

Barriers to Digital Learning Participation in Open and Distance e-Learning Programmes in Lesotho

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Abstract. Despite the increasing adoption of Open and Distance e-Learning (ODEL) in higher education, students and educators in developing regions continue to face barriers that limit effective participation in online learning. Although previous studies have identified technological and financial challenges associated with ODeL, little is known about how multiple barriers interact and collectively influence participation in resource-constrained higher education contexts such as Lesotho. This study explored barriers to digital learning participation within ODeL programmes at a public Higher Education Institution (HEI) in Lesotho during the 2025–2026 academic year. A qualitative case study design was employed to gain an in-depth understanding of participants' experiences. Data was generated through focus group discussions and semi-structured interviews with undergraduate students, instructors, programme coordinators, institutional leaders, and IT support staff. The data were analysed using thematic analysis. The findings revealed four interconnected barriers: financial, technological and infrastructural, institutional and administrative, and digital literacy and training barriers. Participants reported high internet data costs, limited access to digital devices, inadequate network coverage in rural areas, registration delays, and insufficient training opportunities. The findings further showed that these barriers reinforced one another, creating cumulative obstacles to participation. For example, delays in administrative and financial clearance restricted access to the Learning Management System, forcing students and instructors to rely on informal platforms such as WhatsApp for academic communication and learning support. The study concludes that equitable participation in ODeL requires addressing socioeconomic inequalities, improving digital infrastructure, streamlining administrative processes, and providing continuous digital literacy training. The findings offer practical insights for policymakers and higher education administrators seeking to strengthen inclusive and sustainable digital learning systems in Lesotho and similar resource-constrained contexts.

Keywords: Digital literacy; Higher education; Open and Distance e-Learning; Online learning barriers; Technological infrastructure.

Introduction

Open and Distance e-Learning (ODEL) has increasingly become a central mode of delivery in higher education, particularly in contexts where traditional face-to-face instruction is constrained by geographical, infrastructural, and socio-economic challenges. It is widely recognized as an approach that enables teaching and learning to occur beyond the limitations of time and physical space, thereby expanding access to higher education opportunities for diverse learner populations (Aluko et al., 2022). In this regard, ODeL has been widely adopted in sub-Saharan Africa as a strategy to widen participation and address persistent inequalities in access to higher education (Omanyo & Ndiege, 2024). Closely linked to ODeL is the growing integration of digital technologies in education, particularly Online Teaching and Learning (OTL) environments. Online learning environments depend on internet connectivity and digital platforms to facilitate synchronous and asynchronous interaction between instructors and students (Mokenela, 2019; Bernard et al., 2014). These platforms are increasingly viewed as essential in supporting learning continuity, enabling access to learning materials, and enhancing communication in higher education settings. However, access to and meaningful participation in such digital environments is not



uniform, as it is shaped by a range of structural and contextual factors. Globally, participation in online learning is influenced by access to digital infrastructure, affordability of internet services, digital literacy, and institutional support systems (Ionescu et al., 2020; Mian et al., 2020). Although online learning offers flexibility and expanded access, it can also reproduce existing inequalities when learners lack adequate resources or support. Tilbury (2017) argues that sustainable educational systems must ensure inclusive access and functionality over time. Consequently, participation in digital learning should be viewed not only as a technological issue but also as a matter of equity and inclusion.

In sub-Saharan Africa, including Lesotho, the effectiveness of ODeL remains constrained by limited ICT infrastructure, unreliable connectivity, high internet costs, and varying levels of digital literacy (Mutisya & Makokha, 2016). These challenges became more visible during the COVID-19 pandemic when HEIs rapidly adopted online teaching and learning platforms to maintain academic continuity (UNESCO, 2020; Hodges et al., 2020). Although institutions such as the National University of Lesotho implemented Learning Management Systems, WhatsApp, and email to support teaching and learning, studies continue to report challenges related to connectivity, affordability, delayed registration processes, and limited institutional support (Makumane, 2023; Czerniewicz et al., 2021).

Despite the growing adoption of ODeL in higher education, existing studies have largely focused on the experiences of students and instructors, often presenting broad accounts of online learning challenges. In Lesotho, limited research has examined how barriers to digital learning participation are experienced across multiple stakeholder groups, including programme coordinators, institutional leadership, and technical support personnel. Consequently, there is limited understanding of how financial, technological, institutional, and digital literacy barriers interact to influence participation in ODeL programmes. Addressing this gap is important for informing policies and practices that promote equitable and sustainable participation in online learning.

