

SUSTAINABILITY OF ONLINE TEACHING AND LEARNING IN OPEN AND DISTANCE E-LEARNING: LESOTHO'S HIGHER EDUCATION INSTITUTION

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Abstract

Open and Distance e-Learning (ODEL) has been recognised for its potential to bridge educational gaps in higher education. However, the digital divide in Lesotho and other sub-Saharan African countries seemingly pose a threat to sustainable online learning. In this context, the digital divide encompasses disparities in access to devices and connectivity, digital literacy, and the ability to benefit meaningfully from technology use. Presumably, despite the growing adoption of online teaching and learning (OTL) globally and in Lesotho, its sustainability remains uncertain due to infrastructural limitations, affordability challenges, digital literacy gaps, and inconsistent access to digital learning platforms. Guided by the Community of Practice (CoP) theory, this article aimed to explore the sustainability of online teaching and learning in ODEL programmes at one higher education institution (HEI) in Lesotho through a qualitative case study design. Thematic analysis of data generated from students, instructors, and administrators revealed key challenges, including financial constraints, inadequate digital training for students and academics, and infrastructural gaps as barriers to Information and Communication Technology (ICT) integration.

Notwithstanding these challenges, online platforms such as WhatsApp and email accessed via smartphones and computers facilitated meaningful communication and collaboration. The article discovered that while OTL is partially sustainable, addressing the digital divide through subsidised data, structured digital skills training, and streamlined administrative processes is essential. The article concludes that context-sensitive and inclusive approaches

are key to sustaining OTL in resource-constrained environments and to building resilient learning communities.

Keywords

Blended Learning, Higher Education, Learning Communities, Online learning, Open and Distance e-Learning, Sustainability.

1. INTRODUCTION

Open and Distance e-Learning (ODEL) has become a transformative approach in higher education, particularly in regions where traditional learning models are constrained by economic, infrastructural and geographic challenges. Aluko et al. (2022) describe ODeL as an educational approach that facilitates engagement of students with content and instructors with limited constraints of physical space and time. Central to the characteristics of ODeL is the combination of open learning principles, distance education methodologies, and electronic learning technologies for flexibility and access to learner-centred education (Mokenela, 2020). In sub-Saharan Africa, where many higher education institutions (HEIs) struggle with overcrowding, limited resources, and accessibility issues, ODeL offers a viable alternative to conventional in-person learning (Omanyo & Ndiege, 2024).

ODEL comprises eLearning, which refers to the use of any digital device for delivery or access of content in teaching and learning “without any reference to a network or connectivity” (Lesotho Council on Higher Education 2021, p.iii). Furthermore, in the Fourth Industrial Revolution (4IR), central to the concept of ODeL and eLearning is Online Teaching and Learning (OTL), which sets the tone for this article. Different from eLearning, OTL has been perceived as the use of the Internet for synchronous and/or asynchronous content delivery and feedback (Mokenela, 2020; Pop, 2016). This suggests that, by leveraging digital platforms, OTL enables students to access educational resources remotely, reducing the need for physical presence and offering greater flexibility for students with diverse needs (Chanda & Phiri, 2023).

Notwithstanding the significant growth of ODeL and adoption of OTL globally, sustainability of OTL in higher education is a growing area of research, with scholars examining the role of digital education in long-term institutional resilience (Ionescu et al., 2020; Mian et al., 2020; Nagolia & Pagliari, 2016). Tilbury (2017) defines sustainability as the ability of a system to endure and remain effective over time. Although the concept of sustainability has been clouded with nebulousness (Joseph et al. 2022), its broadest view as a state that allows continued existence of human life remains relevant. In this regard, sustenance for human life encompasses economic, environmental, and social shocks, referred to also as resilience, in the short term and in the long run (Solow, 1991). Furthermore,

Joseph (2022, p.4) posits that “sustainability, in its broad sense, has emerged as an approach to ensure long-term sustenance of human life in the context of universal mega-challenges such as changing climates, populations, technology and resources”.

Mutisya and Makokha (2016) emphasise that sustaining e-learning in African universities requires overcoming challenges related to ICT infrastructure, digital literacy, and institutional readiness. Specific to OTL, sustainability denotes creating systems that not only work in the short-term but can adapt to evolving needs of students and instructors (Crawford et al., 2020). This perception is particularly relevant to the Lesotho higher education context, where challenges such as digital literacy gaps, affordability constraints, and infrastructural limitations continue to hinder the effective use of online learning (Mokenela, 2020). Ensuring sustainability in this context requires a systematic and continuous improvement of key interrelated systems including digital tools, Internet infrastructure, pedagogical approaches, and the competencies of both faculty and students. It involves maintaining both quality and access over time while addressing challenges such as resources, infrastructure, and social factors that influence educational outcomes (Tilbury, 2017). In this article, therefore, sustainability of OTL in ODeL institutions depends on continually improving digital tools, infrastructure, pedagogy, and competencies of faculty and students to ensure long-term effectiveness and inclusivity.

