

Lecturers' Reflections on Emergency Remote Teaching and Learning at a University in South Africa During COVID-19 Lockdown



Dagogo William Legg-Jack¹  & Clever Ndebele¹ 

¹ Directorate of Learning and Teaching, Walter Sisulu University, Mthatha, Eastern Cape, South Africa.

ABSTRACT

The outbreak of the COVID-19 pandemic came with a lot of disruptions which saw so many organisations and institutions shut down. Part of the changes brought about by the pandemic was the closure of educational institutions globally, thereby forcing the migration to emergency remote teaching and learning. Whilst some nations grappled with the challenges associated with this shift in the mode of teaching and learning, others tapped into the opportunities inherent in it. This study located in the interpretive paradigm employed a qualitative case study design that explored lecturers' reflections on emergency remote teaching and learning at a university in South Africa during the intense stages of the COVID-19 pandemic. The Technology Acceptance Model was employed as a lens to make meaning of how lecturers perceive emergency remote teaching and learning in the science and technology cluster. The sample for the study consisted of nine participants, recruited from Science and Technology cluster, representing Biological/Life Sciences, Natural Sciences, Physical Sciences and Technology Education faculties. The sample was selected through purposive and convenience sampling. Findings from the study revealed both challenges and opportunities for emergency remote teaching and learning. The challenges identified included, lecturers' lack of readiness, students' internet-related issues, and inability to execute practical tasks online. The positive aspect included improved skills in the use of ICT and diverse online platforms for both lecturers and students. Based on the findings, the study recommends that students, especially those from disadvantaged backgrounds be provided with the necessary ICT infrastructure to ensure their effective participation in online learning.

Keywords: COVID-19, Emergency Remote Teaching and Learning (ERTL), lecturers; reflections; South Africa

© 2022 The Author(s). Published and Maintained by Noyam Publishers.
This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

Correspondence

Dagogo William Legg-Jack
Email: dlegg-jack@wsu.ac.za

Publication History

Received 2nd March, 2022
Accepted 22nd April, 2022
Published online 24th June, 2022

INTRODUCTION

Face-to-face learning has been the approach to the delivery of academic programmes in South African Universities since the inception of higher education,¹ except for the University of South Africa which is an open and distance education university. This approach to teaching and learning possesses huge advantages as

¹ Larry Cuban, *Teachers and machines: The Classroom Use of Technology Since 1920*. (Teachers College Press, 1986); Emmanuel Mgwashu, "Universities Can't Decolonise the Curriculum Without Defining it First." *The Conversation 22* (2016): 1-4.

compared to other means such as online learning.² In affirmation, the significance of face-to-face learning is that it provides real-time contact, takes place within a specified contact time, and provides opportunities for prompt feedback to students.³ Face-to-face learning is an approach that relies mainly on lecturers' presence in the impartation of knowledge through a lecturer or student-centered approach and involves students' verbal communication in a classroom environment.⁴ However, despite the affordances of the face-to-face approach to teaching and learning, there are prevailing circumstances that impede its efficacy. These include conflicts and crises such as wars, violent students protests and pandemics, such as Coronavirus (COVID-19, hereafter) among others.⁵

The outbreak of the COVID-19 pandemic has massively triggered the transition from face-to-face to online teaching and learning globally. COVID-19 was first reported in the City of Wuhan China in late December 2019.⁶ The extent of its spread was such that within five months it crossed borders from Asia to Europe, America and eventually Africa,⁷ leading to its declaration by the World Health Organisation (WHO) as a global pandemic.⁸ The outbreak of the COVID-19 pandemic caused serious changes to how people live, work, do their businesses and even school. To circumvent the spread of the virus globally, many nations of the world instituted national lockdowns to promote social/physical distancing. This resulted in the closure of educational institutions, and placed about 1.2 billion students in 183 countries out of school.⁹ Although face-to-face learning yields more advantages when compared to online methods as argued by some scholars, in the face of such disruption as caused by the COVID-19 pandemic, this mode of learning was impossible during the intense periods of the pandemic due to the observation of social distancing. The continuous closure of educational institutions meant a drawback for all categories of learners. Therefore, in situations such as this, the use of online remote learning became inevitable and the most sought after to ensure the continuity of schools' academic calendars. The compulsory transition from face-to-face to emergency remote learning is a bid to comply with the call for social distancing between persons. Although online learning has been practiced in different parts of the world across various institutions, there are still those who are new to it.

