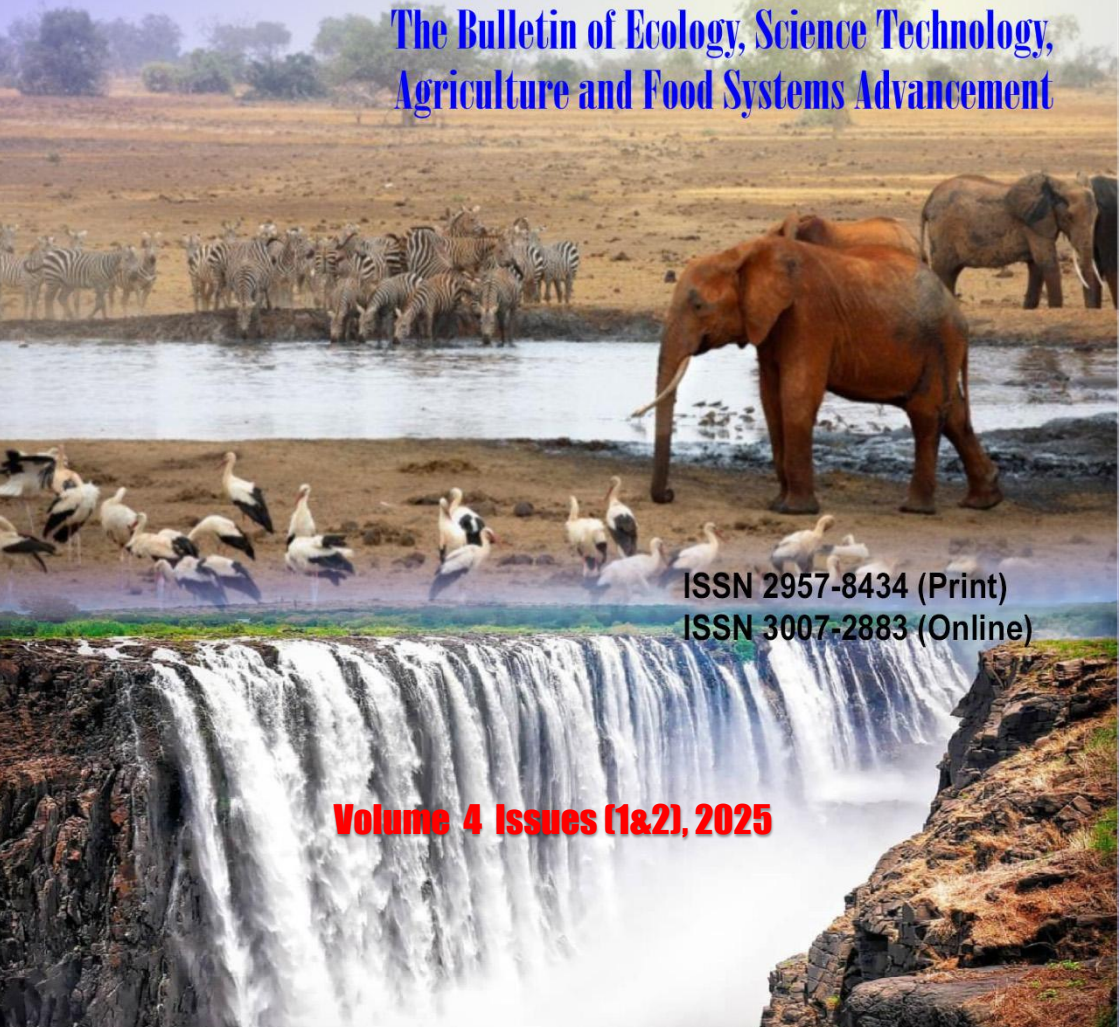




Oikos

The Zimbabwe Ezekiel Guti University
The Bulletin of Ecology, Science Technology,
Agriculture and Food Systems Advancement



ISSN 2957-8434 (Print)

ISSN 3007-2883 (Online)

Volume 4 Issues (1&2), 2025

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Published by the Zimbabwe Ezekiel Guti University Press
Stand No. 1901 Barrassie Rd,
Off Shamva Road
Box 350
Bindura, Zimbabwe

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Oikos - The Zimbabwe Ezekiel Guti University Bulletin of Ecology, Science Technology, Agriculture and Food Systems Review and Advancement

ISSN 2957-8434(Print)

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ADAPTING LEARNING MANAGEMENT SYSTEMS TO ZIMBABWEAN CULTURAL CONTEXTS: ENHANCING USER ENGAGEMENT THROUGH LOCALISED DESIGN

DAGLOUS MASVETA¹, MASIMBA E. MANYANGARA² AND MOREBLESSING
MAKOTA³

ABSTRACT

*The adoption of Learning Management Systems (LMS) in Zimbabwe faces significant challenges due to infrastructural limitations, socioeconomic disparities and cultural mismatches. While e-learning holds transformative potential, its effectiveness is hindered by poor internet connectivity, high data costs and Western-centric LMS designs that conflict with Zimbabwe's collectivist learning culture rooted in the **ubuntu** philosophy. This study explores how LMS platforms can be culturally adapted to enhance user engagement, accessibility and educational outcomes for Zimbabwean learners. Through a qualitative multi-methods approach, combining document analysis of Scopus-indexed literature and qualitative interviews with university*

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educators, the research identifies key barriers, including infrastructural deficits, linguistic exclusion and institutional policy gaps. Findings highlight the need for localised LMS designs incorporating indigenous languages (Shona, Ndebele, etc.), low-bandwidth optimisation and collaborative learning features aligned with Zimbabwean pedagogical traditions. The study also underscores the importance of user-centred design (UCD) and policy interventions to bridge the digital divide. Recommendations include subsidised internet access, faculty training in digital literacy and culturally responsive LMS interfaces. By integrating these strategies, Zimbabwe can foster inclusive, equitable and effective e-learning ecosystems that align with local cultural and infrastructural realities.

Keywords: Digital exclusion, culturally adaptive LMS Learning Management Systems, Cultural Adaptation / Culturally Adapted LMS
Infrastructural Limitations Ubuntu Philosophy / Collectivist Learning
Low-Bandwidth Optimisation Digital Divide.