The growing adoption of OTL in developed economies such as the USA, Japan, and the UK highlights its ability to provide flexible, accessible, and cost-effective educational opportunities. For instance, in the United States, nearly 6 million students were enrolled in at least one online course by the fall of 2015, illustrating the increasing preference for online learning (Allen & Seaman, 2016). This latter assertion demonstrates that OTL is not only a viable option in developing regions but also a growing and preferred mode of education globally, as it enables students to learn beyond traditional time and location constraints.

While OTL in the ODeL context has shown significant growth in developed nations, its impact in developing countries, particularly in sub-Saharan Africa, has also been acknowledged. In countries such as Kenya and South Africa, ODeL has been pivotal in overcoming educational barriers such as limited access to traditional learning spaces, inadequate infrastructure, and social inequalities. For instance, Kenya’s e-Learning project in primary schools has equipped over 21,000 schools with digital devices and internet access, positively influencing learning outcomes (Otieno et.al, 2018). Similarly, in South Africa, institutions such as the University of South Africa (UNISA) have leveraged OTL to expand higher education access, particularly among underserved populations (Leta & Cloete, 2019). These developments indicate that while the challenges may differ across regions, applicability of OTL has been evidenced in developed and developing countries.

In Lesotho, the COVID-19 pandemic necessitated a rapid transition to OTL. HEIs, including the National University of Lesotho (NUL), adopted the use of platforms such as Zoom, Google Meet, and a Learning Management System (LMS) named ‘Thuto,’ which was launched in 2010, to facilitate teaching, learning, and assessment processes (Ayanwale et al.,

2022). However, the sustainability of these initiatives remains uncertain due to infrastructural limitations, financial constraints and gaps in digital literacy. Makumane (2023) emphasises that the effectiveness of online learning relies on the accessibility of LMSs and communication tools, yet many students and instructors in Lesotho struggle with affordability and connectivity issues. Despite these challenges, digital technologies hold great potential to enhance education systems in Lesotho. Ayanwale et al. (2022) emphasise that the effectiveness of e-learning tools in Lesotho HEIs depends on factors such as accessibility, instructor and student training and user-friendliness. Additionally, Mokenela (2020) suggests that a blended learning approach incorporating face-to-face, print-based, and online instruction could offer a more sustainable model in the Lesotho context.

Despite these localized initiatives, a significant gap remains in how HEIs transition from emergency, short-term online delivery to long-term operational sustainability. While existing research frequently documents broad infrastructure limitations and immediate user frustrations (Makumane, 2023), there is a critical lack of empirical clarity regarding how specific institutional challenges and hidden instructional opportunities interact within daily teaching and learning processes. This gap creates a severe operational vulnerability; without a granular understanding of how instructors and students navigate online systems over time, strategic efforts to improve digital accessibility, pedagogical effectiveness, and stakeholder satisfaction may remain futile. Consequently, this systematic ambiguity directly threatens the long-term viability and inclusivity of digital education frameworks.

Chanda and Phiri (2023) emphasise that while e-learning contributes to sustainability by increasing accessibility and reducing infrastructural burdens, the lack of empirical studies focusing on its long-term viability in African HEIs highlights a significant gap. This article, therefore, aims to explore the sustainability of OTL in ODeL programmes at one HEI in Lesotho. The key questions guiding this inquiry were:

1. How sustainable are online teaching and learning tools used by students and instructors in ODeL programmes in one HEI in Lesotho?
2. What challenges and enablers affect the sustainability of online teaching and learning in ODeL programmes at the selected HEI?

2. LITERATURE REVIEW

Open and Distance e-Learning (ODeL) has ostensibly played a transformative role in expanding access to education in sub-Saharan Africa, particularly in overcoming geographical and economic barriers (Mokenela, 2020). Institutions such as the UNISA have successfully implemented ODeL to offer inclusive and flexible learning opportunities for underserved populations (Leta & Cloete, 2019), demonstrating the potential of ODeL to bridge educational inequalities across the sub-Saharan region (Omanyo & Ndiege, 2024). Among the widely acknowledged benefits are enhanced student collaboration, increased

access to educational resources, reduced social isolation, and improved interaction among students, instructors, and digital content (Ionescu et al., 2020).

Critical to the sustainability of OTL in ODeL are institutional factors such as accessibility of resources, adequate infrastructure, pedagogical strategies, digital literacy skills, and robust support systems for students and staff (Angolia & Pagliari, 2020; Mokenela, 2020). Ionescu et al. (2020) further emphasise that the effectiveness of OTL is influenced by the experiences of both instructors and students in using digital technologies. A sustainable OTL system, therefore, requires an enabling environment that fosters positive learning experiences, multicultural inclusivity, consistent feedback, and the appropriate use of educational technologies (Mokenela, 2020). A supportive policy environment, investment in digital infrastructure, and comprehensive instructor training have been identified as key enablers of sustainable OTL implementation (Ayanwale et al., 2022; Letsae et al., 2024). These factors are critical in enhancing the long-term viability of OTL in Lesotho's HEIs.

