International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Assessing the Affordances of Blended Learning Technologies for Nursing Education in Skills Labs: A Case Study of a Public Nursing School in Uganda

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Abstract
This qualitative study explores the affordances of blended learning technologies, including Zoom, Moodle Platform, television and WhatsApp videos, in enhancing nursing education within skills labs in public nursing schools in Uganda. Utilizing interviews with both nursing educators and students, this research investigates the perceived effectiveness and benefits of integrating these technologies into skills lab sessions. Findings suggest that blended learning technologies offer valuable opportunities for enhancing teaching and learning experiences, improving accessibility to educational resources, and facilitating skill mastery among nursing students in the skills lab. However, challenges related to internet connectivity, technological literacy, and resource availability highlight the need for strategic implementation and ongoing support to maximize the potential of blended learning in nursing education.

Keywords: Blended Learning, Technological Affordances, Nursing Education, Uganda

Introduction

Nursing education plays a crucial role in preparing competent and skilled healthcare professionals to meet the complex needs of diverse patient populations. In recent years, advancements in technology have revolutionized educational approaches, with blended learning emerging as a promising pedagogical model in healthcare education (Islam et al., 2022). Blended learning as innovative approach combining traditional classroom instruction with online components has garnered attention for its potential to enhance learning experiences in healthcare education (Sahni, 2019; Singh et al.,2021). Blended learning as mode of delivery which embraces physical as well as online interaction between the facilitator and learners, encompasses a variety of digital tools and platforms, including Zoom, Moodle, YouTube, television videos and WhatsApp, each offering unique affordances for facilitating learning in nursing education (Serrano et al., 2019; Bizami et al., 2023; Islam et al., 2022). Digital tools and platforms became a common phenomenon during the outbreak of COVID-19 and the subsequent lockdowns that followed after. Among these digital platforms,

zoom was the most prevalent and has become a dominant mode of online delivery within institutions of higher learning. Zoom, a video conferencing platform, enables real-time interactions between educators and students, fostering engagement and collaboration (de Oliveira Dias et al., 2020; Mpungose, 2023). Zoom has subsequently been integrated into various learning management systems of institutions such as Moodle. Moodle, an open-source learning management system, provides a virtual space for content delivery, discussions, and assessments, facilitating asynchronous learning opportunities (Athaya, 2021; Alrikabi, 2022). Additionally, YouTube and television videos offer multimedia resources to supplement theoretical concepts and practical skills training (Toleuzhan et al., 2023). In addition to Zoom, Moodle, YouTube, and television videos, WhatsApp also emerges as a potential tool for facilitating communication and collaboration within the realm of nursing education (Udenze & Oshionebo,2023). WhatsApp, a widely used messaging application, offers instant communication capabilities, enabling educators to disseminate timely information, share resources, and engage with students outside of traditional classroom settings (Al-Thubaity et al., 2021). Its accessibility, ease of use, and popularity among students make it a valuable supplement to blended learning initiatives, particularly in regions where internet connectivity may be limited (Namulondo et al., 2023; Aduba & Mayowa-Adebara, 2022). Despite the potential benefits of blended learning technologies, their integration into nursing education is not without challenges. Technical issues, digital literacy gaps, and access barriers may impede effective implementation (Hodges et al., 2020). Moreover, concerns regarding the quality of online learning experiences and the preservation of hands-on clinical skills training persist (Tolentino et al., 2021).

In the context of public nursing schools in Uganda, where resources are limited, understanding the implications of blended learning technologies is particularly pertinent. The skills labs, pivotal in fostering hands-on competencies among nursing students, face notable challenges due to constrained resources and traditional instructional methods. These challenges manifest as gaps in the affordances provided by current educational approaches, hindering students' skill mastery and overall learning outcomes. The traditional skills lab setup struggles to allocate sufficient time for instructor-led demonstrations, resulting in incomplete skill acquisition and a lack of confidence among students in applying these skills in real-world scenarios (Mugimu et al., 2018). Additionally, the rigid structure of traditional methods limits curriculum coverage, leaving gaps in vital areas such as vital observations like blood pressure measurement (Culha, 2019). Resource scarcity exacerbates these challenges, impeding access to essential equipment and hindering hands-on practice, thus inhibiting the development of nursing skills (Faublon, 2022). Furthermore, the dearth of individualized supervision, stemming from large class sizes and limited instructor availability, poses difficulties in providing personalized feedback and guidance, leaving students feeling ill-prepared and isolated during clinical placements (Ssewajje, 2023).

