Perceived Barriers of Learner Nurses Regarding Virtual Learning In A Rural-Based University In Limpopo Province

Masenyani Oupa Mbombi (masenyani.mbombi@ul.ac.za)
University of Limpopo

Livhuwani Muthelo
University of Limpopo

Thabo Arthur Phukubye
University of Limpopo

Research Article

Keywords: barriers, virtual learning, online learning, COVID-19, perceptions

Posted Date: September 20th, 2021

DOI: https://doi.org/10.21203/rs.3.rs-837050/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License. Read Full License
Abstract

**Background:** COVID-19 pandemic resultant in many universities suspending their academic activities, making virtual learning an option for saving the disrupted academic year. One rural-based university was forced to enhance its learning management system. The pandemic presented an opportunity to assessment the implementation of virtual learning at this university. The paper aims to describe the perceived barriers of virtual learning in a rural-based university of Limpopo Province.

**Method:** A quantitative descriptive design was applied to describe the barriers of virtual learning in a rural university. The purposive convenience sampling method was used to select learner nurses from the School of Healthcare Sciences. An electronic survey questionnaire with open and closed-ended questions sent via WhatsApp messenger was used to collect data. Data were analyzed using descriptive statistics with SPSS version 26.

**Results:** Learner nurses described various barriers for virtual learning such as; weak networks for connecting Blackboard, lack of ICT facilities such as laptops and tablets by learner nurses, lack of skills for using Blackboard, and aging.

**Conclusion:** The study findings add knowledge regarding the use of virtual learning in a rural-based university. We conclude that virtual learning in a rural-based university is a significant transition process that comes with complex challenges such as network problems. There is a need to develop strategies to enhance virtual learning in rural-based university.

1. Introduction And Background

The progressive global impact of COVID-19 resulted in many countries with no exact solutions to curb the pandemic, but improvising and enhancing the current online healthcare systems.[1] Countries such as United Kingdom, India, China, France, Italy, New Zealand, Poland, and South Africa implemented the world's largest and most restrictive mass quarantines that include national lockdown as a control measure to detect, test the potential COVID-19 victims, control and reduce the rapidly spreading virus.[2,3,4] Subsequently, many schools and universities suspended academic activities before the actual time to reduce the learner nurses’ and educators’ susceptibility to the rapidly spreading pandemic.[5,6] According to Coopasami [7] the global lockdown of education institutions will cause a significant (and likely unequal) interruption in learner nurses’ learning, disruptions in internal assessments, and public assessments cancellation qualifications or their replacement by an inferior alternative. However, even with the interruption of academic activities resulting from the implemented lockdown, the universities were obliged to honor their pledge of educating the community by putting a proper plan of completing the academic year 2020. The transition from traditional face-to-face to online learning was a priority step for many universities worldwide that had to ensure continuity of teaching, learning, and assessment processes. Pitsoe et al. [8] noted that the concept of online learning that refers to the use of the Internet in education could be described differently, such as ‘virtual learning,’ ‘web-based learning’ ‘internet-based
learning' and 'resource-based learning.' This paper adopts the Department of Higher Education and Training of South Africa [DHET] description of online learning as a “digitally supported, digitally dependent, and internet supported, internet dependent, and fully online” learning process. The concept of online learning will be used interchangeably with virtual learning.

Virtual learning in many developed countries is a well-established practice that has helped countries adapt to the current pandemic demands. Online learning is a promising avenue for many universities because of obvious benefit - providing the opportunity for a variety of choices and increasing self-learning for learner nurses that allows them to take more responsibility for their learning, which in the current Covid-19 pandemic, becomes relevant for discussion. Furthermore, online learning provides learner nurses with easier and more effective access to a wider variety and greater quantity of learning resources, utilizing technology – regardless of learner nurses’ geographical locations. Therefore, we can anticipate that the transition from traditional face-to-face to virtual learning within the universities as dictated by the COVID-19 pandemic and lockdown might be of significance to the majority of learner nurses. However, according to O'Doherty et al., virtual learning’s transition process might not be a simple one. As mentioned above, the authors argue that, while many universities attempt to shift to online learning, the virtual learning process might itself presents with different barriers. For example, Naeem and other scholars questioned the effectiveness of online learning in health education, arguing that online learning might not be effective, especially that certain health sciences disciplines require clinical teaching that needs practice dynamics. The authors mentioned above believe that lack of motivation and skills related to the use of Information and Communication Technology might further render online learning ineffective in the health disciplines.

Furthermore, there are reports on online learning challenges experienced by learner nurses from low-income families. For example, in the United States, learner nurses from low-income families were unprepared for a sudden shift to online learning due to various reasons that include difficulties in finding off-campus housing at short notice and lost access to campus-based healthcare learning facilities. Brown further reported that more than 200,000 learner nurses in the United Kingdom had signed a petition demanding refunds of their tuition payments - claiming that online instruction isn’t what they paid for.

In Africa, universities across the continent set up institution-wide task forces to mitigate the pandemic's impact. Most African countries are affected by economic and technological backwardness. Therefore online teaching might be challenging to implement. Therefore, it is anticipated that the education of African learner nurses would be the most affected post-COVID-19 era. The challenges with online teaching implementation were also reported in Tunisia - the union boycotts the online platforms after labeling them as discriminatory.

Macupe reported that most South African universities, especially in rural areas, are not ready to transition online. Only a few privileged learner nurses will benefit, while the majority are from poor
marginalized, and living in remote rural areas won’t help. Furthermore, learner nurses’ origin in different universities in South Africa might further disadvantaged many learner nurses.[25] For example, the Rakoma[26] study concluded that the two historically disadvantaged universities are not conducive to virtual learning because of being rural-based universities that present many challenges to the learner nurses. The author mentioned above reports a lack of structural support that include unavailability of community centers and internet café, long distances traveling to access the Internet, and the high costs of data bundles as primary barriers for online learning.

