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Curriculum Delivery in Rural Universities: A Qualitative Analysis of Learning Management System Adoption Through the Lenses of Technology Acceptance and Social Justice

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Abstract

Higher education institutions now depend on learning management systems to deliver their academic programs. Implementing them poses challenges in rural areas and at universities serving historically marginalised communities. This study investigates how undergraduate students use a learning management system to access their curriculum materials at a rural university serving historically marginalised students in KwaZulu-Natal, South Africa. The study investigates students' access to digital learning materials through perceptions of system usefulness and operational simplicity, platform access and educational equality, and system participation. The researchers used a qualitative research approach to conduct semi-structured interviews with forty undergraduate students who used the institutional Learning Management System. The researchers used thematic analysis to examine the research material. The findings show that students understand the pedagogical benefits of learning management systems, as they help them access study materials, submit their work, and continue their studies. The research identified multiple structural and economic obstacles which hinder students from adopting the system. Students face obstacles such as inconsistent internet service, expensive data plans, and restricted access to digital tools. Their educational institutions provide different levels of assistance. The existing limits create ongoing access problems that prevent students from fully participating in academic programs, even though institutions have promised to develop digital learning systems. The research shows that educational institutions should balance their technological needs with their social responsibility to develop equitable learning environments, as users receive educational content through learning management systems. The article concludes that meaningful integration of learning management systems in rural universities requires not only user-focused technological design but also sustained structural interventions.

Keywords: *Learning management systems; curriculum delivery; rural universities; Technology Acceptance Model; Social Justice Theory; pre-service teacher education*

Introduction

Educational institutions worldwide have undergone fundamental changes in their curricula as digital technologies have been integrated into their systems. Learning management systems serve educational institutions by providing platforms which enable them to organise, deliver, and manage

their educational materials. Universities now use Moodle, Blackboard, and Canvas as their main systems for delivering educational content, assessing students, and communicating with one another. UNESCO (2023) explains that educational technology is a tool that educational systems use to fulfil their missions, but its actual effects depend on the circumstances in each educational setting.

The South African educational system faces a dual challenge. Its institutions need to embrace learning management systems while the country addresses historical educational inequalities and works to create equal educational opportunities. The historically disadvantaged institutions, which developed as Bantustan schools during the apartheid era, still exist as rural universities. However, these institutions confront severe resource shortages which prevent students from accessing essential digital resources. The students who attend these institutions come from the country's most economically disadvantaged communities. However, they must address two challenges: digital learning requirements and existing obstacles, such as limited internet access, high data costs, and a shortage of devices (Czerniewicz et al., 2020; Ajani & Govender, 2026a).

This article presents findings of a qualitative research study that investigated how pre-service teachers experienced using a learning management system at a rural university in KwaZulu-Natal, South Africa. The study seeks to answer its main research question: How do students from rural areas with limited resources use learning management systems to achieve equal access to educational content? The study uses two theoretical frameworks which work together to solve its research problem. The first framework, the Technology Acceptance Model, explains how users accept technology based on their assessment of its practical value and ease of use. The second framework, Social Justice Theory (Ajani & Maphalala, 2026; Simelane-Mnisi & Mthimunya, 2025), identifies the fundamental components of educational resource distribution, student identity recognition, and learning resource accessibility that determine how students access educational technology.

The study establishes its main theoretical contribution through dual systems, which research how people view technology while studying the social frameworks which affect those views. The study shows that the Technology Acceptance Model provides important insights into how people use systems. However, it fails to explain how learning management systems become established in resource-limited areas. Students who display positive attitudes toward learning management system use still experience ongoing structural inequities, which require an understanding of social justice frameworks (Naidoo & Raju, 2012; Yakobi, 2026). The argument presents essential requirements that influence how institutions function, develop digital learning environments, and create educational programmes that offer equal educational opportunities.

To address this critical gap, this study systematically explores the intersection of technology acceptance and social justice within the context of South African higher education (Ngubane & Makua, 2021; Yakobi & Yakobi, 2025). Rather than viewing these dynamics in isolation, the inquiry first investigates the specific ways in which institutional learning management system frameworks influence or constrain pre-service teachers' engagement in rural universities. Building on this baseline, the research then shifts to examine the nuanced perspectives of pre-service teachers, with a particular focus on how socio-economic factors shape their lived experiences. The study then aims to synthesise these findings into an actionable framework, culminating in strategic recommendations designed to foster more equitable, inclusive, and sustainable practices across the sector.

Literature Review

Digital Technologies and Curriculum Delivery in Higher Education

Digital technology use in universities has grown rapidly over the last ten years, reaching its peak after COVID-19 forced higher education institutions to shift from traditional to emergency remote teaching. The educational institutions used the learning management systems they already had before the pandemic to create emergency remote teaching systems that served as repositories for course documents and tools for both live and recorded student interactions, as well as online testing and assessment sites. The period saw educational institutions establish learning management systems as standard practice, revealing both their teaching capabilities and fundamental operational weaknesses (Czerniewicz et al., 2020).

