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EFFECTIVE TEACHING STRATEGIES AND APPROACHES IN A MULTIFACETED ONLINE PEDAGOGY LANDSCAPE IN AN ODEL INSTITUTION

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Abstract
This qualitative case study explores the evolving landscape of a comprehensive Open Distance e-Learning (ODeL) institution, highlighting the complexities of online teaching and learning. This study uses an interpretive research paradigm, seeking to comprehend the views of instructors who are teaching online. The study involved six lecturers and six e-tutors who were purposively selected based on their online experience. Bronfenbrenner's Ecological Systems Theory was selected as the theoretical model for this study as it presents an inclusive perspective on the various levels of impact that are likely going to shape the learning environment, which suits an online format. The results highlight that if technology is successfully integrated into online teaching with the bonus of a strong lecturer/e-tutor presence and weekly online lessons, student engagement and learning outcomes are significantly increased. In addition, lifelong learning and addressing the digital divide are essential to provide each student with equal education opportunities. The implications of the study are that ODeL institutions are required to constantly innovate and invest in both technological infrastructure and pedagogical training to try to meet the changing needs of students who now operate in a digital learning world.

Keywords: online pedagogy, digital transformation, technology integration, online platforms, learning modalities.

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BACKGROUND OF THE STUDY

The South African higher education system was not adequately prepared to teach using online platforms, and this translated into subpar teaching quality and student engagement (Czerniewicz 2020; Mashau & Nyawo 2021). McKenna and Galt (2021) suggest that the hyper-personal filter bubble caused by online learning may create a passive student experience and decrease motivation, as many instructors who are used to teaching in-person classes do not know how they can modify their instruction in an online setting. The COVID-19 pandemic has imposed a shift from conventional to online teaching which, in addition to fewer opportunities for interaction (Anderson & Rivera-Vargas, 2020; Bali, 2021), increased student isolation and exacerbated the division between students who had access to technology resources and those who did not, particularly among under-resourced students. But students have faced a host of other issues, as well as unreliable internet access, poor digital infrastructure to support the transition and much more. One of the strategies, lecture-based teaching and group discussion was found to be effective in offline mode, yet failing to keep learners engaged online (Jena, 2021). However, nothing from the conventional scope is responding to the real face of online learning when it comes to interactivity in a digital environment. Thus, the use of technology-based programs to improve empathy and provide equal access has been an essential pressure point on student engagement (Nwosu & Adu 2023).

This switch has brought to light the effectiveness of online learning's various types of teaching strategies and approaches. This paper suggests that Bronfenbrenner's Ecological Systems Theory (EST) and its focus on interrelated environmental systems offers a holistic model to describe online pedagogy. However, a challenge that remains unsolved, is the demand placed on online-teaching pedagogies to engage more of the students and thus encourage participation (Dhawan 2020). This comes from a teaching strategy that in addition to a lack of consideration for student experience (Dlamini & Ndzinisa, 2020), nonverbal communication signals issue (Sathik & Jonathan, 2020) and the online evaluation reflexive problem (Cutri et al., 2020). In an ODeL institution, the online pedagogy landscape is multi-faceted only in name this article looked at what works and where (Aluko 2009). Aluko also presents the power of ODeL strategies within higher education and explores differing pedagogy necessary when serving incredibly diverse student populations in this online context. Considering this, ODeL

universities are front runners in this regard with technology aiding in delivering hundreds of programs and courses to students worldwide. Changes in hardware and software, accompanied by advances in pedagogy intended to improve teaching and learning characterize the push toward online pedagogies (López, et. al., 2020).

The COVID-19 pandemic has further increased the use of online pedagogy in many universities (Dhawan, 2020; Crawford et al., 2020). Universities were forced to shift to online platforms when physical campuses collapsed, to continue education. This sudden shift in direction revealed the possibilities and pitfalls of online pedagogy (van Wyk, 2021). Online learning is also known by various names such as web-based learning, e-learning, computer-assisted instruction, or Internet-based learning. It turned the focus on the need for effective methods of online teaching so that students can continue to study effectively and remain engaged. The pandemic also exposed the digital divide, dissimilarities in technology and internet availability that affect how well students do in school (Pawar, 2020). Against the backdrop, there is a critical need to explore and identify effective pedagogical approaches that can address these challenges and enhance the online pedagogy experience in the multifaceted ODEL institutions.

The study aims to find out what useful and effective online teaching strategies and approaches in ODeL pedagogy with the objective found below.

Identify and analyze the influential facets in a multifaceted online pedagogy landscape providing online education in an ODeL institution.

Investigate appropriate strategies to infuse technology in online teaching practices needs to be conducted especially concerning the improvement of student participation and learning outcomes in an ODeL institution.

LITERATURE REVIEW

Technological Pedagogical Content Knowledge (TPCK)

Technological Pedagogical Content Knowledge (TPCK) is a framework that integrates technology into teaching to enhance the educational experience. TPCK emphasizes the interplay between content, pedagogy, and technology, asserting that effective online education requires a balanced integration of these elements (Mishra & Koehler, 2006). Lecturers and e-tutors must develop skills in using technology to deliver content and facilitate learning (Koehler & Mishra, 2009). According to Khoza (2022), TPCK is essential for

creating distinct learning environments and planning effective learning opportunities through digital technology.