The study focus on learner nurses from rural-based university in the Limpopo Province. Therefore, considering the above-outlined barriers and the fact that most learner nurses at the University of Limpopo reside in rural areas, the question arises on how ready are the learner nurses from the School of Healthcare Sciences regarding online learning during COVID 19 pandemic? The study aims to investigate the perceived barriers of healthcare learner nurses regarding online learning at a rural-based university.

2. Research Methodology

2.1. Study design

Descriptive design was used to describe learner nurses’ accurate characteristics at a rural-based university during the COVID 19 pandemic.[27] Descriptive design helped the authors provide detailed descriptive information about perceived barriers for online learning of the Healthcare learner nurses during the COVID 19 pandemic. Moreover, the descriptive design helped the authors identify and describe the perceived barriers that may hinder online learning implementation in the School of Healthcare Sciences.

2.2. Study setting

The study was conducted at the University of Limpopo, which is located in Limpopo Province of South Africa. The University of Limpopo is classified amongst the eight rural/historically disadvantaged universities in South Africa.[24] It is situated in the Capricorn District, about 32 kilometers to the Eastern side of Polokwane City. The university consists of four faculties; Faculty of Health Sciences, Humanities, Management and Law, and Faculty of Science and Agriculture. The Faculty of Health Sciences has two schools, the School of Medicine and the School of Healthcare Sciences. The paper describes the perceived barriers of learner nurses from the School of Healthcare Sciences. The School of Healthcare Sciences provides both theory and clinical teaching, learning, and assessment processes at various accredited clinical institutions.

2.3. Population and Sampling

The target population was all learner nurses registered at the University of Limpopo. Simultaneously, the accessible population consisted of 1,227 undergraduate learner nurses regardless of the study level in the School of Healthcare Sciences at the University of Limpopo. From the 1,227 learner nurses, only 366
learner nurses were purposively and conveniently sampled from the School of Healthcare Sciences. Non-probability purposive convenience sampling was used to select learner nurses whom were available to participate in the study electronically during the Covid-19 pandemic lockdown period. The respondents knew the aspects that are being investigated because they are learner nurses from the selected school at the University of Limpopo.\textsuperscript{[28]} The inclusion criteria were all learner nurses who are registered for the year 2020 in the School of Healthcare Sciences.

### 2.4. Data collection

A self-developed online survey questionnaire was used to collect data from the school’s learner nurses. The survey questionnaire that consisted of both open and closed-ended questions was sent to learner nurses as a link using an email system and WhatsApp messenger over a period of four weeks. To ensure that all learner nurses got access to the link, learner nurses’ leadership, such as class representatives and association members, voluntarily helped distribute the link across all the learner nurses in the School of Healthcare Sciences. The English written survey questionnaire had demographic questions and questions relating to Information and Communication Technological resources like laptops and smartphones.

### 2.5. Data analysis

Data analysis was done using the descriptive statistics method of data analysis using SPSS version 26.\textsuperscript{[29]} Descriptive statistics helped the authors organize and summarize findings using frequency distributions such as percentages and pie charts.\textsuperscript{[29]}

### 2.6. Validity and reliability

Validity was ensured through an intense literature review to safeguard that the questionnaire measures the intended variables.\textsuperscript{[29]} Reliability in this study was enhanced by ensuring consistency of questionnaires and that the respondents understood the questions using simple language.

### 3. Results

The results’ presentation follows the structure of the survey questionnaire that was distributed to the learner nurses electronically. The first section of the results pertains to those emanated from the closed-ended questions regarding the perceived use of online learning in a rural-based university in Limpopo Province.

#### 3.1. Section A

#### 3.1.1 Geographical origin of respondents

The majority of learner nurses (246, 67.2\%) are originally based in deep rural areas, with (120, 32.7\%) learner nurses based in urban areas. The figure below demonstrates the geographical origin of these learner nurses.
3.2. Accessibility of the Internet to the learner nurses

Learner nurses were asked about the internet accessibility during the covid-19 lockdown period when they are outside the university. Only (71, 19%) learner nurses indicated that they could access the Internet in their different respective residential areas. While most learner nurses (156, 43%) were not sure about the accessibility of the Internet while being at home. Whereas (139, 38%) specified that they don’t have access to the Internet while away from the university.

3.3 Learner’s self-rating regarding the use of online communication for teaching, learning and assessment

The School of Healthcare Sciences learner nurses were asked to rate themselves regarding online communication tools for teaching, learning, and assessment. Only (158, 43%) learner nurses reported being comfortable with online communication tools for teaching, learning, and assessment during the covid-19 pandemic, (206, 56.2%) are not comfortable using online education. The figure summarises the findings.

3.4: The type of technological devices used for learning and the residential setting

Learner nurses were asked to indicate the technological learning devices that they could use for online learning while at home during the covid-19 pandemic. Learner nurses were allowed to tell if they own more than one device, such as laptops and smartphones. Most learner nurses (354, 97%) had smartphones, while (216, 57%) learner nurses use laptops for Information and Communication Technology.

3.5 Online versus traditional quality teaching survey

Learner nurses were asked how they perceive online learning versus traditional learning with regard to the provision of quality learning. The majority (296, 81.2%) of learner nurses in the School of Healthcare Sciences reported that online learning is not of good quality than traditional learning. Whereas (68, 18.8%) agreed that online learning would provide the same quality learning as traditional teaching.

3.6. Departmental readiness to implement online teaching

Learner nurses were asked to evaluate their department’s readiness to implement online learning by using Blackboard for teaching, learning, and assessment processes. A total of (194, 50%) learner nurses indicated that their department is not ready for online teaching during the Covid-19 pandemic. While only (178, 49%) agreed that their departments were ready.

