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DIGITAL LEARNING AS A TRANSFORMATIVE FORCE IN HIGHER EDUCATION INSTITUTIONS IN EASTERN CAPE, SOUTH AFRICA**Ntando Elliot Mpahla***Walter Sisulu University, South Africa**E-mail: nmpahla@wsu.ac.za**Received 15 May 2026; accepted 11 September 2026; published 30 September 2026*

Abstract. This paper examined the transformative role of digital learning in the Eastern Cape. The advent of digital learning has emerged as a transformative force in higher education institutions, reshaping pedagogical approaches and enhancing student engagement. The paper adopted a qualitative, interpretive stance to capture lived experiences, meanings, and context-specific understandings of digital learning as a transformative force in Eastern Cape higher education institutions. A qualitative stance was aligned with the emphasis on depth of understanding, pedagogical change, and student and staff experiences rather than purely measurable outcomes. A multisite instrumental case study design was appropriate for illuminating how digital learning functions as a transformative force across diverse Eastern Cape higher education institutions. The population for this paper included students, academics, and administrative staff involved with digital learning across selected Eastern Cape higher education institutions. Purposive sampling was used to select participants to capture diverse perspectives on transformation. The sampling strategy was guided by data saturation, with a focus on in-depth semi-structured interviews for students and staff, complemented by document analysis and observations. Thematic analysis was used to identify, analyse, and report patterns across datasets. Findings suggest that while digital learning can enhance accessibility and flexibility, significant disparities in access to technology and digital literacy persist, exacerbating existing inequalities. The findings of the paper were context-specific to Eastern Cape higher education institutions and may not generalise beyond similar settings. The paper concludes with recommendations for improving digital learning infrastructure and strategies for future research.

Keywords: Digital learning; Transformation; Changing education system; Higher education; Pedagogy

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1. Introduction

The rapid and pervasive integration of digital technologies into higher education is redefining how universities teach, learn, research, and engage with broader social objectives. In the context of South Africa, digital learning is increasingly seen as a transformative force capable of altering the structure, governance, and outcomes of the higher education system. The paper positions digital learning as central to ongoing reform, performance, and equity in South African higher education. This paper situates digital learning within the broader pressures of post-apartheid transformation. In essence, digital learning is understood as more than the deployment of online platforms; it is a driver of organisational and pedagogical change that reconfigures learning spaces, assessment practices, faculty development, and student support (Jakoet-Salie & Ramalobe, 2022). However, as a fulcrum of transformation in a constrained but evolving system, digital learning is meant to achieve academic and administrative objectives through effective leadership, a culture of innovation, and the strategic deployment of digital tools. The convergence across these accounts reinforces the view that digital learning is inseparable from

the quality and equity of the educational experience in the South African milieu (Mhlanga et al., 2022; Mhlanga & Moloi, 2020; Shava, 2022).

A central strand in the discourse on digital transformation is the role of policy frameworks and governance mechanisms in guiding it. In South Africa, policy instruments and national strategies shape how institutions negotiate resource allocation, cybersecurity, and the design of digital learning ecosystems. Adeyemo (2023) and Mhlanga et al. (2022) highlight the need for collaborative, bottom-up policy development and stronger alignment between policy and local practice to reduce inequalities and improve outcomes in higher education. Where governance remains top-down or unevenly funded, implementation gaps emerge, undermining the transformative potential of digital learning (Adeyemo, 2023; Mhlanga et al., 2022).

Although pandemic-driven disruption exposed capacity gaps in infrastructure, digital literacy, and support systems, it catalysed experimentation with online and blended modalities. It also spurred investment in digital infrastructure and prompted rethinking of assessment, student engagement, and flexible learning spaces (Mhlanga & Moloi, 2020; Shava, 2022). This also resulted in a robust body of literature documenting the scale of online migration, the challenges for rural and disadvantaged students, and the necessity of sustainable strategies to close the digital divide post-pandemic (Mhlanga et al., 2022; Mhlanga & Moloi, 2020; Shava, 2022; Moonsamy et al., 2022). These studies collectively argue that the long-term value of digital learning rests on deliberate investments in broadband access, device availability, training for faculty and students, and policy measures that foreground equity. With all these considerations, digital transformation needs to be accompanied by deliberate attention to equity, access, and inclusion. The persistence of inequalities in connectivity, digital literacy, and device access shapes learning experiences and outcomes, requiring targeted policy and resource allocation to prevent widening gaps (Mhlanga et al., 2022; Mhlanga & Moloi, 2020; Shava, 2022; Moonsamy et al., 2022). These arguments led Maimela & Mbonde (2025), Becker (2020), and Jowi (2024) to centre the ethical and epistemic dimensions of digital learning, including debates around the decolonisation of curricula, data governance, and epistemic justice in knowledge production within digital platforms.

Despite substantial scholarship on digital transformation and COVID-era online learning in South Africa, there remains a need to articulate how digital learning constitutes a transformative force within the changing higher education system. This includes how policy, leadership, and infrastructure interact to enable or constrain this transformation. Notably, digital learning can be deliberately designed to advance equity, decolonisation, and sustainable development within South Africa's higher education landscape, thereby fostering 4IR readiness (Oke & Fernandes, 2020; Masinde & Soux, 2020). In other words, studies situate digital learning within broader, forward-looking discourses such as 4IR, illustrating both potential and risk. Analyses of 4IR readiness in Africa and debates about decolonising curricula that consider artificial intelligence (AI) and digital technologies inform the conceptual framework and policy recommendations for the South African context (Oke & Fernandes, 2020; Masinde & Soux, 2020; Mangosuthu & Bayaga, 2025).