Components of TPCK

TPCK is a combination of three essential elements - Technological Knowledge (TK), Pedagogical Knowledge (PK) and Content Knowledge (CK). The notion is that these do too but should be considered in the design of a learning activity to align the use of technology with pedagogical foundations and content delivered. TPCK underscores the importance of combining these three resources and tools, so that technology does not operate as a standalone rather it is strategically applied to enrich pedagogic objectives and content delivery, thereby improving student academic achievements (Schmidt et al., 2020; Chai, 2020).

Instructor Presence

Instructor presence in online pedagogy is crucial in fostering student engagement and academic success. Research by Kennette and Redd (2015) and Dalton (2018) indicates that strong instructor presence, characterized by timely feedback and active engagement, can mitigate the challenges of online learning, especially for first-year students who may lack confidence and experience. Wang and Liu (2020) found an influential role of students' perceived teaching, social, and cognitive presence in shaping online learning community efficacy whereas Li & Lefevre (2020) suggested the most significant impact to be from teaching presence. Cognitive presence is building critical thinking via tasks and discussions, as social presence in the community sense. I argue that design (teaching presence, which directs students) which supports students with frequent communication, timely feedback, and an enabling atmosphere builds trust, and engagement, and improves learning results.

Strategies for Enhancing Instructor Presence

Agbong and Agbong-Coates (2024) note that instructor presence is critical to improving elements of support, communication as well as technological capability. Instructors keep in touch with students to some extent through regular face-to-face synchronous sessions, and they communicate through various online (asynchronous) mediums like emails, announcements on the course homepage, and forums. I maintain that chronological timely feedback on tasks performs an indispensable role in overseeing the direction. Adding some interactive elements, including webinars, virtual office hours, and group projects will help students feel more involved with the class. In

the end, this customization of learning that adjusts to better meet all the differences between our students and all the needs they represent is as foundational to learning support as it is nothing nerdy.

Collaborative and Independent Learning

Students can have a more robust learning process which is an outcome of share-based or student-centric learning. As Herrera-Payo (2021) reported, the grouping can increase social presence and reduce feelings of isolation in an online environment. Independent learning, however, encourages students to take ownership of their education and cultivates skills in self-discipline and critical thinking. Ideally, a good online pedagogy should incorporate both, collaborative activities, and independent study to cater to different learning preferences.

Strategies for Facilitating Collaborative Learning

Interactive group activities with cooperative goals in an ODeL environment are crucial to developing collaboration (Anderson & Dron, 2020). This in turn maximizes engagement, teamwork, and comprehension of the material (Wang et al., 2021). In addition, peer feedback promotes learning since students learn to provide and receive effective feedback giving rise to a community of practice (Bao, 2020). It is with these strategies that ODeL institutions, including ours, can establish a more engaging and nurturing online learning environment as they confront the distinctive needs of distance education.

I assert that online education lends itself well to independent learning for a variety of reasons. It encourages self-learning, critical thinking and problem-solving. The students who take part in independent learning plan their time, set goals, and take their learning into sound responsibility (Agbong & Agbong-Coates, 2024; Wieser & Seeler, 2018).

Strategies for Supporting Independent Learning

Independent learning strategies assist students with this language development, increasing their confidence in their ability and motivation to be more autonomous and responsible towards their academic progression of subjects (Shi, Yang, MacLeod, Zhang & Yang, 2020). Lecturers and e-tutors must identify appropriate methods and should teach the students how to use those strategies for experiential learning. The discussion indicates that the freedom to pick academic materials and strategies, then followed by the

accessibility of adaptive teachers have both additional significance in helping pupils be more independent. One must provide directions and include instructions on how to do independent assignments and activities. Even better, resources such as e-books, articles and online tutorials offer students different types of learning materials to cater for their studies. Assessment and reflection activities promote student self-reflection, so that they may assess where they are and how to move forward. Finally, nurturing the independence of learning inherently involves guiding students to set appropriate and reasonable learning goals and tracking them through action plans.

Addressing the Digital Divide

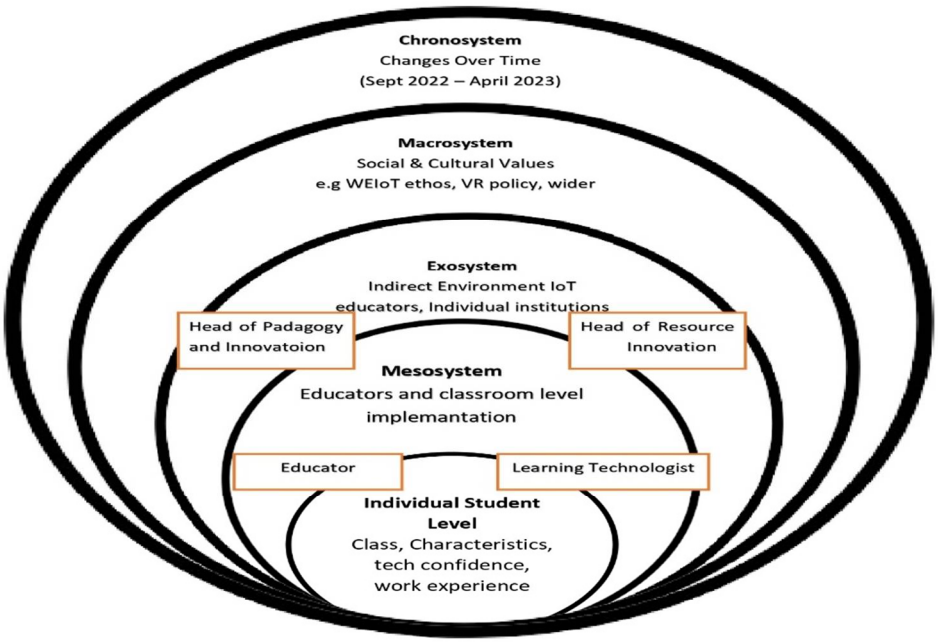
Chen and Wellman (2003) frame the digital divide as disparities regarding Internet use across levels only, while Fuchs and Horak (2008) speak to differential access, usage competencies, and benefits of ICTs. I contend that the digital divide in online education can be defined as a lack of proper resources, devices, internet facilities and digital literacy. The quantitative research by Afzal, Khan, Daud, Ahmad, and Butt (2023) held with more than 400 participants revealed disparities associated with household internet access, gender gaps and technological access inequities according to socioeconomic status. However, bridging the digital divide is crucial to ensure that education remains accessible to all. Supporting students and instructors to formulate tactics which reduce the gap can help bridge this gap (Afzal et al., 2023; Hargittai, 2002), and institutions should invest in technological infrastructure too.