In addition, the availability of technological resources also plays a vital role. The use of accessible tools such as WhatsApp and email has been identified as a practical way to complement formal online learning, particularly in resource-constrained contexts (Ayanwale et al., 2022; Mokenela, 2020). These low-bandwidth platforms help make online learning more inclusive and adaptable. Blended learning approaches have also been acknowledged as promising for enhancing the sustainability of OTL in sub-Saharan Africa, especially in settings with infrastructural limitations (Makumane et al., 2023).

Mokenela (2020) highlights how blended learning promotes critical OTL success factors such as student engagement, motivation, and a sense of community. Hybrid models that combine digital tools with face-to-face interactions are seen as particularly effective in environments where connectivity and access remain challenges. As Omany and Ndiege (2024) argue, blending digital tools with traditional classroom interactions can overcome challenges of connectivity and accessibility, thereby ensuring sustainable OTL in ODeL implementation. Thus, hybrid learning models are seemingly key to the long-term success and sustainability of OTL in ODeL in resource-constrained regions.

Notwithstanding the enablers of sustainable OTL implementation outlined above, there are challenges that ostensibly threaten long-term sustenance of the use of digital spaces. These include limited digital literacy, technological, infrastructural, and financial barriers, inter alia. According to Makumane (2023), there is lack of digital literacy among both students and instructors and this hinders effective use of OTL platforms. For instance, in Lesotho, limited exposure to digital tools and inadequate ICT training have been identified as barriers to online learning adoption (Mokenela, 2020). Notably, digital literacy extends beyond device access as it involves equipping users with the competencies necessary to effectively participate in OTL (Chimbunde & Jakachira, 2024). Addressing these skill-based gaps is therefore critical to ensuring the sustainability of OTL in ODeL programmes in Lesotho. A major underlying issue is the digital divide, which extends beyond connectivity and device ownership. van Deursen and van Dijk (2019) conceptualise it across four dimensions:

motivation, access (inequitable availability of devices and internet), skills (variations in digital competencies), and usage (differences in the ability to derive educational benefits from technology use).

In Lesotho, all four dimensions are prevalent, with students and instructors frequently facing lack of motivation to use technological tools due to unaffordable data costs, inadequate access to digital devices, and limited digital proficiency, particularly in rural areas. This layered understanding makes it clear that access alone is insufficient. Achieving sustainable OTL requires integrated, context-sensitive strategies that simultaneously address infrastructure, skill development, and meaningful digital engagement.

This reality is echoed by several local studies that highlight persistent structural and pedagogical challenges within HEIs in Lesotho. Mokenela (2020) and Mashinini (2020) report that many university instructors lack adequate training and intrinsic motivation to effectively adopt digital teaching methods, often due to limited institutional support, scarce incentives, and a lack of clearly defined digital teaching policies. Makumane et al. (2023) and Makumane (2023) further emphasise that although some strides have been made in expanding ICT infrastructure within HEIs, disparities in access between urban-based institutions and satellite campuses particularly those serving rural populations continue to disadvantage many students and lecturers. Makafane & Chere-Masupha (2021) also observe that low digital literacy levels among students, compounded by high data costs and unreliable connectivity, hinder meaningful participation in online learning environments.

These findings collectively suggest that addressing the digital divide in HEIs requires more than infrastructure, it demands a holistic and context-sensitive approach that fosters digital skills development, sustained motivation, and institutional commitment to equitable digital transformation. Without such integrated efforts, sustainable OTL implementation in Lesotho's higher education sector may remain elusive. With regard to financial constraints, Maphosa (2021) identifies the high cost of data as a significant obstacle for students in Lesotho, making OTL unaffordable for many. This view was earlier noted by Mashinini (2020) and Henaku (2020), who point out that the high cost of internet data continues to limit sustained participation in OTL across the region. Mfaume (2019) also emphasises that these financial challenges extend to other countries, such as Tanzania, where teachers face difficulties affording internet services necessary for delivering online content.

In addition to financial barriers, Dube (2020) and Letsae et al. (2024) reveal that many students in Lesotho lack access to essential digital devices, further hindering their ability to engage with OTL platforms. Furthermore, Oketch-Obboth (2021) and Chimbunde and Jakachira (2024) underline the impact of infrastructural constraints, such as unreliable electricity and poor internet connectivity, particularly in rural areas, which exacerbate the accessibility challenges of online education in sub-Saharan Africa. These findings from various scholars underscore the need for targeted interventions to address these barriers and support the successful implementation of OTL in ODeL in Lesotho HEIs. The next section attempts to theorise sustainability of OTL in ODeL.