Research Questions

Specifically, the study sought to answer the following research questions:

1. What barriers influence digital learning participation in ODeL programmes at a higher education institution in Lesotho?
2. How do these barriers affect stakeholders' participation and engagement in online teaching and learning?

Scope and Delimitation of the Study

This study explored barriers to digital learning participation within Open and Distance e-Learning (ODeL) programmes at a public Higher Education Institution (HEI) in Lesotho during the 2024–2025 academic year. The study focused on four categories of barriers: financial, technological and infrastructural, institutional and administrative, and digital literacy and training barriers. Participants included undergraduate students, instructors, programme coordinators, institutional leadership, and IT support staff. The study was delimited to one public HEI in Lesotho and focused exclusively on participants involved in ODeL programmes. Postgraduate students, non-ODeL programmes, and other higher education institutions were excluded. As a qualitative case study, the findings are intended to provide an in-depth understanding of participants' experiences within the selected institution rather than statistical generalisations to all HEIs in Lesotho.

Literature Review

Digital Learning Participation in Open and Distance e-Learning Programmes

Digital learning participation has emerged as a central pillar of Open and Distance e-Learning (ODeL) as Higher Education Institutions (HEIs) increasingly integrate online technologies into pedagogy. Rather than treating participation as mere administrative enrolment, contemporary literature views it as a multi-dimensional construct encompassing students' and instructors' capacity to access materials, communicate effectively, submit assessments, and engage in collaborative discourse (Moore & Kearsley, 2018). By removing spatial and temporal constraints, ODeL expands access to higher education for historically marginalized demographics, including geographically isolated learners and working adults (Bozkurt et al., 2020). Crucially, active participation directly governs academic success, retention, and student satisfaction in digital spaces. When online learning environments foster robust social presence, interaction, and meaningful communication, they mitigate the



psychological isolation frequently associated with distance education (Palloff & Pratt, 2013; Martin & Bolliger, 2018; Lin et al., 2020). However, the capacity to foster this engagement is highly contextual. In African higher education, digital participation is rarely a frictionless process; rather, it is mediated by a complex interplay of financial constraints, technological infrastructure, digital literacy, and institutional support (Agormedah et al., 2020; Mokenela, 2019; Ayanwale et al., 2023). In Lesotho, although the transition toward Online Teaching and Learning (OTL) accelerated post-COVID-19, structural issues, including erratic connectivity, high data costs, and varying levels of digital readiness continue to fragment student and instructor participation (Mokenela, 2019; Makumane, 2023). Collectively, this literature establishes that digital participation depends on both individual capabilities and institutional environments. However, existing research in Lesotho has predominantly documented these barriers in isolation, providing limited synthesis on how interconnected institutional and socio-economic factors jointly influence overall ODeL programme effectiveness, and a critical perspective this study seeks to provide.

Financial Barriers to Digital Learning Participation

Studies consistently identify financial constraints as a major barrier to participation in online learning. Across both developed and developing contexts, the affordability of digital devices, internet connectivity, and data packages influences students' ability to access learning materials and engage in online activities (Seaman et al., 2018; Li et al., 2020). These challenges appear particularly pronounced in African higher education contexts, where students often rely on personal financial resources to sustain internet access (Agormedah et al., 2020). In Lesotho, evidence suggests that the high cost of data and limited access to digital devices continue to undermine sustained participation in ODeL programmes (Mokenela, 2019; Makumane, 2023; Ayanwale et al., 2023). Collectively, these studies demonstrate that financial barriers are not merely economic challenges but key determinants of equitable participation in digital learning, making them an important area of investigation in this study. However, most studies focus primarily on students' financial challenges, providing limited insight into how other stakeholders experience these constraints within ODeL programmes.

