




Challenges of Learning Management Systems in Enhancing Teaching and Learning: A Study of Undergraduate Students at a Rural University



Oluwatoyin Ayodele Ajani¹ , Samantha Govender²  &
Bongani Thulani Gamede³ 

¹ Curriculum/Education Studies, University of KwaZulu-Natal, Edgewood Campus, South Africa.

² Educational Foundations and Management, University of Zululand, KwaDlangezwa, South Africa.

³ Languages and Social Sciences Education, University of Zululand, KwaDlangezwa, South Africa.

ABSTRACT

This case study explored the challenges associated with the use of Learning Management Systems (LMS) to enhance teaching and learning within a rural university setting, with a focus on the University of Zululand in South Africa. Based on Technological Pedagogical Content Knowledge (TPACK) and Unified Theory of Acceptance and Use of Technology (UTAUT) research frameworks, the research sought to analyse how undergraduate students perceive LMS integration throughout their academic experience across all levels and faculties. A qualitative research design utilizing focus group interviews with 50 students from four faculties: Education, Humanities and Social Sciences, Commerce and Law, and Science, Agriculture and Engineering was chosen. The results indicated a number of ongoing barriers to effective use of LMS: the patchy nature of internet connectivity at the university, the absence of training in digital skills, limited interaction with lecturers on the platform, and over-reliance on the conventional modes of teaching. Besides, students expressed that the LMS was being passive and was merely used for keeping materials rather than promoting collegial engagement and collaborative learning. Recommendations include up-skilling staff in digital pedagogy, student support initiatives in digital literacy, and investment in digital infrastructure by the university. This research adds to existing efforts toward educational technology in under-resourced spaces by placing rural student voices at the forefront of discussions in the field. It indicates that the conditions required for the adoption of LMS at the higher education level should be informed by theory while ensuring that they are grounded in the context.

Correspondence

Oluwatoyin Ayodele Ajani

Email:

aaajani@gmail.com

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INTRODUCTION

The emergence of technologies in the education sector has significantly transformed teaching and learning globally, making learning experiences more impactful.¹ Over the past years, dialogue in the global academic community about equity and digital transformation in under-resourced geographical contexts has lent growing interest to the topics of equity and access in higher education. Digital

¹ Mncedisi Christian Maphalala and Oluwatoyin Ayodele Ajani, "Leveraging Artificial Intelligence as a Learning Tool in Higher Education," *Interdisciplinary Journal of Education Research* 7, no. 1 (January 16, 2025): a01, <https://doi.org/10.38140/ijer-2025.vol7.1.01>.

technologies, if harnessed effectively, would revolutionise education, creating flexible opportunities for student-centred learning and redressing systemic inequalities.² The advent of online platforms and LMS has certainly advantaged the discourse on inclusive educational practices; however, rural universities in the Global South continue to face a plethora of challenges in their effective adoption of these technologies.³

Despite many government and institutional initiatives aimed at creating digital equity, there remain huge gaps in digital infrastructure, access, and pedagogical readiness witnessed in rural institutions.⁴ Rural universities in South Africa continue to bear the brunt of marginalisation in national development planning, with their digital ecosystems often underdeveloped for the objective of equitable curriculum delivery.⁵ Furthermore, issues of disparity in digital literacy among learners and lecturers, professional development of staff, and socio-economic constraints inhibit the effective employment of educational technologies.⁶

While some studies have mapped out the affordances and barriers presented by LMS in urban or well-resourced contexts,⁷ there is still a significant gap in knowledge relating to the contextual realities, cultural issues, and ethical considerations that come into play as an LMS is implemented in rural universities, that is, how digital transformation initiatives can intersect with existing inequalities and therefore either help to bridge or further widen the educational divide in rural areas.⁸ This gap calls for a study that goes beyond adoption in the technical sense and incorporates pedagogical, socio-cultural, and institutional perspectives.

This study is borne of the need to fill the aforementioned gap by exploring ways LMS could be used to promote equity and access in rural South African universities in curriculum delivery. In particular, it seeks to explore and assess the effectiveness of the LMS implementation, as well as examine the challenges facing the implementation and recommend contextually relevant optimisation strategies. The Capabilities Approach guides this study with a focus on human development, digital inclusion, and social justice as the key lenses through which LMS adoption must be looked at.⁹

It will also look at the cultural and ethical dimensions of digital learning environments in rural institutions, especially concerning data privacy, algorithmic bias, and user agency.¹⁰ The study will further highlight teacher digital competence, infrastructural readiness, and institutional support mechanisms that facilitate meaningful engagement with LMS.¹¹ Such an integrated investigation will be critical in identifying contextually relevant digital education strategies that are sustainable and just for those working and teaching in the rural context.

² Oluwatoyin Ayodele Ajani, "Enhancing Knowledge Production through the Management of Technology and Innovation in Higher Education: Challenges and Opportunities," *Indonesian Journal of Innovation and Applied Sciences (IJIAS)* 5, no. 2 (June 28, 2025): 129–44, <https://doi.org/10.47540/ijias.v5i2.1644>.

³ Gert De Freitas and Erna D. Spangenberg, "Mathematics Teachers' Levels of Technological Pedagogical Content Knowledge and Information and Communication Technology Integration Barriers," *Pythagoras* 40, no. 1 (2019): a431; R. I. Lumadi, "The Influence and Effects of Digital Revolution on Africa's Higher Education Systems," *South African Journal of Higher Education* 38, no. 3 (2024): 114–30.

⁴ John Mangundu, "The Effects of Technostress on Academic Commitment among First-Year Undergraduate Students at an Institution of Higher Education in South Africa," in *In Proceedings of the 4th African Human Computer Interaction Conference, 2023*, 106–17.

⁵ Thandi Ngema and Oluwatoyin Ayodele Ajani, "Exploring Digital Transformation in Preservice Teacher Education in Africa: Prospects, Challenges, and Implications for Sustainable Lifelong Learning," *International Journal of Innovative Technologies in Economy*, no. 3(47) (September 29, 2024), https://doi.org/10.31435/rsglobal_ijite/30092024/8236a.

⁶ Zenda Rudairo and Rethabile Dlamini, "Examining Factors That Influence Teachers to Adopt Information and Communication Technology in Rural Secondary Schools: An Empirical Study," *Education and Information Technologies* 28, no. 1 (2023): 815–32; Leon, Tikly and Angeline M. Barrett, "Social Justice, Capabilities and the Quality of Education in Low Income Countries," *International Journal of Educational Development* 31, no. 1 (2011): 3–14.

⁷ Oluwatoyin Ayodele, Ajani, Bogani Gamede, and Samantha Govender, "Cultural and Ethical Dimensions of Learning Management System Adoption in Rural Universities: Exploring Data Privacy, Algorithmic Bias, and Contextual Realities," *Multidisciplinary Science Journal (Accepted Articles)*, 2025.

⁸ Zoltán Bajmócy, Bálint Mihók, and Judit Gébert, "Furthering Social Justice for Disabled People: A Framework Based on Amartya Sen's Capability Approach," *Studia Universitatis Babeş-Bolyai Sociologia* 67, no. 1 (2022): 69–84.

⁹ Sen Amartya, *The Idea of Justice* (Penguin Books, 2009).