2.1 *Theorising sustainability of online teaching and learning in ODeL*

This article is undergirded by the Community of Practice (CoP) theory, which was developed by Lave and Wenger (1991). Lave and Wenger (1991) developed this theory in an attempt to address the social dynamics of learning. In other words, this theory purports that learning is a social process that is created overtime through legitimate peripheral participation (Lave and Wenger, 1991).

According to Busch-Jensen (2014), peripherality and participation denote location and identity in the social world, while legitimation alludes to characteristic ways in which individuals belong to communities within which they operate. In the words, learning is believed to take place through individuals' participation in multiple social practices with an idealised eventuality of attaining a specified outcome (Farnsworth, Kleanthous and Wenger-Trayner, 2016). Thus, CoP in the educational context is a social theory that supports negotiating competence over a given time through mutual engagement and through sustainability enablers that include accessibility to resources, infrastructure and pedagogical strategies to ensure long-term effectiveness and inclusivity. The key principles of this theory are: the domain (what gives a group its identity and distinguishes it from other groups; the community (a group of people for whom the domain is relevant, including the quality of the relationships among members); and the practice (the body of knowledge, methods, tools, inter alia, that members share and use together) (Smith, Hayes and Shea, 2017).

This theory was deemed appropriate for this article as it provides a compelling lens through which to examine social dynamics of learning in ODeL environments. In the context of this study, CoP suggests that learning is a process of engagement and participation in a community of practice, wherein students, instructors and administrators interact using a shared legitimate peripheral learning environment to attain a specified educational goal (Busch-Jensen, 2014). Put differently, this theory underscores the importance of accessibility, infrastructure, both physical but especially digital, and adaptive pedagogical strategies that foster collaboration, social interaction and shared experiences in the construction of knowledge, especially in online spaces.

This line of thought is substantiated by Smith, Hayes and Shea (2017), who assert that technologies, either asynchronous and/or synchronous, help facilitate learner engagement in generating communal knowledge and resources that form their social practice and thus ostensibly promote sustainability of OTL in ODeL. Therefore, applying CoP theory to the ODeL context in Lesotho, this article explores how students and instructors create a virtual community despite the challenges presented by seemingly limited resources through the domain, the community, and the practice established. Wenger (1998) argues that communities of practice are crucial in fostering social learning and engagement, especially in virtual settings. This article is thus premised on the contention that in the case of ODeL,

where physical interactions are existing though minimal, creating opportunities for online collaboration becomes essential to building a sustainable learning community of practice.

3. METHODOLOGY

3.1 *Research design*

A case study research design was adopted in this qualitative study which investigated participants' experiences to determine sustainability of OTL in ODeL. Case studies can facilitate the essential comprehensive understanding of the participants' experiences in exploring intricate social issues such as online teaching and learning (de Araujo, 2020). In this context, a case study was suitable in order to enhance deeper understanding of experiences of the participants in relation to the sustainability of OTL in ODeL, and to guide purposeful sampling of individuals who could provide rich, relevant, and diverse insights.

A sample is a subset of the population used to draw conclusions about the entire group and should be chosen in a manner that ensures it accurately represents the population, meaning the sample's characteristics should closely mirror those of the population (Gravetter and Forzano, 2019). A sample of participants was selected from a population comprising students enrolled in three Adult Education programmes at different levels: Diploma, Bachelor's Degree, and Masters (139), as well as instructors (40), Programme coordinators (3), Head of the Adult Education (1) and Information and Technology (IT) personnel (1). In order to select the required information-rich sample to provide relevant insights to the objectives of the article (McMillan & Schumacher, 2018), purposive sampling technique was used. The technique was suitable to this article in that it allowed a focused exploration of specific experiences rather than broad generalisations across populations (McMillan & Schumacher, 2018; Patton, 2018).

The criteria for purposive sampling were as follows: a student registered in the Diploma, Degree, or Masters in Adult Education programmes in 2023/2024 with a minimum online learning experience of two years; a part-time and full-time instructor as well as staff members, such as Programme coordinators, head of department, and IT specialist involved in these programmes were included. Participant accessibility and willingness to participate also informed the recruitment process. The participant categories, population and sample distribution are presented in Table 1 below.

Table 1. Population and Sample Distribution

Participant Category	population	sample
Students	139	12
Instructors	40	3
Programme Coordinators	3	2
Head of Department	1	1
IT Personnel	1	1

Source: Author's compilation based on fields participants (2026).

Table 1 shows that participants were selected based on their direct involvement and experience with OTL in the institution.

3.2. Data generation methods

Focus Group Discussions (FGDs) and semi-structured interviews were employed in generating data on the sustainability of OTL in an ODeL context. As Creswell and Creswell (2018) note, both FGDs and semi-structured interviews allow for a deep exploration of the phenomenon at hand, and systematic data generation that enhance the principles of trustworthiness, which, according to Lincoln and Guba (2017), are credibility (truth value), dependability (consistency), transferability (applicability) and conformability (neutrality). The researchers obtained permission to conduct the study from the Registrar of the institution before data generation commenced. Semi-structured interviews and FGDs were scheduled according to the participants' availability and convenience in order to maximise generation of authentic data and to ensure inclusivity and accessibility.