Technological and Infrastructure Barriers to Digital Learning Participation

Beyond individual financial capacity, effective participation in digital learning is fundamentally dependent on robust technological infrastructure. Globally, literature underscores that stable internet connectivity, access to functional hardware, and supportive institutional infrastructure form the baseline for viable online education (Dhawan, 2020; Turnbull, 2021). Interruptions in connectivity or inadequate hardware do not merely disrupt learning momentum; they lead to lower retention rates and increased academic frustration (Cullinan et al., 2021; Ren et al., 2024). However, infrastructural limitations do not impact all regions equally. In developing nations such as Lesotho, these technological barriers are critical, compounded by geographical terrain, inconsistent power supply, and unequal telecommunication coverage in rural areas (Mokenela, 2019; Makumane, 2023; Ayanwale et al., 2023). These studies collectively demonstrate that infrastructural failure in remote contexts creates a severe digital divide that standard ODeL policies often fail to accommodate. Although existing research clearly establishes the presence of severe technological barriers, few studies explore how these infrastructural deficiencies interact with administrative policies and institutional support systems to impact overall programme delivery. This study contributes to the literature by examining how technological constraints are experienced and managed across multiple stakeholder levels.

Institutional and Digital Literacy Barriers to Digital Learning Participation

The success of ODeL initiatives relies heavily on the interaction between user digital literacy and institutional support mechanisms. Literature indicates that operationalizing online learning requires more than just hardware; it demands high levels of digital competence from both students and educators to facilitate meaningful pedagogical engagement (Dhawan, 2020; Turnbull, 2021). Without adequate digital skills and ongoing institutional training, both learners and faculty experience reduced self-efficacy and elevated resistance to online platforms. In regional context, studies show that HEIs often roll out ODeL platforms without establishing comprehensive digital literacy framework or continuous technical support (Agormedah et al., 2020; Makumane, 2023). Consequently, institutional expectations often mismatch student and faculty readiness, exacerbating operational bottlenecks in ODeL delivery (Ayanwale et al., 2023). Existing literature has largely examined digital literacy and institutional support in isolation, focusing predominantly on student outcomes. There remains a



significant gap in understanding how students, academic staff, and institutional administrators collectively experience these interconnected readiness barriers within established ODeL environments, a gap this study explicitly seeks to fill.

Methodology

Research Design

This study adopted a qualitative case study design to explore barriers to digital learning participation in ODeL programmes at a HEI in Lesotho. A qualitative approach was considered appropriate because it enabled an in-depth exploration of participants lived experiences, perceptions, and nuanced challenges regarding participation in online teaching and learning. According to Creswell and Creswell (2023) and Yin (2018), case studies facilitate the investigation of contemporary phenomena within their real-life contexts, allowing researchers to gain a comprehensive understanding of complex social and educational issues. The design was therefore suitable for examining the technological, socioeconomic, institutional, and digital literacy factors influencing participation in digital learning environments.

Research Locale

The study was conducted at a prominent HEI in Lesotho that offers ODeL programmes through dual mode which entails traditional and online sessions. This institution represents an appropriate and compelling case for several reasons: first it is one of the primary pioneers of ODeL in Lesotho, serving a geographically dispersed student body spread across both urban centers and rugged, mountain regions with varied telecommunication infrastructure. Second, the institution reflects the real-world operational and socioeconomic dynamics of delivering online education within a developing nation's context. To ensure ethical compliance, institutional confidentiality, and protect participant identities, the specific name of the institution has been replaced with a pseudonym (HEI-Lesotho). The study was conducted at a HEI in Lesotho that offers ODeL programmes through online learning platforms. The institution was purposively selected because of its established implementation of Online Teaching and Learning (OTL) systems and its experience in delivering programmes through digital platforms. To ensure confidentiality and protect participants, the name of the institution has been withheld.

Research Participants

The study involved 19 participants who were directly engaged in Open Distance and e-Learning (ODeL) programmes at the selected institution. The participants comprised 12 ODeL students, three instructors/lecturers, two programme coordinators, one Head of Department (HOD), and one Information Technology (IT)/eLearning specialist. The student participants were currently enrolled in an ODeL programme, had completed more than one year of online study, and represented diverse geographic regions in Lesotho. The instructors/lecturers had at least two years of active experience facilitating ODeL courses through the institution's learning management system (LMS), while the programme coordinators were responsible for ODeL curriculum design, administration, and student academic support. The HOD was involved in departmental policy, resource allocation, and strategic ODeL implementation, whereas the IT/eLearning specialist was responsible for the technical management of LMS infrastructure, bandwidth, and digital support services. Focus group discussions were conducted with the student participants, while individual semi-structured interviews were conducted with the instructors/lecturers, programme coordinators, HOD, and IT/eLearning specialist. Participants with less than one year of involvement in ODeL programmes were excluded because they were considered less likely to provide sustained and reflective insights into digital learning participation and barriers.