Introduction

Culture is a multifaceted phenomenon that influences human behaviour, practice and conception of the world (Asri and Rizki, 2024). According to Aljasmi and Alobaidy (2018), the thought, behaviour and world perception of human beings are shaped by culture. Culture is constructed via past experiences, values, beliefs and environmental factors and, hence, becomes simple but complex to understand (Munasinghe, 2017). Culture, according to Hofstede, are the shared beliefs, values and attitudes of a given group of people that distinguish them from others (Alsswey and Al-Samarraie, 2021). Culture has a significant impact on human-computer interaction (HCI), as far as bringing systems into harmony with users' aspirations and intentions since users have varying cultural elements like language, customs and religion (*ibid.*). For the sake of addressing such diversity, cross-cultural design (CCD) has emerged as the strategy that accommodates divergent social and cultural contexts as a means of facilitating global communication and interactions among people with diverse tastes (Munasinghe, 2017).

User-centred design (UCD) plays a significant role in incorporating cultural considerations in interface design. UCD, which was formulated during the 1980s, involves the involvement of users in the design process to obtain requirements and test prototypes (Lewis and Sauro, 2021). Marcus and Gould, as cited by Aljasmi and Alobaidy (2018), argue that user interfaces (UIs) should express cultural dimensions through elements such as metaphors, navigation and appearance. For example, the availability of multiple languages and the utilisation of culturally relevant icons make interfaces more accessible. In online learning environments, this is particularly important, as Learning Management Systems (LMS) like Moodle and Google Classroom, are likely to reflect Western pedagogical approaches based on individualism and competitiveness (Al-Fraihat *et al.*, 2020). These designs are contradictory to collectivist cultures like Zimbabwe, where interdependence and communal learning, as founded in the *ubuntu* philosophy, are favoured (Mpofu, 2020). This humiliates from Barikzai *et al.*, (2024) who observes that e-learning is a useful tool for educators, enabling them to acquire novel competences, introduce innovative pedagogies into the classroom and support collaborative learning and social interaction. It then concurs with the *ubuntu* philosophy which embraces interdependence, cooperation and knowledge-sharing among communities, hence rendering LMS platforms that put more emphasis on competition and individual assessment less effective in stimulating learners (Mtebe and Raisamo, 2014). In the same way, e-learning plays a vital role in levelling the education playing field by providing learners from rural and urban areas with an equal chance to access quality inclusive education (Amutha, 2020; Maune, 2023).

In Zimbabwe, infrastructural concerns contribute to cultural mismatch in LMS design. Asynchronous urban-rural internet connectivity restricts most students to mobile phone use with low bandwidth (Chitanana *et al.*, 2021). This is compounded by socioeconomic disparities in Africa and particularly in Zimbabwe, that have created a wealth-based divide in technology adoption, establishing two distinct educational systems for the rich and poor (Maune, 2023). Additionally, though English is the official language of learning, most Zimbabweans feel more at ease with native languages like Shona and Ndebele (Ndlovu-Gatsheni, 2013).

Monolingual LMS platforms disenfranchise those students who are not good in English, entrenching inequality (Makumbe and Nyaruwata, 2023). Localisation, through which user interfaces, content and pedagogy are translated to match local customs, has been touted to shatter these barriers (Parrish and Linder-VanBerschot, 2010). In Zimbabwe, this could involve adding *ubuntu*-based collaborative elements such as group discussion fora, collaborative projects and social learning spaces. These features encourage community interaction and knowledge-sharing, based on indigenous principles.

Due to technological constraints, LMS platforms need to be mobile-first, low-bandwidth optimised in order to penetrate urban and rural areas (Mugoni and Chigona, 2022). Some features that can be used to enhance usability include offline functionality, zipping media files and light interfaces. Furthermore, integration of native languages like Shona and Ndebele enhances inclusiveness and respect for cultural values, resulting in more understanding and interaction (Ndlovu-Gatsheni, 2013). Multilingualism also reinforces cultural identity, which can contribute positively to learner motivation. Policy-level recognition of these issues is evident in Zimbabwe's Ministry of Primary and Secondary Education (MoPSE) strategy, which emphasises integrating ICT into education (MoPSE, 2016). However, the cultural appropriateness of the tools is crucial for successful adoption. Another imperative consideration is gender sensitivity because cultural norms limit girls' participation in digital education. Equal access can be promoted through flexible interaction schedules, personalised learning paths, as well as inclusive imagery that can mitigate these barriers (Chikasha *et al.*, 2022).

Despite the existence of studies that examine LMS in both developing and developed nations (Obeng and Coleman, 2020; Ouma, 2021); Ssemugenyi and Seje, 2021); Maune, 2023); Jovanka, 2023); Calonge *et al.*, 2023); Barikzai *et al.*, 2024); Rulinawaty *et al.*, 2024); Widowati and Tyas, 2024); Kamoyo *et al.*, (2025), there have been few studies in Zimbabwe that have investigated how these systems can be adapted to the Zimbabwean situation to enhance user engagement, accessibility and learning outcomes for students. The goal of this study is to examine

how LMS can be adapted to the Zimbabwean situation to enhance user engagement, accessibility and learning outcomes for students. For LMS platforms to be successful in Zimbabwe, it is necessary that there is culturally responsive localisation. This means that LMS designs are adapted to address the linguistic diversity of Zimbabwe, its technological constraints and traditional pedagogical practices. Incompatible systems design and local contexts habitually lead to under-use, learners' low engagement and unequal learning opportunities. Thus, the redesign of LMS platforms to incorporate Zimbabwean cultural values is called for in order to enhance usability, inclusivity and learning impact. By echoing the communitarian values of *ubuntu*, optimising for low-bandwidth mobile access and supporting indigenous languages, educational institutions can foster greater user engagement and more inclusive learning outcomes. The future of digital learning in Zimbabwe is not in simply adopting global LMS platforms, but in rethinking them thoroughly to honour and incorporate local contexts.

Literature Review

Theories guiding this research are Hofstede's Cultural Dimensions Theory and the Cultural-Historical Activity Theory (CHAT theory) (Trent *et al.*, 2002). The two theories are succinctly explained in this research section. The research chose these theories as they examine how LMS can be adapted to the Zimbabwean context for increased user experience, accessibility and learning among students.