To address these gaps in affordances, blended learning emerges as a promising solution. By combining online modules and simulations, blended learning provides flexible learning opportunities, enabling students to access instructional materials anytime, anywhere (Bower, 2019). This approach not only extends learning beyond the confines of the traditional skills lab but also enriches the educational experience by offering interactive platforms that reinforce fundamental nursing concepts (Namulondo, 2020; Donkin et al., 2019). Moreover, virtual simulation environments offer safe and realistic practice scenarios, allowing students to refine their skills and bolster their confidence in clinical settings (Jeffries et al., 2015). While blended learning

has shown promise in enhancing clinical skills and learning efficiency in various contexts (Gong et al., 2021; Sentongo et al., 2022), its application within Ugandan nursing education remains underexplored. Thus, this study aims to assess the affordances of blended learning technologies within the skills labs of public nursing schools in Uganda. By examining the perspectives of both Nurse educators and student nurses, the research seeks to identify the benefits, challenges, and implications of integrating these technologies into nursing education, ultimately bridging the gaps in affordances and enhancing the competence and preparedness of Ugandan nursing students for clinical practice.

Literature Review

Blended learning has emerged as a promising pedagogical approach in nursing education, offering a multifaceted strategy to address the diverse needs of students and enhance learning outcomes. This approach integrates traditional face-to-face instruction with online learning activities, leveraging various technologies to create a dynamic and interactive learning environment. Studies in the field have highlighted the potential of blended learning to foster student engagement, increase flexibility, and improve accessibility to learning resources (Sahn, 2019; Jowsey et al., 2020; Leid et al., 2020). Technological affordances in blended learning refer to the capabilities and opportunities that digital tools and platforms offer to enhance the educational experience, particularly in environments where both online and face-to-face instruction are integrated (Altohami,2020; Van Nguyen et al, 2023). Technological affordances play a pivotal role in enhancing the effectiveness and flexibility of blended learning environments, which integrate online and face-to-face instruction (Rasheed et al, 2020; Al-Maawali, 2020). Central to this approach are Learning Management Systems (LMS), such as Moodle, Canvas, or Blackboard, which provide a centralized hub for course materials, assignments, and communication among students (Bizami et al., 2023; Islam et al., 2022). Additionally, video conferencing tools like Zoom or Microsoft Teams enable synchronous online sessions, facilitating real-time interaction among students and instructors, regardless of geographical constraints (Athaya, 2021; Alrikabi, 2022). Interactive content creation tools, such as Adobe Captivate or H5P, empower educators to design engaging multimedia materials like simulations and interactive videos, enriching the learning experience (Serrano et al., 2019; Bizami et al.,2023). Mobile learning apps like Khan Academy or Duolingo offer learners flexibility and convenience by providing access to educational content on smartphones or tablets, catering to diverse learning styles and preferences (Al-Thubaity et al., 2021, Namulondo et al., 2023). Furthermore, social media platforms like Twitter, Facebook, or LinkedIn serve as informal learning spaces, fostering collaborative learning, peer support, and community building among learners (Abdesslem, & Picault, 2023; Udenze & Oshionebo,2023). Collectively, these technological affordances enable educators to create dynamic and interactive learning experiences that blend the advantages of both face-to-face and online instruction.