Sampling Design

Purposive sampling was employed to select participants who possessed direct experience with online teaching and learning in ODeL programmes. Patton (2015) argues that purposive sampling enables researchers to obtain rich and relevant information from individuals who are knowledgeable about the phenomenon under investigation. Participant recruitment and data analysis occurred concurrently, allowing emerging findings to guide subsequent data collection. Recruitment continued until data saturation was achieved, that is, when no new themes or insights emerged from additional interviews and focus group discussions (Guest et al., 2006).

Research Instrument

Data was generated using semi-structured interview guides and focus group discussion guides. Semi-structured interviews were conducted with instructors, programme coordinators, the Head of Department, and the Information Technology specialist. Focus group discussion guides were used with students to encourage interaction and collective reflection on their experiences of online learning participation. The instruments consisted of open-ended questions designed to explore participants' experiences regarding accessibility, affordability, communication, technological challenges, digital literacy, and institutional support within the online learning environment. To ensure content validity and construct relevance, the instruments were developed following a three-stage operational workflow: first, questions were mapped directly onto the study's theoretical constructs which are accessibility, affordability, communication, technological friction, digital literacy, and institutional support. Second, draft guides were subjected to expert validation by two senior researchers in distance education and educational measurement to evaluate question clarity, alignment with research objectives, and non-leading phrasing. Third, prior to actual data collection, a pilot study was conducted with two non-participant ODeL students and one online lecturer from a similar tertiary context. Feedback from the pilot test was used to refine ambiguous phrasing, adjust time allocation per section, and optimize the sequence of sensitive questions such as personal financial barriers.

Data Gathering Procedure

Following the granting of ethical clearance and institutional permission, potential participants who met the inclusion criteria were identified through programme records and contacted through institutional communication channels. The purpose of the study was explained to all participants, and informed consent was obtained prior to their participation. Data was generated over a one-month period through three focus group discussions with students and individual semi-structured interviews with instructors and key institutional stakeholders. Each focus group discussion consisted of four participants and lasted between 40 and 60 minutes, while interviews lasted between 20 and 30 minutes. All discussions and interviews were audio-recorded with participants' consent and supplemented with field notes to capture contextual information and non-verbal cues. Following data generation, all recordings were transcribed verbatim to facilitate analysis.

Data Analysis

The data generated was systematically analyzed using Braun and Clarke's (2006) six-step thematic analysis framework. The process involved familiarization with the data through repeated reading of transcripts, generating initial codes, identifying emerging themes, reviewing themes, defining and naming themes, and producing the final report. The coding process yielded four primary thematic domains that reflect the multidimensional barriers to ODeL participation. Table 1 outlines these main themes, their corresponding sub-themes, and their operational definitions as applied in this study.

Table 1. Thematic Analysis Framework (Themes, Sub-Themes, and Definitions)

Main Theme	Sub-Themes	Operational Definition
1. Financial & Economic Constraints	• High data tariffs • Device unaffordability	Economic liabilities that restrict a learner's or instructor's capacity to purchase necessary hardware and sustain continuous internet access.
2. Technological & Infrastructural Barriers	• Network instability • Power grid deficits • LMS downtime	Technical interruptions, lack of broadband coverage in remote areas, loadshedding/power outages, and server constraints that disrupt digital participation.
3. Institutional & Administrative Challenges	• Support service delays • Resource allocation • Communication gaps	Policy, administrative, or structural gaps within the institution that impede timely technical assistance, feedback, or digital course delivery.
4. Digital Literacy & Technical Readiness	- Platform Competence • Pedagogical Adaptation • Training Deficits	Variations in technical self-efficacy, software skills, and institutional training among students and staff are required to navigate ODeL platforms effectively.



Trustworthiness

Trustworthiness was ensured through the application of Lincoln and Guba's (1985) criteria of credibility, dependability, confirmability, and transferability. Credibility was enhanced through triangulation of multiple data sources and member checking, whereby participants verified the accuracy of the interpretations. Dependability was strengthened through detailed documentation of the research process. Confirmability was achieved through the use of verbatim quotations and maintenance of an audit trail. Transferability was promoted through rich descriptions of the research context, participants, and procedures.

