquated and unsuitable LMSs. Additionally,

preservice teachers have no opportunity to experiment directly with new technologies. Weak ICT infrastructure and high data costs pose a major threat to the reliability and scalability of digital learning systems (Mohammed et al., 2024; UNESCO, 2022). Unstable Internet connectivity and frequent power interruptions undermine learning continuity and the credibility of online programmes. This demonstrates the lack of infrastructure and institutional support for preservice teachers. Over time, such instability can deter the growth of open and distance e-learning (ODEL) initiatives, particularly in developing contexts. Consequently, HEIs must embed digital infrastructure development and maintenance into their strategic and financial planning to ensure that digital transformation efforts are technically and economically sustainable (Laurillard, 2021). Without sufficient infrastructure, digital transformation can feel more like an administrative burden than an educational advancement.

Even though the transition to digital teaching has the potential to compromise the emerging sense of professional identity of preservice teachers, many of them are concerned about their capacity to effectively manage virtual classrooms in the future. Additionally, there is conflict between digital innovation and conventional educational values. These insecurities can lead to resistance towards digital practices or reluctance to adopt new instructional technologies. The emotional and psychological strain associated with digital learning environments underscores the importance of holistic student support (Bozkurt et al., 2020). The feelings of isolation, anxiety, and disengagement can hinder motivation and academic success, particularly for students transitioning from traditional to online learning. For preservice teachers, such experiences may also have an impact on the development of collaborative and reflective professional identities. The implication is that digital transformation must integrate effective and psychosocial support mechanisms, such as online counselling, mentorship, and peer learning communities, to ensure that preservice teachers thrive both academically and emotionally (Hodges et al., 2020).

Another challenge relates to assessment and feedback to preservice teachers, as digital transformation has changed how learning is assessed, creating confusion and inconsistency in the grading that lecturers use. Preservice teachers often express concern over ambiguity in evaluating their digital competencies because it is difficult to ensure academic integrity in online assessments (Götl et al.,

2024). There is also a lack of immediate, personalised feedback in digital environments, and preservice teachers have to wait for it to be uploaded on to their platforms before they can access it (Ngcobo and Makumane, 2022; Newfield, 2014). These issues hinder their confidence in designing fair and meaningful digital assessments in their future teaching practice. The continuous adaptation to new technologies contributes to stress, anxiety, and cognitive overload among preservice teachers (Mnisi, 2024; Mhlanga and Moloi, 2022; Götl et al., 2024). They must juggle multiple platforms, learn new tools each semester, and navigate complex digital ecosystems. This technostress diminishes their motivation and engagement in online learning, creating feelings of isolation in virtual learning contexts, and this impacts negatively on their academic performance and well-being. The emotional and psychological strain associated with digital learning environments underscores the importance of holistic student support (Bozkurt et al., 2020). Feelings of isolation, anxiety, and disengagement can hinder motivation and academic success, particularly for students transitioning from traditional to online learning. For preservice teachers, such experiences may also have an impact on the development of collaborative and reflective professional identities (Nkhi et al., 2025). This implies that digital transformation must integrate effective and psychosocial support mechanisms such as online counselling, mentorship, and peer learning communities to ensure that students thrive both academically and emotionally (Hodges et al., 2020).

The shift from teacher- to learner-centred pedagogy is another significant trend. In higher education, these approaches manifest through flipped classrooms, problem-based learning (PBL), and inquiry-based models that foster critical thinking and autonomy. However, in many African contexts, including Lesotho, the implementation of such methods faces systemic barriers, including large class sizes, lack of instructional resources, and insufficient training of lecturers in active learning strategies (Matlosa, 2020). Nonetheless, some institutions have begun to pilot interactive teaching approaches, with promising feedback from both students and academic staff. Collectively, these challenges highlight that digital transformation is not solely a technological process but a complex socio-educational reform that requires alignment among policy, pedagogy, and infrastructure (Selwyn, 2016). For preservice teacher education, the implications are particularly significant, as the next generation of teachers must be prepared not only to use digital

tools but also to lead innovation and promote digital inclusion in their own professional contexts. A holistic, system-level approach combining equity, quality assurance, staff development, and sustainability is therefore essential for realising the transformative potential of digital education. The digital transformation of higher education presupposes universal access to technology, yet digital inequities persist.