This paper, therefore, advances a nuanced account of how digital learning can reshape higher education in South Africa when pursued with deliberate policy design, inclusive infrastructure investment, and a commitment to decolonised, contextually relevant pedagogy. By foregrounding the collapse of old hierarchies through digitally mediated access, the paper contributes to the ongoing policy discourse and empirical inquiry into how South African HEIs can leverage digital learning to achieve equitable, high-quality education in a rapidly transforming global knowledge economy.

2. Literature Review

Introduction

Digital learning has become a central vector of transformation in higher education globally. In South Africa, digital learning is frequently framed as a catalyst for expanding access, improving teaching quality, and reconfiguring governance, structure, and outcomes within the sector. Below is a synthesis of recent empirical and conceptual work on how digital technologies are reshaping teaching, learning, research, and social objectives in South African higher education (HEI).

Digital Learning as a Transformative Force in South Africa

Transformation through digital technologies is visible in shifts toward blended and hybrid modes of instruction within South African HEIs, motivated by aims to broaden access and enhance quality. Watson & Struwig (2024) document a clear move toward blended and hybrid delivery in SA public universities. This provides evidence-based recommendations for designing assessments that preserve accessibility, equity, and academic integrity in digital contexts. Building on this notion, complementary analyses emphasise that the adoption of digital platforms and learner management systems (LMSs) has become integral to curricula, with ongoing recalibration of teaching practice at the institutional level (Shava, 2022; Moonsamy et al., 2022). These studies collectively position digital learning as a central reform lever in SA higher education, rather than a peripheral adjunct (Majanja, 2020; Watson & Struwig, 2024).

In this instance, COVID-19 acted as a stress test and accelerator for digital transformation, highlighting both opportunities and persistent constraints. Out of this context, studies identify tenets of digital transformation lessons from the pandemic, notably the imperative to build digital capabilities, address the digital divide, and scale online learning infrastructure and skills development (Mhlanga et al., 2022; Moonsamy et al., 2022; Moyo et al., 2022; Adeyemo, 2023). Across these works, online platforms such as Zoom, Teams, MOODLE, Blackboard, and LMSs became defining features of emergency remote teaching. Authors also consistently call for policy alignment, sustained investment, and continuous pedagogy development to prevent relapse into inequitable access patterns (Majanja, 2020; Mhlanga et al., 2022; Moonsamy et al., 2022; Moyo et al., 2022). Digital inequality and access to infrastructure remain central constraints shaping the transformative potential of digital learning. Woldegiorgis, (2022) argued that the digital divide exacerbates inequities in access to higher education during crises like COVID-19, underscoring the need for inclusive digital pedagogy and coordinated national strategies to ensure continuity and fairness in learning opportunities. Several studies directly link infrastructure, affordability, and digital literacy to student outcomes, urging targeted investments and policies to close gaps between urban and rural, and between advantaged and disadvantaged cohorts (Bere et al., 2018; Majanja, 2020; Woldegiorgis, 2022; Moonsamy et al., 2022). This evidence base cautions against overclaiming transformation without systemic support and policy coherence.

In addition, the role of leadership, policy, and strategic alignment in enabling digital learning as a transformation emerges in SA HEIs. There is an understanding that leadership must navigate the complexities of implementing digital pedagogy at scale, reconciling 4IR aspirations with real-world resource constraints, governance, and inclusivity. To this view, Singaram et al. (2023) articulate the need for strategic vision, organisational readiness, and policy alignment to guide the integration of 4IR-driven technologies into teaching, learning, and curricula. Studies contend that successful digital transformation hinges on coherent policy ecosystems, investment in digital infrastructure, and ongoing professional development for staff and students (Saib et al., 2022; Oke & Fernandes, 2020; Ajani, 2023; Adeyemo, 2023; Mashau & Nyawo, 2021).

Digital Learning and Governance, Structure, and Institutional Outcomes

The evolving digital landscape has reframed librarians' teaching and learning role, with librarians increasingly participating as pedagogical partners in online environments. Saib et al. (2022) and Omarsaib (2024) highlighted

the need for librarians to possess pedagogical and digital skills, and for higher education libraries to cultivate teaching identities and collaborate on policy and practice to support digital learning. This cross-unit collaboration engages with the broader 4IR discourse and the implications for curriculum design, leadership, and skills development in HEIs. Leadership must therefore anticipate the implications of 4IR for learning spaces, workforce readiness, and curricula, while also acknowledging risks of digital inequality and epistemic biases in AI-enabled learning (Singaram et al., 2023). Adequate governance and policy frameworks are consistently identified as prerequisites for responsibly harnessing 4IR advances in SA higher education.

Complexities, Tensions, and Gaps

Across sources, digital learning is described as transformative in principle, with substantial potential to expand access and improve outcomes. Yet, persistent constraints such as the digital divide, inconsistent electricity supply, data costs, inadequate digital literacy, and uneven institutional readiness temper transformative claims and necessitate policy and resource commitments to realise benefits (Moonsamy et al., 2022; Woldegiorgis, 2022; Majanja, 2020; Mashau & Nyawo, 2021). To be transformative, digital transformation requires rethinking pedagogy and assessment to preserve quality and integrity. Re-imagining assessments in digital landscapes, ensuring accessibility and equity, and developing context-sensitive pedagogies are recurrent themes in SA research (Watson & Struwig, 2024). According to Saib et al. (2022) and Omarsaib (2024), librarian-facilitated digital literacies and the evolving role of information professionals in teaching contexts also surface as critical governance considerations.