A considerable body of literature has explored the benefits of integrating different technologies into nursing curricula. Video-based instruction, for example, has been shown to enhance students' understanding of complex procedures and facilitate self-directed learning (Sáiz-Manzanares et al., 2020). Online platforms, such as learning management systems like Moodle, provide opportunities for interactive learning, collaborative activities, and access to educational resources beyond traditional classroom hours (Janes et al.,

2023). Virtual simulations offer a safe and controlled environment for students to practice clinical skills and decision-making, bridging the gap between theory and practice (Jeffries et al., 2015).

Despite the potential benefits, the effective implementation of blended learning in resource-constrained settings poses significant challenges. The digital divide, characterized by unequal access to technology and internet connectivity, exacerbates disparities in educational opportunities (Hodges et al., 2020). Technological infrastructure limitations, including inadequate hardware and software resources, further impede the integration of blended learning approaches (Kumar et al,2021). Moreover, faculty readiness and training in utilizing technology for educational purposes are crucial factors influencing the successful adoption of blended learning methodologies (Sáiz-Manzanares et al.2020). In the context of nursing education in Uganda's public schools, where resources are often limited, understanding and addressing these challenges are essential. While previous research has explored the benefits and challenges of blended learning in various contexts, there is a notable gap in understanding its affordances within the specific setting of skills labs in Ugandan nursing schools.

Methodology

This qualitative study phenomenological research design to explore the affordances of blended learning technologies in nursing education within the context of public nursing schools in Uganda. Semi-structured interviews were conducted with both nursing educators and student nurses to gather rich insights into their experiences and perceptions. To ensure a comprehensive understanding, a purposive sampling approach was adopted, targeting participants who could provide diverse perspectives and valuable insights. Specifically, 10 nurse educator and 10 student nurses were carefully selected to participate in the study, ensuring representation from key stakeholders involved in nursing education.

Prior to the interviews, nurse educators received training on the effective utilization of Zoom, the Moodle Platform, and educational videos uploaded on YouTube, as well as video recordings placed within the skills lab environment. These technologies were strategically chosen to facilitate the demonstration of fundamental nursing practices within the skills lab at Mulago school of nursing and midwifery. Additionally, student nurses underwent training sessions to familiarize themselves with the use of these technologies, ensuring their active participation in the study.

Subsequently, semi-structured interviews were conducted with both nurse educators and student nurses to delve into their experiences with blended learning technologies. The interviews were designed to explore the perceived affordances, benefits, challenges, and implications of integrating these technologies into nursing education. Data analysis followed a systematic approach, involving thematic coding of interview transcripts to identify recurring themes and patterns related to the affordances of blended learning technologies in nursing education. Through this rigorous analytical process, the study aimed to uncover valuable insights that could inform the future implementation and optimization of blended learning approaches in nursing curricula.

Findings

The findings from interviews with nurse educators and student nurses revealed several key themes regarding the affordances of blended learning technologies in skills labs. Both nurse educators and student nurses expressed appreciation for the flexibility and convenience offered by online platforms like Moodle and

YouTube, which allowed access to educational resources anytime, anywhere. Zoom sessions facilitated interactive discussions and real-time feedback, enhancing student engagement and collaboration. WhatsApp groups were very helpful for discussing course materials and clarifying doubts with peers and teachers. Television videos proved useful for visual demonstrations of nursing procedures, complementing hands-on practice in skills labs. However, challenges such as unreliable internet connectivity and limited access to technology were cited as barriers to effective implementation.

Zoom

Facilitating Live Demonstrations and Discussions

Zoom emerged as a pivotal tool for facilitating real-time communication and engagement between nurse educators and student nurses. Through live video sessions, nurse educators could demonstrate nursing procedures, fostering active participation and immediate clarification of doubts.

Quote from a tutor: "With Zoom, I could demonstrate blood pressure taking procedures live, allowing students to observe each step in real-time. It made the learning experience more interactive and engaging."

Quote from a Student nurse: "Attending Zoom sessions allowed me to witness nursing procedures firsthand, which enhanced my understanding. It felt like being in a real classroom."