Theoretical Review

(a) The Cultural-Historical Activity Theory

The Cultural-Historical Activity Theory (CHAT), being a derivation from Vygotsky's (1978, 1986) theory, provides a strong theoretical basis to account for the interplay between culture and human functioning and mediated action's position in activity systems (Engeström, 2001). A focus on analysis of the personal, interpersonal and institutional (Rogoff, 1995) facilitates CHAT to allow the feasibility of research into localised as opposed to societal structure-based cultural and social practices (Sumera, 2021). This meta-theoretical framework is ideally

suiting to re-imagine pedagogic infrastructures, for example, to re-design LMS to accommodate Zimbabwean cultures. Generation One of CHAT, in which cultural mediation of action was established, takes account of how actors handle negotiation with mediating artefacts (Vygotsky, 1978) and is, therefore, an ideal perspective through which to further enhance user participation through localised LMS design. Through determination of mediating structures of an activity system in common (Igira and Gregory, 2009), the approach agrees with designing interactive and educationally relevant learning technologies for a specific context. He believed that human actors react to and act upon mediating objects (artefacts) of the world for an outcome (Vygotsky, 1978). Figure 1 illustrates Vygotsky's First-Generation CHAT Model (1978).

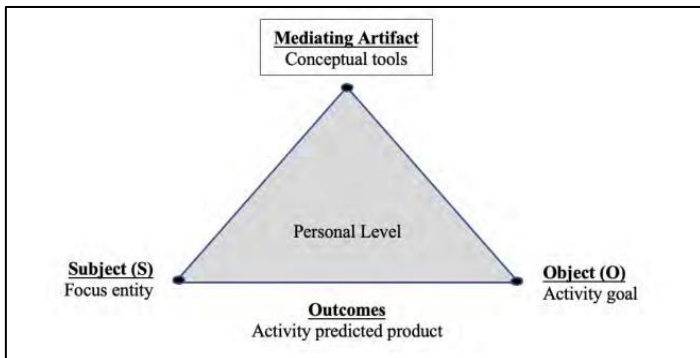


Figure 1: Vygotsky's First Generation CHAT Model (1978)

Hofstede's cultural dimensions

Hofstede's Cultural Dimension Theory provides a framework for describing the manner in which other cultures' values influence behaviour in different societal and organisational contexts. The theory posits that there are six cultural dimensions: power distance, individualism versus collectivism, masculinity versus femininity, uncertainty avoidance, long-term versus short-term orientation and indulgence versus restraint (Hofstede, 1984; Hofstede, Hofstede and Minkov, 2010). These dimensions are used in the research of cultural variation and their implications in communication, decision-making

and learning styles. In the context of cultural adaptation of LMS to Zimbabwean culture, Hofstede's theory is helpful in guiding LMS design adjustment in the incorporation of cultural traits such as high-power distance and collectivism, which are common in most African cultures (Hofstede *et al.*, 2010). By localising these cultural dimensions, LMS may be made to address user engagement requirements and make the educational technology compatible with Zimbabwean learners' culture and practice

Cultural Dimensions in Educational Technology Design

Research on the impact of cultural dimensions on educational technology highlights the need to align design with users' culture in an effort to enhance participation (*ibid.*). Cultural dimensions of collectivism, power distance and uncertainty avoidance greatly impact how individuals perceive and interact with learning spaces and technology. In collectivist cultures, for instance, the value placed upon group cohesion and cooperation could imply that LMS functionality to facilitate collaboration and peer-to-peer communication is needed, as opposed to techniques popular in more individualistic cultures (Marcus and Gould, 2000). Power distance, being a tolerance for non-equal power distribution, can influence communication patterns and communication expectations between teachers and students within an LMS and require culturally sensitive design decisions in order to enable proper communication (Reinecke and Bernstein, 2011). Also, uncertainty avoidance, or the ability of a culture to tolerate ambiguity, may affect the need for clear directions, formal material and readily available support within a learning management system (Henderson, 2007). Omitting such cultural variance while creating education technology, may lead to lower user satisfaction, learner disaffection and poor learning performance, particularly in non-Western contexts where dominant Western design philosophies may conflict with indigenous culture (Kukulska-Hulme, 2012).

The effect of culturally appropriate interface and content design on user interaction with LMS, particularly in non-Western societies, is a robust research area. Indigenous language use, culturally appropriate images and ordinary visual cues have, through research, proved to increase

user convenience, comprehension and motivation within an LMS (Wang *et al.*, 2014). For example, the inclusion of imagery and case studies that are specific and represent local settings within a culture, makes study materials more meaningful and engaging for students (Siritongthaworn *et al.*, 2006). Similarly, changes to user interface based on supporting local patterns of communication and navigation options could reduce cognitive load and enhance usability (Barber and Badre, 1998). Sánchez-Franco *et al.* (2009) show that when LMS sites are perceived as culturally appropriate and accessible, learners are more likely to access online processes in greater depth, exchange ideas and utilise materials offered). Conversely, a cultural mismatch brings alienation and disconnection, limiting constructive interaction and learning (Zhao *et al.*, 2005). According to this, good knowledge of values and practices of target culture is an essential foundation for creation of LMS, not only functional, but also compatible with respective culture and appropriate to be employed in multicultural global cultures.

Barriers to LMS Adoption in Zimbabwean Educational Institutions

Adoption of LMS in Zimbabwe is faced with very robust infrastructural and socioeconomic issues that present very robust challenges to digital education being fair. Poor internet penetration to rural areas, where the broadband penetration rate is less than 20% and unreliable power supply with continuous load-shedding, present robust challenges to effective use of LMS (Mhlanga, 2021). This is also complemented by the highly expensive digital devices and mobile data, where smartphone ownership remains a luxury for most families and data charges consume gigantic portions of family budgets, disproportionately impacting low-income students as they must settle for data bundles and essentials (Mpungose, 2020). Cultural incompatibilities also hinder adoption because most LMS sites are designed on Western pedagogy models concerned with individualistic achievement and normative testing, which, by design, are incompatible with the collectivist learning tradition in Zimbabwe modelled on the *ubuntu* philosophy, emphasising communal sharing of information and orality (Ngwenya *et al.*, 2020).

This linguistic barrier still persists as a result of English domination of most global LMS websites, which poses additional challenges to the Shona- and Ndebele-speaking learners who may more easily comprehend in their native languages, but are forced to work with challenging technical and academic material using a second language (Ndlovu, 2018). In addition, historically based gender inequalities in technology access find women students in rural areas always last in line for family computers, under cultural pressure to put home work ahead of computer literacy, whereas city women students suffer harassment at cybercafés, all curtailing their engagement in computer learning spaces (Chitanana, 2012). These cross-cutting obstacles cumulatively create a perfect storm which will thoroughly bar huge pieces of the Zimbabwe's student body from the benefits of online learning unless countered through localised interventions.