A total of three FGDs were conducted, each group consisted of 4 students from various academic levels: diploma, bachelors, and masters. These groups were formed to ensure a balanced and diverse representation of experiences across all levels of the study. Each FGD lasted between 40 and 60 minutes. FGDs, through the use of pre-prepared guiding questions, were selected for their capacity to foster interactive dialogue, allowing participants to clarify and build upon one another's perspectives. This method was deemed appropriate as it supports the development and sustainability of learning communities within innovative open education environments.

Semi-structured interviews were conducted with 3 instructors and 4 key administrative personnel involved in the implementation and support of online teaching and learning in the ODeL programmes. Each interview, lasting between 20 and 30 minutes, was guided by a semi-structured interview protocol specifically designed to align with the participants' professional roles and responsibilities. Ethical procedures were strictly observed. All participants were fully informed about the purpose of the article, the intended use of the data, guarantee of anonymity through the use of pseudonyms, and their right to voluntarily withdraw at any stage. For telephone interviews, verbal consent was obtained and recorded.

All interviews were audio-recorded using a smartphone, and supplementary field notes were taken to capture key insights and contextual observations. This integration of two rigorous data generation methods enhanced understanding of the experiences of the participants in relation to sustainable practices in ODeL. It also reinforced the role of communities of learning and practice in fostering resilient, inclusive educational systems that support long-term social and economic development.

4. FINDINGS

The findings from the perspectives of instructors, administrators, and students regarding their experiences with OTL in ODeL programmes are organized into themes that reflect key aspects of sustaining learning communities. This thematic approach aligns with Creswell and Cresswell's (2018) assertion that qualitative research relies on producing textual data, which is then analysed for emerging patterns and themes.

4.1 Theme 1: Accessibility of digital learning tools to students and instructors

The study found that students had access to digital tools necessary for engaging in online learning, although the quality and reliability of these tools varied. For instance, **FG2 -A**, stated as follows: *"I use my smart tab and a laptop for online learning."* **FG1 -D**, *"I use my smartphone to access course materials and communicate with my lecturers, but sometimes the screen size makes it difficult to read long documents."* Similarly, the instructors and staff members indicated access to multiple devices, including smartphones, laptops, tablets and desktops. The staff members contributed the following statements:

Erica: *"I have a smartphone and I also have access to my office desktop."*

Nikitta: *"I have a laptop and a tablet that I use for my online lessons."*

These findings suggest that participants had access to multiple digital tools that supported participation in OTL, through accessibility and usability challenges remained evident among some participants.

4.2 Theme 2: Competencies of students and instructors in online teaching and learning

The administrators indicated that the digital literacy level of some students was low. This was demonstrated by students who often needed help navigating platforms before they could participate in online activities. **Jenna** mentioned that, *"Some students are not familiar with the e-learning platform, so we have to spend extra time guiding them before they can fully participate in online classes."* **Elizabeth** also indicated that; *"Digital literacy is relatively low in*

Lesotho. Even if the platforms are user-friendly, some users, both students and instructors are not adequately skilled to use them." This indicates that while access to digital tools may be available, the ability to use them competently remains a significant barrier for students. The need for constant support suggests gaps in students' digital skills, which are critical for the success of online education. These findings are supported by Makumane (2023) and Ayanwale et al. (2022), who emphasize that effective participation in online learning environments requires more than access, it requires digital competence. Makumane (2023) highlights that in the context of Lesotho, limited exposure to digital tools and inadequate ICT training hinders students' ability to navigate online platforms, while Ayanwale et al. (2022) recommend the integration of structured digital skills training to bridge this gap. Furthermore, Omanyo and Ndiege (2024) argue that for sustainable OTL, institutions must not only focus on affordability and access, but also on equipping users with the skills necessary to engage meaningfully with digital platforms. Jenna and Elizabeth's observation confirm this, showing that without foundational digital competencies, access alone cannot ensure active participation or success in ODeL.

4.3 Theme 3: The effectiveness of OTL

The effectiveness of OTL was widely acknowledged by both students and instructors. From the students' perspective, online learning was seen as a convenient means of maintaining academic engagement, especially in remote settings. **FG1-D** shared: *"They are really helpful because they allow me to do all the given tasks... I am able to complete the assignment from home."* This finding aligns with Hodges et al. (2020), who highlighted that online learning provides flexible access to resources and learning materials, offering opportunities for students to engage with content independently, especially in situations where face-to-face education is not feasible. Additionally, some students appreciated the role of online learning in fostering academic independence and self-regulation. **FG2-A** noted: *"Online learning plays a significant role in my successful learning. It provides quick access to resources...and enables collaborative learning."* This view supports Dube's (2020) findings, which emphasise the positive impact of online learning on student autonomy and the development of self-regulated learning skills. By allowing students to access content at their own pace, online platforms facilitate a deeper engagement with material, enabling learners to manage their time and learning strategies effectively. Peer interaction also played a vital role in enhancing the learning experience. **FG1-A** shared: *"We created a WhatsApp group where we share knowledge amongst ourselves and discuss things that we don't understand with our facilitators."* This resonates with Dube (2020), who stressed the importance of peer collaboration in virtual learning environments. Collaboration fosters a sense of community, which is critical for student engagement and learning in online contexts.