3. THEORETICAL FRAMEWORK

The study draws from Transformational Learning Theory developed by Jack Mezirow in 1978. Mezirow believed that learners can adjust their thinking based on new information. Mezirow's initial research led him to theorise that adults do not apply their old understanding to new situations; instead, they find a need to look at new perspectives to gain a new understanding of things as they change. Mezirow believed that learners have important teaching and learning opportunities that are connected to their past experiences and that critical reflection and review could lead to a transformation of their understanding. He believed that transformation occurs when people face a disorienting dilemma, which forces them to reconsider their beliefs in a way that will fit this new experience into the rest of their worldview. This often happens through critical reflection in the context of dialogue with other people. According to Mezirow, adult education and adult learning are key in this theory, as children often do not have the same kind of transformation with their learning experiences. Mezirow found that adult learning involves taking the very things we believed and thought as a child and letting critical reflection and teaching impact the transformation to what we should believe and understand now. Mezirow's theory has developed into a larger idea that our worldview changes the more we learn, helping us grasp new concepts and ideas. This theory is relevant to the current study as it offers a valuable lens for navigating challenges brought about by digital trends that are transforming teaching and learning in higher education. Digital pedagogy frequently serves as this disorienting dilemma in the context of higher education. Many preservice teachers enter teacher training with limited exposure to technology-rich learning environments, and often perceive teaching as a traditional, teacher-centred activity. The introduction of digital tools, such as LMSs, digital assessment platforms, and communication tools, requires them to reassess not only how they teach but also how they endure throughout the transformation process.

4. METHODOLOGY

This study adopted a qualitative research design, employing a multiple-case-study approach to gain in-depth insights into teaching and learning practices across selected HEIs in Lesotho (Edmond and Kennedy, 2017). The study sheds light on other similar cases and hence provides a level of generalisation that made the case study approach more relevant to the study. A qualitative approach was appropriate for capturing the nuanced perspectives of challenges that preservice teachers face due to digital transformation in higher education, experiences, and institutional dynamics, which quantitative methods may overlook. The study purposively sampled three HEIs in Lesotho, representing a mix of public and private universities (O'Leary, 2017). From each institution, two final-year preservice teachers were selected to participate, one male and one female having expertise in this area for in-depth insights. Data were collected using semi-structured interviews lasting 30–45 minutes each (Saunders et al., 2023) to explore challenges related to transformative teaching and learning in higher education. Participants were informed about the aim of the study and that participation was voluntary, and there were no incentives for participating (Creswell and Creswell, 2023). Pseudonyms were used to protect the identities of the participants. Transcription of data was done immediately after collection, while the data were still fresh (Janson and Glenwick, 2016). Codes were assigned to themes that were often recurring, and the final themes were identified (Braun and Clarke, 2024). Data were analysed using thematic analysis, guided by the research questions and the theoretical framework. The analysis involved coding transcripts, identifying recurring patterns, and mapping transformative learning constructs (Creswell and Creswell, 2023). Ethical approval was obtained from the relevant university ethics committees. Participants provided informed consent, and confidentiality was maintained through the anonymisation of data (Tracy, 2023). Participants were informed that participation was voluntary and that they were free to withdraw at any stage (Creswell and Creswell, 2023).

4.1. Findings And Discussions

Data analysis revealed that the challenges associated with digital transformation in higher education extend beyond technological limitations to include deep-seated social, pedagogical, and institutional issues. From the perspective of the preservice teachers, these challenges have far-

reaching implications for equity, quality, and sustainability within the higher education sector. The subsequent discussion outlines the key implications corresponding to the major challenges identified.