3.7. Departmental staff (lecturers) interest in the use of Blackboard.
Leaners were asked if their previous experience of the departmental staff was interested in Blackboard for teaching, learning, and assessment processes. The majority (298, 81.4%) indicated that most lectures lack interest in using Blackboard to learn for teaching, learning, and assessment processes. Whereas (67, 18.4%) learner nurses expressed that their departmental staff members were interested in using Blackboard learn for teaching, learning, and assessment.

3.8 Clinical teaching during Covid-19 lock down

School of Healthcare Sciences provide both theory and clinical teaching. Learner nurses were asked how the clinical modules should be taught during the Covid-19 pandemic. The majority of learner nurses (201, 55%) indicated that clinical teaching during the Covid-19 pandemic must be conducted using video clips. Whereas (128, 35%) learner nurses indicated that they should be allocated to their nearest Healthcare facilities. While (37, 10%) of learner nurses indicated that the time lost for clinical modules must be replaced during the December holidays.

The section that follows presents the study results from the open-ended questions of learner nurses regarding the perceived barriers of online learning in a rural-based university in Limpopo Province.

3.2 Section B

The majority (297, 81.2%) of the School of Healthcare Sciences learner nurses perceived online learning as not equal to traditional classroom learning. The learner nurses were asked to describe the perceived barriers of virtual learning based on their current experiences with the use of Blackboard learn for teaching, learning, and assessment process. The findings of the perceived barriers with regard to virtual learning in a rural-based university of Limpopo Province are presented in a table format below.

| Variables                                                                 | Total   |
|---------------------------------------------------------------------------|---------|
| 1. Unstable network coverage                                              | 296 (81%) |
| 2. Lack of mobile data                                                    | 266 (72.6%) |
| 3. Lack of ICT skills by learner nurses (uncomfortable in using ICT facilities) | 207 (56.8%) |
| 4. Lack of clinical learning                                              | 202 (55.2) |
| 5. Lack of proper study area at home (home chores)                        | 176 (48%) |

The learner nurses were asked five questions related to how they perceived barriers to virtual learning. As illustrated in Table 1, the major barriers of virtual learning that related to learner nurses include; unstable network coverage (296; 81%), lack of mobile data (266; 72.6%), lack of ICT skills (207; 56.8%), and lack of clinical learning (202; 55.2).
Table 2 below outlines findings of the perceived barriers related to lecturers with regard to virtual learning in a rural-based university of Limpopo Province.

| Variables                                      | Total     |
|------------------------------------------------|-----------|
| 1. Lack of interest in the use of Blackboard by departmental lectures | 298 (81.4%) |
| 2. Lack of IT skills by aging academics        | 188 (51%)  |
| 3. Insufficient guidance by the lecturer        | 140 (38.2%) |
| 4. Limited interaction of lecturer and learner nurses | 82 (22.4%)  |

Regarding the perceived barriers related to the lecturers, four questions were asked to the learner nurses as indicated in Table 2. The main barriers related to lecturers with regard to virtual learning as perceived by School of Healthcare Sciences learner nurses include; lack of interest in the use of Blackboard learn by departmental lecturers (298; 81.4%), and lack of IT skills by aging academics (188; 51%).

4. Interpretation Of The Results

4.1 Geographical origin of respondents

Regarding the respondents’ geographical origin (246, 67.2%) resides in deep rural areas, whereas (120, 32.7%) learner nurses are based in urban areas. Therefore, it can be generalized that the majority of learner nurses in the School of Healthcare Sciences are originally based in rural areas. The study results are in line with Mdepa\cite{30}, who outlined that SA higher education sector fascinates learner nurses from different backgrounds. More importantly with most of the university learner nurses coming from deep rural areas with the poor network coverage. This can be viewed as an implication for the implementation of virtual learning during the Covid-19 pandemic lockdown amongst the Healthcare learner nurses as they are mostly residing in deep rural areas.

4.2.1 Unstable Network coverage

As depicted in figure 2, only 71 (19%) learner nurses indicated that they have access to the Internet in their different respective residential areas. Most learner nurses indicated that either they don’t have internet coverage or the internet coverage is unstable. Lack of network coverage might affect access to the learning resources such as PowerPoint notes, video demonstrations, and assessments. The limited access or unstable network might impact the majority of learner nurses of the School of Healthcare Sciences, especially that, majority (246, 67.2%) of learner nurses are originally from deep rural areas with unstable network coverage - thus a barrier for virtual learning as indicated in Table 1. Cloete\cite{31} outlined that internet connectivity because of poor signal is a major barrier of online amongst SA university
learner nurses in rural areas. The Michigan State University’s Quello Center\textsuperscript{[32]} report limited access and unstable connection to the Internet from rural homes can contribute to learner nurses falling behind academically. The same was also a factor in Zimbabwe whereby network coverage hindered online education due to network congestion as students use the system at the same time.\textsuperscript{[33]} Inadequate and unstable internet connectivity is a barrier to effective online teaching.\textsuperscript{[34]} This is congruent with the studies\textsuperscript{[35,36]}, where the students mentioned unstable network coverage as a barrier for successful online education. In this study, only 19% of the students were sure of accessing the internet coverage in their respective areas, and this is supported by the study conducted in Iraq\textsuperscript{[37]}, where low Internet was a barrier to e-learning at home and even within the university premises.