Overcoming Geographical Barriers

One of the key strengths of Zoom was its ability to transcend geographical barriers, enabling remote learning opportunities for students located in different areas within the school. This feature proved invaluable during periods of lockdown and restricted movement.

Quote from a tutor: "Zoom sessions allowed us to maintain continuity in education, even when students could not physically attend classes. It ensured that learning was not disrupted despite the challenges."

Quote from a Student nurse: "Being able to attend Zoom sessions from home was a lifesaver, especially during the lockdown. It kept me connected to my studies and classmates."

Flexibility in Scheduling

Zoom's flexibility in scheduling virtual sessions provided students with opportunities to participate in learning activities at their convenience. This flexibility accommodated diverse learning needs and schedules, contributing to a more inclusive learning environment.

Quote from a tutor: "With Zoom, we could schedule sessions at different times to accommodate student nurses with varying schedules. It allowed us to be more flexible and responsive to their needs."

Quote from a Student nurse: "Having Zoom sessions scheduled at different times made it easier for me to balance my studies with other commitments. I appreciated the flexibility it offered."

Weaknesses of Zoom

Despite its numerous strengths, Zoom was not without its challenges. Technical issues, such as poor internet connectivity, occasionally disrupted sessions, impacting the quality of learning experiences.

Quote from a tutor: "Technical glitches sometimes interrupted our Zoom sessions, causing frustration and disrupting the flow of learning. It was a reminder of the limitations of relying solely on technology."

Quote from a Student nurse: "There were times when I could not join Zoom sessions due to internet problems, which affected my ability to participate fully. It was frustrating, especially when I missed important discussions."

Moodle

Centralized Access to Course Materials

The Moodle Platform emerged as a valuable tool for providing centralized access to course materials, assignments, and resources. Through this platform, educators could organize and disseminate educational content efficiently, enhancing accessibility and organization for students.

Quote from a tutor: "Moodle allowed me to upload lecture notes, presentations, and additional resources in one centralized location. It made it easier for student nurses to access course materials and stay organized."

Quote from a Student nurse: "Having all the course materials available on Moodle was convenient. I could access lecture notes, assignments, and readings from anywhere, at any time."

Support for Asynchronous Learning

One of Moodle's strengths was its support for asynchronous learning, enabling students to pace their studies according to their schedules. This flexibility empowered student nurses to engage with course materials at their own pace, accommodating diverse learning needs and preferences.

Quote from a tutor: "Moodle's asynchronous nature allowed students to review course materials and complete assignments at their own pace. It provided flexibility for students with different learning styles and schedules."

Quote from a Student nurse: "I appreciated being able to access course materials on Moodle at any time. It allowed me to study at my own pace and review concepts as needed, which was helpful."

Facilitating Interactive Discussions and Collaborative Activities

Moodle facilitated interactive discussions and collaborative activities through its forums and messaging features. These tools promoted student engagement, critical thinking, and knowledge sharing, fostering a sense of community among learners.

Quote from a tutor: "Moodle's discussion forums enabled students to engage in meaningful discussions, share insights, and collaborate on projects. It created a sense of community among learners, even in a virtual environment."

Quote from a Student nurse: "Participating in online discussions on Moodle allowed me to interact with my peers, exchange ideas, and learn from different perspectives. It enhanced my understanding of course concepts in the skills lab."

Weaknesses of Moodle

Despite its strengths, Moodle also had limitations. Technical proficiency was a barrier for some student nurses, particularly those who were less familiar with navigating online learning platforms.

Quote from a tutor: "Some student nurses struggled with navigating Moodle and accessing course materials. Providing additional support and training was essential to ensure all student nurses could fully utilize the platform."

Quote from a Student nurse: "I found Moodle a bit challenging to navigate at first, especially setting up my profile and finding course materials. It took some time to get used to it."

Television Videos

Visual Demonstrations of Nursing Procedures

TV videos recorded with nurse educators making demonstrations provided students with visual representation

of nursing procedures conducted within the skills lab. These videos served as valuable supplements to traditional instruction, offering students a clear and detailed view of each step of the procedure.