Localised Design Strategies for LMS in Zimbabwe

The incorporation of cross-cultural design (CCD) principles in LMS can enhance learner motivation and usability in non-native cultures, such as in Zimbabwe. CCD aims at the deployment of system interfaces to be in harmony with users' cultural habits, language use and the learning context (Ford and Kotzé, 2005). Localisation in the Zimbabwean setting could involve inclusion of local languages such as Shona and Ndebele, alongside English, to expand coverage. Culturally descriptive icons, metaphors and imagery can also render interfaces more intuitive and familiar (Evers and Day, 1997). Pedagogical models that are specific to the local setting, i.e., *ubuntu*-based collaborative learning, can similarly be accommodated in LMS design in order to facilitate congruence with Zimbabwean communal cultural heritage (Mawere, 2024). This encourages inclusivity while enabling learning technologies to be harmonised with traditional practice and modes of learning.

Integrating indigenous knowledge systems (IKS) and collaborative learning approaches into LMS design can further enrich the educational experience. IKS emphasise community-based knowledge sharing, oral traditions and practical problem-solving, which can be digitised and embedded into LMS platforms (Hoppers, 2002). Collaborative tools, such as discussion fora and peer-assessment features, can reflect

Zimbabwe's collectivist culture, promoting knowledge co-construction and shared learning experiences. African case studies suggest the potential of localised education technologies. For instance, local content and multimodal presentation were employed in the MobiLiteracy Uganda programme to support adult literacy (Wagner *et al.*, 2019). Similarly, localised academic content offline was disseminated through the eGranary Digital Library in Kenya, bypassing infrastructure challenges (Fuchs and Horak, 2008). Such examples are used to highlight the capability of locally adapted LMS to propel education in Zimbabwe through integrating technological progress with local cultural conditions.

The Role of User-Centred Design in Enhancing LMS Accessibility and Engagement

User-Centred Design (UCD) methods have been effective in improving the usability and accessibility of LMS, particularly for heterogeneous and resource-poor settings such as Zimbabwe. UCD prioritises system design from the end-users' needs, wants and limitations to achieve an easy-to-use and accessible LMS (Gulliksen *et al.*, 2010). For Zimbabwean students, this approach could address usability challenges such as low digital literacy and language through the utilisation of user-friendly interfaces and multilingual interfaces. For example, iterative test loops and pilot testing with teachers and students can ensure that the LMS is localised to local learning processes and technical infrastructures (Zaharias and Pappas, 2016). Further, accessibility features like text-to-speech, offline access and low-bandwidth optimisation, are particularly applicable to Zimbabwe, whose infrastructural challenges have a way of limiting equal access to digital content (World Bank, 2019).

Involving end-users throughout the design process as well as when evaluating them, is the focus of UCD and is critical in addressing the specific issues that face Zimbabwean education stakeholders. Getting students, teachers and administrators involved in co-design can lead to new information regarding what they require, for example, how they need to live with limited resources and cultural awareness (Kujala, 2003). This participatory approach guarantees that the LMS is flexible to support various user goals, including content adaptability across

different levels of learning and incorporation of pedagogic practices that carry local importance. Secondly, UCD can narrow down digital illiteracy challenges by incorporating training modules and intuitive navigation to support new technology users (Norman, 2013). Demonstrators in similar contexts, such as the eLearning Africa initiative, show how UCD approaches have successfully complemented LMS use and implementation by implementing solutions to adapt to the socio-economic status of consumers (Unwin *et al.*, 2010). The outcomes show the validity of UCD in using the development of accessible and appealing LMS solutions in Zimbabwe to be successful.

Methodology

To seek multifaceted insight into the deployment of LMS in Zimbabwean cultural contexts, this study combines an extensive document analysis with qualitative interviews. This multimethod assisted the research to investigate the adoption of LMS in a Zimbabwean context. Figure 2 displays the research process of this research.

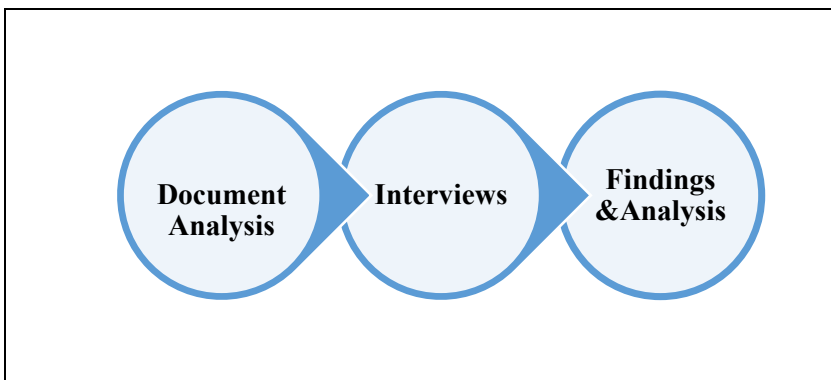


Figure 2: The methodological research process (Authors' Construct, 2025)

Document Analysis

Document review of 10 published research papers was the first task. The Tylor and Francis Scopus indexed research papers were selected and used for the purposes of carrying out this study in an attempt to have research material that was specifically on the topic of the research. Research articles reviewed in this study are Obeng and Coleman (2020), Ouma (2021), Ssemugenyi and Seje (2021), Maune (2023), Jovanka (2023), Calonge *et al.* (2023), Barikzai *et al.* (2024), Rulinawaty *et al.* (2024), Widowati and Tyas (2024) and Kamoyo *et al.*, (2025). The choice of research works fulfilled the following criteria (1) that they were released in peer-reviewed journals or conference proceedings; (2) that they investigated adaptation of LMS in cultural context; (3) that they discussed the opportunities and challenges of adopting LMS; and (4) That they were in English. The research selected Scopus-indexed research articles published by Taylor and Francis due to the rigour, credibility and academic relevance that these sources are reputed to provide. Scopus is also the world's largest database of peer-reviewed literature, which ensures high quality and reliability in the articles selected. In addition, Taylor and Francis is a reputable scholarly publisher issuing a collection of Scopus-indexed journals on fundamental topics such as educational technology, user-centred and cross-cultural design considerations, all of which have immediate applicability to the present study. It is presupposed that in this manner, the study succeeds in the inclusion of evidence-based findings and high-impact research by leading experts, raising the study's theoretical validity and real-world applicability.