Learning management systems offer universities located in rural areas significant educational advantages. Ajani (2026) conducted a study at a rural South African university that showed that learning management systems allow students to study at their own pace while accessing learning resources and course materials outside scheduled class time. They can continue their studies notwithstanding interruptions to institutional operations. Feng (2023), Maluleke et al. (2025), and Sims (2024) demonstrate that learning management system platforms can support sustainable educational development in rural higher education by enabling flexible, accessible course delivery. Amhag et al. (2019) and Maluleke and Maake (2025) further highlight the role of learning management systems in supporting teacher educators' professional development and enhancing their digital competence, suggesting that their integration can have cascading benefits for the quality of teacher preparation programs.

Existing research indicates that resource-limited environments hinder the effective use of learning management systems. The international study by Fraillon et al. (2020) on computer and information literacy found that students in developing countries and rural regions face the greatest obstacles to accessing digital devices and reliable internet connections. The digital divide is more than a technical issue of infrastructure provision, as it reveals fundamental social and economic disparities that determine who can interact effectively with digital educational platforms (Warschauer, 2004; Bon et al., 2024).

The Digital Divide in Rural and Historically Disadvantaged Contexts

The notion of the so-called digital divide—the existing difference in the capability to use digital technology between those who possess it and those who lack it—has significantly transformed since the 1990s, when it first emerged. In a highly influential paper, Warschauer (2004) postulated that the digital divide is better construed as the ratio of device access to other important factors, such as those of information as knowledge, computing literacy, and all supporting and enhancing social factors of the given technology, within which it is being made user-friendly. This form of the digital divide is most pronounced in rural South African universities, where there is a high prevalence of student smartphone ownership but a lack of affordable data bundles, leading to limited use of learning management systems by learners.

There is no denying that South Africa is rife with pronounced digital disparities, which are also spatial. For instance, the digital infrastructure in the urban areas seems to be relatively well established, particularly for those in the big metropolitan clusters such as Gauteng, Western Cape, and the coastal cities of KwaZulu-Natal with adequate broadband connectivity, while rural areas are

still at the mercy of fluctuating mobile network coverages and the costly data that they present (African Development Bank, 2022; Yakobi & Yakobi, 2025). These disparities are also evident in the rural education centres, where, for instance, a more significant proportion of the disadvantaged students are from rural and peri-urban settings (Maluleke et al., 2025), which puts a severe limitation on quite a considerable number of the students in the university; they do not have reliable digital resources, if any at all (Ajani & Maphalala, 2014).

The African Union's *Digital Strategy for Africa 2020-2030* acknowledges this inertia and calls on member states to promote the development of an all-inclusive national information and communication technology (ICT) infrastructure accessible to everyone, particularly in the most remote and underdeveloped areas (African Union, 2020; Signal, 2018). According to a study by Akçal Gür and Kulesza (2024), the use of satellite broadband technology to narrow the digital divide in rural regions of the developing world is achievable. However, its application may be limited by high costs and the support it requires. Mpofo (2025), situated in Eswatini, also blames the status of technological utilisation advancement in secondary education across Southern African countries on the lack of uniform approaches to achieving this, with particular emphasis on concerns raised about policies and the allocation of resources in favour of the underprivileged.

Social Justice and Digital Equity in Education

In educational contexts, social justice theory is commonly conceptualised in terms of three interrelated dimensions: redistribution, recognition, and representation. Redistribution concerns the equitable allocation of material and educational resources; recognition emphasises the validation and respect of diverse identities, cultures, and lived experiences; while representation advocates for the meaningful participation of all stakeholders, particularly historically marginalised groups, in educational decision-making processes (Lekota & Ajani, 2026; Maluleke & Maake, 2025; Ngubane & Makua, 2021; Sims, 2024). These dimensions provide a robust analytical framework for examining the extent to which the use of learning management systems either mitigates or perpetuates existing educational inequalities. Consequently, social justice theory facilitates a critical interrogation of how digital learning environments may reinforce, reproduce, or challenge disparities in access, participation, and educational outcomes.

From a social justice perspective, there are inequalities in access to digital technologies, connectivity, and data that affect rural university students more than those in urban settings. This is broadly true where 'digital learning' in higher education courses merely refers to 'e-learning' and 'online learning' because 'digital learning' involves integration of more technologies and high-end ICT equipment into education. According to Ajani et al. (2026), providing all students with equal opportunities to improve their learning through appropriate educational technologies is difficult, particularly in South African rural universities.

Recognition-oriented analyses of digital equity highlight how learning management system design and implementation often fail to acknowledge or accommodate the realities of rural students' lives. When learning management system platforms are designed primarily for well-resourced, urban users, their interfaces, data demands, and pedagogical assumptions may be poorly suited to the contexts of rural students who access the internet via mobile devices on constrained data plans (Mokoena & Ajani, 2026). Siyaya and Ajani (2026) highlight similar recognition deficits in South African accounting education, showing that teachers' limited ICT competency, shaped by inadequate professional development and poor infrastructure, reproduces cycles of digital exclusion.