Facilitators also affirmed the effectiveness of online teaching, particularly through the use of digital tools. For instance, **Erica** mentioned: *"I am able to prepare my lessons, share*

them, mark assignments there and not printing them." This perspective aligns with Bozkurt and Sharma (2020), who highlighted the benefits of online platforms in allowing educators to streamline their workflows, making lesson planning, resource sharing, and assessment more efficient. Similarly, **Stefan** praised the use of tools such as interactive whiteboards and breakout rooms for replicating in-person learning experiences: *"The online platforms I use have been instrumental in helping me conduct successful lessons... breakout rooms, interactive whiteboards, and live instruction help simulate in-person experiences."* This aligns with Güler et al. (2022), who emphasised the importance of creating an engaging online presence that mirrors the face-to-face classroom environment, promoting active student participation and collaboration.

However, challenges such as disappearing tools and navigation difficulties were reported by student participants. For example, **FG1-C** expressed: *"Helpful tools such as Turnitin and Thuto disappear over time... I used Turnitin once in the first semester, then I could no longer access it."* This concern reflects Bates (2019), who argued that technical barriers and the reliability of online platforms can impede the successful implementation of OTL, particularly in resource-constrained environments.

Administrators also provided a critical view, highlighting the limitations of online sessions in certain contexts. For example, **Jenna** stressed: *"At some point, the institution tried two out of five sessions online, but the online sessions were not effective, so, we went back to five face-to-face sessions."* This observation aligns with Li et al. (2023) who suggested that while online learning has potential, it is not always suitable for every type of content or learner. Hybrid models, such as blending online and face-to-face sessions, might be more effective in certain contexts.

4.4 Theme 4: Effective Communication

Effective communication emerged as a cornerstone of online teaching and learning. Both students and instructors cited tools such as WhatsApp and email as essential for exchanging information, submitting assignments, and receiving timely feedback. As **FG1-C** shared: *"WhatsApp makes it easy to share information and updates between us as students and a facilitator... We submit assignments and receive feedback through email."* This finding aligns with Güler et al. (2022), who emphasised the critical role of communication in sustaining engagement and collaboration in online learning. Effective communication tools ensure that students remain connected with instructors and peers, fostering a sense of community in the virtual classroom. Students further appreciated the privacy and immediacy that email provided for formal communication and feedback. **FG1-D** remarked: *"Feedback is sometimes confidential... the lecturers send each one of the students their feedback through email."* This echoes Carrillo and Flores (2020), who highlighted the importance of asynchronous communication methods, such as email, for offering individualised feedback in a private,

reflective manner. The ability to engage in private, formal exchanges enables students to address personal academic concerns without the pressure of a public forum.

Instructors also valued the ability to provide timely and personalised feedback through digital platforms. **Nikitta** noted: *"I can leave comments on assignments directly in the LMS... students receive feedback almost instantly. I can also show them errors in real-time during class."* This aligns with Chaka and Govender (2021), who emphasised that providing real-time feedback enhances student learning by allowing immediate clarification of misunderstandings and reinforcing correct concepts. **Tyler** also highlighted their flexible approach to assignment submissions: *"Sometimes students struggle to submit through email, so they ask to send it via WhatsApp."* This flexibility reflects Bozkurt & Sharma (2020), who recommended adaptive teaching practices that cater to the diverse needs of students. By accommodating students' preferences, Tyler ensures that learning remains accessible and inclusive.

Overall, the findings reinforce the importance of effective communication in creating a responsive, inclusive and sustainable OTL environment. Whether through formal email, LMSs, or informal messaging tools such as WhatsApp, communication facilitates engagement, support, and academic success. This mirrors the findings of Omanyo and Ndiege (2024), who underscore that effective communication is vital for the success of OTL, especially in resource-constrained contexts.

4.5 Theme 5: Sustaining Learner Engagement and Satisfaction through Communities of Practice in Online Education

A recurring theme in the findings was that while learners appreciated the flexibility afforded by online education, they also expressed a strong longing for in-person interaction. **FG 2- B** noted, *"I enjoy the flexibility of online learning, but I miss face-to-face interaction with my classmates and lecturers."* This sentiment reflects a broader challenge in online and distance education: sustaining engagement in the absence of physical presence. According to Ayanwale et al. (2022), social presence is a key determinant of learner satisfaction in online environments. When students feel socially and emotionally connected to their peers and instructors, their level of engagement tends to increase, thereby enhancing their overall learning experience.