¹⁰ Ajani, Gamede, and Govender, "Cultural and Ethical Dimensions of Learning Management System Adoption in Rural Universities: Exploring Data Privacy, Algorithmic Bias, and Contextual Realities."

¹¹ Oluwatoyin Ayodele Ajani and Tinashe C. Matiyenga, "Enhancing Critical Analysis and Argumentation Skills in University Students Through Multimodal Approaches: A Comprehensive Study," *International Journal of Educational Reform*, April 15, 2025, <https://doi.org/10.1177/10567879251326556>.

The hybrid theoretical framework grounding this study consists of Sen's Capability Approach and Critical Theory, which together provide the strength of underpinning the collaboration between technology, pedagogy, and justice.¹² These approaches provide great potential to critically examine prevailing power relations and capabilities within educational contexts, thus deepening the analysis of digital transformation in rural universities. Further, this study responds to the call for decolonisation of digital learning spaces by embedding indigenous perspectives into LMS adoption strategies and ensuring such strategies are contextually relevant.¹³

This paper is organised as follows: the literature review investigates previous research on digital transformation, equity, and curriculum delivery in rural higher education. A qualitative research design based on interpretivist tenets was adopted to explore undergraduate students' perceptions and lived experiences of Learning Management System (LMS) usage at the University of Zululand, a rural-based higher education institution in South Africa. The findings section brings forth key themes acquired from the research about challenges, benefits, and strategies with regard to LMS use in rural universities. This is followed by a discussion section that synthesises the findings with theoretical perspectives and global debates on educational justice. Recommendations for the application, directed at policymakers, academic institutions, and developers, finish off the paper.

In so doing, by shedding light on the structural, pedagogical, and ethical challenges facing rural institutions, this study will contribute to the burgeoning literature around inclusive digital education, arguing for policy responsiveness, collective partnerships, and ongoing evaluation to see that the digital transformative journey in higher education not only makes access more readily available but is also anchored in equity, dignity, and human flourishing.¹⁴ Accordingly, the main objective of this research is to investigate the challenges that undergraduate students experience while using the LMS to enhance teaching and learning at the University of Zululand. In line with the theoretical frameworks (TPACK and UTAUT), the study also investigates pedagogically and technologically related hurdles that inhibit the effective use of LMS. In so doing, the growing discourse regarding the digital transformation of higher education is enriched with a student-centred rural perspective. The research ultimately seeks to inform more inclusive and contextually relevant strategies for LMS adoption and implementation.

LITERATURE REVIEW

The integration of Learning Management Systems (LMSs) in higher education has become an essential component of contemporary curriculum delivery, particularly in the context of digital transformation. Globally, LMSs have enhanced pedagogical effectiveness, improved student engagement, and facilitated remote learning.¹⁵ However, rural universities in Africa, especially in South Africa, face unique challenges that complicate the seamless adoption of such technologies. These institutions often grapple with infrastructural deficits, financial limitations, low digital literacy, and inconsistent policy implementation.¹⁶ The pressing need to improve access and equity through digital platforms must therefore be critically examined within localised and context-sensitive frameworks.

A number of studies have demonstrated that South African rural universities suffer from poor internet connectivity, unreliable electricity supply, and insufficient digital infrastructure.¹⁷ These deficits severely hinder the functionality of LMS platforms, especially during peak academic periods when consistent access is critical. For instance, the digital learning journey of South Africa as markedly unequal, citing that rural institutions were significantly disadvantaged during the COVID-19 pandemic. Similarly, concerns about inclusivity and equity for indigenous students, have continued to shape how the digital divide exacerbates existing educational inequalities.

¹² Robin Celikates and Jeffrey Flynn, "Critical Theory (Frankfurt School)," 2023; Tikly and Barrett, "Social Justice, Capabilities and the Quality of Education in Low Income Countries."

¹³ Pam Christie, *Decolonising Schools in South Africa: The Impossible Dream?* (Routledge, 2020); Lumadi, "The Influence and Effects of Digital Revolution on Africa's Higher Education Systems."

¹⁴ Amartya, *The Idea of Justice*.

¹⁵ Ajani, "Enhancing Knowledge Production through the Management of Technology and Innovation in Higher Education: Challenges and Opportunities."

¹⁶ Christie, *Decolonising Schools in South Africa: The Impossible Dream?*

¹⁷ E.T. Woldegiorgis, "Configurations of Progress and the Historical Trajectory of the Future in African Higher Education," *Educational Philosophy and Theory* 54 No 11, (2022): 54, no. 11 (2022): 1839–53; Ajani, "Enhancing Knowledge Production through the Management of Technology and Innovation in Higher Education: Challenges and Opportunities."

Practical case studies further illustrate the gravity of these challenges. The University of Zululand, a rural-based institution in KwaZulu-Natal, experienced notable difficulties in migrating to full LMS-based instruction during the pandemic due to limited access to data and digital devices among its student body.¹⁸ Comparable challenges were observed in Nigeria and Kenya, where rural tertiary institutions struggled with bandwidth limitations and low levels of student and lecturer preparedness for digital education.¹⁹ These shared experiences underscore a broader continental crisis that demands context-sensitive technological interventions.

Barriers to effective LMS adoption also include institutional resistance and pedagogical inertia. Lumadi argues that beyond physical infrastructure, cultural and ethical considerations—such as data privacy, algorithmic bias, and local content irrelevance—further complicate LMS integration.²⁰ Lecturers often lack professional development in digital pedagogy, which reduces the pedagogical value of LMS tools.²¹ This is consistent with the findings of De Freitas and Spangenberg, who documented that even when LMS platforms are available, insufficient TPACK (Technological Pedagogical Content Knowledge) impedes meaningful integration.²²

In response to these barriers, several scholars have proposed multi-level interventions. These include investments in digital infrastructure, professional development programmes, and co-creation of culturally relevant content.²³ For instance, the work of Ajani and Matiyenga demonstrates how multimodal approaches can enhance students' critical thinking and argumentation skills, especially when supported by LMS-based scaffolding strategies.²⁴ The potential of these systems to foster student-centred, flexible, and inclusive learning environments remains underutilised in rural contexts due to lack of coherent policy implementation and limited cross-sector collaboration.²⁵

Another critical issue relates to institutional governance and policy frameworks. Despite South Africa's national drive for digital transformation in higher education, the lack of specific support policies for rural universities has led to uneven LMS adoption rates. According to Ajani, there is an urgent need for universities and policymakers to address these systemic disparities through a more inclusive digital transformation agenda.²⁶ Without robust support mechanisms, rural institutions are likely to remain on the periphery of technological advancement, further entrenching educational inequity.²⁷

Moreover, digital inequality in African higher education is intricately tied to broader social justice concerns. Tikly and Barrett advocate for applying frameworks such as Amartya Sen's Capability Approach to analyse how unequal access to technology affects students' educational freedoms.²⁸ In the context of rural universities, this approach reveals that students' capabilities to engage meaningfully with LMS tools are often constrained by socio-economic and infrastructural limitations, demanding a rethinking of digital learning models from an equity lens.

Conversely, the literature reveals a multifaceted landscape where LMSs hold promise for transforming curriculum delivery but are simultaneously hindered by structural, pedagogical, and policy-related challenges. Future discussions in this study will explore: (1) the theoretical grounding of digital equity in rural education, (2) the practical enablers and barriers to LMS adoption, (3) institutional

¹⁸ Ajani, "Enhancing Knowledge Production through the Management of Technology and Innovation in Higher Education: Challenges and Opportunities."