Implications of Digital Learning for SA Higher Education

A transformed SA higher education system will likely feature blended and hybrid pedagogies as standard practice with governance mechanisms that coordinate digital strategy across teaching, learning, libraries, and ICT support. This calls for a redesigned curriculum and assessment practices aligned with digital literacies and 4IR capabilities (Moonsamy et al., 2022; Moyo et al., 2022; Watson & Struwig, 2024). The transformation also demands targeted investments to close the digital divide, including rural and under-resourced institutions. Ongoing leadership and professional development to sustain digital pedagogy and data-informed decision-making are a vital need as well (Woldegiorgis, 2022; Adeyemo, 2023; Singaram et al., 2023).

Future directions should therefore deepen longitudinal assessments of digital learning outcomes and investigate the efficacy of governance models for digital strategy in SA HEIs. This relates to examining AI and ethics in 4IR-enabled higher education, with explicit attention to equity across contexts, be it urban or rural (Woldegiorgis, 2022; Adeyemo, 2023; Singaram et al., 2023). Within this understanding, digital learning, as a transformative force in South African higher education, can reconfigure teaching, learning, research, and social objectives when supported by coherent governance, infrastructure investment, and capacity building. However, the transformative promise is constrained by persistent inequities in access to technology, digital literacy gaps, and variable institutional readiness. A holistic approach that integrates policy alignment, leadership, librarianship, curriculum redesign, and equitable resource distribution is required to realise the emancipatory potential of digital learning in South Africa's higher education system.

3. Research Methods

Introduction

This paper aimed to understand how digital learning functions as a transformative force within higher education institutions (HEIs) in the Eastern Cape, South Africa, against a backdrop of ongoing educational transformation. The paper sought to capture stakeholders' lived experiences, meanings, and interpretations of digital learning and to elucidate how ICT-enabled pedagogy, governance, and student engagement contribute to or hinder transformative change in the local context (Garton et al., 2022; Nqabeni et al., 2024; Chirowamhangu, 2024). The research adopted an interpretivist stance to foreground participants' perceptions and meanings and uses a

qualitative, case-study approach to illuminate how digital learning acts as a mechanism for transformation across multiple HEIs in the Eastern Cape (Matabane & Matabane, 2021; Ugwuanyi et al., 2023; Mmodana-Zide, 2023; Nqabeni et al., 2024). Given inequities in ICT access, infrastructure, and digital literacies, the paper explicitly addressed issues of digital poverty, digital readiness, and digital citizenship as they pertain to transformative educational outcomes in Eastern Cape HEIs (Birdthistle et al., 2022; Seleke, 2024).

Research Paradigm

The paper adopted an interpretivist stance that is linked with exploring meanings, perceptions, and lived experiences of stakeholders in complex social contexts, such as digital learning in South African HEIs in the Eastern Cape (Fataar & Norodien-Fataar, 2021; Turner, 2023; Ngqulu & Nomnga, 2023; Nqabeni et al., 2024). Applying an interpretive paradigm for this paper enabled interpretation through stakeholders' meanings, experiences, and sense-making within the Eastern Cape HEI context. The great benefit of espousing this research paradigm is that knowledge is co-constructed between the researcher and participants, emphasising participants' perspectives and local discourses surrounding digital learning, technology readiness, pedagogy, and equity. This aligns with an interpretive stance that prioritises participants' voices to understand transformation processes (Fataar & Norodien-Fataar, 2021; Nqabeni et al., 2024). The paradigm situated qualitative methods, such as interviews, document analysis, and observations, as appropriate for accessing nuanced meanings, rather than solely measuring outcomes. In essence, the interpretive paradigm foregrounds the ways in which local histories, socio-economic conditions, language and decolonisation discourses, and infrastructural realities shape the enactment and perception of digital learning. This resonates with literature that situates digital transformation within South Africa's post-apartheid socio-political and educational landscape, where context is essential to interpretation (Fataar & Norodien-Fataar, 2021; Turner, 2023; Ngqulu & Nomnga, 2023).

Research Design

An interpretive paradigm informed the choice to employ a multisite case study design that aligns with interpretive aims to illuminate how digital learning is understood and experienced across different HEIs (Ugwuanyi et al., 2023). It takes this position while enabling deep comparisons of meanings across sites rather than testing universal hypotheses (Ngqulu & Nomnga, 2023; Nqabeni et al., 2024). The rationale for using a case study design in this paper was to enable an in-depth exploration of phenomena within their real-world contexts, using multiple data sources to enhance the credibility and transferability of the findings (Mpongwana & Cishe, 2024).

Population and Sampling Strategy

The population for this paper included active course students, academics delivering online and hybrid modules, IT staff, and policy-makers within the selected institutions. This multi-stakeholder frame supports a rich, interpretive understanding of digital learning as a transformative phenomenon from multiple vantage points. The rationale for including students is that students are central to any evaluation of digital learning's transformative potential, as they are the primary agents of engagement with digital pedagogy, platforms, and resources. Their experiences reveal how digital learning reshapes access, participation, identity, and belonging within Eastern Cape HEIs (Mhlanga & Moloi, 2020; Fataar & Norodien-Fataar, 2021; Nqabeni et al., 2024). Contextual factors such as digital readiness, connectivity, device access, and language of instruction influence students' experiences and perceptions of transformation, making students a critical population for capturing lived realities under resource constraints common in the Eastern Cape (Turner, 2023; Nqoma et al., 2024).