Results and Discussions

This study explored the barriers to participation in digital learning within Open and Distance e-Learning (ODEL) programmes at a Higher Education Institution (HEI) in Lesotho. Thematic analysis of the qualitative data generated four interrelated, mutually reinforcing themes: (1) financial barriers, (2) technological and infrastructural barriers, (3) institutional and administrative barriers, and (4) digital literacy and training barriers.

Financial Barriers and Inequality of Access

Participants identified severe financial constraints as a primary barrier limiting their ability to engage effectively with online learning. The high cost of acquiring digital devices and purchasing internet data emerged as the most prominent challenges. For example, FG2-C noted that *"I struggle to buy data regularly, so I sometimes miss online classes."* FG1-B also explained that *"Without financial support, it becomes difficult to balance daily needs and online learning requirements."* The cost of technological devices further compounded these challenges, especially since students lacked sponsorship. FG3-A further indicated that *"The devices are expensive since we are not sponsored."* Furthermore, participants pointed out a complete absence of institutional financial support to help ease these burdens. FG1-A stated, *"When I do not have enough money to pay for student data, the university doesn't offer any assistance."* Interestingly, this financial strain was not unique to students. Instructors also reported having to absorb the costs of connectivity personally. For example, Kat state, *"I use my money and buy data just like my students."* The findings suggest that financial constraints remain a significant determinant of digital learning participation within ODEL programmes. The ability to access online learning resources, attend virtual classes, and engage with digital platforms was largely dependent on participants' financial capacity. In the context of Lesotho, where many ODEL students are self-sponsored and may already face economic hardships, the cost of internet data and digital devices presents a considerable challenge to meaningful participation in online learning. The absence of institutional financial support further increases the risk of exclusion from digital learning opportunities. These findings support previous studies that identify internet data costs, connectivity expenses, and access to digital devices as major barriers to online learning participation in developing contexts (Agormedah et al., 2020; Li et al., 2020; Seaman et al., 2018). However, the present study extends this literature by demonstrating that financial barriers affect not only students but also instructors, who reported personally financing their internet connectivity to facilitate teaching and learning activities. This finding suggests that affordability challenges influence both participation and the delivery of online learning, thereby affecting the sustainability of ODEL programmes. The findings further indicate that financial barriers may contribute to educational inequalities by limiting access to essential digital resources. Consistent with Cullinan (2021) and Mokenela (2019), participants who lacked adequate financial resources were more likely to experience difficulties accessing online learning opportunities. From the perspective of Digital Divide Theory (van Dijk, 2020), these challenges reflect the access divide, whereby unequal access to financial and technological resources results in unequal opportunities for participation in digital learning environments. Addressing these challenges may therefore require targeted institutional interventions, such as subsidised data packages and increased support for students and instructors participating in ODEL programmes.

Technological and Infrastructural Barriers

Beyond financial limitations, participants identified significant technological and infrastructural barriers that hindered effective participation in digital learning. These challenges included unstable internet connectivity, inadequate network coverage, and limited access to institutional internet facilities. An instructor highlighted the lack of basic infrastructure on campus. For example, Stebo stating, *"Internet connectivity is a problem here at our institution"*. Similarly, Kat noted, *"Here at the institution, we don't have WI-FI"*. For students residing in rural



areas, these challenges were compounded by weak telecommunications networks. FG1-D explained, *"I stay in the rural area where we do not have the 4G network."* The findings indicate that technological and infrastructural challenges remain significant barriers to digital learning participation within ODeL programmes. The participants' experiences suggest that unreliable internet connectivity and inadequate network coverage disrupted access to learning materials, online interactions, and communication between students and instructors. The reported lack of institutional Wi-Fi further highlights limitations in the institution's capacity to support effective online learning. In the context of Lesotho, these findings are particularly important because many students reside in rural and mountainous areas where telecommunications infrastructure remains unevenly distributed. As illustrated by the experiences of participants, geographical location may influence the quality of access to online learning, resulting in unequal opportunities for participation. These findings therefore suggest that expanding ODeL programmes without corresponding improvements in digital infrastructure may inadvertently reproduce existing educational inequalities. The findings support previous studies that identify poor connectivity and limited technological infrastructure as persistent barriers to online learning participation (Ayanwale et al., 2023; Cullinan et al., 2021; Ren et al., 2024). However, while previous studies have largely focused on students' experiences, the present study demonstrates that instructors also face infrastructural challenges. The lack of institutional internet facilities reported by instructors suggests that technological barriers affect not only participation but also the delivery of online learning. This highlights the importance of considering multiple stakeholder perspectives when assessing the effectiveness of ODeL programmes. Furthermore, participants' reliance on mobile phones to access learning materials suggests that access to technology alone may not guarantee meaningful participation. Although mobile devices improve access to educational resources, they may not adequately support all academic activities required in higher education (Dhawan, 2020). From the perspective of Digital Divide Theory (van Dijk, 2020), these challenges reflect the access divide, whereby inequalities in connectivity, infrastructure, and access to appropriate devices create unequal opportunities for participation in digital learning. The findings therefore underscore the need for improved digital infrastructure and expanded network coverage to support equitable participation in ODeL programmes.