¹⁹ Yakubu Bala Mohammed et al., "A Hybrid Soft Computing Approach for Prediction of Cloud-Based Learning Management Systems Determinants," *International Journal of Human-Computer Interaction* 41, no. 1 (2025): 504–14.

²⁰ Lumadi, "The Influence and Effects of Digital Revolution on Africa's Higher Education Systems."

²¹ Ajani, Gamede, and Govender, "Cultural and Ethical Dimensions of Learning Management System Adoption in Rural Universities: Exploring Data Privacy, Algorithmic Bias, and Contextual Realities."

²² De Freitas and Spangenberg, "Mathematics Teachers' Levels of Technological Pedagogical Content Knowledge and Information and Communication Technology Integration Barriers."

²³ Mangundu, "The Effects of Technostress on Academic Commitment among First-Year Undergraduate Students at an Institution of Higher Education in South Africa."

²⁴ Ajani and Matiyenga, "Enhancing Critical Analysis and Argumentation Skills in University Students Through Multimodal Approaches: A Comprehensive Study."

²⁵ Scientific, and Cultural Organization. UNESCO - United Nations Educational, "Ethical Impact Assessment. A Tool of the Recommendation on the Ethics of Artificial Intelligence," 2023, <https://doi.org/10.54678/YTSA7796>.

²⁶ Ajani, "Enhancing Knowledge Production through the Management of Technology and Innovation in Higher Education: Challenges and Opportunities."

²⁷ Ngema and Ajani, "Exploring Digital Transformation in Preservice Teacher Education in Africa: Prospects, Challenges, and Implications for Sustainable Lifelong Learning."

²⁸ Tikly and Barrett, "Social Justice, Capabilities and the Quality of Education in Low Income Countries."

and pedagogical strategies for optimising digital delivery, and (4) policy recommendations for inclusive and sustainable integration.

THEORETICAL FRAMEWORKS

By critically investigating the challenges that Learning Management Systems (LMS) bring to teaching and learning in rural universities, the framing of the study is through tried and tested theoretical frameworks that appreciate pedagogy and technology acceptance. Two models were deemed most relevant for the present study: the Technological Pedagogical Content Knowledge (TPACK) framework and the Unified Theory of Acceptance and Use of Technology (UTAUT). Such differences, yet complementary contributions to understanding how lecturers and students interact with digital tools in learning environments were offered by these frameworks.

TPACK is an acronym introduced by Mishra and Koehler to extend the idea of Pedagogical Content Knowledge by Shulman to integrate technology as a vital third component. Ineffective teaching with technology, the TPACK model comprises an interplay of three domains: technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK). This triadic relationship aids educators' understanding of how technology should be applied in particular strategies for the subject being taught.²⁹

Thus, in rural universities, TPACK can be a relevant tool in identifying the kinds of missing professional knowledge or support that lecturers need to use the LMS. Really, knowledge is often there; professors have that knowledge with regard to content, unlike pedagogy and a lot more in technological knowledge or as far as navigating digital tools concerning meaningful ways of learning.³⁰ Therefore, the TPACK framework will lead this investigation in terms of determining how far or near the intersection of these three domains is or is not in LMS implementation.

The pandemic unmasked such hurdles as schools, because they were expected to go online in no time.³¹ In some cases, teachers deposited documents into the LMS, treating it as some surface or superficial way to drive student learning. Such superficial penetration would stand for a very weak or fragmented TPACK alignment, where the use of technology does not support deep pedagogical intentions.³²

This study uses TPACK to investigate how well an LMS is integrated into teaching practice an LMS is and what students experience from that integration. Poor pedagogical and content alignment with technology can leave students disengaged, as they perceive the LMS as burdensome or simply irrelevant. Pedagogically tenuous digital delivery can add to the limited accessibility normally available in rural settings for educational inequalities.³³

TPACK guides the assessment of educator readiness in instructional design, whereas the UTAUT model complements this with a forward-looking aspect on technology acceptance and use among students, which is the core of the UTAUT. The model was developed by Venkatesh et al., and it posits four types of core constructs that make up the user's behavioral intention to adopt technology: performance expectancy, effort expectancy, social influence, and facilitating conditions.³⁴ The model is

²⁹ Ang Chooi Kean, Mohamed Amin Embi, and Melor Md Yunus, "Incorporating ICT Tools in an Active Engagement Strategy-Based Classroom to Promote Learning Awareness and Self-Monitoring.," *International Education Studies* 5, no.4(2012):139–49.

³⁰ Vaughn Malcolm Bradley, "Learning Management System (LMS) Use with Online Instruction.," *International Journal of Technology in Education* 4, no. 1 (2021): 68–92; Muchineripi Munyaradzi, Dichaba Mpho Mildred, and Addae David, "Engaging Students Online: Readiness of Lecturers to Use Learning Management System (LMS) at a Technical Vocational Education and Training College," *Community College Journal of Research and Practice* 48, no. 6 (2024): 369–85.

³¹ Shalote Chipamaunga et al., "Response to the Impact of COVID-19 by Health Professions Education Institutions in Africa: A Case Study on Preparedness for Remote Learning and Teaching," *Smart Learning Environments* 10, no. 1 (2023): 31.

³² Hakkun Elmunsyah et al., "Understanding the Impact of a Learning Management System Using a Novel Modified DeLone and McLean Model," *Education Sciences* 13, no. 3 (2023): 235; Shaveen Maharaj, "An Analysis of Online Learning and Teaching at the Department of Electronic Engineering at a University of Technology during the Coronavirus Pandemic in South Africa," *The Independent Journal of Teaching and Learning* 18, no. 2 (2023): 42–64.

³³ Bekithemba Dube, "Rural Online Learning in the Context of COVID 19 in South Africa: Evoking an Inclusive Education Approach," *Multidisciplinary Journal of Educational Research* 10, no. 2 (June 15, 2020): 135–57, <https://doi.org/10.17583/remie.2020.5607>; Nombuso Lubanyana, Courage Matobobo, and David Tatenda Risinamhodzi, "Impact of Electronic Learning in Rural Universities: A Case of WSU Ibika Campus," in *2022 IEEE World Engineering Education Conference (EDUNINE)* (IEEE, 2022), 1–5.

³⁴ Viswanath Venkatesh et al., "User Acceptance of Information Technology: Toward a Unified View." *MIS , Quarterly*, 2003, 425–78.

handy, especially when it comes to considering students' interaction with LMS tools in underperforming institutions.³⁵

Performance expectancy takes on the belief that using a certain technology will enable users to perform better. This study is about the students' belief in the improvement of their learning, academic performance, and content accessibility by the LMS. Various studies indicate that students from rural areas are skeptical regarding the effectiveness of the LMS owing to the few interactive features and lack of immediate feedback from lecturers.³⁶

Effort expectancy is the perception of ease associated with using the system. A confusing interface of the LMS, coupled with inconsistent internet access, is a great deterrent for students toward utilization. This is more so in rural universities where digital fluency may be low, and where mobile data or internet services are unreliable, as expressed by Basaran and Hussein and Mtshali et al.³⁷ Application by students of mastery thereby embodies not only a technical problem but also barriers to which survival tactics should be adopted towards equal learning.