Instructors, too, expressed concern over the lack of active student participation in online discussions. **Stefan** remarked, *"Some students don't engage much in discussions, which makes teaching online feel isolating at times."* This aligns with Mokenela's (2020) study, which identified limited learner-instructor and learner-learner interaction as detrimental to the perceived quality of online education. The feeling of isolation reported by instructors underscores the necessity of adopting pedagogical approaches that actively foster interaction and collaborative engagement. In response to these challenges, institutional administrators highlighted the importance of balancing technological tools with human-

centered interaction. For instance, **Jenna**, emphasized: *"We need to balance technology with human interaction so that students feel part of a learning community."* This observation resonates with Oketch-Oboth (2021).,

These findings point to the potential of Communities of Practice (CoP) as a strategic framework for enhancing learner engagement and satisfaction in online education. CoP promote knowledge sharing, mutual support, and a sense of belonging among participants, elements that are especially crucial in technology-mediated learning environments. When online courses are intentionally designed to nurture social presence, collaboration, and shared learning experiences, they are more likely to lead to sustained student satisfaction and engagement.

5. DISCUSSIONS

5.1 Accessibility of digital learning tools to students and instructors

The findings revealed that students and instructors had access to a range of digital learning tools that supported participation in OTL within the ODeL context. Access to smartphones, laptops, smart tabs, tablets, and office desktops demonstrates the growing integration of digital technologies in HEI in Lesotho. These findings suggest that digital learning tools contribute to improving access to educational resources and communication between students and instructors.

The findings align with Leta and Cloete (2019), who argue that ODeL has expanded access to higher education in Sub-Saharan Africa by reducing geographical and infrastructural barriers. Similarly, the findings support Omanyo and Ndiege (2024) assertion that digital technologies play an important role in enhancing accessibility and flexibility within online learning environments.

However, the findings also revealed challenges associated with usability and reliability of digital tools, particularly when using smartphones for accessing lengthy learning materials. This suggests that although digital devices support accessibility, unequal access to suitable devices and technological limitations may continue to affect effective participation in OTL. From the perspective of the CoP theory, access to digital learning tools is important in facilitating participation, interaction, and collaborative learning among students and instructors. Effective participation with online learning communities depends largely on reliable access to communication and learning technologies.

5.2 Digital literacy and competencies

The findings revealed that some students and instructors experienced difficulties navigating online platforms and participating effectively in online activities due to limited digital literacy skills. Although participants had access to digital tools, the ability to use these tools

completely remained a significant challenge affecting meaningful participation in OTL. This suggests that, access to technology alone is insufficient for sustaining effective online learning within ODeL contexts.

These findings align with Makumane (2023) on their observation that, limited exposure to digital technologies and inadequate ICT training hinder effective participation on online learning environment in Lesotho. Similarly, Ayanwale et al. (2022) argue that successful implementation of OTL depends not only on accessibility of digital tools, but also on user competency and confidence in using online learning platforms effectively.

The findings further imply that inadequate digital competencies may contribute to learner frustration, reduced participation, and dependence on continuous support from instructors and peers. In resource-constrained contexts, this may negatively affect the long-term sustainability of OTL programmes if structured digital literacy support is not provided.

From the perspective of the CoP, collaborative interaction and peer support observed among participants contributed positively to the development of digital competencies. Learning communities therefore, play an important role in helping students and instructors acquire practical technological skills necessary for meaningful participation on online learning environments.

5.3 Communication and Learner Engagement

The findings revealed that communication platforms and online interactions played an important role in supporting learner engagement within OTL environments. Participants indicated that communication through digital platforms enabled students and instructors to share information, receive academic support, and remain connected during online learning activities. This therefore, suggests that communication and interaction remain essential components of effective participation in ODeL programmes.

The findings further indicate that online communication platforms promoted collaboration and strengthened relationships between students and instructors despite physical distance. Participants valued opportunities for interaction and emphasised the importance of maintaining human interaction within online learning environments to promote a sense of belonging and active participation among learners.

These findings align with Omanyo and Ndiege (2024) argument that meaningful participation and interaction are important for sustaining online learning environments. Makumane (2023) also observed that collaborative engagement and continuous communication contribute positively to learner participation and support within digital learning contexts. The findings further imply that, limited interaction in online environments may contribute to feelings of isolation and reduced learner motivation. Sustainability in OTL therefore, depends not only on access to technology, but also on the ability of institutions and instructors to create supportive and interactive online learning communities.

From the perspective of CoP, participation, collaboration, and social interaction are central to meaningful learning. The findings therefore, support the view that communication and learner engagement strengthen participation within online learning communities and contribute positively to the sustainability of OTL in ODeL programmes.