The participation dimension of social justice is equally significant (Naidoo & Singh-Pillay, 2025; Yakobi et al., 2026). Meaningful learning management system integration requires not only that students have physical access to platforms but also that they possess the digital literacy skills, institutional support, and confidence to engage with learning management system tools as active, agentic learners. Where these conditions are absent, the formal availability of a learning management system may mask substantive exclusion from curriculum participation, as students nominally enrolled in courses find themselves unable to engage with the full range of digitally mediated learning activities.

Technology Acceptance in Educational Contexts

Davis's (1989) Technology Acceptance Model is among the most widely applied frameworks in the study of educational technology adoption. The Technology Acceptance Model posits that users' intention to adopt a new technology is primarily determined by two factors: Perceived usefulness, defined as the degree to which a person believes that using a particular system would enhance their performance, and perceived ease of use, defined as the degree to which a person believes that using the system would be free of effort. Subsequent research has extended and refined the Technology Acceptance Model in various directions, incorporating additional variables such as social influence, facilitating conditions, and hedonic motivation.

In higher education contexts, the Technology Acceptance Model has been widely applied to explain students' and academics' adoption of learning management systems. Studies consistently find that perceived usefulness and ease of use are significant predictors of learning management system adoption intentions, whilst also identifying contextual factors, including instructor support, prior digital experience, and system quality, as important moderating variables (Ajani & Govender, 2026a; Ajani & Maphalala, 2026). However, as noted above, the Technology Acceptance Model's focus on individual perceptions of technology tends to render invisible the structural conditions that shape those perceptions, including the socio-economic and infrastructural contexts of rural universities.

This limitation of the Technology Acceptance Model in structurally unequal contexts motivates the present study's integration of Social Justice Theory into its analytical framework. Whilst the Technology Acceptance Model helps to explain the user-level dynamics of learning management system adoption, why students may or may not find a system useful or easy to use, Social Justice Theory illuminates the institutional and societal conditions that mediate these dynamics, producing a more complete and contextually sensitive account of learning management system adoption in rural higher education (Naidoo & Singh-Pillay, 2025).

Theoretical Framework

This study is guided by the dual theoretical frameworks of the Technology Acceptance Model (Davis, 1989) and Social Justice Theory (Ajani & Maphalala, 2026; Naidoo & Raju, 2012; Naidoo & Singh-Pillay, 2025; Ngubane & Makua, 2021; Simelane-Mnisi & Mthimunye, 2025), which together form the conceptual foundation for the analysis of learning management system adoption and curriculum delivery in the rural university context under investigation. The two frameworks are not merely additive but mutually corrective: The Technology Acceptance Model provides the vocabulary for analysing how students perceive and interact with learning management system technologies at the user level, whilst Social Justice Theory situates these perceptions within the broader structural

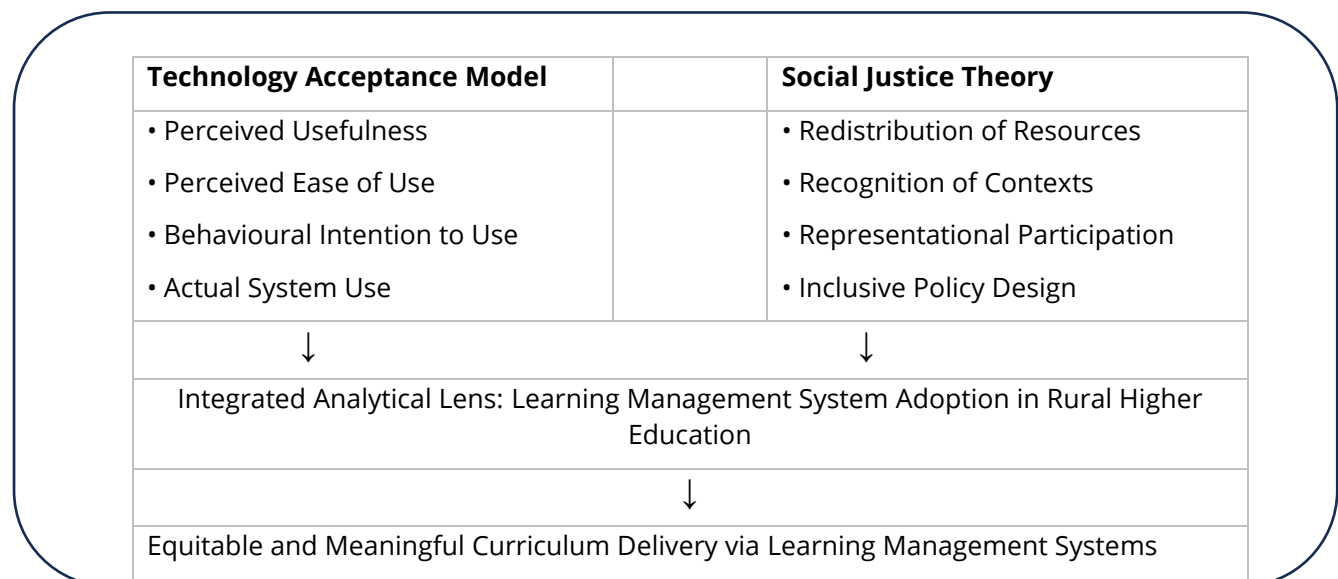
conditions of inequality, recognition, and participation that characterise rural South African higher education (Yakobi et al., 2026).