Interviews

To obtain profound insights of complex and nuanced experiences, perceptions and attitudes of stakeholders regarding the implementation of LMS to Zimbabwean cultural contexts, face-to-face interviews were chosen as a data collection mode in this study and prior to conducting the interviews, word-of-mouth consent from the respondents was obtained. Interviews were utilised as they gain deeper, nuanced information that quantitative procedures might not be able to capture, therefore appropriate for exploratory studies. Interviews provided an opportunity to ask questions, for discussion, arrive at consensus and

concurrence among the interviewees, thus enhancing stakeholder views and study of experience. It was undertaken after literary analysis in order to obtain qualitative information from a wide representative sample of stakeholders directly engaged in LMS implementation. This phase sought to test a comprehensive opinion regarding the potential of benefit and difficulties of integrating LMS within the Zimbabwean context.

Participants Selection

To obtain different opinions and experiences concerning how to use LMS in the Zimbabwean cultural context, 10 participants were conveniently and purposively selected from the Chinhoyi University of Technology (CUT) faculties. Sampling criteria were experience in higher education, curriculum development, LMS technology knowledge and agreeing to participate in the study. Table 1 depicts the demographic details of the 10 participants sampled from university faculties.

Table 1: Demographics of the ten participants.

Code	Qualifications	Faculty	Years	Duties
1	PhD	Art and Design	10	Lecturer
2	Master's Degree	Wildlife and Environmental Sciences	6	Lecturer
3	PhD	Agricultural Sciences and Technology	9	Lecturer
4	Master's Degree	Hospitality and Tourism	6	Lecturer
5	PhD	Engineering Sciences and Technologies	6	Lecturer

6	PhD	Entrepreneurship and Business	10	Dean
7	PhD	Health Sciences and Technology	7	Lecturer
8	Master's Degree	Graduate Business School	8	Lecturer
9	U-degree	Natural Sciences and Mathematics	3	GTA
10	U-degree	Lifelong Learning and Developmental Studies	3	GTA

Source: Research Data (2025).

The research recruited participants from the same institution since they share the same characteristics to ensure the study is consistent and reliable. The institution was selected particularly due to its motto, "Technology, Innovation and Wealth" and vision to become a world-class technological innovation and entrepreneurship centre. Its mission is centred on the development of innovative graduates, knowledge creation, entrepreneurship development and community services through quality instruction, training and research in technology. These are premised on core values of Integrity, Excellence, Dynamism, Entrepreneurship, Democracy and Culture. In addition, the institution's mission also aligns with the United Nations Sustainable Development Goal (SDG) 17, where international cooperation and partnerships are highlighted to ensure the achievement of the other 16 SDGs, since it is argued that cross-cutting concerns like this call for aligned, multi-stakeholder action. The selection of this institution is highly applicable to the study since its vision, mission and core values are all aligned and resonate highly with the idea of the necessity for contextualising LMS to the Zimbabwean culture. The institution's emphasis on technological innovation and entrepreneurship offers a fertile platform for infusing

culturally responsive LMS designs that address local needs. Additionally, its concentration on community service and knowledge generation ensures that the systems developed align with the cultural, educational and entrepreneurial requirements of Zimbabwe. In alignment with SDG 17, the organisation develops partnerships and collaborations which play a central role in developing and implementing effective, localised LMS solutions. This not only optimises user engagement, but also ensures that the systems are sustainable as well as culturally meaningful

Data Analysis

Thematic analysis, comprising transcriptions of the responses, coding and theme identification, was employed to examine the interview data. With emphasis on transformative potential, engagement and personalisation, challenges and obstacles, ethical concerns and recommendations for effective integration, the qualitative study seeks to establish significant trends how LMS can be tailored to the Zimbabwean context with a view to augmenting user engagement, accessibility and learning outcomes for the learners.

Integration of Findings

Results from interviews and document analysis were integrated to yield a complete picture on how to maximise user engagement, accessibility and learning accomplishment for students. By integrating rich, qualitative feedback from practitioners across a range of areas of expertise with evidence-based ideas from peer-reviewed literature, the multi-methods design secured findings and conclusions of the study.

Findings and Analysis

Ten Scopus indexed research papers between Tylor and Francis, Congent Education Articles were purposively chosen and analysed: Obeng and Coleman (2020), Ouma (2021), Ssemugenyi and Seje (2021), Maune (2023), Jovanka (2023), Calonge *et al.* (2023), Barikzai *et al.* (2024), Rulinawaty *et al.* (2024), Widowati and Tyas (2024) and Kamoyo *et al.*, (2025).and merged with data collected from interviews. Barikzai *et al.* (2023) conducted a systematic review of 84 research studies to determine the key factors influencing e-learning adoption in emerging economies.

Their research identifies four overarching themes: critical success factors, failure factors, implementation recommendations and future study directions. Similarly, Maune (2023) utilises the Delphi technique to analyse e-learning adoption in Zimbabwean universities and concludes that while e-learning is greatly known and valued, its application is limited. In Indonesia, Rulinawaty *et al.* (2024) applied the updated DeLone and McLean IS model of success to measure LMS effectiveness and experienced positive significant impacts on system quality, information quality and user satisfaction, emphasising the need for better infrastructure to complement LMS practices. Ssemugenyi and Seje (2021) examine the transition to e-learning among PNGUoT staff and students during the COVID-19 pandemic with employee and student attitudes and ICT support as certain predictors of e-learning adoption, additionally focusing on fostering inclusion, innovation and creativity.

Obeng and Coleman (2020) evaluate the impact of technological innovation on web-based e-learning systems, with innovation being seen to have significantly improved system performance and features, since 61% of learners showed satisfaction. Widowati and Tyas (2024) contribute knowledge in the area of trends in mobile inquiry-based learning using bibliometric analysis of 308 global documents, of which eight were from Indonesia, to determine the growing research landscape in this area. Kamoyo *et al.*, (2025) also examines the pedagogic impacts of the virtual e-learning management systems that have been adopted at Chinhoyi University of Technology, as resilience against the COVID-19 pandemic. In it, they illustrate the association between students' e-learning adoption patterns and e-learning performance outcomes. Structural equation modelling was applied in data analysis from a sample of 70 undergraduate students. Their findings are, that despite positive intentions on the part of the management in arresting the COVID-19 pandemic disaster in higher education, the performance of the virtual e-learning system as a pandemic response measure was hindered by inhibitorier than accelerator factors. Factors such as uneven access to the e-learning infrastructure, network-connectivity problems, internet connectivity, power unreliability and unaffordability of

compatible digital devices, were very high-deterrents against the take-up of virtual e-learning.