Factors Contributing to the Digital Divide

The digital divide has several components that affect how individuals have access to both technology and the internet. Due to economic disparities, students struggle to pay for both proper internet and devices (van Dijk, 2020) hence missing out significantly on online learning. The inability to create the necessary infrastructure in rural and remote areas, as well as geographical barriers (Park 2017) limit access. Further widening the separation are inequities in education, whereby under-resourced schools are unable to provide students with digital tools and support (Warschauer, 2004). Solving for these will be key to levelling the playing field when it comes to digital access.

I hold that there are a few valuable steps that institutions can take to address the digital divide. Institutions deploying devices for students that support features such as remote maintenance and automation

can do this relatively easily thanks to these tools continuing to operate when needed. Strategic alliances with local governments and service providers can play a significant role in improving internet connectivity by adding their dimensions. Moreover, conducting digital literacy training programs is highly essential in improving the digital skills of students as well as instructors. Improving equitable access to educational resources and support for all students is essential in helping all thrive in a digital age.



Adapted Bronfenbrenner's (1992) ecological systems model

THEORETICAL FRAMEWORK

Figure 1: Bronfenbrenner's Ecological Systems Theory

Bronfenbrenner's Ecological Systems Theory in the Context of Online Education

Bronfenbrenner's EST provides an insightful framework for comprehending the complex nature of online education. According to the theory, human development is influenced by different layers of environmental systems, including the microsystem, mesosystem, exosystem, macrosystem, and chronosystem (Bronfenbrenner, 1979). These systems can be understood as the individual student, the immediate learning environment, the larger educational context, societal impacts, and temporal changes in the setting of online pedagogy. Many elements that affect online teaching and learning can be recognised and addressed with the aid of this holistic viewpoint.

Bronfenbrenner`s (2005) EST places a strong foundation for determining the multi-level factors contributing to an individual's learning in online education. The core is the microsystem, which includes the student's direct interactions with lecturers, tutors, fellow students, and family members. The quality of these interactions is an important factor in student engagement and success in distance learning (Bronfenbrenner, 1986). The mesosystem is related to the relationships between two or more settings in which an individual participates, for example, home and school environments are common in university students. The better the communication and cooperation among these systems, the more successful is their overall educational experience. Exosystems are external influences on the student, like university policies or parental work environments that will affect a student’s ability to participate in and engage with content (Bronfenbrenner, 1979) At the macrosystem level, this includes wider societal and cultural values concerning online education resulting in the investment of technology and resources (Bronfenbrenner, 2005). These are followed by the influence of time, captured in the chronosystem, and include examples such as the quick evolution in educational technology use and ways in which online learning is organized. (Bronfenbrenner, 2005) Integrating these systems will help instructors, universities, and policymakers to develop a responsive online learning landscape.

Classroom Application

EST explains how multiple ecological forces affect student development and growth (Bronfenbrenner, 1979). Examples of microsystems consist of relationships with significant others such as students, teachers, and family members (Chen, 2003), whilst mesosystems include peer and classroom environmental interactions (Xu, 2015). Thus, the microsystem, mesosystem and exosystem refer to the "proximal process", while the macrosystem refers to a more distal process, for example, such as living in a subculture due to its more indirect nature. The chronosystem pertains to socio-historical eras and their sustained effects on student development (Fuligni, 2013). Investigation in human subjects in both micro- and meso-environments is essential to comprehend these effects (Ghuman, 2004; Udvari-Solner & Francis, 2016).

Lecturers and e-tutors need to understand the social and economic factors contributing towards the lack of access. Indeed, student academic communities and faculty-student interactions are both potentially one of many important antecedents that can facilitate the development of students within online learning environments (Evans, 2012) and it also underscores the importance of online education programming for meaningful learning experiences. This study provides an example of the complexity and dynamism of academic relationships by intentionally incorporating a two-sided approach to EST that includes support for students as well as instructors (Hayes & O'Toole, 2017).

These authors also proposed a neo-ecological theory (Navarro & Tudge, 2022), which incorporates virtual microsystems to capture online contexts. These micro-systems are different from the physical ones in that they need to deal with properties such as availability and asynchronicity. In addition to all of this, digital technology enables student involvement in society in new ways and the process of cultural norms is partially created using for example multimodal practices that also involve centrally proximal processes that take place within online environments which are vital for students' development. When instructors apply this framework, students thrive academically and as individuals (Garcia & Johnson, 2019). This suggests that EST positively impacts the academic and personal development of our students. EST not only serves as a student empowerment that motivates students and provides them with a sense of identity, especially for these challenging university populations (Jones & Brown, 2018; Roberts & Lee, 2021).