### 4.2.2 Availability of learning gadgets and mobile data

The findings in figure 3.4 only 216 (57%) learner nurses indicated that they had laptops. The majority of the learner nurses 354 (97%) have smartphones. Simultaneously, most learner nurses perceived a lack of mobile data to connect on the Blackboard Learning System as a barrier to virtual learning. The cost associated with purchasing data is a severe concern to the School of Healthcare Sciences learner nurses with limited funding opportunities. However, the learner nurses can switch from the expensive cell phone network to the most affordable data network, which in this case, the unstable well-known network connectivity becomes a concern. Given the current state of the Covid-19 lockdown pandemic and the urgent need to adopt online teaching and learning, the South African universities have since prioritized the procurement of laptops and data bundles for students.\textsuperscript{[38]} It is of high importance that the institutions ensure that the students are well equipped with home based teaching and learning equipment for proper and effective online teaching.\textsuperscript{[39]} In a study by Willemse\textsuperscript{[35]} lack of data was a negative factor as some students were coded saying “When we tried submitting, our data ran out and we had to make alternative arrangements for submission” (participant 22) while participant 21 was coded as follows “We experienced signal problems at work and not everyone had data so it caused somewhat confusion and chaos”.

### 4.2.3 Lack of ICT skills by learner nurses (uncomfortable in using ICT facilities)

As shown in table 3.5 learner nurses’ online teaching skills and comfortability were 50/50. Online learner nurses need basic technical skills to succeed. These include creating new documents, using a word processing program, navigating the Internet, and download software. Tamarat\textsuperscript{[40]} allude to this finding by indicating that online instructors and students should be equipped with the technical skills to function in the new learning platform and hence require sustained support pre-, during, and post-delivery. Rasheed\textsuperscript{[41]} highlighted technological complexity challenges where lack of ICT skills by learner nurses become apparent, students wasted more time in trying to learn how to navigate through the systems than learning. This is supported by Maboe\textsuperscript{[42]} findings amongst health science students at the University of South Africa whereby only 3.8% of the students participated in the online platform as the majority
struggle with technology or lack of ICT skills. The study by Al-Azawei\textsuperscript{37}, outlined the internal and external barriers to effective online learning whereby ICT literacy from the students was also an internal barrier.

### 4.2.4 Poor quality of online learning versus the traditional way of teaching

The quality of online teaching in this study was measured in terms of learner nurses’ views on the quality of online teaching versus the traditional teaching method. The findings revealed (81.2\%) learner nurses in the School of Healthcare Sciences indicated that online learning is not of good quality as compared to traditional learning. This is similar to Mgutshini’s\textsuperscript{43,44} where online students gave less positive self-assessments of their perceived content mastery than their campus-based counterparts who indicated learning and retaining more than online learning. Janse\textsuperscript{34} study findings demonstrated a lack of interaction with the peers and instructors as a challenge while, Asiri\textsuperscript{45} discovered that online learning on dental students received positive regards but should not be seen as a supplement to traditional face to face teaching. Asiri\textsuperscript{45} argument corroborates the current study findings. Similarally, Almaghaslah\textsuperscript{46}, which suggested that pharmacy students at KKU still prefer traditional in-class methods to online learning even though they did express some interest in online learning methods. Different authors pointed out that there is no significant difference between online and traditional teaching quality. Moreover, a well-structured online course could lead to an identical level of quality as traditional courses.\textsuperscript{47,48,49}

However, there are some studies where the online method was favored over the traditional method of learning. For examples, students preferred the online learning method over the traditional face to face is contradictory to the findings of this present study.\textsuperscript{50,51} Janse\textsuperscript{34} indicated that students are individuals with differences and such differences should be considered to enhance teaching practices.

### 4.2.3 Limited exposure to clinical learning

Despite the deliberated benefits of BMS regarding educational instructions, communication, and assessments, the School of Healthcare Sciences learner nurses reports that implementing the virtual learning system might affect their modules’ clinical learning. Therefore, learner nurses perceive a lack of clinical learning for respective modules within the School of Healthcare Sciences as a barrier to virtual learning for rural-based university. The results in table 4.9 showed that of all the suggested mode of clinical teaching during the covid-19 pandemic, and online procedural video clips had a higher percentage (55\%) as compared to the use of nearest Healthcare facilities (35\%) and replacement of clinical learning during December holiday (10\%). The results of Jang\textsuperscript{51} shows that students have positive perceptions of Objective Structured Clinical Examination (OSCE) videos and that they make use of these videos in various ways to support their self-study of clinical skills, However, despite mentioning the benefits of having to access the video conveniently, barriers like lack of interaction as one of the student was coded as follows “I had some questions while I was viewing the video clips”. Similarly, in the study by Wong\textsuperscript{52} Ninety percent (90\%) of students agreed the videos helped them learn psychomotor skills that required oral health accuracy students. According to nursing students in the study of Lee\textsuperscript{53}, the advantages of
mobile-based education are its accessibility without constraints of place and time, availability for preparation and review, visualized learning effect, increased learning motivation, improved confidence in skill performance, and reduced anxiety about making mistakes when performing the skill and suggested that video clips using mobile devices are useful tools that educate student nurses on relevant clinical skills and improve learning outcomes. Exploring video usage as a learning resource for health science education has gained momentum in recent years with special recognition of their clinical student value. Chankseliani[54], and Stone[55] concurs that videos contribute to quality nursing care as they enable learner nurses to develop clinical competencies in a close to a real-life situation, facilitating correct performance and knowledge acquisition without the added anxiety that may be experienced practicing nursing skills in real-life situations advocated for further research into the quality of the educational or clinical video clips.

Various authors have indicated that online teaching effectively conveys clinical skills and knowledge through virtual clinical case studies.[56,57,58] However, they also argued in health care science, online teaching for clinical learning is more effective when combined with a mixed learning approach, using different styles and modes not only to facilitate learning but also to bring positive change in practice.