Collectively, these studies demonstrate the importance of technological infrastructure, stakeholder values and innovative practice for the promotion of e-learning systems in a range of settings. After integrating the results, the research starts with reporting respondent characteristics and then determines overall themes, which are: Infrastructure and Accessibility Challenges, Socioeconomic and Cultural Barriers, Institutional and Policy Gaps, Pedagogical and Technological Integration, Psychological and Behavioural Factors, Success Stories and Recommendations and Cross-cutting Themes and Implications.

Demographics of respondents

Gender of participants

Table 1 indicates gender of respondents who participated in the study.

Table 4.1: Gender of participants (N=10)

Ser	Female	Male	Total
Participants	4	6	10

Source: Research Data (2025)

Findings in Table 1 show clearly that more male teachers participated in the research study as compared to female teachers. Male teachers accounted for 60%, while female participants accounted for 40%. The study findings may be an indication that more male teachers were interviewed than female teachers.

Age of respondents

Table 2 illustrates age of educators who participated in the study.

Table 2: Ages of respondents (N=10)

Age	Number
18-25	3
26- 35	3

36– 50	2
50+	2
Total	10

Source: Research Data (2025)

Findings in Table 4.2 show that there were three respondents aged between 18 to 25 years. Another 3 were 26 to 35 years of age, while two respondents were between 36 years to 50 years. Findings in Table 2 also show that there were also two who were 50 years and above.

Infrastructure and Accessibility Challenges

LMS in Zimbabwe is greatly impacted by infrastructure issues such as poor ICT devices, unstable electricity supply and expensive internet prices (Dzinotyiweyi and Taddese, 2020; Ouma, 2021; Maune, 2023). Rural students are disproportionately affected by internet connectivity issues such as high data charges and low bandwidth, with many of them using WhatsApp as a cheaper alternative (Ouma, 2021; Maune, 2023). This concurs with Dzinotyiwai and Teddesse who acknowledges that there is disparity in access to electricity and ICT between rural and urban areas with electricity and connectivity accessible to urban schools more than rural schools. The findings concur with the Zimbabwe's National ICT Policy of 2022-2027 which is anchored on the priority areas of infrastructure and services, policy, legislation and regulation, digital skills, investment and funding, innovation and local production, inclusiveness, content and applications, emerging technologies, partnerships and collaboration, sustainability and safe use of digital services (National ICT Policy 2022-2027). Researchers believe that the policy tries to fill these digital connectivity voids in Zimbabwe. This is further supported by findings from interviews in which 80% of interviewees reported that unavailability of the internet and devices was the major reason against LMS usage. Although penetration of the mobile phone is high (88.2%), broader e-learning participation is hindered by costs (Maune, 2023). As one of the interviewees said:

"Network must be everywhere, affordable and provided to educators."

The response concurs with the Southern Africa Development Community (SADC) broadband gap analysis, which states that 83% of African countries have broadband plans and, therefore, demand for broadband is not in doubt (National ICT Policy 2022-2027). Internet penetration was at 62.6% and mobile population coverage was at 99.87% 2G, 93.47% 3G and 35% LTE, according to POTRAZ's 2021 third quarter abridged ICT Sector Report. This embarrasses from the respondent's suggestion since high-speed broadband coverage continues to be limited for most rural and previously disadvantaged communities. While solar-powered solutions have been proposed as ways to address electricity issues, structural barriers still exist that charge students extra to access online materials (Ouma, 2021). In Zimbabwe, this is consistent with the Smart Zimbabwe 2030 master plan which includes the e-Government roll out, supply of power and other supporting infrastructure and enhancing efficiency of state enterprises and parastatals. These findings highlight the importance of localised, low-bandwidth LMS designs consistent with the infrastructural realities in Zimbabwe to improve accessibility and engagement.

Socioeconomic and Cultural Barriers

Socioeconomic disparities and cultural resistance further complicate LMS implementation in Zimbabwe. Maune's (2023) "Toiling Class Theory" emphasises that economic inequalities make digital spaces beyond the reach of poor students, of with gender and rural divides exacerbating inequalities (Ouma, 2021; Barikzai *et al.*, 2024). This is in line with the Zimbabwe National ICT Policy (2022-2027) which indicates that, while liberalisation in the ICT industry has created the potential for increased growth in internet users within the country, affordability and digital literacy in tandem with differences in urban/rural, gender, persons with disabilities, etc, among users, still exist. Cultural resistance grounded in indigenous instruction norms and technophobia is also a barrier to the digital transformation, with senior members of staff primarily relying on students for technical support (Ouma, 2021). Interview participants placed significant emphasis on the inclusion of Zimbabwean cultural elements on LMS platforms, with 80% indicating this inclusion as "very important" and 60% proposing the use of local languages to promote cultural retention. According to a respondent:

"Embracing local languages is a step in the right direction in a bid to preserve cultural heritage."

Another noted:

"They make it easy for learners in disadvantaged areas to understand what is being taught."

Excluding cultural elements from LMS platforms risks neglecting Zimbabwe's heritage and alienating students. Respondents stressed that such exclusion could lead to "low indigenous knowledge applications in life" and create "graduates who are not respecters of culture and the environment". These findings suggest that LMS designs should incorporate culturally sensitive training programmes, local languages and culturally relevant artefacts to enhance inclusivity and engagement. Inclusivity has revolutionary potential and can be a change force, modernisation and innovation, connecting people and communities, improving living standards and creating new opportunities for trade both within and beyond (ICT Policy 2022-27).

Institutional and Policy Gaps

Institutional weaknesses, including inadequate financing, inadequate governance and a lack of collaborative national e-learning policies, hinder successful LMS adoption in Zimbabwe (Maune, 2023; Barikzai *et al.*, 2024). This shames from the Zimbabwe National Policy for ICT 2022-2027 which was developed through consultations to bring in a shared vision, harmonious purpose and shared ownership of the ICT policy to ensure the same product is a people-driven output which they can own. It can be observed that it is rooted in democracy, equality and inclusiveness, innovativeness and sustainability. State universities cannot even handle platforms like Moodle and gaps in training are prevalent, with only 25% of the lecturers being certified in Moodle (Ouma, 2021). Interview responses highlight the need for more institutional and government support. The responses emphasised the need for educators' critical role in content creation, with one reacting thus:

"It should be them who create the content always — they know the objectives of the degree and the particular module they teach."