The inclusion of academics relates to their pivotal role in translating digital learning policy into classroom practice. Their pedagogical beliefs, digital literacies, and perceived institutional support directly shape student experiences and transformation outcomes (Fataar & Norodien-Fataar, 2021; Ntlabathi & Mashiyi, 2022; Badaru & Adu, 2022). The literature on academics' preparedness, capacity-building needs, and adaptation during COVID-19 highlights the importance of including teaching staff who are actively implementing online and hybrid modalities in Eastern Cape contexts (Ugwuanyi et al., 2023; Mudau et al., 2022; Ntlabathi & Mashiyi, 2022). On

the one hand, ICT staff are the infrastructural and technical backbone enabling digital learning. Their perspectives illuminate the feasibility of transformative aims, capacity limitations, maintenance challenges, and strategic priorities for digital infrastructure and support services (Fataar & Norodien-Fataar, 2021; Nqoma et al., 2024). They provide institutional insights into readiness, system interoperability, and the alignment between policy intentions and technical realities (Fataar & Norodien-Fataar, 2021; Ntlabathi & Mashiyi, 2022). Lastly, policy-makers and leaders shape the strategic direction of digital learning, resource allocation, and overarching transformation agendas. Their views reveal governance, prioritisation, and framing of transformation at the macro level, including decolonisation and inclusion discourses pertinent to the Eastern Cape context (Fataar & Norodien-Fataar, 2021; Turner, 2023; Nqabeni et al., 2024). Their involvement helps connect classroom-level experiences with policy intent, enabling examination of alignment, tensions, and enactment gaps between policy and practice (Fataar & Norodien-Fataar, 2021; Nqabeni et al., 2024).

The paper espoused a purposive sampling strategy to illuminate the study's interpretive aims by capturing diverse, information-rich perspectives across stakeholder groups and HEIs. Purposeful sampling was intended to select participants who could lay bare the meanings, practices, and transformation processes surrounding digital learning, rather than to seek statistical representativeness. It allowed for the chosen participants, students, academics, IT staff, and policy-makers to provide complementary viewpoints on transformation, policy enactment, infrastructure, and everyday teaching and learning practices in the Eastern Cape context (Fataar & Norodien-Fataar, 2021; Ngqulu & Nomnga, 2023; Nqabeni et al., 2024). Moreover, a purposive, criterion-based selection ensured participants have substantial engagement with digital learning) (Mdodana-Zide, 2023; Chirowamhangu, 2024).

The sample size for this paper was guided by a prioritisation of depth, with sample sizes typically varying based on data saturation and resource constraints (Ntlabathi & Mashiyi, 2022; Ugwuanyi et al., 2023). Two higher education institutions were selected in the Eastern Cape. For each site, a target of three (3) active students was maintained, giving a total of six (6) students, three (3) academics from each site with a total of six (6) academics, two (2) ICT staff from each site with a total of four (4) and two (2) policy-makers from each site with a total of four (4). The total number of participants was twenty (20).

Data Collection

Data collection is the systematic process of gathering information from sources or participants to answer research questions, test ideas, or build theory. In qualitative research, data collection emphasises depth, context, and meaning, using methods such as interviews, observations, and document review to reveal how people experience and interpret phenomena (Nqabeni et al., 2024). For this paper, data collection aimed to elicit rich, descriptive accounts that illuminate how participants understand and enact social processes, rather than produce numerical generalisations (Nqabeni et al., 2024). Data was collected using triangulation and multiple data sources, such as interviews, observations, and documents, to strengthen credibility and cross-verify findings across sources (Elly et al., 2024).

Data Collection Procedures

Semi-structured interviews were used to collect data. The researcher developed an interview guide with a core set of open-ended questions applicable to all groups, along with flexible probes tailored to participant groups. The sections on interviews included context and background, daily practices, perceived transformation, equity and inclusion, supports and barriers, and future directions. This section also incorporates probes around power relations, language and decolonisation considerations, and local contextual factors unique to the Eastern Cape, such as connectivity, device access, and infrastructural variability. Interviews were conducted face-to-face where feasible; otherwise, via secure Microsoft Teams or phone calls to accommodate connectivity constraints. These interviews were also audio-recorded with consent and transcribed verbatim, with anonymisation and participant

codes applied. Interviews were conducted at the participants' convenience to avoid disruptions to their schedules. In other words, these interviews were conducted during and after working hours.

Observations, as an instrument, allowed the researcher to document actual digital teaching and learning practices, platform use, interactions, and infrastructural affordances in real time, grounding interpretations in observable phenomena (Sinnige et al., 2023; Fourar et al., 2024). Selected classes observed included online, hybrid, and face-to-face classes with digital components, computer labs, learning management system (LMS) use, and library and ICT-enabled events or workshops. The researcher took field notes detailing the environment, technology affordances, pedagogy shifts, student engagement, and academic teaching strategies. Throughout this due process, the researcher obtained consent for observations, maintained a non-intrusive presence, and anonymised any identifiable information from participants.

Document Analysis was used by the researcher to identify relevant documents from current and archival sources within each institution and to ensure access permissions to collect multiple documents per site, enabling cross-checking. A data extraction sheet was developed to capture key themes, including transformation aims, equity commitments, allocated resources, implementation timelines, measurement indicators, and governance structures. The focus was on comparing policy-intended goals with classroom and student experiences, as evidenced by interviews and observations, to identify consistencies and gaps.