4.2.6 The readiness of the departments and lack of interest in the use of Blackboard by departmental staff

Blackboard is the core Learning Management System used in the rural-based university to teach, and assess the School of Healthcare Sciences learner nurses. The majority of learner nurses perceive a lack of interest by departmental staff members regarding the system's use as a barrier to the envisaged implementation of virtual learning. Learner nurses demonstrate concern about the staff members who show no interest in using Blackboard to teach, learn, and assess activities. The current studies' findings are consistent with those of other scholars. For example, Moonsamy[59] showed concern regarding the staff members who do not use Blackboard to learn despite the universities' evolving technology. Martin with other scholars[60,61,62] highlighted that the departmental staff are the role players in the implementation of online teaching. Therefore, departmental staff's perceptions, attitudes, and skills are essential in the effective integration of online teaching, communication, and assessment.[39] In a study by Kite[63], regarding the use of Learning Management System (LMS), responses of both students and lecturers in the study appeared to be driven by a perception that face-to-face learning is the best way to learn as compared to online learning. Nsouli[64,15] found attitude and lack of ICT skills as factors making most academics less interested in using online teaching platforms. Similarly, the study by Al-Azawei[37] outlined the unwillingness of both the academic staff 47.29% and students 75% to online learning. In this study, students pinpointed that 81.4% of academic staff are not interested in online learning and compared to 18.4 who think the staff is interested in online learning platforms.

Thorell[65], study findings discovered that the students experienced that teachers did not use digital services such as social media and professional networks or other internet resources, which influenced
their perception of their importance and thereby their usage of these services and resources concerning their studies; this indicates the critical role that the department or academic staff plays in influencing the use of online technology by the students.

4.2.10. Knowledge about ICT skills by learner nurses and aging academics.

The Blackboard Learning System as the current learning management for the School of Healthcare Sciences learner nurses requires technical skills for effective navigation of tools used in the system. However, the current study learner nurses perceived a lack of ICT skills as a barrier to virtual learning. Learner nurses reported that the departmental staff, who most of them are aging, also lacks the skills to navigate the Blackboard learning management system, affecting the teaching, learning, and assessment activities. The findings are congruent to those of other studies such as Moonsamy[59] who reported a lack of ICT skills as a barrier when implementing Blackboard learn. The study by [33] also identified a lack of ICT skills as a barrier to online teaching where academics, especially the aged, found it challenging to navigate through the system. In the study of Wassel[65] ICT skills of academics were found wanting in terms of the competency to deliver online teaching, most of the academics rated satisfactory in terms of basic ICT skills like sending emails and word processing programs. Most of the studies[34,41,44] outlined a lack of knowledge on ICT skills as a barrier to online teaching. However, according to Ghavifekr[67], these barriers differ from country to country, wherein the barrier of lack of ICT competency is more apparent in developing countries. The present study was conducted in a developing country, South Africa, of which this could be a factor for academics to run smoothly with online learning.

5. Conclusion And Recommendation

The study was conducted to determine the perceived barriers of the school of healthcare learner nurses regarding online learning at a rural-based university. According to the findings, there are barriers identified by learner nurses with regard to the implementation of online teaching during Covid-19. These barriers can be attributed to the fact that though the adoption of online teaching platforms such as Blackboard was long introduced in higher education, it was only enforced during the unforeseen Covid-19 lockdown pandemic were in the higher institutions were ill-prepared. The fact that the nature of health care professional learning involves both theory and practical online learning has robbed the learner’s opportunity to practice and learn in a real-life situation. The following recommendations are made as a way of overcoming the barriers of online teaching amongst health care learner nurses in rural-based universities:

- The barriers of accessibility to the internet/unstable network should be considered and addressed before online teaching is implemented.
- The lectures in different departments should be equipped with online teaching material and information.
- More importantly, there is a need for identifying alternative ways to cover clinical modules.
• Since online teaching has become a necessity, acceptance of change and compliance from both the learner nurses is essential for proper and effective online teaching.
• Research on the strategies to improve online teaching amongst health care sciences students can also enhance the current challenges which were identified.

Declarations

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The permission to conduct the study was obtained from the Turfloop Research Ethics Committee (TREC) of the University of Limpopo for ethical clearance (TREC/59/2020: PG). The permission to involve the learner nurses was sorted with the faculty of health sciences’ executive dean at the University of Limpopo. The respondents were informed about the nature of research, and the purpose of the study to obtain informed consent. The respondents gave a written consent to participate in the study and they were assured of the protection of their identity. The link sent to the learner nurses did not require any names and personal details of the respondents to be recorded on the questionnaire. The respondents were also informed that the results would only be published in aggregate/group format without revealing participants’ identities or names (Brink et al., 2012).[29] The respondents were also reassured that they would not be victimized because they have participated in the study. Fairness was ensured by sending the email and WhatsApp link to all the learner nurses, thereby providing an equal chance of participating. To ensure anonymity, the authors confirmed that the questionnaire did not contain any information that could be traced back to the respondents.[68]

AVAILABILITY OF DATA AND MATERIAL

Data is available upon request to the main authors.

CONSENT FOR PUBLICATION

All participants were informed about the plan of publishing the data in the form of an article upon completion of data analysis.

COMPETING INTERESTS

Authors declare no competing interest, financial or otherwise.

FUNDING

This study did not receive grants from any funding agencies in the public commercial, or not-for-profit sectors.
AUTHORS’ CONTRIBUTIONS

MOM wrote conceptualised the study, and completed the final draft of the article. LM performed data capturing and analysis. TAP completed the methodology section.

ACKNOWLEDGEMENTS

The authors would like to acknowledge Turfloop Research Ethics Committee of the University of Limpopo for granting ethical clearance to this independent study. Our special thanks to the learner nurses who made their time to participate in the study during the COVID-19 pandemic lockdowns.