Another participant added:

"Local educators must participate in content creation and provide relevant information."

These findings point to the importance of investing in upskilling the faculty, rural internet connectivity and subsidised data costs and crafting policy measures that prioritise digital learning. Respondents further suggest that policymakers consult rural communities and elderly people so that LMS platforms reflect Zimbabwean socio-economic and cultural realities. Likewise, the number of trained teachers for primary and secondary levels is also high, but only 15% of the primary teachers have even a basic level of computer skills and less than 2% of the secondary teachers are computer science specialty teachers (Ministry of Primary and Secondary Education, 2018). Researchers believe that the low ICT skill levels are the result of higher education institutions' poor quality teacher training

Pedagogical and Technological Integration

Successful LMS implementation in Zimbabwe is about harmonising usability and pedagogical needs. Empirical evidence has established the use of easy-to-use systems such as Moodle and WhatsApp (Maune, 2023; Rulinawaty *et al.*, 2024). This is in line with Zimbabwean ICT Policy mandate (2022-2027) of empowering businesspeople to create locally relevant content and programmes, enhancing Zimbabwean web exposure and developing a software industry in the country by ensuring that at least 30% of ICT software and apps used by government offices are locally produced in all the languages spoken in the country. Interview findings agree, with 80% of the interviewees mentioning WhatsApp as their preferred LMS platform due to affordability and accessibility. The participants suggested culturally relevant audio-visual materials, simplicity in navigation using local languages and topics align with Zimbabwean culture, for example, rural or urban settings. Hence, promotion of local ICT products and services, along with content using local languages and the use of appropriate technologies that are compatible with international standards, are of great importance. One of the interviewees said:

"Yes, cultural context is very important as it gives the Zimbabwean context in learning."

Another stated:

"It grounds the student who is usually learning from foreign textbooks about foreign places."

HyFlex designs which combine online and classroom learning also have potential, but must be technologically supported strenuously (Calonge *et al.*, 2023). All this means that Zimbabwean LMS design must prioritise easy-to-use interfaces, flexibility with blended learning and ongoing improvement based on user experience to enhance use.

Psychological and Behavioural Factors

Psychological and behavioural factors, including attitudes, perceived control and social norms, influence the use of LMS in Zimbabwe (Maune, 2023; Raymena *et al.*, 2023). Perceived risks, such as data privacy concerns and cyberbullying, however, lowers trust in LMS sites (Barikzai *et al.*, 2024). Hedonic motivation enjoyment in technology conversely has a positive prediction of LMS usage (Raymena *et al.*, 2023). Structural constraints like inadequate electricity supply, low internet connectivity, high cost of data and rural-urban digital divide are prevalent, with the potential to widen educational inequalities, depriving most disadvantaged students' educational rights to accessing adequate e-learning resources (UN, 2020; UNESCO, 2020). Interview feedback lists interactive attributes as extremely important to the involvement of users, where 80% of the participants endorsed them. One of the participants expressed that:

"Interactive features make the context understandable and less esoteric."

Six participants (60%) suggested discussion fora be conducted in the local language, 20% suggesting gamified learning experiences and 20% virtual study groups with local themes. Technophobia can be overcome through targeted training and building confidence of the users through interactive, secure LMS interfaces for drive adoption.

Success Stories and Recommendations

Despite challenges, innovative strategies such as Public-Private Partnerships (PPPs) and local low-bandwidth solutions such as WhatsApp integration have the potential to scale up LMS adoption in Zimbabwe (Maune, 2023; Barikzai *et al.*, 2024). Energy unreliability is circumvented by solar-powered devices, while HyFlex models benefit

from iterative design and stakeholder feedback (Calonge *et al.*, 2023). Stakeholders underscore the importance of involving local teachers in the development of content and continuous updating of LMS platforms for relevance to Zimbabwean contexts. A participant stated:

"Constantly update its look and feel so the students can focus on the curriculum."

Others emphasised making LMS resources accessible and affordable, with one suggesting:

"Network infrastructure must be everywhere, affordable and provided to educators."

Policymakers have to prioritise rural internet infrastructure, subsidised data rates and mandatory digital literacy training to bridge existing gaps. These will assist in providing equitable access to digital learning and promote sustained LMS utilisation. Hale (2006), in Kamoyo *et al.*, (2025) and Chang and Tung (2008) stress the need for learner's digital capabilities, access to e-learning infrastructure and connectivity level, that impact on the ability of an individual learner to embrace the e-learning technological changes. Upgrading and setting relevant infrastructure to e-learning is relevant because e-learning platforms are HTML web applications that require internet connectivity (Huang *et al.*, 2020). Lack of internet accessibility due to lack of proper infrastructure has crippled 82% of learners in sub-Saharan Africa (Moyo-Nyede and Ndoma, 2020; UNESCO, 2020). This has resulted in unequal e-readiness which induces educational inequalities (Lizcano *et al.*, 2020), thereby triggering disparities in educational accessibility.

Cross-cutting Themes and Implications

The underlying needs are the tension between the e-learning promise of innovation and the infrastructural as well as cultural needs of Zimbabwe. WhatsApp and other such platforms offer a viable substitute to the commercial LMS platforms but require enrichment with localised information and culturally relevant themes to ensure maximum interaction (Maune, 2023). Kamoyo *et al.* (2025) also find out that BigBlueButton learning application, Google Classroom and CUT VLE were low in students' attendance at Chinhoyi University of Technology. The platforms recorded mean attendance rates of 16%, 21% and 12%, respectively. In contrast, WhatsApp fared much better with a mean attendance rate of 78% for the two classes in the study. The study further

reveals that the BSc Supply Chain Management (BSCM) class with 385 students, had 14% attendance on BigBlueButton, 18% on Google Classroom and 12% on CUT VLE. It was, however, WhatsApp that reported the highest attendance for this class at 78%. The same was displayed by the BSc International Marketing (BSIM) group, with lower participation being seen on BigBlueButton (22%), Google Classroom (33%) and CUT VLE (10%), while the highest was noted on WhatsApp again at 80%. The findings confirm that e-learning platforms such as BigBlueButton, Google Classroom and CUT VLE are less favoured compared to WhatsApp (*ibid.*). Incorporation of Zimbabwean cultural aspects, for example, local languages, artefacts and symbols, is a significant consideration in raising user engagement as well as the preservation of heritage. A successful e-learning adoption model should recognise the value of a social system (*ibid.*). One participant noted:

"Localised themes and examples make learning less esoteric and more familiar."