Quote from a tutor: "Recording demonstrations in the skills lab allowed us to capture every detail of nursing procedures. It provided students with visual cues and step-by-step instructions, enhancing their understanding."

Quote from a Student nurse: "Watching TV videos of nursing procedures was incredibly helpful. It allowed me to see exactly how each step was performed, which made it easier to replicate during practice."

Accessibility and Flexibility

TV videos offered students the flexibility to access demonstrations at any time, catering to individual learning preferences and schedules. By providing on-demand access to instructional content, students could review demonstrations as needed, reinforcing their learning outside of scheduled class times.

Quote from a Clinical Instructor: "Placing recorded demonstrations on TV allowed students to access them at their convenience. Whether they wanted to review a procedure late at night or early in the morning, the videos were available whenever they needed them."

Quote from a Student nurse: "Being able to access TV videos of nursing demonstrations any time in the skills lab was convenient. It allowed me to review procedures at my own pace and practice whenever I had free time."

Complementing Hands-on Practice

While TV videos provided visual demonstrations of nursing procedures, they were most effective when paired with hands-on practice in the skills lab. By combining visual learning with hands-on experience, student nurses could reinforce their understanding of nursing concepts and develop proficiency in performing procedures.

Quote from a Tutor: "TV videos served as a valuable supplement to hands-on practice in the skills lab. By watching demonstrations beforehand, students were better prepared to apply their knowledge during practical sessions."

Quote from a Student nurse: "Watching TV videos of nursing procedures before practicing in the skills lab helped me understand what to expect. It gave me confidence and made the hands-on experience more meaningful."

Weaknesses of Moodle

Despite their benefits, TV videos also had limitations. The quality of the recordings and the clarity of demonstrations could vary, impacting the effectiveness of the instructional content.

Quote from a Tutor: "Ensuring the quality of TV videos was crucial, but we sometimes faced challenges with lighting, audio, or camera angles. Maintaining consistency in the recording process was essential to produce clear and informative videos."

Quote from a Student: "While TV videos were helpful, some recordings were unclear or difficult to follow. It could be frustrating when important details were not visible or explained properly."

Sub-theme 1: Accessibility and Convenience

WhatsApp served as a convenient platform for sharing instructional videos with student nurses, allowing them to access the content directly on their mobile devices. This accessibility enabled student nurses to engage with the videos at their convenience, both inside and outside the skills lab.

Quote from a Tutor: "Sharing videos via WhatsApp made it incredibly convenient for student nurses to access instructional content. They could watch the videos on their phones whenever they had free time, whether they were in the skills lab or in the hostel."

Quote from a Student: "Having videos shared on WhatsApp was great. I could watch them on my phone whenever I had a few minutes to spare, even if I was not in the skills lab. It made learning more flexible."

Self-Paced Practice

WhatsApp videos allowed students to practice nursing procedures at their own pace in the skills lab, without the need for direct supervision from instructors. This self-paced approach empowered student nurses to review demonstrations repeatedly until they felt confident in their abilities.

Quote from a Tutor: "Sharing videos on WhatsApp gave student nurses the freedom to practice procedures independently. They could watch the demonstrations as many times as they needed, refining their skills at their own pace."

Quote from a Student nurse: "Being able to watch videos on WhatsApp made practicing in the skills lab less intimidating. I could watch the demonstrations multiple times until I felt comfortable performing the procedures on my own."

Reinforcing Learning with Visual Guidance

The visual nature of WhatsApp videos provided student nurses with clear and detailed guidance on nursing procedures, enhancing their understanding and retention of key concepts. By visually demonstrating each step of the procedure, the videos served as valuable supplements to traditional instruction.

Quote from a Tutor: "Videos shared on WhatsApp allowed us to provide visual guidance to students, which is essential for learning complex nursing procedures. The videos helped reinforce what student nurses learned in class and provided additional context."