4.2. Digital Divide and Inequalities

The rural-urban, high-low-income differentiation in network or Internet access, device ownership, and reliable electricity is a recurring theme. Digital divide refers to the gap existing between those who have access to these modern technologies and internet and those who do not, causing inequalities among preservice teachers. The digital transformation of higher education is seen as presupposing universal access to technology, yet digital inequities persist. The participating preservice teachers from rural or low-income backgrounds frequently reported limited access to reliable Internet, modern devices, or licensed educational software. The participants consistently identified disparities in access to digital resources across socio-economic and geographical contexts. Those from rural and low-income backgrounds faced limited Internet connectivity, unreliable electricity, and a lack of personal devices, constraining participation in online and blended learning. These inequalities risk reinforcing existing educational and social divides, where preservice teachers with greater digital access enjoy better learning opportunities and academic outcomes. These problematic frames impede transformation, as Mezirow (1978) indicated in his theory. These inequalities also threaten to reproduce and worsen existing social inequalities in access to higher education quality, worsening the existing educational and social inequalities rather than mitigating them (van Dijk, 2020). This concurs with an OECD report (2021) which shows that students from low-income or rural backgrounds continue to experience limited access to reliable Internet, devices, and electricity, constraining their participation in online learning environments. This also agrees with Thomas et al. (2025), an AUC report (2015), and de Wit and Altbach (2025) that transformation portrays the existence of 21st century, and if higher education is not transformed, preservice teachers will not develop the 21st century skills demanded in the workplace. Such disparities reduce opportunities for meaningful engagement and learning continuity, potentially widening achievement gaps between privileged and marginalised students. Institutions must therefore adopt inclusive digital access policies that prioritise infrastructure investment, device provision, and equitable connectivity to ensure that all students/preservice teachers benefit from digital

learning advancements.

4.3. Pedagogical Readiness and Confidence

Participants acknowledged having gained exposure to digital tools but expressed limited confidence in integrating these tools into future classroom practice. Data analysis revealed that they felt unconfident in using these tools even though they had started using them in their teaching. This means that they had learned how to use digital tools but felt incompetent in integrating them pedagogically. The findings further show that many participants struggled to effectively integrate technology into lesson design, classroom management, and assessment. This is highlighted by Oza and Ozarslan (2025), who maintained that a lack of digital pedagogical practice and support hinders preservice teachers from feeling confident enough to use digital tools in their practices. This challenge does not only lie in technical skill but also in the pedagogical reasoning required to select, adapt, and evaluate digital tools for meaningful learning outcomes. This implies a gap in preservice teacher preparation and a need for more practical training and not just theory, which will allow for hands-on preparation in digital lesson design for them to gain confidence to teach in these environments. This reflects broader critiques of higher education, where digital literacy training often focuses on basic ICT skills rather than pedagogical integration. These are views that lead to what transformation is according to Mezirow (1978). This also highlights a gap between basic ICT skills training and the pedagogical integration of technology. These findings are in line with literature on higher education contexts showing that training often emphasises digital literacy without sufficient focus on technology-enhanced pedagogy (CHE, 2020). These are some of the gaps that Zhanda et al. (2023) identified as constraints in the transformation of higher education. Therefore, autonomy is discouraged as it affects the success of digital transformation.

4.4. Infrastructure and cost constraints

Inadequate infrastructure was cited by participants as a major impediment to effective digital learning. The findings reveal that high data costs, poor Internet speeds, and frequent power outages disrupted teaching and assessment processes. Participants further highlighted that institutions often lacked sufficient ICT facilities or reliable learning platforms, leaving both staff and students dependent on personal devices and mobile data. The persistence of inadequate infrastructure

and high data costs widens the digital divide between urban and rural or affluent and under-resourced students. This is supported by Mtebe and Raisamo (2014) and Semlambo et al. (2022), who explained that threats such as these become barriers and weaken policy and teachers' practices, with preservice teachers becoming victims as a result. These barriers also undermine the transformative goal of inclusiveness and equitable access to higher education, which is the central principle of digital transformation. The participants emphasised that these infrastructural challenges disadvantage those studying in remote areas particularly, limiting their participation in the global trend of data-driven decision-making and digital power in higher education. Inadequate infrastructure and high data costs not only hinder day-to-day digital learning but also threaten the transformative potential of higher education. Without addressing these foundational barriers, trends such as digital inclusion, lifelong learning, and innovative pedagogy risk remaining aspirational rather than achievable. This inconsistency affects the quality and creativity of digital learning experiences offered to preservice teachers.