This is in line with Rogers, (2003) and Bakkabulindi (2014) who comment that individual attributes and personal traits like gender, age, experience, knowledge, attitude, behaviour and beliefs towards the technological change, affecting one's intentions to adopt a technological innovation and the subsequent adoption behaviour, which in its turn, decides the success of any technological innovation. This means that the impact of e-learning on higher education increases when the e-learning system becomes well integrated into the cultural norms of the social system (Findik-Coskuncay *et al.*, 2018). In addition, resolutions to infrastructure-related problems, such as power supply and slow internet, together with policy and institutional reforms, will create an enabling environment for culturally responsive LMS solutions that maximise user uptake and learning performance.

Theoretical Implications

This study on Learning Management System (LMS) adoption in Zimbabwe draws on earlier technology adoption theories by showing cultural, socioeconomic and infrastructural factors uniquely shaping e-learning in developing nations. The research affirms the Extended Theory of Planned Behaviour (ETPB) and the Unified Theory of Acceptance and Use of Technology (UTAUT2) and illustrate how

Zimbabwean consumers' value perceived risk (e.g., information privacy, online harassment) and hedonic motivation (enjoyment) more than Western consumers, who are convenience- and efficiency-oriented. This means that these models must be modified in the future to incorporate cultural trust and participation variables to better fit developing contexts. In addition, the study brings to light the need for culturally sensitive LMS design theories, focusing on localised features like indigenous languages (Shona, Ndebele), symbols in contextually cultural contexts and pedagogically viable content. The Postcolonial Theory of Education also shows how erstwhile inequalities, for example, colonial disparities in resources—continue to impede digital access to education, calling for decolonised models of e-learning. The study also supports the Socio-technical Systems Theory by confirming that the success of LMS implementation depends on alignment among infrastructure, policy and cultural context, particularly in low-resource contexts like Zimbabwe, where frequent changes in electricity and internet access necessitate low-bandwidth, offline-friendly solutions. The study further contributes to digital divide literature, offering empirical support for Maune's (2023) Toiling Class Theory, linking wealth disparities with unequal e-learning access. The Feminist and Rural Education Theory also explains how gender and geographical disparities compound marginalisation because women and rural students must overcome multiple barriers of limited device ownership, social expectations and connectivity deprivation. These findings underscore the need for targeted interventions, including localised LMS designs, digital literacy programmes and policy changes that address infrastructural and socio-economic inequalities. Synthesizing these theoretical frames, future research and implementation practices can better address the complex interaction of cultural, economic and technological forces propelling LMS adoption in Zimbabwe and other similar developing nations.

Practical Implications

The research findings provide useful practical implications for promoting LMS adoption in Zimbabwe and other developing environments. For policymakers and organisations, the main interventions should involve subsidising data and internet expenses to

enhance access, requiring thorough digital literacy training in universities and designing national e-learning policies that focus on low-bandwidth, offline-accessible solutions such as WhatsApp-enabled platforms. LMS implementers must optimise technology and culture through localising user interfaces with Zimbabwean languages and culture-specific images and rendering platforms lightweight and accessible in low-connectivity settings by adopting mobile-friendly designs and offline capabilities. Universities also must play a significant role through scaling up faculty development programmes in Moodle and public-private partnerships for securing infrastructure funding for devices and subsidised internet. Implementation of HyFlex learning models would also have to be accompanied by good technical support, including stable virtual classroom links and pre-recorded lectures available to handle connectivity glitches. Local community engagement is also key to sustainable LMS adoption, requiring direct involvement of local teachers in content creation to cater for cultural and pedagogical appropriateness. Targeted interventions must address gender disparities via particular digital skills training for women students with foras in the local language being of overriding concern, since 60% of the interviewees supported it. In embracing these multilevel interventions spanning policy reforms, technological innovations, institutional capacity building and community-oriented approaches, Zimbabwe can make significant strides to close the digital divide and create an efficient and inclusive e-learning environment.

Study limitations

The study employs qualitative research methodology, although future studies should employ mixed methods because they make use of both qualitative and quantitative approaches. Mixed methods provide researches with the flexibility of adapting their research to different data and following up on emerging concepts during the research process. Current studies include only participants from one university; future studies should also include participants from other universities for better generalisability of findings since LMS is utilised in learning by academics in other universities. The present study adopted a cross-sectional time horizon and data were collected. Once off future studies are encouraged to adopt longitudinal time horizon where data will be

collected more than once. This will enable researches to properly assess and crosscheck preliminary research findings, in this way, tracking changes.

Further Research

Future research must prioritise longitudinal studies tracking LMS adoption following policy and training interventions and cost-benefit analyses between localised vs. global LMS platforms in Zimbabwean environments. Additional gender-disaggregated research is necessary to identify and address specific challenges faced by female learners.

Conclusion

This study identifies the imperative for culturally sensitive Learning Management Systems (LMS) in Zimbabwe to enhance user adoption, usability and learning outcomes because available Western-centric designs have a tendency to contradict the country's collectivist learning style, linguistic diversity and infrastructure challenges like unpredictable electricity supply and high internet fees disproportionately affecting rural students, compounded by socioeconomic and gender disparities that exacerbate digital exclusion. To address these challenges, the study advocates for localised LMS designs integrating indigenous languages (Shona and Ndebele), culturally relevant content and low-bandwidth optimisation for mobile accessibility, while pedagogical adaptations such as collaborative tools should reflect Zimbabwe's communal the *ubuntu* philosophy. Institutional and policy changes, such as subsidised data prices, instructor training and public-private collaborations, are critical to bridge infrastructural holes, with the theoretical contributions of the study expanding technology adoption theories by highlighting cultural trust and postcolonial inequalities. A multi-stakeholder strategy, with policymakers, instructors and developers, is essential for developing inclusive digital learning environments, with future studies required on longitudinal adoption studies and gender-disaggregated analyses. Lastly, reconciling technological innovation with the cultural and infrastructural situation in Zimbabwe will make e-learning a good

option for leveraging equal opportunities in education and sustainable development.

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