RESEARCH APPROACH, PARADIGM AND DESIGN

This article aimed to gain a better understanding of the lived experiences and worldviews of the 12 participants about the phenomenon under investigation. Within the context of an ODeL institution, this study used an interpretive paradigm to understand instructors' knowledge when they practice integrating teaching strategies and approaches into a more complex online pedagogy landscape. The philosophical paradigm that guides qualitative research methods is interpretivism (Creswell, 2015). I employed a qualitative case study design, defined as the process of collecting, analyzing, and interpreting non-numerical data (Yin 2018), within a full-fledged ODeL institution. The analysis aided in the comprehension of best teaching and practices strategies; required for a nuanced online pedagogy landscape in an ODeL institution, by scrutinising the social and recent trends.

Population and Sampling

The participants sampling for this study consisted of six lecturers and six e-tutors, who were purposefully selected in turn on account of their practical experience and engagement with online teaching. Purposive sampling also referred to as judgmental or selective enables the researcher to choose participants strategically, who are likely to be a source of in-depth and insightful information (Crossman, 2020; Etikan, Musa & Alkassim, 2016). Thus, in this specific query to judge how likely the sample of my participants was to meet these criteria through their experience with online pedagogy. Selection was independent of age, sex, or qualifications and depended on the practical experience with online teaching and efforts inclusivity. In addition, data were collected from a learning management system mathematics module, providing additional information on student engagement and online performance (Creswell & Poth, 2018).

In addition, participants were selected based on three criteria to ensure a comprehensive study. Academics with at least two years of online teaching experience were chosen for their valuable insights (Anderson & Dron, 2020). Participants came from diverse academic disciplines to provide a broad understanding of online pedagogy (Bao, 2020). Additionally, those involved in pedagogical innovation, particularly in developing or implementing new teaching strategies, were included to capture innovative approaches (Martin et al., 2019).

Data Collection Methods

I chose to use semi-structured interviews over a structured interview format for the current study, as this interview style permitted flexibility (Bowen, Rose & Pilkington, 2017). The use of semi-structured interviews was intended to encourage an in-depth examination of participants' experiences and views on online teaching. Data was also sourced from mathematics students on the learning management system for engagement and performance trends on those who access online education.

ETHICAL CONSIDERATIONS

The human enterprise is threatened, and the right ethical principles must be observed (Cortazzi & Jin, 2021). It was explained that the research was purely for academic purpose and their consent was sought before data collection. Including a moral charter, the researcher also made it clear that their identities would remain undisclosed and never be traced throughout the research documents. This study addressed the concerns of confidentiality and anonymity. To ensure the use of ethical standards resources, all participants used pseudonyms instead of their real names. Also, this research does not damage the mental or psychological aspect of them because of the questions in interviews to safeguard their dignity and rights.

DATA PRESENTATIONS AND DISCUSSIONS

The effectiveness of teaching strategies in a multifaceted online pedagogy landscape within an Open Distance e-learning (ODeL) institution is influenced by several key factors. These factors, as identified through the analysis of the provided themes include technological integration, instructor presence, content engagement, the digital divide, and the need for continuous professional development.

Discussions on Question 1

What constitutes the key features affecting the efficacy of teaching strategies in a multivariate online pedagogy environment on ODeL?

To maximize the depth of the online learning experience, integration with technology will be essential. Participants 2 and 5: '…Various institutions use their preferred learning management system to integrate teaching and learning…'. Participants emphasized that institutions should adopt suitable technologies intentionally in line with pedagogical goals and content). Participants 1, 3, 4, 9 and 10:…Using multimedia tools mixed with interactive platforms to do

the data analytics usually has important implications for technology applications to be effective…. …technology improves access and scalability, but it is challenging to foster a strong sense of community…'. Multimedia services, interactive programming, and data analytics may make online education accessible, engaging, and scalable, say participants. Interactive platforms with multimedia and data analytics can make technology integration more learnable and effective (Anderson & Dron, 2020). These technologies allow teachers to work with students of varying learning abilities and construct a personalized curriculum (Bao, 2020). Data analytics also lets instructors track student performance and participation in real time, allowing them to identify weak connections and intervene (Khoza, 2022; Martin et al., 2019). With increased availability and scalability, it can reach more students and make teaching cheaper (Garcia & Johnson, 2019). One of the biggest obstacles in online learning is building a strong classroom community (Roberts & Lee, 2021). This is more effective than Zoom video conferencing, but it might feel remote and make it hard for kids to connect with peers and teachers. Smith et al. (2020) emphasize that developing relationships and community requires a variety of tactics, including feedback for individual or team proposals and regular face-to-face contacts.

Participants 3, 4, 10 and 12 highlighted the "… importance of a persistent but more passive lecturer presence or e-tutor presence….. formed through regular correspondence …. feedback and weekly lessons ….. maintain student engagement ….. sustain a supportive learning environment". Online student engagement and success depend on having a lecturer/e-tutor (Dalton, 2018; Kennette & Redd, 2015). Communication plans with weekly classes and check-ins, timely grading and feedback, and guest-facilitated live sessions increase instructor presence (Wang & Liu, 2020). I believe lecturer and e-tutor presence can include regular communication, daily posts, weekly lessons, interactive multimedia content, and virtual office hours to create a helpful learning atmosphere. Participants stressed the importance of building trust and rapport with students to provide a conducive learning environment (Agbong & Agbong-Coates, 2024).