References

[1] World Health Organisation (WHO). 2019. Coronavirus Disease (COVID-19) Pandemic. Geneva. Obtained from World Wide Website on the 31st March 2020: https://www.who.int/emergencies/diseases/novel-coronavirus-2019

[2] Kaplan, J. 2020. At least 20% of the global population is on coronavirus lockdown – here are their rules. South African Business Insider. Retrieved on the 08th of April 2020 from World Website: www.BusinessInsider.co.za.

[3] Matangira, L. 2020. At least 20% of the global population is on coronavirus lockdown – here are their rules. Eye Witness News. Retrieved on the 08th of April 2020 from World Website: https://ewn.co.za/2020/03/24/these-are-all-the-countries-worldwide-on-coronavirus-lockdowns

[4] Mahaye, NE. 2020. The Impact of COVID-19 Pandemic on Education: Navigating Forward the Pedagogy of Blended Learning. Department of Education. KwaZulu-Natal, South Africa. www.researchgate.net › publication › 340899662

[5] Hassan, I. 2020. South Africa orders schools closed as COVID-19 spreads President also suspends visits by family members of prisoners to all correctional facilities across the country. Obtained from World Wide Website on the 08th of April 2020: https://www.aa.com.tr/en/africa/south-africa-orders-schools-closed-as-covid-19-spreads/1767271

[6] Hendricks, A & Chirume, J. 2020. Covid-19: Universities across the country close. Ground Up News South Africa. Obtained from World Wide Website on the 08 of April 2020: https://www.groundup.org.za/article/covid-19-universities-across-country-close/

[7] Coopasami, M., Knight,S., & Pete,M. (2017). e-Learning readiness amongst nursing students at the Durban University of Technology. Health SA Gesondheid (Online), 22, 300-306. https://dx.doi.org/10.1016/j.hsag.2017.04.003
[8] Pitsoe, V. and Letseka, M. (2018), "Access to and Widening Participation in South African Higher Education", Hoffman, J., Blessinger, P. and Makhanya, M. (Ed.) *Contexts for Diversity and Gender Identities in Higher Education: International Perspectives on Equity and Inclusion (Innovations in Higher Education Teaching and Learning, Vol. 12)*, Emerald Publishing Limited, Bingley, pp. 113-125. https://doi.org/10.1108/S2055-364120180000012009

[9] Department of Higher Education and Training (DHET). *Draft Policy Framework for the Provision of Open Learning and Distance Education in South African Post-School Education and Training*. Pretoria: DHET; 201.

[10] Oliver, W. 2020. *Education post-COVID-19: Customized blended learning is urgently needed*. Nelson Mandela University. theconversation.com › education-post-covid-19-custom.

[11] Zayapragassarazan, Z. 2020. COVID-19: Strategies for Online Engagement of Remote Learner nurses. *Department of Medical Education Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER)*, Puducherry 605006, India. DOI: 10.7490/f1000research.1117835.1

[12] Appana, S. (2008). A Review of Benefits and Limitations of Online Learning in the Context of the Student, the Instructor and the Tenured Faculty. *International Journal on E-Learning, 7*(1), 5-22. Waynesville, NC USA: Association for the Advancement of Computing in Education (AACE). Retrieved March 31, 2020 from https://www.learntechlib.org/primary/p/22909/.

[13] Farid A, Plaisent M, Bernard, P and Chitu O. 2014. "Student Online Readiness Assessment Tools: A Systematic Review Approach" *The Electronic Journal of e-Learning, 12*(4):375-382 available online at www.ejel.org

[14] Regmi, K., Jones, L. A systematic review of the factors – enablers and barriers – affecting e-learning in health sciences education. *BMC Med Educ* 20, 91 (2020). https://doi.org/10.1186/s12909-020-02007-6

[15] O’Doherty, D., Dromey, M., Lougheed, J. et al. Barriers and solutions to online learning in medical education – an integrative review. *BMC Med Educ* 18, 130 (2018). https://doi.org/10.1186/s12909-018-1240-0

[16] Rouleau G, Gagnon MP, Côté J, Payne-Gagnon J, Hudson E, Bouix-Picasso J, Dubois CA. Effects of e-learning in a continuing education context on nursing care: a review of systematic qualitative, quantitative and mixed studies reviews (protocol). *BMJ Open*. 2017 Oct 16;7(10):e018441. doi: 10.1136/bmjopen-2017-018441. PMID: 29042394; PMCID: PMC5652594.

[17] Curran V, Lockyer J, Sargeant J, Fleet L. Evaluation of learning outcomes in Web-based continuing medical education. *Acad Med*. 2006 Oct;81(10 Suppl):S30-4. doi: 10.1097/01.ACM.0000236509.32699.f5. PMID: 17001130.
[18] Naeem NK, Khan RA. 2019. Stuck in the blend: challenges faced by learner nurses enrolled in blended programs of Masters in health professions education. *Pak J Med Sci.* 35:929–33. doi: 10.12669/pjms.35.4.12

[19] Gardner P, Slater H, Jordan JE, Fary RE, Chu J. 2016. Briggs AM. Physiotherapy learner nurses’ perspectives of online e-learning for interdisciplinary management of chronic health conditions: a qualitative study. *BMC Med Educ.* 16:62.

[20] Cook D, Levinson A, Garside S, Dupras D, Erwin P, Montori V. 2008. Internet-based learning in the health professions: a meta-analysis. *JAMA.* 300:1181–96. DOI: 10.1001/jama.300.10.1181

[21] Brown, C & Salmi, J. 2020. Putting fairness at the heart of higher education. University World News: *The Global windows on higher education.* 18 April 2020. www.universityworldnews.com › post › story=20200417.

[22] United Nations Education Scientific and Cultural Organization. 2020. *COVID-19 Educational Disruption and Response.* Retrieved from: https://en.unesco.org/covid19/educationresponse.