Institutional and Administrative Barriers

Participants emphasized that rigid and delayed institutional administrative workflows heavily restricted initial entry and sustained participation in online learning. Specifically, administrative delays in registration repeatedly blocked students from accessing the university's Learning Management System (LMS). One instructor described how registration timelines directly dictate platform utility. For example, Sthabi explained *"The institution's Learning Management System called is currently not being used because students register late... I am not able to use it because most learners register late."* Because institutional access blocks locked unregistered students out of the LMS at the start of the academic term, instructors were forced to bypass formal university infrastructure entirely to prevent instructional collapse. Stebo noted, *"I resorted to WhatsApp so that we would not run out of time."* These findings demonstrate that digital exclusion at HEI in Lesotho is not merely a byproduct of technical or financial limitations but is actively engineered by institutional administrative rigidity. In the context of Lesotho's higher education system, registration is strictly tied to upfront financial clearance. Because many ODeL students are self-sponsored and struggle to secure funds at the start of the term, fee clearance is delayed weeks into the semester. Institutional software automatically enforces a digital lockout against uncleared accounts, transforming an administrative clearance protocol into a structural barrier to learning. These administrative bottlenecks severely compromise the instructor's pedagogical capacity. While global literature highlights administrative efficiency as a prerequisite for e-learning success (Bacolod, 2023; Tuiloma et al., 2022), the findings reveal how staff bear the operational brunt of administrative failure. When forced off the institution's LSM, instructors lose essential instructional management tools, including automated gradebooks, assignment submission verification, integrated discussion boards, and structured learning pathways. Managing coursework through unstructured mobile messaging apps adds significant administrative overhead for staff, forcing them to manually track submissions across fragmented digital streams. Critically, while the reliance on WhatsApp mirrors "emergency remote teaching" practices described in global literature (Hodges et al., 2020), the findings diverge from this framework in a keyway. While Hodges et al. viewed informal channels as temporary coping mechanisms during unexpected global crises, at HEI in Lesotho, WhatsApp becomes a permanent, recurring default forced by institutional policy. Furthermore, while researchers like Makumane (2023) document these informal workarounds as signs of institutional resilience, they are critically interpreted as a structural degradation of

educational quality. Informal tools lack the security, privacy, and pedagogical depth of a dedicated LMS. Framed through Digital Divide Theory, these procedural hurdles demonstrate a structurally induced usage divide. Even when physical devices and cellular networks are available, rigid institutional governance dictates *how*, *when*, and *if* learners and educators can utilize formal digital resources.

Digital Literacy and Training Barriers

Varying levels of digital literacy and a lack of structured institutional training opportunities emerged as a major barrier to effective online engagement. Both students and academic staff reported low self-efficacy and technical anxiety when attempting to navigate formal digital tools. For students, institutional orientation to the LMS was described as superficial and rushed. For example, FG1-C stated, *"We were not really trained because it was just a one-day session."* On the other hand, instructors reported a parallel institutional deficit, highlighting a total absence of continuous professional development in online instructional design. Sthabi asserted, *"I haven't received any formal training on using technology for online learning."* This institutional neglect directly eroded instructors' pedagogical confidence when managing digital classrooms. Furthermore, Stebo mentioned, *"I don't think I have enough skills and knowledge on using them."* Faced with steep learning curves on the official LMS, both educators and learners abandoned formal software features in favour of low-threshold, consumer-grade messaging applications like WhatsApp. These empirical findings demonstrate that providing access to digital learning software is useless without systemic human capacity building. In the context of Lesotho's higher education landscape, institutional digital strategy has historically focused on basic hardware acquisition or software licensing, while neglecting the continuous professional development required to translate technology into effective teaching and learning. A single, one-off orientation session treats digital literacy as a static event rather than an evolving set of technical and pedagogical competencies.