Data was analysed through *thematic analysis*. Thematic analysis was well-suited to explore how participants interpret digital learning as a transformative force within Eastern Cape HEIs, capturing meanings, patterns, and variations across institutions, staff, and students (Rof et al., 2020; Patil & Patil, 2022; Gkrimpizi et al., 2023). Data sources analysed through thematic analysis included semi-structured interviews with academics, ICT staff, students, and policy-makers; policy documents; and observation notes from digital learning environments. Interviews were transcribed, with repeated reading and annotation to capture first impressions about how digital learning is described as transformative (Morales et al., 2021; Gkrimpizi et al., 2023; Polin et al., 2023). Potential themes were then generated and checked against data to ensure internal coherence and distinctiveness, and to ensure that they capture both convergence and divergence across participants and institutions

4. Results of the Study

The results of the study were presented as emerging from the participants' responses, with data collected through interviews, observations, and document analysis. The following results were presented and organised by stakeholder group and by key themes:

Academics: Pedagogical Transformation and Practice

Shifts toward blended and hybrid modalities are prominent, with academics reporting incremental integration of digital tools into teaching and assessment, consistent with SA-wide digital learning reform trends. The results indicate academics increasingly design learning activities that leverage learner management system (LMS) platforms, digital resources, and online collaboration to complement face-to-face instruction. This indication emphasises digital platforms as central levers for reform in SA higher education. The results also revealed pedagogical reconfiguration, accompanied by concerns about quality and equity, including how digital formats affect assessment integrity and student engagement. This resonates with the call for policy alignment, investment, and ongoing pedagogy development to sustain equitable digital teaching practices post-pandemic. In this instance, institutional readiness and leadership emerge as critical enablers. This is where academics linked successful digital transformation to coherent policy ecosystems, infrastructure investment, and professional development. Such sentiments echoed broader SA findings about governance and capacity-building as prerequisites for 4IR-aligned curricula.

ICT Staff: Infrastructure, Support, and Governance

Infrastructure readiness and reliability were central concerns. ICT staff reported ongoing needs to strengthen bandwidth, LMS reliability, and hardware provisioning to support scalable digital learning. This revelation mirrors the emphasis on broadband access, device availability, and resilient ICT ecosystems as foundational for transformation. Support ecosystems and interoperability were highlighted as key determinants of user adoption. ICT staff emphasised the importance of training for academics and students, responsive helpdesk support, and system interoperability. This aligns with calls for capacity building and governance that enable 4IR-enabled learning environments. ICT staff also pointed to gaps between policy intentions and on-the-ground technical realities, underscoring the need for governance structures that integrate digital strategy with ICT operations and data security.

Students: Access, Literacy, and Learning Experiences

Access and connectivity disparities are evident, with students' experiences reflecting rural-urban and resource-related inequities. Issues raised included device ownership, internet reliability, and language and contextual barriers that influence participation and engagement in digital environments. Aligned with this view is evidence that the digital divide is a persistent constraint on transformation. Students revealed that digital literacy and user experience shape learning outcomes. The understanding is that students' engagement with online platforms and digital tools is mediated by their technological literacy and their ability to navigate digital learning spaces. This view supported the emphasis on capacity-building for students as part of equitable digital learning strategies.

Policy-makers: Alignment, Funding, and Decolonisation Discourses

The results indicated tensions between macro-level policy design and classroom enactment. From this viewpoint, policy-makers emphasised the need for collaborative, bottom-up policy development and strong alignment with local practice to reduce inequalities in the digital transformation of higher education. Policy-makers also highlighted resource allocation, long-term funding commitments, and governance mechanisms as determinants of the scalability and continuity of digital learning. This revelation stresses the calls for sustained investment and coherent digital strategy across teaching, learning, libraries, and ICT support. The results reflected on decolonisation and inclusion discourse to shape strategic direction. Policy discussions reflected epistemic justice, curriculum relevance, and decolonisation considerations as central to the transformation agenda, consistent with decolonising curricula and data governance in digital platforms.

Across academics, ICT staff, students, and policy-makers, there was consensus that digital learning is a core driver of transformation when accompanied by coherent governance, infrastructure investment, and capacity building. This convergence framed digital learning as a central reform lever requiring policy coherence and infrastructure investment.

While there was agreement on the transformative potential, tensions arose around equity of access (digital divide), the urgency of policy-practice alignment, and the pace of implementation given resource constraints. These tensions reflected ongoing debates about how to balance innovation with inclusivity and sustainability in SA higher education.

Lastly, the results suggested that successful digital transformation in the Eastern Cape requires integrated policy design, targeted investment in broadband and devices, ongoing professional development for staff and students, and governance mechanisms that coordinate digital strategies across all sectors. These implications advocate for strategic alignment, persistent investment, and combined top-down or bottom-up governance approaches to realise 4IR-ready, equitable higher education in SA.

4. Summary and Interpretation of the Results

The paper presented results that emerged from interviews, observations, and document analysis, organised by stakeholder groups such as academics, ICT staff, students, and policy-makers. The results were anchored in four cross-cutting themes: pedagogical transformation and practice; infrastructure, support, and governance; access, literacy, and learning experiences; and alignment, funding, and decolonisation discourses. Across stakeholder groups, a consensus is evident: digital learning is a core reform lever for higher education transformation in the Eastern Cape and in South Africa as a whole. This is particularly relevant when it is undergirded by coherent governance, sustained infrastructure investment, and capacity-building. However, tensions remain regarding equity of access, policy-practice alignment, and the pace of implementation under resource constraints.

Around pedagogical transformation and practice, academics viewed the emergence of blended and hybrid modalities as a central reform trajectory. These participants described shifts toward blended learning, with incremental integration of digital tools into teaching and assessment. Academics increasingly designed activities that leveraged LMS platforms, digital resources, and online collaboration to supplement face-to-face instruction. This aligns with SA-wide reform trends that position digital platforms as levers for reform in higher education. These views highlighted that learning design is increasingly mediated by digital infrastructures, with LMSs and online resources becoming foundational for modern curricula.