Participants 7, 8 and 11 mentioned that "…. don't normally do videos though work together to use audio recordings which are valuable…." Online pedagogies can improve participation and social presence with weekly audio-recorded collaborative learning (Wang et al., 2021; Xu, 2015). Not all employ recorded classes or pre-produced downloaded videos.

Participants 2,3, 5,6, 10 and 12 mentioned that "…. simply focused on … how to use Moodle so the training …. and no one's training on in mathematics when you're going to tutor mathematics on LMS, this is how you supposed to do it …. otherwise, Tippy Tube have given positive results…''. Tippy Tube is UNISA College of Education's online academic video student support service. Participants reported favourable results from group discussions, projects, and peer evaluation, however several were apprehensive about Tippy Tube training. Collaborative learning builds community and improves course comprehension (Agbong & Agbong-Coates, 2024; Wieser & Seeler, 2018).

Participants 2, 6, 7, 10, 11, and 12 mentioned that "… use interactive platforms where students are grouped and can work on projects, discussions…..this not only creates a feeling of togetherness that is hard to replicate in an online setting but fosters engagement …. use data analytics to follow up on participation and completed work….". Another important component in online course effectiveness is content engagement. The study stresses interesting and accessible content (Shi et al., 2020). E-tutors must make textbooks and study materials dynamic and engaging rather than just rewording them. To engage pupils, use films, quizzes, and real-time interactions. Online TPCK requires picking technology that improve material delivery and pedagogy. For instance, leveraging multimedia to generate interesting instructional materials, interactive platforms for student collaboration, and data analytics to track student achievement.

Participants 2, 4, 8, and 11 said that "…barely live in areas that have electricity every day, …. expect them to check Moodle every day ….. independent learning is a challenge having taught in the single week when they have five or six modules…". The statement illustrates a major issue for underprivileged ODeL students. Electricity is a key barrier to Moodle use. Without backup power, students can't attend class every day or complete homework on time. Lack of teaching support exacerbates the challenge of autonomous learning in this setting. This is on top of the weekly restricted contact sessions, making self-directed learning between five or six modules difficult. Online learning is not an exception, thus most students in remote areas need greater institutional support or alternate access.

Participants 1, 2, 3, 5, 6, 8, 9 and 12 mentioned "…. Some of them don't have a smartphone, so in as much as they receive data from the university, ……they do not have the devices to use for their online learning and engagement or for them to be able to participate…. even network is a challenge". The digital divide

makes it difficult to ensure ODeL teaching strategy effectiveness. The study found that students' equipment and internet access vary, which can hamper online learning. Institutions must invest in technology infrastructure, supply equipment, and help underserved students to address this issue (Afzal, et al. 2023; Hargittai, 2002). Even well-designed instructional strategies may fail without addressing these discrepancies.

Participants 2, 4, 6, 7, 8 and 11 said '…. continuous professional development opportunities…..we want to deliver more engaging and interactive course content…..deliver better lessons in this ever-changing digital learning landscape….'. To maintain their methods, lecturers need CPD (Dalton, 2018; Kennette & Redd, 2015). The study demonstrates that e-tutors and lecturers need to learn how to integrate technology into their education, not how to utilize it. It required learning to generate compelling and interactive content, knowing online pedagogy, and staying current on teaching-learning technologies. Lecturers/e-tutors need online pedagogy CPD to succeed in digital teaching. Quality CPD stays on topic, is active learning-based, and allows lecturers/e-tutors to collaborate, improving online pedagogy.

Participants 3, 7, 8, 9, 10 and 12 indicated that "… online CPD is an enhancement option …. provides space for lecturers and e-tutors …. we learn at their own pace but its dependant on the level of digital literacy of staff …. face additional barriers …. self-directed learning and TPCK….". Participants say online CPD formats allow lecturers/e-tutors to grow professionally at their own pace, but success depends on participants' digital literacy and self-regulated learning skills. Effective TPCK practices require lecturers and e-tutors to receive CPD and support to keep up with technological and pedagogical advances. Online CPD is flexible, self-paced learning for lecturers and e-tutors who need to improve their digital-based teaching. These programs can hinder instructors with inadequate digital abilities. Effective TPCK combinations require digital and content abilities (Schmidt et al., 2020; Chai, 2020).

Discussions on Question 2

How can technology successfully be used with online teaching approaches to drive increased student interaction and student success within the context of a single-mode ODeL institution?

Open ODeL universities should use technology into online pedagogy to boost student engagement and performance. Integration changes everything by scaffolding and guiding technology to match pedagogy,

supporting instructor presence to boost engagement, creating innovative digital content, and addressing digital equity.

Participants 1, 3, 4, 6, and 9 said that "…if technology is going to be truly useful in online teaching….. it must be attuned to the pedagogical goals….. based on experience…. use multimedia tools….. to help break down complex topics and maintain student engagement. …data analytics allow us to observe how students are progressing and what areas they need further help on which always makes for better learning…..". Technology should match course content and pedagogical aims to be effective in online education. The research stresses the necessity of choosing technologies that improve content delivery and pedagogy. This involves creating compelling educational materials with multimedia tools, using interactive platforms for student cooperation, and using data analytics to track student success. It is essential to ensure that the selected technology aligns with educational objectives to optimize student engagement and learning outcomes (van Wyk, 2021).