The Technology Acceptance Model's core constructs, perceived usefulness and perceived ease of use, are operationalised in this study to examine how students evaluate the learning management system as a tool for accessing the curriculum, submitting assessments, and communicating with academic staff. The model's focus on behavioural intention to use and actual system use provides a framework for understanding the range of learning management system engagement observed among participants, from consistent and purposeful use to reluctant or partial engagement driven by institutional requirements rather than genuine uptake.

Social Justice Theory, as applied in educational research (Lekota & Ajani, 2026), directs analytical attention to three dimensions. First, redistribution examines whether digital resources, devices, data, and connectivity are equitably distributed among students at the rural university. Second, recognition interrogates whether learning management system design, institutional policy, and academic practice adequately acknowledge and accommodate the material realities of rural students' lives. Third, representation asks whether rural students have meaningful opportunities to participate in the decisions and practices that shape their digitally mediated learning environments.

Social Justice Theory in this study is grounded in Fraser's (1995, 2008) tripartite framework of redistribution, recognition, and representation, which conceptualises social justice as encompassing economic equity, cultural inclusion, and political participation (Ngubane & Makua, 2021; Yakobi & Yakobi, 2025). Building on this foundation, Lekota and Ajani (2026) applied these dimensions to educational contexts to examine issues of access, inclusion, and student participation within digitally mediated learning environments. Hence, drawing on the foundational social justice scholarship of Nancy Fraser (1995, 2008), Social Justice Theory complements the Technology Acceptance Model by extending the analysis beyond technology acceptance to critically examine equity, inclusion, participation, and access in digitally mediated learning environments (Lekota & Ajani, 2026; Simelane-Mnisi & Mthimunye, 2025).

Figure 1: Conceptual Framework for the Study (Adapted from Davis (1989) and Social Justice Theory)



As illustrated in Figure 1, the two frameworks converge to form an integrated analytical lens through which the study examines the relationship between technology acceptance and social justice in the context of learning management system-mediated curriculum delivery (Naidoo & Raju, 2012; Naidoo & Singh-Pillay, 2025; Yakobi et al., 2026). The key tension the framework illuminates is that positive Technology Acceptance Model perceptions, students finding the learning management system useful and relatively easy to use, may coexist with persistent social justice deficits in redistribution, recognition, and representation, producing a situation in which formal learning management system adoption proceeds but substantive digital equity remains unrealised.

Research Methodology

Research Design

This study employed a qualitative interpretive research design, selected for its capacity to generate rich, contextually grounded understandings of participants' lived experiences and meaning-making processes (Braun & Clarke, 2021). The interpretive paradigm, which holds that social reality is constructed through the subjective experiences and interpretations of social actors, is well-suited to investigating the complex interplay between technology use, institutional context, and structural inequality that characterises the phenomenon under study. Rather than seeking to measure or generalise about learning management system adoption rates or user satisfaction scores, the study aimed to develop a nuanced account of how students experience, navigate, and make sense of learning management system-mediated curriculum delivery within a specific rural university context. The following research questions guide this study:

1. How do undergraduate pre-service teachers at a rural, historically disadvantaged university in KwaZulu-Natal perceive the usefulness and ease of use of the institutional learning management system for curriculum delivery and academic engagement?
2. What structural and socio-economic barriers constrain equitable access to and meaningful participation in learning management system-mediated curriculum delivery among students at a rural South African university?
3. To what extent do institutional policies and support structures address the social justice dimensions, redistribution, recognition, and representation, necessary for equitable learning management system integration in rural higher education?

Research Site and Participants

The study was conducted at a selected rural-based, historically disadvantaged university in KwaZulu-Natal Province, South Africa. This institution was selected purposively based on its rural location, its status as a historically disadvantaged institution, and its formal commitment to learning management system-based curriculum delivery across undergraduate programmes. The university serves a predominantly Black African student population, many of whom are first-generation higher education entrants from rural and peri-urban communities characterised by limited digital infrastructure.