The third pillar of UTAUT, social influence, is an area in which the opinions of peers or lecturers or culture may affect the decision of someone to use technology. In most rural environments, digital learning may not be taken seriously by students if it is not well-promoted or modeled by the academic staff.³⁸ More so, when students view the LMS as merely an administrative tool and not as a collaborative space for learning, their motivation to use it meaningfully decreases.³⁹

Facilitating conditions are the resources and the institutional support that empower the effective usage of the LMS. This includes infrastructure, training, and technical support. Rural students usually find it difficult to log onto their LMS platforms, download content on their mobile devices, and get help when the systems go wrong.⁴⁰ This makes their life even more difficult, adding to the frustration and lack of use on the platform.

TPACK and UTAUT, in tandem, furnish a multi-perspective glint for this study to understand in an integrated way both the pedagogical and behavioral dimensions of LMS usage. TPACK essentially signifies good instructional design, whereas UTAUT denotes the student's view of usability, motivation, and support. The proponents of both models intend to find commonalities between system design, educator readiness, and learner engagement, especially significant in a rural context like the University of Zululand.

Thus, TPACK and UTAUT (the two complementary perspectives used in this study) provide a well-theorized basis for the study. It conceives technology in education as going beyond mere access to the tools; it involves how tools are really woven into teaching practice and accepted by users. In the quest for rural universities in South Africa and beyond for modernisation and expansion into digital learning, these frameworks will serve as a valuable compass in identifying not only technical gaps but also pedagogical and social gaps that lead to success.

³⁵ Brandford Bervell and Irfan Naufal Umar, "Utilization Decision towards LMS for Blended Learning in Distance Education: Modeling the Effects of Personality Factors in Exclusivity," *Knowledge Management & E-Learning* 10, no. 3 (2018): 309–33; Yaser Hasan Salem Al-Mamary et al., "Factors Impacting Saudi Students' Intention to Adopt Learning Management Systems Using the TPB and UTAUT Integrated Model," *Journal of Science and Technology Policy Management* 15, no. 5 (2024): 1110–41.

³⁶ Esther M Ajijola et al., "Perception of Learning Management System among Distance Learners in South-West, Nigeria," *Journal of Digital Learning and Education* 1, no. 2 (2021): 72–84; Gabriel Fredi Daar et al., "Students' Perception of the Use of Learning Management System in Learning English for Specific Purpose During the Pandemic: Evidence From Rural Area in Indonesia," *Journal of Language Teaching and Research* 14, no. 2 (2023): 403–9.

³⁷ Seren Başaran and Kowther Abdikarin Hussein, "Determinants of University Students' Intention to Use Video Conferencing Tools during COVID-19 Pandemic: Case of Somalia," *Sustainability* 15, no. 3 (2023): 2457; N G Mtshali et al., "Postgraduate Students' Experiences with Learning Management Systems at a Selected Nursing Education Institution in KwaZulu-Natal Province," *African Journal of Health Professions Education* 14, no. 2 (2022): 89–97.

³⁸ Bradley, "Learning Management System (LMS) Use with Online Instruction."

³⁹ Mustafa Kamel Mohammadi, Abdul Aziz Mohibbi, and Mohammad Hadi Hedayati, "Investigating the Challenges and Factors Influencing the Use of the Learning Management System during the Covid-19 Pandemic in Afghanistan," *Education and Information Technologies* 26, no. 5 (2021): 5165–98.

⁴⁰ Kharendwe Ndou, Nkhangweni L Mashau, and Joel Chigada, "Learning Management Systems as a Platform for Information Sharing during the COVID-19," *South African Journal of Information Management* 25, no. 1 (2023): 1618; Mohammed et al., "A Hybrid Soft Computing Approach for Prediction of Cloud-Based Learning Management Systems Determinants."

METHODOLOGY

A qualitative research design based on interpretivist tenets was adopted to explore undergraduate students' perceptions and lived experiences of Learning Management System (LMS) usage at the University of Zululand, a rural-based higher education institution in South Africa. The qualitative methodology was thus seen as the best candidate for gaining in-depth insights into the nuanced challenges and expectations of students regarding digital learning platforms.⁴¹ The research was performed between February and April of 2025, and its goal was to reveal not only the technical challenges but also the pedagogical, affective, and environmental dimensions of LMS use.

Participants from four faculties, namely Education, Commerce and Law, Humanities and Social Sciences, and Science, Agriculture and Engineering, took part in the study. Fifty undergraduate students purposefully selected to represent diverse academic disciplines, years of study, and gender contributed to the study. Ages ranged from 18 to 25 years, with 28 females and 22 males. Such a broad representation was instrumental in capturing longitudinal insights and thus highlighting how LMS is used, and perceptions may change as the students advance in their education.⁴²

In the study, discussions prompted by focus group interviews were used to gather data that gave participants opportunities to voice their opinions freely and interactively. Five focus group meetings were convened with between 8 and 12 participants each. A semi-structured interview guide that included themes on digital readiness, accessibility of the LMS, interaction with lecturers, perceptions of LMS usefulness, and perceived learning outcomes framed the themes of the discussion. The interview questions were developed following the TPACK and UTAUT frameworks, with a particular focus on performance and effort expectancy, pedagogical alignment, and technology self-efficacy.⁴³

Focus groups lasted for 60 to 90 minutes in sessions held on campus in venues that were easy to access. The discussions were held in English, which is also the university's medium of instruction. Informed consent was obtained from the participants prior to the onset of the sessions. Ethical clearance had already been granted from the research ethics committee of the University of Zululand to move forward with the interviews. Anonymity was guaranteed using pseudonyms, with all audio records securely stored and accessible only to the research team.

The taped focus group interviews, transcribed verbatim for thematic analysis, entailed reading through those transcripts multiple times while formulating initial codes and recurring themes and sub-themes. The coding process was manual by the researcher and reviewed by a peer researcher to ensure rigour and consistency among the codes. Thematic analysis was the preferred method because of its flexibility in correlating patterns across the participants' narratives while preserving the individual voice and context.⁴⁴

Areas of study involved: access to LMS platforms by students and their knowledge about them; value attached to LMS for academic success (performance expectancy); perceived ease of use or effort expectancy; peer and lecturer influence (social influencing conditions); infrastructural and institutional support (facilitation conditions); and students' perceptions of pedagogical integration of LMS within course content delivery (TPACK-aligned delivery). Some intersectional issues include socio-economic status and previous exposure to technology, just to name a few, as they also fine-tune LMS usage and access in rural locations.⁴⁵

⁴¹ Bervell and Umar, "Utilization Decision towards LMS for Blended Learning in Distance Education: Modeling the Effects of Personality Factors in Exclusivity."; Chipamaunga et al., "Response to the Impact of COVID-19 by Health Professions Education Institutions in Africa: A Case Study on Preparedness for Remote Learning and Teaching."

⁴² Ajijola et al., "Perception of Learning Management System among Distance Learners in South-West, Nigeria"; Mtshali et al., "Postgraduate Students' Experiences with Learning Management Systems at a Selected Nursing Education Institution in KwaZulu-Natal Province."

⁴³ Kean, Embi, and Yunus, "Incorporating ICT Tools in an Active Engagement Strategy-Based Classroom to Promote Learning Awareness and Self-Monitoring."; Al-Mamary et al., "Factors Impacting Saudi Students' Intention to Adopt Learning Management Systems Using the TPB and UTAUT Integrated Model."