[23] Mahaye, M.N. 2020. *The Impact of COVID-19 Pandemic on South African Education: Navigating Forward the Pedagogy of Blended Learning.* https://www.researchgate.net/publication/340899662_

[24] Macupe, B. 2020. ‘Online push sets us up for failure’. *The Mail and Guardian.* 23 April. mg.co.za › article › 2020-04-23-online-push-sets-us-up...

[25] Wondwosen T & Damtew, T. 2020. *The shift to online learning calls for global cooperation.* https://www.researchgate.net/publication/341030743_

[26] Rakoma, M.A. 2018. *Rural students’ experiences of online learning support in an open distance learning environment.* Unpublished thesis. https://scholar.sun.ac.za/handle/10019.1/103278

[27] Gray, J.R., Grove, S.K. & Sutherland, S. 2017. *Burns and Grove’s The Practice of Nursing Research: Appraisal, Synthesis, and Generation of evidence.* 8th edition. Missouri: ELSEVIER

[28] Grove, S.K., Burns, N. & Gray, J. 2013. *The practice of nursing research: Appraisal, synthesis and generation of evidence.* Seventh edition. St Louis, MO: Elsevier Saunders.

[29] Burns, N. & Grove, S.K. 2011. *Understanding nursing research: Building an evidence-based practice.* Philadelphia, PA: Elsevier Saunders.

[30] Mdepa. W. 2020. The use of learning technology or online learning is a pipe-dream for most rural learner nurses and learner nurses. Daily MARVARIK. *COVID-19 online resources and news portal.* 11. May. https://www.dailymaverick.co.za/opinionista/2020...
[31] Cloete, J. 2020. *SA Universities are failing to meet the challenge of teaching during Covid-19 pandemic*. From: www.dailymaverick.co.za › opinionista › 2020-04-09-s...

[32] Michigan State University’s Quello Center report. 2020. Poor internet connection leaves rural learner nurses behind. 20 March. From: msutoday.msu.edu › news › poor-internet-connection.

[33] Sakala, L., & Chigona, W. (2017). *Lecturer resistance during ICTs implementation in higher education in Zimbabwe: forms and triggers*. SAICSIT ‘17. https://doi.org/10.1145/3129416.3129449.

[34] Jansen Van Rensburg, E. S (2018) Effective online teaching and learning practice for health science students: An integrative review. *International Journal of Africa Nursing Science*. https://doi.org/10.1016/j.ijans.2018.08.004

[35] Willemse, J.J., Jooste, K and Bozalek, V (2019) Experiences of undergraduate nursing students on an authentic mobile learning enactment at a higher education institution in South Africa. *Nurse Education Today*. https://doi.org/10.1016/j.nedt.2018.11.021

[36] Alenezi, A. (2018). *Barriers to Participation in Learning Management Systems in Saudi Arabian Universities*. Hindawi Education Research International https://doi.org/10.1155/2018/9085914.

[37] Al-Azawei, A., Parslow, P., & Lundqvist, K. (2016). Barriers and Opportunities of E-Learning Implementation in Iraq: A Case of Public Universities. *The International Review of Research in Open and Distributed Learning*, 17(5). https://doi.org/10.19173/irrodl.v17i5.2501

[38] Dipa, K. 2020. Covid-19 presents curricula crunch for SA's universities. 27 April. From: www.iol.co.za › saturday-star › news › covid-19-presen...

[39] Ali.W. 2020. Online and Remote learning in higher education institutes a necessity in light of Covid-19 pandemic. *Higher Education studies*. 3 (10) 17-25. DOI: 10.5539/hes.v10n3p16

[40] Tamarat, W & Teferra, D. 2020. The shift to online learning calls for global cooperation. University World News African edition. 27 April. From: www.universityworldnews.com › post

[41] Rasheed, R.A, Kamsin, A, Abdullah, N. A. (2020) Challenges in the online component of blended learning: A systematic review.Elsevier.https.doi.org/10.1016/j.compedu.2019.103701.

[42] Maboe, K. (2017). Use of online interactive tools in an open distance learning context: Health studies students’ perspective*. Health SA Gesondheid, 22, 221–227. doi:https://doi.org/10.4102/hsag.v22i0.1003

[43] Mgutshini, T., 2013, 'Online or not? A comparison of students’ experiences of an online and an on-campus class’, Curationis 36(1), Art. #73, 7 pages. http://dx.doi.org/10.4102/curationis.v36i1.73
[44] Weldy, T.G (2018) Traditional, Blended, or Online: Business Student Preferences and Experience with Different Course Formats. e-Journal of Business Education & Scholarship of Teaching Vol. 12, No. 2, September 2018, pp: 55-62

[45] Asiri, M.A. (2017) Dental students’ perceptions of online learning. Saudi Dental Journal. http://dx.doi.org/10.1016/j.sdentj.2017.03.005

[46] Almargaslah, D., Ghazwani, M., Alsayarirwa, A., Khaled, A. (2018) Pharmacy students’ perceptions towards online learning in a Saudi Pharmacy School. Saudi Pharmaceutical Journal. https://doi.org/10.1016/j.jsps.2018.03.001

[47] DiRienzo, C., & Lilly, G. 2014. Online versus face-to-face: Does delivery method matter for undergraduate business school learning? Business Education & Accreditation, 6(1), 1-11.

[48] Farmakis, H., & Kaulbach, M. 2013. Teaching online? A guide on how to get started, International Journal of Organizational Innovation, 6(2), 34-40.