With pedagogical reconfiguration and quality- or equity-related concerns, the results highlighted concerns about assessment integrity, student engagement, and overall quality in digital formats. These concerns reference ongoing policy alignment, infrastructure investment, and professional development to sustain equitable digital teaching post-pandemic. They also implicate governance and capacity-building as prerequisites for 4IR-aligned curricula. It then becomes clear that rapid digitalisation without robust pedagogical design exacerbates inequalities. When looking at enablers, readiness, coherent policy ecosystems, and investment, academics explicitly connected successful digital transformation to coherent policy ecosystems, infrastructure investment, and ongoing professional development. This mirrors the broader SA context where governance, strategic planning, and investment in ICT are prerequisites for scalable digital learning and 4IR-ready curricula. The stakeholder consensus across academics reflected the discourse that policy coherence and strong leadership are central enabling conditions for durable reform.

ICT staff identified infrastructure readiness and reliability as central concerns, citing the need to strengthen bandwidth, LMS reliability, and hardware provisioning to support scalable digital learning. This reflects SA-wide emphasis on broadband access, device availability, and resilient ICT ecosystems as foundational for transformation. In other words, without reliable infrastructure, digital learning cannot scale or sustain quality. Support ecosystems, interoperability, and capacity-building staff also stressed the importance of training for academics and students, responsive helpdesk support, and system interoperability. These elements are critical determinants of user adoption and sustained use of digital platforms. This suggests that capacity-building and governance mechanisms that integrate digital strategy with ICT operations are essential for 4IR-enabled teaching environments. ICT staff also highlighted gaps between policy aims and technical realities, calling for governance structures that bridge digital strategy and ICT operations, as well as data security considerations. This tension is noted in issues of policy design versus practical implementation, policy ownership, resource allocation, and infrastructural realities in HEIS.

Students reported device ownership, internet reliability, and language and contextual barriers affecting participation. This situation is caused by the digital divide that intensifies inequalities in South African higher education, particularly in open and remote contexts and rural settings. The emphasis is that access disparities mediate engagement and outcomes in digital learning environments. Student experiences also indicated that digital literacy and user experience moderate learning outcomes, with engagement shaped by students' capacity to

navigate online spaces. These experiences highlighted digital literacy as a key lever for equitable uptake of e-learning and for mitigating access barriers.

Lastly, policy-makers reported tensions between macro-level policy design and classroom enactment, advocating for collaborative, bottom-up policy development and alignment with local practice to reduce inequalities. This identifies policy coherence across teaching, libraries, and ICT support, as well as the need for governance mechanisms to ensure scalability and continuity. The results also focused on resource allocation, long-term funding, and governance as determinants of scalability. The results foreground sustained investment and governance as critical determinants of digital learning scalability and continuity. Policy-makers also highlighted decolonisation and inclusion discourse as central to strategic direction, aligning with epistemic justice, curriculum relevance, decolonising curricula, and data governance in digital platforms.

6. Conclusions

The convergence of stakeholder voices in the Eastern Cape study indicates that digital learning is a central transformative lever for higher education reform in South Africa. This is so when embedded within coherent governance, sustained infrastructure investment, and capacity-building across all levels. Academics described a visible move toward blended and hybrid modalities underpinned by LMS use and online collaboration. ICT staff identified the indispensability of reliable bandwidth, interoperable systems, and robust training to sustain quality and scale. Students' experiences foreground the digital divide and digital literacy as pivotal determinants of access and learning outcomes, reinforcing the need for targeted student support and inclusive design. Policy-makers' emphasis on bottom-up policy alignment, long-term funding, and decolonisation discourses further underscores that technological adoption alone is insufficient without epistemically just and contextually relevant curricula supported by durable funding and governance structures. Taken together with SA-wide scholarship on 4IR-ready curricula and infrastructure, the study suggested that the pathway to equitable, transformative higher education in South Africa rests on integrated policy design, multi-stakeholder governance, and persistent investment in broadband, devices, and human capacity. This must be complemented by deliberate attention to pedagogy, assessment integrity, and inclusive student support. While consensus exists on digital learning as a driver of reform, tensions around equity of access, policy-practice alignment, and implementation pace remain, signalling the necessity for context-sensitive, multi-level strategies that couple top-down direction with local practice innovation.

The novelty of the research results lay in positioning digital platforms as central, evidence-based levers for reform within the SA higher education reform landscape. The results provided an integrated, region-specific diagnosis of governance, infrastructure, and capacity-building needs, thereby delivering a nuanced and contextualised account of the digital divide that links access, literacy, and learning experiences. Digital learning, as a transformative force, perceived decolonisation and epistemic justice as strategic axes shaping policy design and resource allocation, and presented a holistic, multi-stakeholder consensus on the conditions necessary for scalable, equitable, 4IR-aligned transformation in the Eastern Cape. The results were supported by cross-cutting evidence from academics, ICT staff, students, and policy-makers, and were consistent with broader SA reform trajectories while offering detailed, location-specific insights that refine policy and practice recommendations. These novel contributions extend existing SA higher education literature by combining a granular regional analysis with a theory-informed, governance-centred interpretation of 4IR-enabled digital learning transformations.

The limitations of the study are reflected in its geographic and institutional confinement to two Eastern Cape HEIs, which impedes generalizability to the broader SA context or to other provinces and types of institutions.