⁴⁴ David Moher et al., "Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement," *Bmj* 339 (2009); Patricia Simon, Juming Jiang, and Luke K Fryer, "Measurement of Higher Education Students' and Teachers' Experiences in Learning Management Systems: A Scoping Review," *Assessment & Evaluation in Higher Education* 49, no. 4 (2024): 441–52.

⁴⁵ Dube, "Rural Online Learning in the Context of COVID 19 in South Africa: Evoking an Inclusive Education Approach"; Lubanyana, Matobobo, and Risinamhodzi, "Impact of Electronic Learning in Rural Universities: A Case of WSU Ibika Campus."

Even though this study was qualitative, elementary descriptive statistics were used to report the demographics of the research participants and general access trends to LMS captured in a brief questionnaire prior to the interview. This count is computable through Microsoft Excel, and although no inferential statistical test was conducted, the narrative descriptive data underpinned sufficient contextualization of the qualitative findings under consideration. Overall, both numerical and narrative data improved the triangulation of this study and attested credibility.⁴⁶

Thus, the study incorporated the following abbreviations: LMS- Learning Management System; TPACK- Technological Pedagogical Content Knowledge; UTAUT- Unified Theory of Acceptance and Use of Technology; TK- Technological Knowledge; PK- Pedagogical Knowledge; CK- Content Knowledge; and HEI- Higher Education Institution. The said frameworks and terminologies guided the structure and interpretation of the data while also being resourceful in articulating challenges both at the systemic and user levels toward effective integration of LMS in rural higher education.

PRESENTATION OF RESULTS /FINDINGS

This section provides a thematic analysis of focus group interviews with 50 undergraduate students in four faculties of the University of Zululand. Findings are organized into three main themes derived from the TPACK and UTAUT frameworks: (1) Access and Infrastructure; (2) Pedagogical Integration; and (3) User Engagement and Digital Confidence. Each theme is grounded in the student's responses and compared with earlier studies to show consistencies and variations in socio-contextual challenges. The data is presented in percentages and visualized in the bar chart (Figure 1), with detailed summaries in **Table 1**.

Table 1: Theme Summary of Student Responses Related to LMS Challenges

| Theme | High Satisfaction (%) | Moderate Satisfaction (%) | Neutral (%) | Low Satisfaction (%) | Very Low Satisfaction (%) |
|----------------------------------------|-----------------------|---------------------------|-------------|----------------------|---------------------------|
| Access and Infrastructure | 12% | 28% | 20% | 25% | 15% |
| Pedagogical Integration | 8% | 25% | 22% | 30% | 15% |
| User Engagement and Digital Confidence | 10% | 30% | 18% | 26% | 16% |

The above table is a table showing the percentages of students indicating high, moderate, neutral, low, and very low satisfaction regarding the LMS under the three thematic areas. From five focus group discussions conducted at the University of Zululand.

Biographical information of the participants

This empirical study consisted of 50 undergraduate students at the University of Zululand through purposive sampling to capture diverse representation across faculties, levels of study, and gender. The group consisted of students from four faculties: Education, Commerce and Law, Science and Agriculture, and Humanities and Social Sciences, where each of the faculties contributed between 10 and 15 participants to give a balanced representation according to the academic discipline. The ages of the participants were between 18 and 25 years, with a mean age of 21 years. Concerning gender distribution within the participants, 28 identified as female, while 22 were male. The sample also consisted of different stages in the academic progression: first-year (n = 12), second-year (n = 13), third-year (n = 14), and final-year students (n = 11). The cross-sectional composition allowed the research to

⁴⁶ Elmunsyah et al., "Understanding the Impact of a Learning Management System Using a Novel Modified DeLone and McLean Model"; Başaran and Hussein, "Determinants of University Students' Intention to Use Video Conferencing Tools during COVID-19 Pandemic: Case of Somalia."

include entry-level and more advanced experiences of LMS use in the student journey. Most of the participants live in rural or peri-urban communities either on campus, in nearby university residences, or privately off-campus. Most of them said that they were NSFAS funded because of which one could guess their background in comparison to the overall student population at such institutions that have always suffered discrimination. The breadth of prior experience with digital technologies among the various participants was great, with many reporting very little access to personal computers or home internet before they had enrolled in a university. This biographical context made a difference in students' engagement with LMS and with digital learning experiences. This is further illustrated in **Figure 1** below:

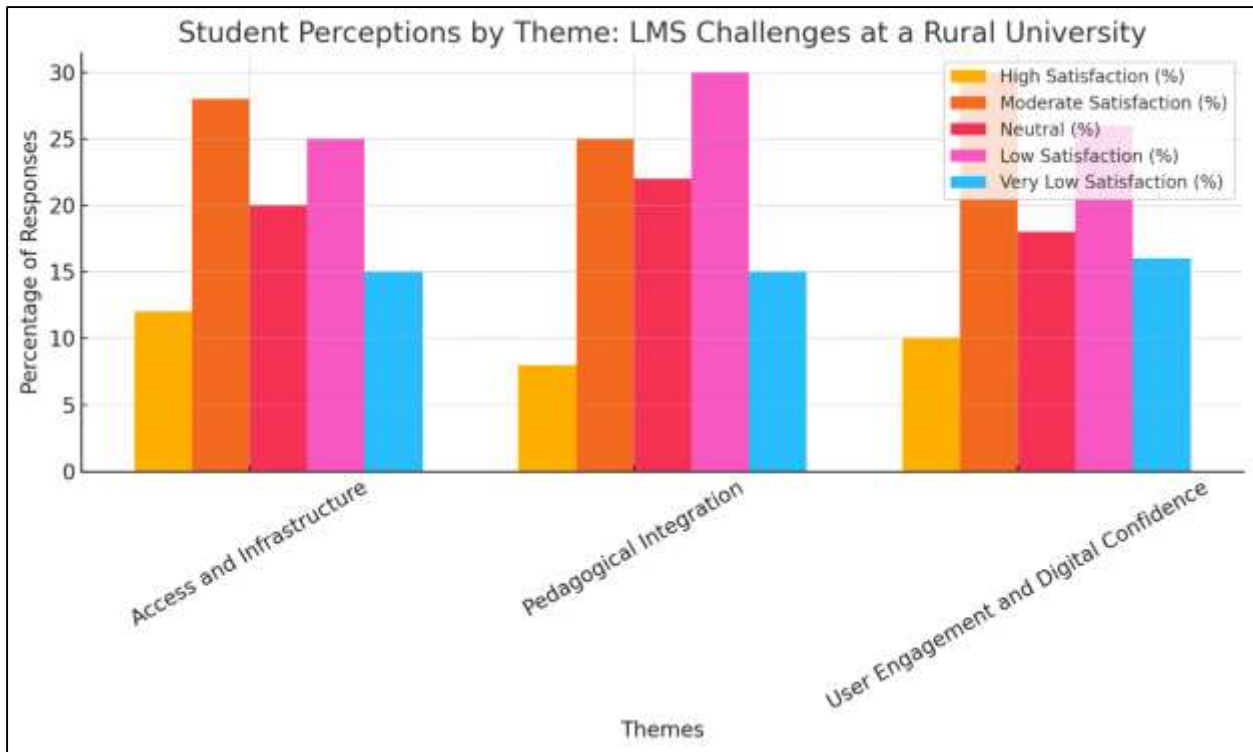


Figure 1: Student-Indicated Perceptions by Title: LMS Obstructions at a Rural University

This bar graph demonstrates the satisfaction levels along the three significant lines of Access and Infrastructure, Pedagogical Incorporation, and User Interaction and Digital Confidence percentages that represent student responses. LMS = Learning Management System.