The study participants comprised 40 undergraduate pre-service teachers enrolled in the Bachelor of Education (B.Ed.) degree programme. Participants were selected using purposive sampling to ensure the sample included students with varying levels of engagement with the learning management system, from different year groups and diverse socio-economic backgrounds. All 40 participants had direct experience of using the institutional learning management system as part of

their academic programme, which was an essential criterion for participation. The sample included 24 female and 16 male students, aged 18 to 31. Ethical clearance was obtained from the university's ethics committee, and all participants provided informed consent before they participated in the study.

Data Collection

Data were collected through semi-structured individual interviews, which Adeoye-Olatunde and Olenik (2021) identify as a particularly appropriate method for exploring participants' attitudes, experiences, and perspectives in depth. Semi-structured interviews allow the researcher to follow a predetermined set of guiding questions whilst retaining the flexibility to probe emerging themes and pursue lines of inquiry that arise spontaneously during the interview process. This flexibility is especially valuable in a study of this nature, where participants' learning management system experiences are likely to vary considerably and where the most significant insights may emerge from unanticipated directions in the conversation.

Each interview lasted between 45 and 75 minutes and was conducted in a private setting on the university campus. With participants' consent, all interviews were digitally recorded and subsequently transcribed verbatim. Interview questions explored four principal domains: participants' patterns of learning management system use and the specific features of the platform they engaged with most frequently; their perceptions of the usefulness and ease of use of the learning management system for curriculum access and academic tasks; the structural challenges they encountered in accessing and using the system; and their views on the institutional support available to them as system users. Interviews were conducted in English, with occasional code-switching into isiZulu when participants preferred to discuss particular topics in their home language.

Data Analysis

Data were analysed using thematic analysis as described by Braun and Clarke (2021), following their six-phase process: familiarisation with the data; generation of initial codes; searching for themes; reviewing themes; defining and naming themes; and producing the report. Thematic analysis was selected for its theoretical flexibility and capacity to identify, analyse, and interpret patterns of meaning across a qualitative dataset, making it particularly suited to research questions concerning participants' experiences and perspectives.

The analysis proceeded iteratively, with the researchers moving between data familiarisation, coding, and theme development across multiple cycles. Initial codes were generated inductively from the data, allowing themes to emerge from participants' accounts rather than being imposed from the theoretical framework in advance. However, in a second analytical phase, the Technology Acceptance Model and Social Justice Theory frameworks were used deductively to organise and theorise the emergent themes, examining how participants' experiences mapped onto the constructs of perceived usefulness, ease of use, redistribution, recognition, and participation. To ensure trustworthiness, the researchers engaged in regular member-checking discussions, peer debriefing, and reflexive journaling throughout the analytical process.

Figure 2. Thematic Map of Key Findings

Theme 1: Perceived Pedagogical Value of LMS	Theme 2: Structural and Socio-economic Barriers
<ul style="list-style-type: none"> • Access to learning materials • Assessment submission • Continuity of learning • Communication with lecturers 	<ul style="list-style-type: none"> • Inconsistent connectivity • High data costs • Device scarcity • Varying institutional support
Theme 3 Equity and Participation Constraints	Theme 4 Institutional Response and Policy Gaps
<ul style="list-style-type: none"> • Unequal curriculum access • Marginalisation of rural students • Recognition deficits • Exclusion from digital participation 	<ul style="list-style-type: none"> • Digital policy commitments • Gaps between policy and practice • Support structure inadequacies • Need for contextual interventions

Source: Authors' own thematic analysis

Findings And Discussion

The analysis produced four major themes, as illustrated in Figure 2: perceived pedagogical value of the LMS; structural and socio-economic barriers to LMS adoption; equity and participation constraints; and institutional responses and policy gaps. These themes are presented and discussed below, drawing on participant quotations and situating the findings within the theoretical framework and the existing literature.

Theme 1: Perceived Pedagogical Value of the Learning Management System

Participants across all year groups and academic backgrounds demonstrated a clear recognition of the pedagogical value of the institutional learning management system. The platform was widely appreciated for its capacity to centralise course materials, enable flexible access to learning content, and facilitate communication with academic staff. Students described the learning management system as an indispensable resource for accessing lecture notes, slides, and reading lists, particularly during periods when they could not attend face-to-face classes due to illness, family responsibilities, or transport challenges common in rural contexts.

During the thematic analysis of the 40 interviews, codes related to the pedagogical utility, document centralisation, and flexibility of the learning management system (LMS) emerged as a dominant pattern, occurring across 36 out of the 40 participant transcripts (90% occurrence rate).

One third-year student emphasised that "

The LMS is our online class where everything we learn is. Even if I am not in the physical class, I can catch up with others, as I will get the notes for every lecture there. We also use it to submit assessments without having to go to campus. This is good for many of us. "It really helps to study

at my own pace when I am away from campus, especially because we can access reading lists and slides at any time of the night without relying on physical handouts."

One second-year student articulated the perceived usefulness of the learning management system in the following terms: *"The LMS is where everything is. If I miss a lecture, I know I can go there and get the notes. I can submit my assignment without going to campus. That part works for me."* This sentiment closely aligns with Davis's (1989) construct of perceived usefulness, capturing the student's belief that the platform enhances their academic performance and reduces the logistical burdens of rural campus life.