References

- Adeyemo, K. S. (2023). The status of digital innovation and data security in South African Higher Education. *South African Journal of Higher Education*, 37(2). <https://doi.org/10.20853/37-2-5001>
- Ajani, O. A. (2023). Challenges mitigating against effective adoption and usage of e-learning in curriculum delivery in south african universities. *International Journal of Innovative Technologies in Social Science*, (2)(38). https://doi.org/10.31435/rsglobal_ijitss/30062023/8005
- Badaru, K. A., & Adu, E. O. (2022). Prospects of Blended Learning for the Post-COVID-19 Higher Education: The Instructors' Perspectives at a University in South Africa. *E-Journal of Humanities Arts and Social Sciences*, 126–139. <https://doi.org/10.38159/ehass.2022sp31111>
- Becker, A. (2020). A reflective analysis of articles published in the journal of Transformation in Higher Education (2016–2020): Beyond transformation? *Transformation in Higher Education*, 5. <https://doi.org/10.4102/the.v5i0.98>
- Bere, A., Deng, H., & Tay, R. (2018). *Assessing the impact of using instant messaging in eLearning on the performance of teaching and learning in higher education*. <https://doi.org/10.5130/acis2018.by>
- Birdthistle, I., Mulwa, S., Sarrasat, S., Baker, V., Khanyile, D., O'Donnell, D., Cawood, C., & Cousens, S. (2022). Effects of a multimedia campaign on HIV self-testing and PrEP outcomes among young people in South Africa: a mixed-methods impact evaluation of 'MTV Shuga Down South.' *BMJ Global Health*, 7(4), e007641. <https://doi.org/10.1136/bmjgh-2021-007641>
- Chirowamhangu, R. (2024). Inclusive education pandemic: Learning barriers for children with disabilities in South Africa. *African Journal of Disability*, 13. <https://doi.org/10.4102/ajod.v13i0.1462>
- Elly, E., Ismail, I., & Sofyan, H. (2024). Strategies for Improving Education Quality via New Student Admission Management. *J. Educ. Manag. Learn.*, 2(2), 91–99. <https://doi.org/10.60084/jeml.v2i2.178>
- Fataar, A., & Norodien-Fataar, N. (2021). Towards an e-learning ecologies approach to pedagogy in a post-COVID world. *Journal of Education*, (84), 1–14. <https://doi.org/10.17159/2520-9868/i84a08>
- Fourar, H., Bouchetara, M., Belaidi, A., & Azizi, Y. M. (2024). Effects of Organisational Change Caused by The Covid-19 Pandemic Case Study: Logitrans. *Economics and Business*, 38, 1–22. <https://doi.org/10.7250/eb-2024-0001>
- Garton, P., Wawrzynski, M. R., Lemon, J. D., & Naik, S. (2022). Relational Student Engagement in Co-curricular Spaces: Evidence from a South African University. *Journal of Student Affairs in Africa*. <https://doi.org/10.24085/jsaa.v10i1.2193>
- Gkrimpizi, T., Peristeras, V., & Magnisalis, I. (2023). Classification of Barriers to Digital Transformation in Higher Education Institutions: Systematic Literature Review. *Education Sciences*, 13(7), 746. <https://doi.org/10.3390/educsci13070746>
- Jakoet-Salie, A., & Ramalobe, K. (2022). The digitalisation of learning and teaching practices in higher education institutions during the Covid-19 pandemic. *Teaching Public Administration*, 41(1), 59–71. <https://doi.org/10.1177/01447394221092275>
- Jowi, J. O. (2024). Recent developments in higher education in Africa: partnerships for knowledge transformations. *Journal of International Cooperation in Education*, 26(1), 34–48. <https://doi.org/10.1108/jice-11-2023-0037>
- Maimela, C., & Mbonde, P. (2025). Artificial intelligence in South African universities: curriculum transformation and decolonisation—aid or obstacle? *Frontiers in Sociology*, 10. <https://doi.org/10.3389/fsoc.2025.1543471>
- Majanja, M. K. M. (2020). The status of electronic teaching within South African LIS Education. *Library Management*, 41(6/7), 317–337. <https://doi.org/10.1108/lm-05-2020-0084>
- Mangosuthu, L. L. L., & Bayaga, A. (2025). *University Managers' Insights into Collaborative Networks and the Adoption of Digital Technologies for Human-Centric Teaching and Learning Models*. <https://doi.org/10.21203/rs.3.rs-7100705/v1>
- Mashau, P., & Nyawo, J. C. (2021). The use of an online learning platform: a step towards e-learning. *South African Journal of Higher Education*, 35(2). <https://doi.org/10.20853/35-2-3985>