5.4 Effectiveness of Online Teaching and Learning

The findings revealed mixed perceptions regarding the effectiveness of OTL among students and instructors. While some participants reviewed OTL as effective in improving flexibility, access to learning materials, and continuity of education, others indicated that challenges related to internet connectivity, limited interaction, and technological difficulties affected the quality of teaching and learning experiences. This suggests that the effectiveness of OTL depends largely on the availability of adequate technological and instructional support systems.

The findings further revealed that, OTL created opportunities for students and instructors to continue academic activities beyond traditional classroom settings. Participants appreciated the flexibility associated with online learning, particularly the ability to access learning materials and participate in academic activities from different locations. However, some participants expressed concerns regarding reduced face-to-face interaction and difficulties maintaining active learner participation in online environments.

These findings align with Leta and Cloete (2019) argument that, ODeL has expanded access to higher education by increasing flexibility and reducing geographical barriers to learning. Similarly, Omanyoo and Ndiege (2024) maintain that digital learning technologies can enhance accessibility and continuity of education when supported by effective institutional systems and learner support mechanisms. The findings further imply that, the effectiveness of OTL extends beyond technological availability and includes the quality of learner engagement, communication, and institutional support systems, students may experience challenges that reduce meaningful participation and satisfaction within online learning environments.

Now, from the perspective of the CoP, meaningful learning occurs through active participation, collaboration, and interaction among members of the learning community. The findings therefore, suggest that the effectiveness of OTL is strengthened when online learning environments promote engagement, participation, and collaborative learning experiences among students and instructors.

5.5 Challenges affecting the sustainability of Online Teaching and Learning

The findings revealed that, several challenges continued to affect the sustainability of OTL within ODeL programmes. Participants identified poor internet access to suitable digital devices, and inconsistent participation in online activities as major barriers affecting effective

implementation of OTL. These findings suggest that infrastructural and economic challenges remain significant obstacles to sustainable online learning in the institution.

The findings further indicated that some students experienced difficulties participating consistently in online learning activities due to financial constraints and unreliable network services. Instructors also expressed concerns regarding limited learner participation, delayed communication, and difficulties monitoring student engagement in online environments. This implies that, sustainability of OTL depends not only on technical availability, but also on continuous institutional, financial, and technical support for both students and instructors.

These findings align with Makumane (2023) observed that, inadequate ICT infrastructure and limited technological support continue to affect effective participation in online learning environments in Lesotho. Omanyo and Ndiege (2024), also argue that, sustainable implementation of OTL requires reliable digital infrastructure, affordability of internet services, and adequate institutional support systems.

These findings further suggest that, persistent technological and economic barriers may widen inequalities among learners, particularly for students from disadvantaged backgrounds or remote areas with limited digital access. Without adequate intervention, these challenges may negatively affect learner participation, engagement, and long-term sustainability of OTL programmes.

From the perspective of the CoP, effective participation and collaborative learning depend on active engagement and continuous interaction among members of the learning community. Challenges that limit access, communication, and participation may therefore, weaken collaborative learning processes and reduce the effectiveness and sustainability of OTL within ODeL programmes.

6. CONCLUSION

The aim of this article was to explore sustainability of OTL in ODeL in one HEI in Lesotho. The article sought to establish how sustainable the OTL tools were in fostering accessibility to resources, infrastructure and effective pedagogical strategies to ensure long-term effectiveness and inclusivity. The findings of the study demonstrate that participants had access to digital tools that allowed them to participate in OTL. Furthermore, communication platforms such as WhatsApp and email facilitated interaction, collaboration, and learner engagement within online learning environments.

However, the broader challenge lay in the multidimensional nature of the digital divide, encompassing disparities in access, digital skills, affordability, and meaningful use of digital technologies. Most participants demonstrated limited digital literacy, which compromised their ability to engage actively, sustain participation, and communicate effectively factors essential for achieving desired learning outcomes. These limitations, compounded by poor

infrastructure and weak support systems, further hindered the overall effectiveness of online learning.

The findings further suggest that, sustainability of OTL extends beyond technological access and includes meaningful interaction, learner engagement, institutional support, and collaborative participation. Guided by the Community of Practice theory, the study highlights the importance of creating supportive online learning communities that promote interaction, social presence, and shared learning experiences among students and instructors. The existing blended learning model, which combines face-to-face interaction with virtual spaces, seemed to bolster social presence, learner motivation, and the development of resilient and sustainable learning communities.

This article therefore, recommends context-sensitive strategies for strengthening sustainable OTL practices within resource-constrained environments. These include subsidising data costs, providing structured digital literacy training for both students and instructors, strengthening institutional support systems, and streamlining administrative processes to improve accessibility and participation in online learning.

This study contributes to understanding the sustainability of OTL within resource-constrained ODeL contexts. The findings provide detailed into the experiences of students and instructors regarding digital accessibility, learner engagement, communication, and digital literacy within online learning environments. However, because the study focused on one HEI, the findings may not be generalisable to all institutions in Lesotho. Future researchers may adopt comparative broader insights into the sustainability of OTL across different higher education contexts.

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