Assessment submissions through the learning management system were particularly valued by participants, who noted that the platform eliminated the need to physically submit written assignments, which had previously required costly, time-consuming trips to campus. Participants also highlighted the LMS's role in maintaining learning continuity during institutional disruptions, including service delivery protests that periodically disrupt access to university facilities. These findings align with Ajani and Govender's (2026b) observation that learning management systems can support sustainable educational development in rural higher education by enabling flexible and resilient curriculum delivery.

Perceived ease of use was more varied among participants. Whilst some described the learning management system interface as intuitive and straightforward, others, particularly first-year students and those with limited prior digital experience, found it challenging to navigate. Several participants noted that the platform had not been introduced to them through any systematic orientation programme, and that they had learned to use it primarily through peer support and trial-and-error experimentation. This finding underscores the importance of adequate digital literacy support as a precondition for the Technology Acceptance Model's predicted relationship between perceived ease of use and actual system use.

Theme 2: Structural and Socio-economic Barriers to Learning Management System Adoption

Whilst participants broadly recognised the pedagogical value of the learning management system, their accounts were permeated by descriptions of structural barriers that severely constrained their ability to benefit from this value. The most pervasive of these barriers was internet connectivity and data costs. Participants described irregular and unreliable mobile network coverage on and around the university campus and in their home communities, making sustained engagement with the learning management system difficult or impossible at critical times, such as the run-up to assignment deadlines.

Thus, structural and economic obstacles are specifically infrastructure deficits highlighted by these participants, with device scarcity and high data costs intensely emphasised throughout the data, being coded a total of 142 times across all 40 interviews, proving to be an almost universal challenge (100% participant exposure).

A fourth-year student reiterated that.

For those of us from poor homes, and without funding or provided laptops, trying to read a 30-page PDF document or complete an online timed quiz on a small smartphone screen with a cracked display and slow processing is exhausting, but a phone is the only device I have.

A third-year student from a rural community approximately 80 kilometres from the university campus described her experience as follows: *"At home, the signal is very bad. Sometimes I drive to the main road to get data. By the time the LMS loads, I have spent R20 on data to download one document. It is not fair."* This account illustrates vividly the intersection of connectivity infrastructure deficits and the prohibitive cost of mobile data in rural South Africa, two structural factors that the African Development Bank (2022) identifies as key obstacles to digital inclusion across the continent.

Device access emerged as a further significant barrier. Most participants reported relying exclusively on smartphones as their primary means of accessing the learning management system, while a minority had access to a personal laptop or computer. Whilst smartphones enable basic access to learning management systems, participants reported significant difficulties engaging with certain learning management system features, including reading lengthy PDF documents, completing online quizzes, and uploading large assignment files, on small screens with limited processing capacity. Fraillon et al. (2020) document similar device-mediated inequities in their international study of computer and information literacy, noting that the nature of digital access, rather than its mere presence, is a critical determinant of meaningful technology engagement.

Many participants described institutional support for learning management system users as inadequate and inconsistent. Whilst the university formally maintained a technical support function for the learning management system, participants reported long response times, limited help-desk hours, and a general absence of proactive support for students encountering difficulties. These findings resonate with Ajani et al.'s (2026) research, which identifies inadequate institutional support structures as a key factor in the psychological distress experienced by students at rural South African universities who are required to use learning management system platforms as a mandatory component of their academic programmes.

Theme 3: Equity and Participation Constraints

The third theme addresses the equity and participation dimensions of learning management system adoption as seen through the lens of Social Justice Theory. Participants' accounts revealed a consistent pattern of unequal curriculum access that tracked closely with students' socio-economic circumstances. Students from wealthier backgrounds or those living in more urbanised areas with better connectivity were able to engage with the learning management system more consistently and comprehensively than their peers from more disadvantaged rural communities. This differential access to learning management systems effectively reproduced and amplified pre-existing socio-economic inequalities within the curriculum delivery system.

Codes capturing unequal curriculum access, institutional disregard for rural realities, and feelings of marginalisation occurred 88 times, appearing prominently in 31 of the 40 interviews (77.5% occurrence rate).

A first-year student related his frustration,

The university sets up these systems assuming everyone has stable Wi-Fi and a laptop ready to go. It feels like they have completely forgotten the reality of living in a deep rural area where basic network towers do not even work consistently.

A fourth-year student reflected on these inequities in explicit terms:

My friend has a laptop and WI-FI at home. She submits everything on time, she watches the videos, and she participates in the online discussions. I have a phone, and I buy data when I can. We are not having the same education, even though we are in the same class.

This student's articulation of differential access to curriculum as a form of educational inequality resonates powerfully with Czerniewicz et al.'s (2020) concept of the 'digital divide' as a form of educational stratification that mirrors and reinforces broader socio-economic hierarchies.