4.5. Access to devices and connectivity

The participating preservice teachers' responses reveal widespread dependence on smartphones as their primary learning device. Access to devices mean having tools such laptops and or smartphones to access internet. While smartphones allow for participation in WhatsApp groups and access to Google Classroom or similar platforms, they were described as inadequate for writing assignments or engaging in more complex digital tasks. As Seotsanyana (2015) indicated, preservice teachers are not able to engage in online learning and hence develop attitudes towards LMSs because they feel unprepared. Connectivity also emerged as an equally pressing concern. Connectivity means the state of having enough data or Wi-Fi to connect to internet using these devices. Participating preservice teachers from rural and mountainous regions highlighted the difficulty of accessing reliable Internet, reporting that they often travelled to urban centres to download reading materials or submit their assignments. This disadvantage makes them feel demotivated and challenged, widening the gap between those who have and those who do not have connections, enforcing the digital divide, as claimed by Nkhi et al. (2023). These challenges align with national data showing that Internet penetration in Lesotho remains uneven and significantly lower in rural areas (World

Bank, 2025). The findings clearly point to a rural-urban digital divide that continues to shape students' educational opportunities in higher education in Lesotho.

4.6. Support and affective dimensions

Beyond technical and academic issues, emotional and psychological aspects were highlighted as critical to digital learning success. The participants reported feelings of isolation, stress, and uncertainty when transitioning between online and face-to-face modes. Limited interaction with lecturers and peers weakened their sense of belonging and engagement. These affective challenges underline the need for holistic student support systems that address both academic and emotional well-being in digital contexts. This is supported by Bozkurt et al. (2020), who explained that the emotional and psychological strain associated with digital learning environments underscores the importance of holistic student support. Hence, feelings of isolation, anxiety, and disengagement can hinder motivation and academic success, particularly for preservice teachers' transition from traditional to online learning. Like Oza and Ozarslan (2025) highlighted, such experiences may also impact the development of collaborative and reflective professional identities of these preservice teachers, leading to low self-efficacy and digital incompetence. The implication is that digital transformation must integrate effective and psychosocial support mechanisms, including online counselling, mentorship, and peer learning communities, which will ensure that preservice teachers thrive both academically and emotionally.

5. CONCLUSION

Digital transformation in higher education can significantly reshape how preservice teachers learn, teach, and prepare for future classrooms. While technology integration offers opportunities for innovation, flexibility, and collaboration, it also presents several challenges. The challenges that preservice teachers often face during the transition include technological, pedagogical, and

psychological barriers. Many of them struggle with limited digital literacy, inconsistent access to technological resources, and insufficient institutional support or training. This implies grappling with adapting traditional teaching methods to digital platforms, designing engaging online learning experiences, and balancing technology use with sound educational practices. Additionally, the rapid shift to online and blended learning environments, accelerated by the COVID-19 pandemic, is exposing these gaps in digital competence and confidence among preservice teachers. Issues of technostress, lack of motivation, and feelings of isolation are common, impacting their readiness to integrate technology into future classrooms. Building digital resilience and fostering positive attitudes towards technology are essential for preparing future teachers to thrive in a continually evolving digital education landscape. The structural character shows inequalities that preservice teachers experience when using their own smartphones for learning, which only allows them to submit assignments but not to write them. Internet costs, rural connectivity, and institutional support remain persistent barriers. Preservice teachers are motivated and recognise the transformative potential of digital learning but need stronger practical preparation in digital pedagogy, as well as institutional support mechanisms that include training, subsidies, device loans, and inclusive policies. Therefore, the study underscores the need for comprehensive digital competency frameworks, ongoing professional development, and supportive learning environments that encourage experimentation, reflection, and collaboration. This can help preservice teachers reflect on their understanding, that is, disorientation dilemma to understand things as they change. The implications point to the need for systemic, inclusive, and sustainable digital transformation in higher education. Addressing these challenges demands coordinated action across institutional leadership, government policy, and international collaboration to ensure that digitalisation enhances educational quality, accessibility, and resilience rather than reinforces existing inequalities.

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