Theme 1: Access and Infrastructure

A persistent and deeply felt concern among students was the lack of reliable access to infrastructure necessary for consistent LMS engagement, especially for those living off-campus. Only 12% of students reported high satisfaction with LMS accessibility, while 40% indicated low or very low satisfaction. The majority of participants described the experience of accessing LMS as frustrating and unpredictable, primarily due to poor network coverage, load-shedding, and the high cost of mobile data. As one student plainly stated, *“When there is no electricity, I can't even charge my phone. And when the network is bad, everything just stops. I feel left behind.”*

These barriers echo the systemic challenges documented by Dube and Lubanyana et al., who highlight how digital infrastructure gaps in rural South African institutions perpetuate educational inequality.⁴⁷ The situation is further compounded by economic hardship. Another participant explained, *“I depend on my NSFAS allowance to buy data, but sometimes it finishes in a week. The LMS needs strong Wi-Fi, or you must buy more data, and that's not always possible.”* These comments illustrate how access is not just a technical issue but deeply tied to broader socio-economic realities.

⁴⁷ Dube, “Rural Online Learning in the Context of COVID 19 in South Africa: Evoking an Inclusive Education Approach”; Lubanyana, Matobobo, and Risinamhodzi, “Impact of Electronic Learning in Rural Universities: A Case of WSU Ibika Campus.”

In addition, many students expressed dissatisfaction with using LMS platforms via mobile phones, which, for most, is their only device. Although institutions promote mobile accessibility, the mobile interface is often described as “unfriendly” and “slow.” One participant shared, *“I try using my phone, but the pages take forever to load, and sometimes it crashes. It’s hard to focus when you’re always trying to fix the app instead of studying.”* These experiences are consistent with Kondoro et al., who found that many LMS platforms are not designed with low-end devices in mind, further marginalising students with limited digital resources.⁴⁸

Efforts by the university to provide access to Wi-Fi and computer labs were appreciated, but students indicated these services were inconsistent or inconvenient. Labs were frequently described as “overcrowded” or “too far,” particularly for students staying in private, rural accommodation. As another student expressed, *“The lab closes too early, and by the time I walk there, it’s already full. Then I just give up and try to do everything on my phone.”* Such limitations directly hinder the facilitating conditions described in the UTAUT model, which are essential for encouraging technology adoption and sustained use.⁴⁹ Taken together, these findings highlight that access to LMS in a rural university context is not a matter of physical infrastructure alone. It is shaped by geography, income, time, and institutional support. The cumulative effect of these challenges is a learning environment where students struggle to engage meaningfully with digital platforms, despite their willingness to do so. These access barriers ultimately affect academic performance and widen the digital divide, undermining the transformative potential of e-learning in rural higher education settings.

Theme 2: Pedagogical Integration

Students reported growing frustration with the limited pedagogical applications of the Learning Management System. While some students acknowledged that the LMS allowed for the sharing of materials, others called it a file dump rather than a teaching platform with any redeeming pedagogical quality. *“They just upload the notes, and that’s it—no videos, no questions, nothing to help us understand,”* said one student. Only 8% were satisfied with high pedagogical quality in LMS usage; slightly more than one-fifth reported being low, and 15% very low, on satisfaction with pedagogical quality. These sentiments find resonance in Maharaj and Elmunsyah et al., who observed a similar pattern of passive content distribution without interactivity.⁵⁰

Students feel that the desire for more engaging and student-centred content is heard. They felt that LMS should offer more than just downloadable PDFs. *“I wish they could give us quizzes or allow comments so we can ask questions directly on the topic,”* a student from the Faculty of Education conveyed. The absence of such features— instant polling, discussion forums, recorded lectures, or feedback tools— represented a weak application of the TPACK framework, whereby TPACK refers to the interplay between technology, pedagogy, and content.⁵¹ One participant said, *“Even when the lecturer knows how to use the system, it feels like they don’t know how to teach through it.”*

Another issue was the disparity in LMS use across modules and faculties. While some lecturers used LMS to conduct weekly quizzes and announcements, others neglected the platform altogether and complained to the students. *“Some of our modules are updated every week. Others, you check and it’s just the course outline since February,”* said one final-year student. Such disparity resulted in some confusion and disorganisation among the learners. The findings underscore Bervell and Umar’s contention that without institutional commitment to pedagogical coherence and proper staff development, the LMS will never complement the realisation of a transformative educational role.⁵²

⁴⁸ Aron Kondoro et al., “Towards Improving the Accessibility and Usability of a Mobile-Based Learning Management System for Blind Primary School Teachers,” in *2023 IST-Africa Conference (IST-Africa)* (IEEE, 2023), 1–10.

⁴⁹ Al-Mamary et al., “Factors Impacting Saudi Students’ Intention to Adopt Learning Management Systems Using the TPB and UTAUT Integrated Model.”

⁵⁰ Maharaj, “An Analysis of Online Learning and Teaching at the Department of Electronic Engineering at a University of Technology during the Coronavirus Pandemic in South Africa”; Elmunsyah et al., “Understanding the Impact of a Learning Management System Using a Novel Modified DeLone and McLean Model.”

⁵¹ Kean, Embi, and Yunus, “Incorporating ICT Tools in an Active Engagement Strategy-Based Classroom to Promote Learning Awareness and Self-Monitoring.”

⁵² Bervell and Umar, “Utilization Decision towards LMS for Blended Learning in Distance Education: Modeling the Effects of Personality Factors in Exclusivity.”

Theme 3: User Engagement and Digital Confidence

The last theme was around students' confidence in using the LMS and how much they are engaged with it. While 30% reported moderate confidence, only 10% described feeling highly comfortable navigating the system. An overall 42% expressed low or very low satisfaction with their digital competence. *"In the beginning, I just clicked around hoping something would work. It's not like someone teaches us how to use it,"* says one student. This is in line with the general anxiety found in terms of digital self-efficacy and the emotional costs of using unknown systems with little guidance, as discussed by Simon et.al.⁵³

Students also described feeling discouraged due to the lack of feedback and interaction on the LMS. Many anticipated that the lecturers would use the system for commenting on submissions, starting discussions or replying to questions, but rather felt ignored. *"We submit assignments, and then nothing. No mark, no comment, no update,"* said one student from the Faculty of Commerce and Law. As per the UTAUT's concept of social influence, user adoption is further strengthened by the occasions that influential individuals like lecturers practice and role-modelling technology use; in this context, however, students noted that LMS engagement is largely isolated and unsupported.⁵⁴

Despite all these constraints, some students narrate uplifting stories. Those who had earlier been engaged with online platforms in their high school or during the COVID-19 lockdown had more confidence and participation. *"Because I used Moodle in college, I already knew how to navigate this one. I even helped my friends,"* said one third-year student. These cases suggest that early exposure and informal peer learning can greatly impact LMS engagement. The majority, however, do not have this experience, indicating a great need for structured digital orientation. This matches recommendations made by Basaran and Hussein, who call for fully inclusive onboarding processes for building student confidence in technology use, especially in rural and underserved learning environments.⁵⁵