[49] Cabi, E & Kalelioglu, F (2019) A fully online course experience from students’ perspective: readiness, attitudes and thoughts. Turkish Online Journal of Distance Education-TOJDE July 2019 ISSN 1302-6488 Volume: 20 Number: 3 Article 12

[50] Luaran, J.E, Samsuri, N.N, Nadzri, F.A & Rom, K.B.M (2013) A study on the student’s perspective on the effectiveness of using e-learning. Procedia - Social and Behavioral Sciences 123 (2014) 139 – 144. doi: 10.1016/j.sbspro.2014.01.1407

[51] Jang, H.W & Kim, K. (2014) Use of online clinical videos for clinical skills training for medical students: benefits and challenges. BMC Med Educ 14, 56. https://doi.org/10.1186/1472-6920-14-56

[52] Wong, G, Aforo, H.C., Ruiz, K & Nanayakkara S (2018) An innovative educational approach in using instructional videos to teach dental local anaesthetic skills. European Journal of Dental Education. https://doi.org/10.1111/eje.12382

[53] Lee, N.J, Chae, S; Kim, H, Lee, J, Min, H.J; Park, D. (2016) Mobile-Based Video Learning Outcomes in Clinical Nursing Skill Education, CIN: Computers, Informatics, Nursing: Volume 34 - Issue 1 - p 8-16 .doi: 10.1097/CIN.0000000000000183

[54] Chankseliani.M. 2013. Rural Disadvantage in Georgian Higher Education Admissions: A Mixed-Methods Study MAIA CHANKSELIANI. 2013. Jastor, Comparative Education Review, Vol. 57, No. 3, Special Issue on Fair Access to Higher Education (August 2013), pp. 424-456

[55] Stone, R, Cooke, M., & Mitchel, M (2019) Undergraduate nursing students’ use of video technology in developing confidence in clinical skills for practice: A systematic integrative literature review. Nurse Education Today. https://doi.org/10.1016/j.nedt.2019.104230
[56] Ikram UZ, Essink-Bot M, Suumond J. 2015. How we developed an effective e-leaning module for medical students on using professional interpreters. Med Teach. 37:422–7. Doi: 10.3109/0142159X.2014.939579.

[57] Khasawneh R, Simonsen K, Snowden J, Higgins J, Beck G. 2016. The effectiveness of e-learning in pediatric medical student education. Med Educ Online. 21:295-16. Doi: 10.3402/meo.v21.29516

[58] Kitching F, Winbolt M, MacPhail A, Ibrahim JE. 2015. Web-based social media for professional medical education: perspectives of senior stakeholders in the nursing home sector. Nurse Educ Today. 35: 1192–8. DOI: 10.1016/j.nedt.2015.05.013

[59] Moonsamy D & Govender I. 2018. Use of Blackboard Learning Management System: An Empirical Study of Staff Behavior at a South African University. EURASIA Journal of Mathematics, Science and Technology Education, 2018, 14(7): 1-14. https://doi.org/10.29333/ejmste/91623

[60] Martin, F., Budhrani,K.& Wang,C. 2019. Examining Faculty Perception of Their Readiness to Teach Online. https://files.eric.ed.gov/fulltext/EJ1228799.pdf

[61] Buabeng-Andoh, C. & Yidana, I. (2015). Teachers’ ICT usage in second-cycle institutions in Ghana: A qualitative study. International Journal of Education and Development using ICT, 11(2),. Open Campus, The University of the West Indies, West Indies. Retrieved August 19, 2021 from https://www.learntechlib.org/p/151849/.

[62] Nasrabadi, A.N., Mohammadi, N., Rooddehghan, Z. et al. The stakeholders’ perceptions of the requirements of implementing innovative educational approaches in nursing: a qualitative content analysis study. BMC Nurs 20, 131 (2021). https://doi.org/10.1186/s12912-021-00647-7

[63] Nsouli, R., Vlachopoulos, D. Attitudes of nursing faculty members toward technology and e-learning in Lebanon. BMC Nurs 20, 116 (2021). https://doi.org/10.1186/s12912-021-00638-8

[64] Kite, J., Schlub, T. E., Zhang, Y., Choi, S., Craske, S., & Dickson, M. (2020). Exploring lecturer and student perceptions and use of a learning management system in a postgraduate public health environment. E-Learning and Digital Media, 17(3), 183–198. https://doi.org/10.1177/2042753020909217

[65] Thorell, M., Fridorff-Jens, P. K., Lassen, P., Lange, T., & Kayser, L. (2015). Transforming students into digital academics: a challenge at both the individual and the institutional level. BMC medical education, 15, 48. https://doi.org/10.1186/s12909-015-0330-5

[66] Wassel, F & Fadhilah, Y (2019) Attitudes and Challenges Toward Use of ICTs: An Assessment of ICT Skills Among University Lecturers and Students in Afghanistan. International Journal of Recent Technology and Engineering (IJRTE) ISSN: 2277-3878, Volume-8, Issue- 1C2

[67] Ghavifekr, S., Kunjappan, T., Ramasamy, L., & Anthony, A (2016) Teaching and Learning with ICT Tools: Issues and Challenges from Teachers’ Perceptions MOJET, Malaysian Online Journal of
Figures

Figure 1

Geographical origin of learner nurses
Figure 2

Accessibility of the Internet

![Pie Chart showing Internet Accessibility]

- Yes: 71 (19%)
- Maybe: 156 (43%)
- No: 139 (38%)

Figure 3

Self rating on online teaching and assessment

![Bar Chart showing online communication]

- Comfortable: 158
- Uncomfortable: 206
- Non-responses: 2
Figure 4

Availability of Technological devices for learning and the residential setting

Online learning is of good quality compared to traditional learning

Figure 5

Online compared to traditional learning
Figure 6

Departmental readiness to implement online teaching

Figure 7

Departmental staff interest in Black board
**Supplementary Files**

This is a list of supplementary files associated with this preprint. Click to download.

- LearnerreadinessregardingICTplatformsforteachinglearningandassessment.csv2.zip