Participants 1, 4, 5, 9, and 11 said that "…. engaging content leads to increased student participation and better learning results…. by including videos, quizzes with the real-time interactions ……. able to effectively engage most of the students better….. they feel more supported by modern technology through interactive weekly lessons…". Effective online teaching requires engaging content. Content that informs and engages students is crucial, according to literature and interviews (Shi et al., 2020). This requires movies, quizzes, and real-time interactions in addition to text. Accessible content allows students to fluidly connect with materials across devices, improving its effectiveness (Herrera-Payo, 2021). E-tutors should also learn how to produce and present engaging and motivating content utilizing learning management systems. The weekly lessons improve module student involvement and learning. By contextualizing the subject, the courses have improved students' knowledge and relevancy, reducing email questions, suggesting that the classes are providing the assistance and clarity they require. Student involvement with the curriculum and submissions have increased, indicating that weekly courses are motivating students. This shows that structured, frequent instructional engagement is increasing student learning and course outcomes.

Participants 2, 3, 4, 5, 6, 7, and 11 said that "…affordability and access to finances for some students is an issue….. to have computers ….. devices that are available at the regional centres are around 50 computers…stable internet in part of our country is a

problem…." ODeL institutions struggle to integrate technology due to the digital divide. According to Pawar (2020), unequal access to gadgets, dependable internet connectivity, and digital literacy abilities can impair students' online learning. In the interviews, students mentioned practical issues such not having smartphones or dependable internet connections for online education. Institutions must invest in technical infrastructure, give relevant gadgets to regional centre students, and support digital literacy to overcome these difficulties (Afzal, et al. 2023; Hargittai, 2002). Ensuring that all students may benefit from online education technology requires closing this gap.

Participants 3, 4, 5, 6, 8, 9 and 10 said that "…. interactive tutoring in real-time is, for sure, the game changer of online learning…. students seem to enjoy real-time chats and virtual office hours most pronounced effect is on the reduction of loneliness, which runs high in ODeL….". Students must connect with teachers in real time to stay engaged in online learning (Archambault et al., 2022). The interviews suggest that students enjoy live connection, such as virtual office hours or real-time discussion groups on Tippy Tube or social media. Encourage real-time engagement to establish relationships and communities in online learning settings. Using live talks, video conferencing, and instant messaging, lectuterers/e-tutors can reduce transactional distance and boost student happiness and participation (Borup et al., 2020). These encounters generate a social presence, which is essential for student motivation and success. Effective online pedagogy requires real-time communication as online education expands (Palloff & Pratt, 2011). These interactions clarify content and build community among students, which is crucial in an ODeL situation where students may feel alone.

FINDINGS

This study identified several innovative effective strategies critical in the ODeL context which all relate to online pedagogy. Technology integration with multimedia tools and data analytics supports pedagogical goals such as content delivery. Interactive content (videos, quizzes, real-time interactions) is essential to engage the students in an online pedagogy. Lecturers and e-tutors need ongoing professional development to continuously improve their technological skill set to continue creating engaging and interactive learning environments. This includes ensuring all students have devices and access to the internet to curb the digital divide. Finally, instructor presence is essential to keep the students supported and focused on

all of this. This can be done by communicating regularly and providing feedback. These strategies correspond to the research question by considering both technological and instructional aspects, which in turn lead to student success as generally found within online pedagogy.

CONCLUSION

This article focused on effective teaching strategies and approaches to enhance online teaching at ODeL institutions. It is also imperative that the technology be in alignment with pedagogical goals and be multimedia and collaborative. Investing in infrastructure, however, is how we solve the digital divide and give all learners equal access to devices and the internet. Encouraging and enhancing continuous professional development from the lecturers provides material that is enjoyable for students, leading to better student retention. In addition, regular correspondence and feedback as real-time interactions build student support and create a sense of instructor presence. These strategies not only make the standard an online education better but build a strong community which is one of the most important purposes of ODEL environments, and supportive learning experiences that prepare students for the complexities of the modern world.

Some of the implications for practice are technology should be used following pedagogical goals in ODL institutions, good learning resources must be made available to the students and lecturers need a regular dose of professional development. Interactive communication is important as it helps create a presence for the instructor. The foundation of successful online education is a robust, student-centred learning community.

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REFERENCES

Afzal, A., Khan, S., Daud, S., Ahmad, Z., & Butt, A. (2023). Addressing the Digital Divide: Access and Use of Technology in Education. Journal of Social Sciences Review, 3(2), 883–895. https://doi.org/10.54183/jssr.v3i2.326

Agbong, J.B.G. & Agbong-Coates, I.J.G. (2024). Instructors' presence and communication strategies on student engagement in

asynchronous online classes. International Journal of Educational Management and Development Studies, 5 (2), 206-232. https://doi.org/10.53378/353071

Aluko, F. R. (2009). The impact of an ODeL approach to learning on the students' attitudes in South Africa. The International Review of Research in Open and Distributed Learning, 10(4).

Anderson, T., & Dron, J. (2020). Three generations of distance education pedagogy. International Review of Research in Open and Distributed Learning, 12(3), 80-97.

Anderson, T., & Rivera-Vargas, P. (2020). Online learning and teaching in higher education during COVID-19: International perspectives. Education and Information Technologies, 26(1), 21-36.