Critically, these results broaden the understanding of faculty vulnerability in developing ODeL contexts. While existing literature widely notes that digital competency drives online learning success (Lin et al., 2020; Peng et al., 2022), findings show how a lack of training creates a severe pedagogical power imbalance. Instructors are expected to guide students through complex LMS interfaces, yet they themselves receive no formal grounding in e-learning pedagogy or platform administration. This lack of technical confidence causes instructors to experience high cognitive load and instructional anxiety, leading them to strip away interactive LMS features (e.g., discussion boards, automated quizzes, turn-in repositories) and default to basic file distribution.

Furthermore, the findings critically extend the critique by Turnbull et al. (2021) regarding superficial training workshops. In Lesotho, the retreat to informal platforms like WhatsApp is not merely a preference for convenience, but a defensive strategy against institutional unpreparedness. While literature from broader developing regions often attributes digital literacy gaps to individual student resistance or generational gaps (Van Laar et al., 2020), evidence points to an institutional failure of continuous support. When HEIs fail to provide sustained digital training, they force both educators and students into a lower tier of digital engagement.

Framed through Digital Divide Theory, this dynamic illustrates the sequential progression from the skills divided to the usage divide. Even if hardware access and internet connectivity were fully resolved, the absence of operational confidence ensures that engagement with formal ODeL platforms remains superficial, fragmented, and fundamentally inequitable.

The Interconnected and Cumulative Nature of Barriers

A final crucial finding is that these four categories of barriers do not operate in isolation; rather, they are deeply interconnected and mutually reinforcing. An important insight from the study is that the identified barriers do not operate independently but are interconnected. Financial constraints limit access to devices and data, infrastructural challenges restrict connectivity, institutional processes delay system access, and digital literacy gaps reduce effective engagement. This overlapping, systemic pathway is illustrated in the conceptual model below.

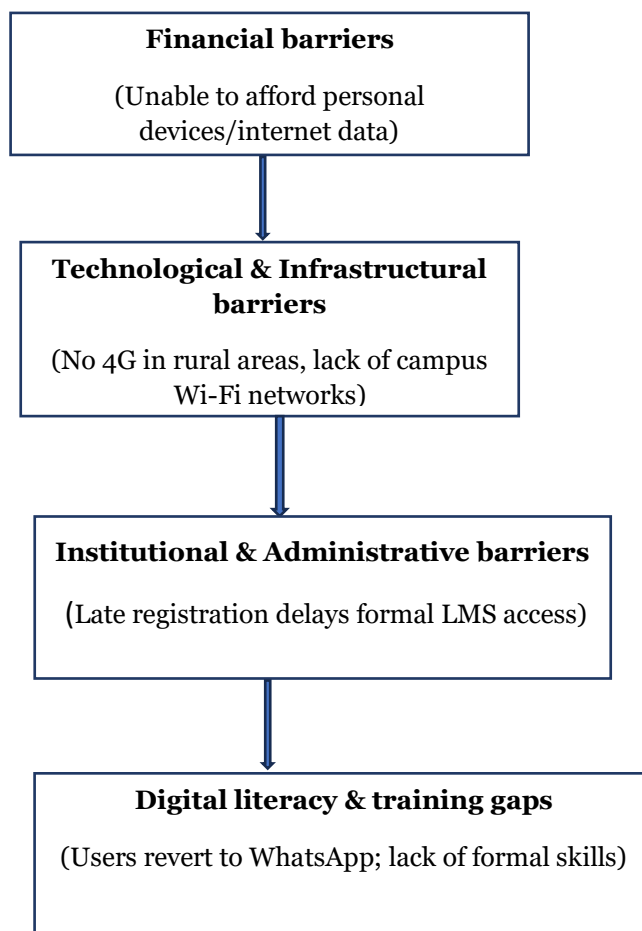


Figure 1. A conceptual model of the interconnected and cumulative pathway of ODeL exclusion.