Quote from a Student nurse: "Watching videos on WhatsApp helped me understand nursing procedures better. Seeing each step demonstrated visually made it easier to remember the sequence of actions when practicing in the skills lab."

Ability to Playback and Pause

WhatsApp videos offered student nurses the valuable ability to pause, rewind, and replay demonstrations, providing them with a dynamic learning experience that catered to their individual learning preferences and pace. This feature empowered students to engage with the content at their own speed, allowing them to delve deeper into complex nursing procedures and concepts.

Quote from a Clinical Instructor: "WhatsApp's playback and pause feature was a game-changer for our student nurses. They could watch a demonstration, pause to digest each step, and rewind if they missed something. It allowed them to take control of their learning process."

Quote from a Student nurse: "Being able to pause and rewind WhatsApp videos was incredibly helpful. Sometimes, I needed to see a particular step multiple times to fully understand it. This feature allowed me to learn at my own pace and grasp concepts more effectively."

Weaknesses of **WhatsApp as a Learning Platform**

Despite its benefits, using WhatsApp to share videos also had limitations. The quality of the videos could vary, impacting their effectiveness as instructional resources.

Quality of WhatsApp Videos

Quote from a Tutor: "While WhatsApp was convenient for sharing videos, we sometimes encountered issues with video quality. Poor lighting or shaky camera work could make it difficult for students to follow along effectively."

Quote from a Student nurse: "Some videos shared on WhatsApp were blurry or unclear, which made it challenging to see the details of the procedures. It could be frustrating when important information was difficult to discern."

Limited Data Plans

For students with limited data plans, streaming or downloading WhatsApp videos could consume a significant portion of their data allocation. This restriction placed constraints on their ability to access instructional content regularly, particularly if they needed to conserve data for other essential purposes.

Quote from a Tutor: "We noticed that some student nurses hesitated to access WhatsApp videos because of concerns about data usage. They were mindful of their limited data plans and prioritized other necessities over accessing instructional content on their phones."

Quote from a Student nurse: "I wanted to watch the WhatsApp videos, but I had to be cautious about my data usage. Streaming videos consumed a lot of data, and I could not afford to use up my data allowance just for educational purposes."

Outdated Smartphones with Low-Quality Screens

Students using outdated smartphones with low-quality screens faced challenges in viewing WhatsApp videos clearly. Poor screen resolution or small screen sizes compromised the clarity and detail of the demonstrations, diminishing the effectiveness of the instructional content.

Quote from a Clinical Instructor: "Some student nurses struggled to view WhatsApp videos clearly because of their outdated smartphones. Low-resolution screens made it difficult for them to discern the details of the demonstrations, impacting their ability to learn effectively."

Quote from a Student nurse: "My smartphone is quite old, and the screen quality is not great. When I tried to watch WhatsApp videos, the image was blurry, and I could not see the details clearly. It was frustrating because I wanted to learn, but the video quality was poor."

Discussion

The findings suggest that blended learning technologies hold great promise for enhancing nursing education

in skills labs, particularly in resource-constrained settings like Uganda. The flexibility and accessibility afforded by online platforms offer opportunities for personalized learning and self-paced study, catering to diverse learning styles and preferences. However, addressing challenges related to technological infrastructure, internet connectivity, and faculty readiness is essential to ensure equitable access and maximize the potential benefits of blended learning in nursing education.

Zoom emerged as a pivotal tool in nursing education, facilitating real-time communication and engagement between nurse educators and student nurses. Through live video sessions, nurse educators could demonstrate nursing procedures, fostering active participation and immediate clarification of doubts (Dixson, 2010). Both nurse educators and student nurses expressed appreciation for Zoom's ability to transcend geographical barriers, enabling remote learning opportunities during periods of lockdown and restricted movement (de Oliveira Dias et al., 2020; Mpungose, 2023). The flexibility in scheduling virtual sessions provided by Zoom accommodated diverse student schedules, contributing to a more inclusive learning environment (Bizami et al., 2023; Islam et al., 2022). However, technical issues such as poor internet connectivity occasionally disrupted sessions, impacting the quality of learning experiences and highlighting the limitations of relying solely on technology (Namulondo et al., 2023).