Archambault, L., Leary, H., & Rice, K. (2022). Pillars of online pedagogy: A framework for teaching in online learning environments. Educational Psychologist, 57(3), 178–191. https://doi.org/10.1080/00461520.2022.2051513

Bao, W. (2020). COVID-19 and online teaching in higher education: A case study of Peking University. Human Behavior and Emerging Technologies, 2(2), 113-115.

Bali, S. (2021). The impact of COVID-19 on digital inequality in higher education. Journal of Digital and Social Media Learning, 18(2), 35-45.

Bowen, P., Rose, R., & Pilkington, A. (2017). Mixed methods theory and practice. Sequential, explanatory approach. International Journal of Quantitative and Qualitative Research Methods, 5(2), 10-27. http://www.eajournals.org/wp-content/uploads/Mixed-Methods-Theory-and-Practice.-Sequential-Explanatory-Approach.pdf

Bronfenbrenner, U. (1979). The Ecology of Human Development: Experiments by Nature and Design. Harvard University Press.

Bronfenbrenner, U. (2005). Making Human Beings Human: Bioecological Perspectives on Human Development. Sage Publications.

Bronfenbrenner, U., & Ceci, S. J. (1994). Nature-nuture reconceptualized in developmental perspective: A bioecological model. Psychological Review, 101(4), 568–586. https://doi.org/10.1037/0033-295X.101.4.568

Chai, C. S. (2020). The role of technological pedagogical content knowledge (TPACK) in fostering online teaching effectiveness: A systematic review. Educational Technology Research and Development, 68(1), 123-145.

Chen, W. (2003). The role of micro-level relationships in student development. Journal of Educational Psychology, 95(2), 304-315.

Cortazzi, M., & Jin, L. (2021). Metaphorical Conceptualizations of Language: Networks of Meanings and Meta-functions. International Journal of Education and Literacy Studies, 9(1), 2-14. https://doi.org/10.7575/aiac.ijels.v.9n.1p.2

Crawford, J., Butler-Henderson, K., Rudolph, J., Malkawi, B., Glowatz, M., Burton, R., Magni, P., & Lam, S. (2020). COVID-19: 20 countries' higher education intra-period digital pedagogy responses. Journal of Applied Learning & Teaching, 3(1), 1-20.

Creswell, J.W. (2015). A concise introduction to mixed methods research. Sage Publications.

Crossman, A. (2020). Understanding purposive sampling. Retrieved from https://www.thoughtco.com/purposive-sampling-3026727

Creswell, J. W., & Poth, C. N. (2018). Qualitative Inquiry and Research Design: Choosing Among Five Approaches (4th ed.). Sage Publications.

Czerniewicz, L. (2020). Teaching and learning in the era of COVID-19: A digital education perspective. Higher Education in the Time of COVID-19, 13(3), 1-9.

Dalton, M. H. (2018). Online programs in higher education: Strategies for developing quality courses. FOCUS on Colleges, Universities & Schools, 12(1), 1-8. http://www.nationalforum.com/Electronic%20Journal%20Volumes/Dalton%20Margaret%20H%20Online%20Programs%20in%20Higher%20Education%20FOCUS%20V12%20N1%202018.pdf

Darling-Hammond, L., Hyler, M. E., & Gardner, M. (2017). Effective teacher professional development. Learning PolicyInstitute. https://learningpolicyinstitute.org/product/teacher-prof-dev

Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. Journal of Educational Technology Systems, 49(1), 5-22.

Crossman, A. (2020). Purposive sampling: An overview. ThoughtCo. Retrieved from https://www.thoughtco.com/purposive-sampling-3026727

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. American Journal of Theoretical and Applied Statistics, 5(1), 1-4. https://doi.org/10.11648/j.ajtas.20160501.11

Fuchs, C. and Horak, E. (2008). Africa and the digital divide. Telematics and Informatics, 25(2), 99–116. Retrieved

from http://www.sciencedirect.com/science/article/pii/S0736585306000359

Fuligni, A. J. (2013). Social change and adolescent development: The influence of socio-historical periods on learning experiences. Developmental Psychology, 49(5), 944-957.

Garcia, M., & Johnson, T. (2019). The impact of applying ecological systems theory in online education on student success. Journal of Online Education Research, 14(2), 102-118.

Ghuman, P. A. S. (2004). Researching human subjects in the ecological environment. British Journal of Educational Psychology, 74(1), 5-20.

Hargittai, E. (2002). Second-level digital divide: Differences in people's online skills. First Monday, 7(4). https://doi.org/10.5210/fm.v7i4.942

Hayes, N., O'Toole, L., & Halpenny, A. M. (2017). Introducing Bronfenbrenner: A guide for practitioners and students in early years education. Taylor & Francis.

Herrera-Payo, M. A. (2021). Collaborative learning for virtual higher education. Learning, Culture and Social Interaction, 28. https://doi.org/10.1016/j.lcsi.2020.100437

Jena, P. (2021). Impact of pandemic COVID-19 on education in India. International Journal of Current Research, 12(7), 12582-12586.

Jones, L., & Brown, P. (2018). The ecological systems approach: Empowering, connecting, and motivating students. Educational Theory and Practice, 29(3), 45-58.