From a recognition perspective, participants reported feeling that the university's expectations of learning management system engagement were disconnected from the realities of their lives as rural students. They described a mismatch between institutional assumptions, that students have reliable internet access and appropriate devices, and the material conditions of their daily existence. This recognition deficit, as Lekota and Ajani (2026) note in their analysis of technology-enhanced curriculum for pre-service teachers, produces a form of institutional disregard for student contexts that undermines the conditions of equitable curriculum participation.

The participation dimension of social justice was further compromised by what several participants described as a lack of agency in their interactions within the learning management system. Mandatory use of a learning management system without adequate support, orientation, or accommodation for diverse access contexts positioned students as passive recipients of a digitally mediated curriculum rather than active, agentic learners. Mokoena and Ajani (2026) identify a parallel dynamic in the context of mobile learning in South African secondary schools, where top-down technology integration mandates without adequate contextual support can undermine rather than enhance student participation.

Theme 4: Institutional Response and Policy Gaps

The fourth theme addresses the institutional and policy dimensions of learning management system adoption at the research site. Participants' accounts revealed a significant gap between the university's formal commitments to digital transformation, articulated in institutional policy documents and strategic plans, and the lived realities of learning management system engagement that characterised their academic experience. This policy-practice gap was experienced by participants as institutional hypocrisy, in which ambitious digital transformation rhetoric sat uneasily alongside the absence of the material conditions necessary to realise it.

The university's digital transformation commitments broadly align with the African Union's (2020) *Digital Transformation Strategy for Africa (2020-2030)*, which calls for inclusive, contextually appropriate, and equitably distributed digital education across the continent. However, as Mpofu (2025) and Bon et al. (2024) observe in parallel studies from Eswatini and broader African contexts, respectively, the gap between digital policy aspirations and implementation realities is frequently wide, particularly in rural and resource-constrained educational settings.

Most participants had frustrations with the policy-practice gap, long wait times for technical support, and the lack of structured digital orientation programs, which were coded 64 times across 28 distinct student interviews (70% occurrence rate).

Another fourth-year student lamented her experience at the university over many years: *"They write these beautiful strategic plans about digital transformation and modern learning, but on the ground, we do not have data subsidies or a proper technical helpdesk when the system crashes before a deadline."*

In addition, a second-year student had this to say: "We were just expected to figure out how to navigate the platform on our own using trial-and-error or asking friends. There was no systematic orientation or digital literacy training to show us how to use it properly."

Participants also identified gaps in the university's academic and technical support infrastructure for learning management system users. The absence of systematic digital literacy development programmes, adequate technical helpdesk provision, and data subsidies for students was identified as a concrete manifestation of the policy-practice gap. Ajani and Maphalala (2026), in their systematic review of emerging technologies for curriculum design in rural universities, argue that meaningful digital transformation in such contexts requires not merely the provision of learning management system platforms but a comprehensive ecosystem of contextually responsive support that addresses the full range of conditions necessary for equitable system engagement.

Figure 3. Structural Barriers to learning management system Adoption and their Equity Consequences

Barriers to Learning Management System Adoption and Equitable Curriculum Delivery in Rural Universities				
Structural Factor		Barrier to learning management system use		Equity Outcome
Rural Infrastructure	→	Inconsistent Internet Connectivity	→	Unequal curriculum access
Socio-economic Status	→	High Data Costs and Device Scarcity	→	Participation inequities
Institutional Capacity	→	Inadequate Technical Support	→	LMS disengagement
Digital Policy Gaps	→	Uncontextualised Implementation	→	Recognition deficits

Source: Authors' own model derived from thematic analysis

As illustrated in Figure 3, the structural barriers to learning management system adoption, rural infrastructure deficits, socio-economic disadvantage, inadequate institutional capacity, and digital policy gaps translate into concrete barriers to learning management system use, which, in turn, compound equity consequences for students. These consequences, unequal access to the curriculum, participation inequities, learning management system disengagement, and recognition deficits, collectively constitute a pattern of digital injustice that undermines the formal commitment of rural universities to equitable curriculum delivery.

Discussion

The findings of this study illuminate a fundamental tension at the heart of learning management system adoption in rural higher education: the tension between the individualised, perception-centred account of technology adoption offered by the Technology Acceptance Model and the structural, equity-oriented account demanded by Social Justice Theory. This tension is not merely

theoretical but has concrete implications for curriculum delivery, student experience, and institutional policy in rural university contexts.

The Technology Acceptance Model's predictive utility is evident in the study's findings: students who perceived the learning management system as useful and relatively easy to use were more likely to engage with it consistently and to derive pedagogical benefit from it. This pattern confirms the broad applicability of the Technology Acceptance Model's core constructs across diverse higher education contexts, including those characterised by significant resource constraints. However, the study also demonstrates compellingly that the Technology Acceptance Model's explanatory power is limited precisely at the point where the most critical questions of equity arise. The Technology Acceptance Model cannot explain why two students in the same cohort, with equivalent levels of perceived usefulness and ease of use, may have radically different learning management system engagement experiences depending on their access to devices, data, and connectivity. For this, a social justice lens is indispensable (Naidoo & Raju, 2012; Ngubane & Makua, 2021; Yakobi & Yakobi, 2026).