The Moodle Platform provided centralized access to course materials, assignments, and resources, enhancing accessibility and organization for students (Athaya, 2021; Alrikabi, 2022). Its support for asynchronous learning allowed student nurses to pace their studies according to their schedules, catering to diverse learning needs and preferences (Toleuzhan et al., 2023). Moodle also facilitated interactive discussions and collaborative activities, fostering student engagement and community building within the virtual learning environment (Serrano et al., 2019; Bizami et al.,2023). However, technical proficiency was identified as a barrier for some student nurses, and navigation challenges hindered effective utilization of the platform, highlighting the importance of providing additional support and training (Aduba & Mayowa-Adebara, 2022).

Television videos recorded with tutors making demonstrations provided student nurses with clear and detailed visual representations of nursing procedures, complementing hands-on practice in the skills lab (Khasawneh, 2023). The flexibility to access demonstrations at any time offered by TV videos catered to individual learning preferences and schedules, enhancing accessibility and flexibility in learning (Nguyen, 2023). Additionally, TV videos served as valuable supplements to hands-on practice, reinforcing student nurses' understanding and confidence in performing nursing procedures (Khoiriyah et al., 2022). Despite their benefits, challenges such as varying video quality and maintenance of consistent recording standards were noted, emphasizing the importance of ensuring the clarity and effectiveness of instructional content (Abdesslem, & Picault, 2023).

WhatsApp emerged as a convenient platform for sharing instructional videos with student nurses offering accessibility and flexibility in accessing educational content (Al-Thubaity et al., 2021). Its ability to facilitate self-paced practice empowered student nurses to review demonstrations repeatedly until they felt confident in their abilities, enhancing understanding and retention of nursing procedures (Ozkan & Koseler, 2009). The playback and pause feature of WhatsApp videos allowed student nurses to engage with the content at their own speed, promoting deeper learning and comprehension (Udenze & Oshionebo,2023). However, challenges such as varying video quality, limited data plans, and outdated smartphones with low-quality screens were identified as barriers to effective utilization of WhatsApp as a learning platform, highlighting the need for addressing technological limitations and ensuring equitable access to educational resources (Namulondo et

al., 2023).These findings highlight the significance of blended learning technologies in nursing education, offering opportunities for enhanced engagement, accessibility, and flexibility. However, addressing challenges such as technical issues, resource limitations, and equitable access to technology is crucial for optimizing the effectiveness of these technologies in skills labs within nursing education contexts.

Conclusions and Recommendations

In conclusion, this study highlights the potential of blended learning technologies to enhance nursing education within skills labs in public nursing schools in Uganda. It's evident that these technologies offer significant benefits in terms of accessibility, flexibility, and engagement. Platforms like Zoom, Moodle, television videos, and WhatsApp provide valuable tools for educators to deliver instruction and for student nurses to access educational resources, collaborate with peers, and enhance their learning experience. However, several challenges such as technical issues, varying video quality, and limited access to technology persist and need to be addressed to fully leverage the potential of these technologies in nursing education. From a policy perspective, it's essential for educational institutions and policymakers to prioritize investment in technological infrastructure and training to support the effective implementation of blended learning in nursing education. This includes ensuring reliable internet connectivity, providing access to quality devices, and offering training and support for both nurse educators and student nurses to navigate and utilize these technologies effectively. Additionally, policies should be developed to address issues of digital equity and accessibility, ensuring that all student nurses have equal opportunities to engage with educational resources regardless of their socioeconomic background or geographic location. By implementing these recommendations and addressing the identified challenges, nursing schools can maximize the benefits of blended learning technologies in skills labs, ultimately improving the quality of nursing education and preparing students to meet the complex demands of modern healthcare practice.

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