Kennette, L. N., & Redd, B. R. (2015). Instructor presence helps bridge the gap between online and on-campus learning. College Quarterly, 18(4). https://eric.ed.gov/?id=EJ1095942#:~:text=http%3A//www.collegequarterly.ca

Khoza, N. G. (2022). A Review of Literature on the Effective Pedagogy Strategies for Online Teaching and Learning in Higher Education Institutions: Lessons from the COVID-19 Pandemic. European Journal of Education, 5(1), 43-53. https://doi.org/10.26417/738tqq65

Koehler, M. J., & Mishra, P. (2009). What is technological pedagogical content knowledge (TPACK)? Contemporary Issues in Technology and Teacher Education, 9(1), 60-70.

Li, N., & Lefevre, D. (2020). Holographic teaching presence: Participant experiences of interactive synchronous seminars

delivered via holographic videoconferencing. Research in Learning Technology, 28, 1–13. https://doi.org/10.25304/rlt.v28.2265

López Núñez, J. A., López Belmonte, J., Moreno Guerrero, A. J., & Pozo Sánchez, S. (2020). Effectiveness of Innovate Educational Practices with Flipped Learning and Remote Sensing in Earth and Environmental Sciences—An Exploratory Case Study. Remote Sensing, 12(5), 897. https://doi.org/10.3390/rs12050897

Martin, F., Ritzhaupt, A., Kumar, S., & Budhrani, K. (2019). Award-winning faculty online teaching practices: Roles and competencies. Online Learning Journal, 23(1), 184-205. doi:10.24059/olj. v23i1.1329

Mashau, T.S., & Nyawo, J.C. (2021). Online learning challenges: The case of South African rural schools. African Educational Research Journal, 9(1), 45-52.

McKenna, L., & Galt, S. (2021). Adapting teaching and learning in higher education to the new normal. Higher Education Pedagogy, 23(4), 120-135.

Misra, P. K. (2018). MOOCs for teacher professional development: Reflections and suggested actions. Open Praxis, 10(1),67–77. https://doi.org/10.5944/openpraxis.10.1.780. https://www.learntechlib.org/p/183570/

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for integrating technology in teacher knowledge. Teachers College Record, 108(6), 1017-1054. https://doi.org/10.1111/j.1467-9620.2006.00684.x

Navarro, J. L., & Tudge, J. R. (2022). Technologizing Bronfenbrenner: neo-ecological theory. Current Psychology, 1-17. https://doi.org/10.1017/S0954579424000579

Nwosu, I.E., & Adu, E.O. (2023). Innovative pedagogies for online learning in post-COVID-19 higher education: The Nigerian experience. International Journal of Digital Education, 7(3), 55-72.

Park, S. (2017). Digital inequalities in rural areas: Examining the contributions of technological infrastructure and education. Rural Studies Journal, 52, 10-19.

Pawar, M. (2020). The Global Impact of and Responses to the COVID-19 Pandemic. The International Journal of Community and Social Development, 2(2), 111-120. https://doi.org/10.1177/2516602620938542

Roberts, S., & Lee, K. (2021). Supporting at-risk students through ecological systems theory: Fostering social, personal, and academic growth. Journal of Special Education and Inclusion, 35(1), 76-90.

Schmidt, D. A., Baran, E., Thompson, A. D., Mishra, P., Koehler, M. J., & Shin, T. S. (2020). Technological Pedagogical Content Knowledge (TPACK): The development and validation of an assessment instrument for preservice teachers. Journal of Research on Technology in Education, 42(2), 123-149.

Shi, Y., Yang, H., MacLeod, J., Zhang, J., & Yang, H. H. (2020). College Students' Cognitive Learning Outcomes in Technology-Enabled Active Learning Environments: A Meta-Analysis of the Empirical Literature. Journal of Educational Computing Research, 58(4), 791-817. https://doi.org/10.1177/0735633119881477

Smith, A., Johnson, P., & Williams, R. (2020). Ecological systems theory in the classroom: Enhancing academic development. Journal of Educational Research, 25(4), 220-235.

Steele, J., Holbeck, R., & Mandernach, J. (2019). Defining effective online pedagogy. Journal of Instructional Research, 8(2), 5-8. https://eric.ed.gov/?id=EJ1242649#:~:text=http%3A//www.instructionalresearch.com

Udvari-Solner, A., & Francis, G. L. (2016). Considering human factors in the analysis of external environmental systems. The Journal of Special Education, 50(4), 213-221.

Van Dijk, J. A. G. M. (2020). The Digital Divide. Polity Press.

Van Wyk, M. M. (2021). Academic support under COVID-19 lockdown: what students think of online support e-tools in an ODeL course. Interactive Technology and Smart Education, 18(2), 137-157. https://doi.org/10.1108/ITSE-08-2020-0121

Wang, Y., & Liu, Q. (2020). Effects of online teaching presence on students' interactions and collaborative knowledge construction. Journal of Computer Assisted Learning, 36(3), 370–382. https://doi.org/10.1111/jcal.12408

Warschauer, M. (2004). Technology and Social Inclusion: Rethinking the Digital Divide. MIT Press

Wieser, D. and Seeler, J.-M. (2018), "Online, Not Distance Education: The Merits of Collaborative Learning in Online Education", Altmann, A., Ebersberger, B., Mössenlechner, C. and Wieser, D. (Ed.) The Disruptive Power of Online Education, Emerald Publishing Limited, Leeds, pp. 125-146. https://doi.org/10.1108/978-1-78754-325-620181008

Xu, L. (2015). Interactions within classroom environments and their effect on student development. Educational Research and Reviews, 10(19), 2672-2681.