DISCUSSION

The findings of the present study resonate with and are applicable to the lived experiences of undergraduate students in rural South African universities engaging with Learning Management Systems (LMS). Overall, these findings affirm that students perceive options and attributes of LMS. Nonetheless, they face multiple consequential hindrances to their effective use: structural, pedagogical, and socio-economic. In this regard, they resonate with literature suggesting that the opportunities afforded by educational technology are not adequately distributed, especially in rural or under-resourced higher education settings.⁵⁶

Access to infrastructure-restricted digital commons ranked high among the obstacles faced. The students expressed their displeasure over poor internet connectivity, limited access to computers, and reliance on expensive mobile data, which corroborates previous evidence presented by Maharaj and Mtshali et al., on the failure of digital inequality in the South African university environment.⁵⁷ These infrastructural barriers grossly disadvantage rural students and thereby worsen existing educational disadvantages while simultaneously undermining the democratic potential of online learning.⁵⁸

Other infrastructural problems being discussed were subsequently deep concerns regarding the pedagogical use of LMS.⁵⁹ They described the system as static and underutilised—often relegated to a place where notes sit without conversation or context. This passive idea of online engagement opposes

⁵³ Simon, Jiang, and Fryer, "Measurement of Higher Education Students' and Teachers' Experiences in Learning Management Systems: A Scoping Review."

⁵⁴ Al-Mamary et al., "Factors Impacting Saudi Students' Intention to Adopt Learning Management Systems Using the TPB and UTAUT Integrated Model."

⁵⁵ Başaran and Hussein, "Determinants of University Students' Intention to Use Video Conferencing Tools during COVID-19 Pandemic: Case of Somalia."

⁵⁶ Dube, "Rural Online Learning in the Context of COVID 19 in South Africa: Evoking an Inclusive Education Approach"; Lubanyana, Matobobo, and Risinamhodzi, "Impact of Electronic Learning in Rural Universities: A Case of WSU Ibika Campus."

⁵⁷ Maharaj, "An Analysis of Online Learning and Teaching at the Department of Electronic Engineering at a University of Technology during the Coronavirus Pandemic in South Africa"; Mtshali et al., "Postgraduate Students' Experiences with Learning Management Systems at a Selected Nursing Education Institution in KwaZulu-Natal Province."

⁵⁸ Daar et al., "Students' Perception of the Use of Learning Management System in Learning English for Specific Purpose During the Pandemic: Evidence From Rural Area in Indonesia."

⁵⁹ Mncedisi Christian Maphalala and Oluwatoyin Ayodele Ajani, "Teaching and Learning of Computer Science in Higher Education: A Self-Directed Learning Perspective," in *Navigating Computer Science Education in the 21st Century* (IGI Global Scientific Publishing, 2024), 89–111.

the pedagogical aspirations of a TPACK framework, which encourages technology integration that actively promotes content delivery and enhances the learning experience.⁶⁰ Paradoxically, as pointed out by Elmunsyah et al., the mere use of digital tools without reference to any such pedagogical consideration detracts from their potency.⁶¹

The absence of interactivity with quizzes, forums, and real-time feedback severely diminished students' motivation and sense of academic belonging. Bradley argued that lecturer preparedness in digital pedagogy is vital in determining whether LMS will be a transformative or transactional tool.⁶² Where the lecture fails in detailing pedagogical tools, delivering online content creatively and responsively, once again, rather than an acquisition tool for students, LMS becomes an administrative burden.

A significant point raised in the study was that there was inconsistent use of LMS across different faculties and modules. Some lecturers uploaded content regularly and engaged students, while others completely neglected the platform. This variation in practice indicates no absence of an institutional policy or monitoring mechanism, as similarly reported in another study by Bervell and Umar. In the absence of any coherent strategy or professional development framework, LMS implementation remains fragmented and largely dependent on the initiative of individual lecturers.⁶³

A strong issue was also digital confidence. Some students already use educational technologies, whereas most say that they find it very hard to use the LMS, especially since there is no formal training. This is seen to be in line with the effort expectancy construct of the UTAUT model, which emphasizes that users are less likely to engage in any digital tool that they find difficult to use.⁶⁴ Digital orientation and structured onboarding, as established by Basaran and Hussein, are of primary importance in propelling student engagement in online environments.⁶⁵

Another dramatic issue was a perceived lack of feedback and contact. Students expected the LMS to generate some real academic exchanges, but they were very disappointed by the lack of engagement from the lecturer. According to the UTAUT model, social influence, or the peer and instructor bit of perceived support, is very significant in the behavior of use.⁶⁶ The negative response from the lecturers, which was reported by students in the study, demolished trust in the system and contributed to their non-engagement.

However, by and large, a few numbers of students with previous exposure to LMS or other e-learning platforms reported a much more positive experience. They had more digital confidence and autonomy. This therefore indicates that familiarity and experience may be important enablers of engagement and supports arguments by Simon, et.al., that digital readiness goes beyond infrastructure to include prior contexts and habits of learning.⁶⁷ However, the study also brings out the point that this was indeed an exception rather than the rule in rural universities.

These findings underscore the importance of an inclusive and robust digital strategy, one that does not merely consider technology in terms of adoption but seeks to meaningfully embed it into curriculum and pedagogy. The measure of success for any LMS should be determined not by mere adoption of the system but by its ability to improve the teaching and learning process, enhance engagement, and narrow the digital divide. As pointed out by Dlamini and Ndzinisa, without some

⁶⁰ Kean, Embi, and Yunus, "Incorporating ICT Tools in an Active Engagement Strategy-Based Classroom to Promote Learning Awareness and Self-Monitoring."

⁶¹ Elmunsyah et al., "Understanding the Impact of a Learning Management System Using a Novel Modified DeLone and McLean Model."

⁶² Bradley, "Learning Management System (LMS) Use with Online Instruction."

⁶³ Bervell and Umar, "Utilization Decision towards LMS for Blended Learning in Distance Education: Modeling the Effects of Personality Factors in Exclusivity."

⁶⁴ Al-Mamary et al., "Factors Impacting Saudi Students' Intention to Adopt Learning Management Systems Using the TPB and UTAUT Integrated Model."

⁶⁵ Başaran and Hussein, "Determinants of University Students' Intention to Use Video Conferencing Tools during COVID-19 Pandemic: Case of Somalia."

⁶⁶ Al-Mamary et al., "Factors Impacting Saudi Students' Intention to Adopt Learning Management Systems Using the TPB and UTAUT Integrated Model."

⁶⁷ Simon, Jiang, and Fryer, "Measurement of Higher Education Students' and Teachers' Experiences in Learning Management Systems: A Scoping Review."

pedagogical innovations in LMS, the real purpose of the LMS itself has some risk of perpetuating inequities which it endeavors to address.⁶⁸

In this regard, the present study adds to the increasing pool of literature highlighting the complex realities of digital learning in resource-poor settings. It accentuates the need for synergy between technology, pedagogy, and socio-cultural considerations. The voices of students from the University of Zululand tell of not only the limits of current LMS implementation but also the yearning and potential for truly enriching, interactive, and empowering digital learning experiences. Such changes will require institutional commitment, targeted investment, and renewed engagement with the concept of digital equity in higher education.