The concept of digital equity, as theorised by Warschauer (2004) and operationalised in this study through Social Justice Theory, is essential for understanding why positive perceptions of learning management system technology do not automatically translate into equitable participation in the curriculum. Digital equity is not achieved simply by making a learning management system platform available to all enrolled students; it requires the active redistribution of digital resources, the recognition of diverse student contexts in learning management system design and policy, and the creation of genuine opportunities for participatory engagement with digitally mediated curriculum. In the absence of these conditions, learning management system adoption, however widely and enthusiastically embraced by institutional policy, risks reproducing and deepening the educational inequalities it purports to overcome.

These findings have significant implications for the design and implementation of digital education policy in rural universities, not only in South Africa but across the broader Southern African and Sub-Saharan African region. The aspiration articulated in the African Union's *Digital Transformation Strategy for Africa (2020-2030)*. It is reflected in national digital education policies, which require concerted institutional and governmental action to address the structural conditions that currently constrain equitable adoption of learning management systems (African Union, 2020; Signal, 2018). Piecemeal technological provision, in the absence of attention to connectivity, device access, data costs, digital literacy, and institutional support, will continue to generate the policy-practice gaps that participants in this study identified as a persistent source of frustration and disempowerment.

The study's findings also contribute to the growing body of research on the mental well-being consequences of mandatory adoption of learning management systems in resource-constrained contexts (Ajani et al., 2026). When students are required to engage with platforms as a mandatory component of their academic programmes, but lack the structural conditions to do so meaningfully, the result is not merely academic disadvantage but psychological distress. This finding underscores the ethical dimensions of digital transformation policies and institutions' responsibility to ensure that the transition to learning management system-mediated curriculum delivery does not create new forms of student vulnerability.

Conclusions and Recommendations

This study has demonstrated that a critical tension between technological acceptance and social justice characterises learning management system adoption in a rural, historically disadvantaged South African university. Whilst students broadly recognise the pedagogical value of learning management system platforms and express positive perceptions of their usefulness for curriculum access and assessment submission, these perceptions coexist with structural barriers, inconsistent connectivity, high data costs, device scarcity, and inadequate institutional support, which severely constrain equitable participation in the curriculum. Viewed through the lens of Social Justice Theory, these barriers constitute a pattern of digital injustice characterised by redistribution deficits, recognition failures, and participation inequities that persist despite formal institutional commitments to digital transformation.

The study's integration of the Technology Acceptance Model and Social Justice Theory as a dual analytical framework represents a methodological contribution to the literature on educational technology adoption in marginalised contexts. This integrated approach makes visible the limitations of perception-centred models of technology adoption in structurally unequal settings. It demonstrates the analytical necessity of attending to structural conditions of equity when investigating learning management system adoption and curriculum delivery in rural higher education. The argument is not that the Technology Acceptance Model is without value, but that its application in contexts of structural inequality must be complemented by frameworks that can illuminate the social justice dimensions of digital technology adoption.

Based on the study's findings, the following recommendations are offered for institutional policy and practice. First, rural universities should develop and implement comprehensive digital access support programmes that include data subsidies, device lending schemes, and on-campus WI-FI infrastructure to enable students to engage with learning management system platforms without incurring prohibitive personal costs. Second, learning management system orientation and digital literacy development should be systematically embedded in undergraduate programmes, particularly for first-year students, rather than left to informal peer-to-peer knowledge transfer. Third, learning management system design and institutional policy should be developed with explicit recognition of the material realities of rural students' lives, including limited device access, variable connectivity, and competing domestic and community responsibilities. Fourth, universities should review their digital transformation policies to ensure that substantive resource allocation accompanies formal commitments to learning management system adoption and to the support infrastructure necessary to realise equitable curriculum delivery.

Finally, this study highlights the importance of student voice in the governance of digital transformation processes. Rural students must be recognised not merely as end-users of learning management system platforms but as active agents whose situated knowledge of their own digital contexts is an indispensable resource for the design of contextually appropriate and equitable curriculum delivery systems. Their inclusion in institutional decision-making processes related to learning management system adoption and digital policy is both a social justice imperative and a practical necessity for developing digital education strategies that are fit for purpose in rural higher education contexts.

Future research should examine the longitudinal effects of sustained structural interventions on learning management system adoption equity in rural universities, as well as the perspectives of

academic staff and institutional managers on the challenges and opportunities of equitable digital curriculum delivery. Comparative studies across rural universities in different Southern African national contexts would also contribute to a richer regional understanding of the structural and policy conditions necessary for digital equity in higher education.

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