Figure 1 illustrates how these barriers transition from one stage to another, forming a cumulative and mutually reinforcing loop of exclusion. For instance, personal financial constraints directly limit a student's ability to purchase functional devices or internet data. This lack of access is immediately worsened by poor technological infrastructure and weak network coverage in outlying rural areas. Simultaneously, rigid institutional processes such as delayed registration and financial clearance prevent students from accessing the formal LMS, early in the semester. Because both students and instructors lack systematic, continuous digital training to navigate and troubleshoot these issues, they collectively experience a drop in digital self-efficacy. This cumulative chain of hurdles eventually forces them to bypass formal institutional systems altogether and default to informal communication tools such as WhatsApp to preserve basic academic continuity. This interconnectedness supports existing ODeL literature which argues that digital learning barriers are rarely isolated, but rather form a multidimensional loop of exclusion (Bozkurt et al., 2020; Mokenela, 2019; van Dijk, 2020). Addressing only one dimension of the digital divide is fundamentally insufficient because learners experience these constraints simultaneously. A successful institutional intervention, therefore, must move away from piecemeal solutions and instead adopt a holistic approach that integrates financial, structural, and educational capacity-building strategies.

Ethical Considerations

Ethical clearance and departmental approval were granted by the Department of Adult Education where the researcher is based, and formal institutional permission to conduct the study with participants was sought and granted by the office of the Registrar at the HEI where the research took place. The study strictly adhered to recognized international ethical standards governing research involving human participants, including the core

tenets of the declaration of Helsinki. Participation was entirely voluntary, and all participants provided written informed consent prior to data generation. Confidentiality and anonymity were rigorously maintained through the use of pseudonyms and the systematic removal of identifying details from all transcripts and reports. Furthermore, the specific identity of the institution was withheld to safeguard both the participants and the study setting.

Conclusion

This study demonstrates that digital learning participation in developing ODeL contexts is fundamentally constrained by a cumulative, mutually reinforcing system of structural exclusion. By integrating the perspectives of students, instructors, programme coordinators, institutional leadership, and IT support staff, the empirical evidence establishes that digital divides cannot be understood or resolved as isolated technical failures. Rather, financial hardship, rural infrastructural deficits, rigid administrative fee-clearance protocols, and digital training gaps converge to systematically dismantle formal e-learning engagement. Consequently, this study claims that sustainable digital education in resource-constrained higher education settings cannot be achieved through piecemeal technology adoption or software procurement alone; true inclusion requires an integrated institutional framework that simultaneously targets material access, administrative policy reform, and ongoing pedagogical capability-building. To build upon the findings of this study, future research should explore several key avenues. First, longitudinal quantitative studies are needed to evaluate the long-term academic and retention impacts of informal tool usage (e.g., WhatsApp) compared to formal Learning Management System engagement. Second, future inquiry should investigate scalable, cost-effective models for continuous professional development in digital pedagogy tailored specifically to faculty in low-resource environments. Finally, comparative research across other ODeL institutions within Sub-Saharan Africa would help determine the degree to which these cumulative barriers and platform workarounds are generalizable across varying national telecommunications and higher education policy landscapes.

Recommendations

Based on the findings, the study recommends a coordinated, cross-institutional implementation framework where HEI leadership and policy makers prioritize strategic resource allocation by partnering with national telecommunications providers to secure a minimum 70% data subsidy and establish device loan schemes serving at least 25% of economically disadvantaged learners. To eliminate system lockouts, administrative and IT support departments should execute integrated workflows that decouple financial clearance protocols from portal access, ensuring 100% "day-one" access to the Learning Management System alongside a 24-hour resolution timeframe for technical support tickets. Concurrently, Instructors and Programme Coordinators should actively pursue continuous professional development in digital pedagogy, targeting an 80% annual faculty participation rate, and systematically design flexible, low-bandwidth online courses capped under 5 MB to accommodate students in rural areas with weak 2G/3G network coverage. Additionally, students should consistently engage in institutional digital literacy training to build technical self-efficacy, aiming for a 90% orientation completion rate within the first semester of enrollment. Finally, future researchers are encouraged to undertake longitudinal and comparative regional studies across Southern Africa at 12- and 36-month intervals to track the long-term sustainability of ODeL programmes, evaluate the practical effectiveness of these proposed interventions, and explore the socio-emotional well-being of learners navigating digital environments. The quantitative indicators specified above serve as evidence-informed operational targets derived from participant narrative accounts of bandwidth limits, financial constraints, and administrative delays.

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