- Masinde, M., & Soux, P. (2020). Transforming South Africa's universities of technology: a roadmap through 4IR lenses. *Journal of Construction Project Management and Innovation*, 10(2). <https://doi.org/10.36615/jcpmi.v10i2.405>
- Matabane, B. R., & Matabane, M. E. (2021). Black Students' Experiences of Academic Support Programs during First Year at University: Case of Extended Studies. *Research in Social Sciences and Technology*, 6(3), 93–108. <https://doi.org/10.46303/ressat.2021.28>
- Mdodana-Zide, L. (2023). Teacher's Pedagogical Strategies in Under-Resourced Rural Schools in South Africa. *E-Journal of Humanities Arts and Social Sciences*, 20–31. <https://doi.org/10.38159/ehass.20234123>
- Mhlanga, D., & Moloi, T. (2020). COVID-19 and the Digital Transformation of Education: What Are We Learning on 4IR in South Africa? *Education Sciences*, 10(7), 180. <https://doi.org/10.3390/educsci10070180>
- Mhlanga, D., Denhere, V., & Moloi, T. (2022). COVID-19 and the Key Digital Transformation Lessons for Higher Education Institutions in South Africa. *Education Sciences*, 12(7), 464. <https://doi.org/10.3390/educsci12070464>
- Moonsamy, M., Nkomo, S., & Matli, W. (2022). New Education Technologies in Higher Education: E Leadership Perspectives on South African Student Learning During and Post-Covid Reality. *2018 International Conference on Multidisciplinary Research*, 2022, 241–252. <https://doi.org/10.26803/myres.2022.20>
- Morales, V. J. G., Garrido-Moreno, A., & Martín-Rojas, R. (2021). The Transformation of Higher Education After the COVID Disruption: Emerging Challenges in an Online Learning Scenario. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.616059>
- Moyo, R., Ngidi, S. A., Koai, M., & Lemeko, P. (2022). Online Teaching and Learning Experiences of Higher Education Lecturers and Students in the COVID-19 Era: A Leap to Digital Pedagogies? *Journal of Culture and Values in Education*, 5(1), 23–42. <https://doi.org/10.46303/jcve.2022.4>
- Mpongwana, Z., & Ciske, E. N. (2024). Evidence of Factors Hindering Establishment of Viable Rural Development Action in Eastern Cape Municipalities. *African Journal of Governance and Development (Ajgd)*, 13(1), 34–50. <https://doi.org/10.36369/2616-9045/2024/v13i1a3>
- Mudau, T. S., Tshivhase, L., & Randa, M. B. (2022). Health Course Lecturers Managing Online Teaching in a Historically Disadvantaged University in South Africa: The Raging Waves. *Journal of Culture and Values in Education*, 5(1), 195–210. <https://doi.org/10.46303/jcve.2022.14>
- Ngqulu, N., & Nomnga, P. (2023). Covid-19 pandemic: A necessary catalyst for e-learning adoption and application. *South African Computer Journal*, 35(1). <https://doi.org/10.18489/sacj.v35i1.1080>
- Nqoma, L., Mpiti, T., Makena, B., Ginyigazi, Z., & Qoyi, M. (2024). *Stretching the Boundaries of Transformative Learning to Selected Rural Schools of Eastern Cape in South Africa*. <https://doi.org/10.5772/intechopen.113918>
- Ntlabathi, S., & Mashiyi, N. (2022). Exploring Hybrid Course Design in Promoting Active Engagement in extended curriculum and mainstream contexts. *European Conference on E-Learning*, 21(1), 310–322. <https://doi.org/10.34190/ecel.21.1.911>
- Oke, A., & Fernandes, F. A. P. (2020). Innovations in Teaching and Learning: Exploring the Perceptions of the Education Sector on the 4th Industrial Revolution (4IR). *Journal of Open Innovation Technology Market and Complexity*, 6(2), 31. <https://doi.org/10.3390/joitmc6020031>
- Omarsaib, M. (2024). Integrating a digital pedagogy approach into online teaching: are academic librarians at Universities of Technology in South Africa prepared? *Information and Learning Sciences*, 126(3/4), 192–213. <https://doi.org/10.1108/ils-01-2024-0012>
- Patil, K. D., & Patil, V. (2022). *The Impact of COVID-19 Outbreak on the Digital Teaching and Learning Process in Indian Higher Education Institutions*. <https://doi.org/10.26434/chemrxiv-2022-vkr3w>
- Polin, K., Yiğitcanlar, T., Limb, M., & Washington, T. L. (2023). The Making of Smart Campus: A Review and Conceptual Framework. *Buildings*, 13(4), 891. <https://doi.org/10.3390/buildings13040891>
- Rof, A., Bikfalvi, A., & Marquès, P. (2020). Digital Transformation for Business Model Innovation in Higher Education: Overcoming the Tensions. *Sustainability*, 12(12), 4980. <https://doi.org/10.3390/su12124980>

Saib, M. O., Rajkoomar, M., Naicker, N., & Olugbara, C. T. (2022). Digital pedagogies for librarians in higher education: a systematic review of the literature. *Information Discovery and Delivery*, 51(1), 13–25. <https://doi.org/10.1108/idd-06-2021-0066>

Selekez, Z. (2024). *Chronicling Information Communication Technology into Teaching and Learning in the Eastern Cape Province, South Africa*. Metacognition in Learning - New Perspectives <https://doi.org/10.5772/intechopen.113790>

Shava, E. (2022). Reinforcing the Role of ICT in Enhancing Teaching and Learning Post-COVID-19 in Tertiary Institutions in South Africa. *Journal of Culture and Values in Education*, 5(1), 78–91. <https://doi.org/10.46303/jcve.2022.7>

Singaram, S., Mayer, C., & Oosthuizen, R. M. (2023). Leading higher education into the fourth industrial revolution: an empirical investigation. *Frontiers in Psychology*, 14. <https://doi.org/10.3389/fpsyg.2023.1242835>

Sinnige, A., Kittelson, A. J., Rutgers, K. M., Marcellis, L. H. M., Wees, P. J. van der, Teijink, J. A. W., & Hoogeboom, T. J. (2023). Nationwide implementation of personalised outcomes forecasts to support physical therapists in treating patients with intermittent claudication: Protocol for an interrupted time series study. *Plos One*, 18(7), e0288511. <https://doi.org/10.1371/journal.pone.0288511>

Turner, I. (2023). Decolonisation through Digitalisation? African Languages at South African Universities. *Curriculum Perspectives*, 43(S1), 73–82. <https://doi.org/10.1007/s41297-023-00196-w>

Ugwuanyi, C. S., Okeke, C., & Alex, J. K. (2023). Exploring South African university academics' level of preparedness for emergency multimodal remote teaching during the COVID-19 pandemic. *Perspectives in Education*, 41(2), 77–88. <https://doi.org/10.38140/pie.v41i2.6272>

Watson, S., & Struwig, M. (2024). Re-Imagining Teaching and Learning at South African Higher Education Institutions in the Digital Landscape. *ICER*, 1(1), 313–321. <https://doi.org/10.34190/icer.1.1.3145>

Woldegiorgis, E. T. (2022). Mitigating the digital divide in the South African higher education system in the face of the Covid-19 pandemic. *Perspectives in Education*, 40(3), 197–211. <https://doi.org/10.18820/2519593x/pie.v40.i3.13>

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