RECOMMENDATIONS

It's on this new line of scholarly inquiry and the grievances of students that various theoretical as well as empirical suggestions are advanced for the amelioration of the integration as well as the use of learning management systems (LMS) at rural universities in the South African context.

Digital pedagogy should be curriculum-aligned. Structured training for academic staff is needed. Institutions must do more than offer mere technical workshops; they should provide further professional development along the lines of the TPACK framework. Lecturers need much more than training in the use of the LMS tools. They should also include in the training effective instructional strategies linked to their specific discipline goals for student learning. This would help shift the use of LMS from passive content sharing to dynamic, student-centered engagement.

Standardise LMS practices across faculties and departments. Develop and implement an institutional minimal guiding principle of engagement on the LMS. Such minimum requirements would include weekly content updates, discussion forums, or feedback protocols. Though academic freedom needs respect, such a baseline would create less inconsistency and confusion among students. Standardising provides equitable access to quality learning experiences regardless of course or lecturer.

There must be some improvement in the digital orientation programmes for students. Many respondents in the current study expressed that they were not very familiar with the LMS and its functions. Structured onboarding sessions for first-year students should be organised by universities, and they should also offer refresher workshops throughout the academic year. Such sessions should ideally go beyond technical walkthroughs and instill confidence, autonomy, and understanding of how the LMS can provide support for their learning journey.

For infrastructural constraints, institutions must invest in digital equity across the campus. This includes providing affordable data bundles, wider Wi-Fi coverage in residences and rural accommodation areas, as well as running computer labs with extended-hour operations. Computer laboratory facilities should be optimised for mobile-first access since most of the entry-level phones are used by students. Without such infrastructural support, even the best pedagogical interventions will have little significance.

That is your last training on data up to October 2023. Smart use of social influence, as emphasized in this model by UTAUT, must indeed harness active participation among these forces. It should encourage the lecturer to be visible in broadcasting such things as announcements, feedback, and interactive features on the LMS so that students will be motivated to follow them this way. Introduced might be peer mentoring or LMS ambassador-fellows-train students to assist others in building a more collaborative digital learning culture. It does not increase usage but cultivates a sense of shared responsibility for navigating online learning.

One remark is that the school would set up their LMS solutions with some of those interactive features to encourage learner participation in active academic studies. Features such as auto-graded quizzes, video discussion threads, real-time Q&A sessions, and feedback pop-ups can help the course create more immersion and connection to the moment in learning. Such criteria, if tied to an assessment or participation marks, can encourage students to actively use the platform.

⁶⁸ Reuben Dlamini and Nqobile Ndzinisa, "Universities Trailing behind: Unquestioned Epistemological Foundations Constraining the Transition to Online Instructional Delivery and Learning," *South African Journal of Higher Education* 34, no. 6 (2020): 52–64.

In terms of policy, universities should adopt a holistic digitized institution-wide digital strategy. That is going to incorporate infrastructure, pedagogy, support services, monitoring, and funding into that one coherent vision all upside approach to ensure that digital transformation is not left to individual departments or enthusiastic lecturers as it becomes a collective mainstream mandate for digital-age teaching and learning into the institution.

The study also recommends further research that would deepen and extend the study findings. Future studies may further apply a mixed-methods approach, as surveys of more participants and interviews with the respective lecturers and administrators might be included. In addition, comparative studies across rural and urban universities or across faculties may provide richer context-specific insights into their unique challenges and enablers of LMS adoption. Further research can also be done regarding how the integration of LMS affects student performance and retention in academics over time.

Also, the student voice should be blended into the design and improvement of an LMS. The focus group findings in this study substantiate user-driven feedback and how this should generate technology use. Possible initiatives for institutions would be to set up student advisory panels or conduct regular user experience surveys of the LMS with students to help renew the system regularly to keep it relevant, usable, and responsive to the learning needs of the time.

Moreover, rural universities need to take contextual experimentation with innovations. Instead of just replicating models of institutions within towns and cities or assumed global institutions, rural campuses ought to invent local-cost, low-bandwidth solutions coupled with cultural digital pedagogy. This would mean producing material in local languages, using WhatsApp for additional communication, or offline packages of LMS where there is bad internet. The aim will be to ensure that no student ends up being out of the digital learning loop due to geographical, connectivity, or economic barriers.

CONCLUSION

In this research, the experiences of undergraduate students in the educational uses of Learning Management Systems (LMS) in a rural South African university were explored. TPACK and UTAUT were used as theoretical frameworks, which highlighted the view of students regarding the academic development support envisaged for the LMS, but many barriers that compromised effective usage were cited. Poor infrastructure and connectivity, poor pedagogical integration into the LMS, inconsistent use across faculties, and a lack of digital confidence among many students were cited as barriers to LMS use. It was also learned from the findings that the LMS was being used mainly for passive consumption of learning materials, with little interaction and very little feedback, thus leaving the students on their own on platforms that they were almost never trained for. Moreover, infrastructural constraints such as intermittent internet connectivity and a lack of computers only heightened the existing divide. However, students openly declared that they would make use of the LMS with support, resources, and training. In conclusion, this study emphasized the necessity for rural universities to adopt a comprehensive and student-centred approach to digital learning that provides a continuum linking pedagogical innovation, infrastructural investment, and capacity-building activities toward ensuring that LMS platforms genuinely facilitate teaching and learning, not hinder, in resource-scarce settings.

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ABOUT AUTHORS

Dr. Oluwatoyin Ayodele Ajani is an eminent academician and researcher having PhD in Curriculum Studies from the University of Zululand, South Africa. He is currently a Senior Lecturer in the Department of Curriculum/Education Studies, University of KwaZulu-Natal, Edgewood Campus. With over 100 publications in peer-reviewed journals and book chapters, Dr. Ajani has indeed put quite some effort into contributing to the field of education. A good measure of Dr. Ajani's impact can be gleaned from his citation index, which exceeds 700 citations in various works on ResearchGate. His research interests include curriculum studies, teacher education, professional development, sociology of education, and decolonisation of higher education. Dr. Ajani is particularly interested in improving educational practices in rural and under-resourced contexts by creating a better bridge between the theory and practice of education. He is especially involved in supervising postgraduate students and conducting research together that tackles the educational challenges in South Africa.

Prof. Samantha Govender acquired a doctorate in Curriculum and Instructional Studies at the University of Zululand in 2013. She is the Deputy Dean of Teaching and Learning, at the Faculty of Education, University of Zululand. With a robust academic portfolio, she has authored numerous publications focusing on teacher professional development, curriculum implementation, and assessment practices. Her research explores the efficacious ways of teaching, curricular set-up, and technological deployment in education. Associate Professor Govender is quite committed to the enhancement of educational outcomes through innovative pedagogies and has been at the forefront of mentoring young scholars in this field.

Prof. Bongani Thulani Gamede is an experienced educator and researcher in Social Science Education. He serves as Deputy Dean of Research and Innovation, at the Faculty of Education, University of Zululand. His research interests focus on rural education, entrepreneurship education, and community development. Prof. Bongani Gamede has a wide range of publications on issues of educational access and equity in rural contexts, aimed at economic empowering of rural students.