In light of the above discussion, this study argues that, despite the challenges associated with online remote learning arising from the outbreak of the COVID-19 pandemic, there are still positive changes brought about by this sudden disruption in higher education globally that may positively impact the effective integration of technologies in teaching and learning by higher educational institutions in developing countries

-
- ² Oliver Keis, Claudia Grab, Achim Schneider, and Wolfgang Öchsner. "Online Or Face-To-Face Instruction? A Qualitative Study on the Electrocardiogram Course at The University Of Ulm To Examine Why Students Choose A Particular Format." *BMC Medical Education* 17, no. 1 (2017): 1-8. <https://doi.org/10.1186/s12909-017-1053-6>
- ³ Paul Black., and Dylan Wiliam. "Developing the Theory of Formative Assessment." *Educational Assessment, Evaluation and Accountability (formerly: Journal of Personnel Evaluation in Education)* 21, no. 1 (2009): 5-31. <https://doi.org/10.1007/s11092-008-9068-5> ; F. Waghid,. "Action research and educational technology: Cultivating disruptive learning." *South African Journal of Higher Education* 32, no. 4 (2018): 1-11. <https://doi.org/10.20853/32-4-3097>
- ⁴ Chun Tang, and Lee Chaw. "Readiness for Blended Learning: Understanding Attitude of University Students." *International Journal of Cyber Society and Education* 6, no. 2 (2013): 79-100. <https://www.learntechlib.org/p/209223/>.
- ⁵ Negin Dahya,. "Education in Conflict and Crisis: How Can Technology Make a Difference?: A Landscape Review." (2016). Add the date accessed to online articles <https://inee.org/resources/landscape-review-education-conflict-and-crisis-how-can-technology-make-difference> ; Cedric B. Mpungose, "Emergent Transition From Face-to-Face to Online Learning in A South African University in the Context of the Coronavirus Pandemic." *Humanities and Social Sciences Communications* 7, no. 1 (2020): 1-9. <https://doi.org/10.1057/s41599-020-00603-x>
- ⁶ Nuhu A. Sansa, Analysis for the Impact of the COVID - 19 to the Petrol Price in China (March 2, 2020). Available at SSRN: <https://ssrn.com/abstract=3547413> or <http://dx.doi.org/10.2139/ssrn.3547413>
- ⁷ Jennifer Giandhari, Sureshnee Pillay, Eduan Wilkinson, Houriiyah Tegally, Ilya Sinayskiy, Maria Schuld, José Lourenço et al. "Early transmission of SARS-CoV-2 in South Africa: An Epidemiological and Phylogenetic Report." *International Journal of Infectious Diseases* 103 (2021): 234-241. <https://doi.org/10.1016/j.ijid.2020.11.128>
- ⁸ David Mhlanga, and Emmanuel Ndhlovu. "Socio-Economic Implications Of The COVID-19 Pandemic on Smallholder Livelihoods in Zimbabwe." (2020).<https://10.20944/preprints202004.0219.v1>
- ⁹ Cathy Li, and Farah Lalani. "The COVID-19 Pandemic has Changed Education Forever." In *World Economic Forum*, Vol. 29. The Rise of Online Learning During The COVID-19 Pandemic| World Economic Forum (weforum. org), (2020). <https://www.weforum.org/agenda/2020/04/coronavirus-education-global-covid19-online-digital-learning/>.

like South Africa. Hence, the study seeks to answer the question: *What are lecturers' reflections on the use of emergency remote teaching and learning at a university in South Africa during COVID-19?*

To answer the research question in the study, a qualitative case study approach was deemed appropriate. The focus of the study centers on lecturers' reflections on the use of emergency remote teaching and learning (ERTL, hereafter) that involved the use of information and communication technologies (ICT, hereafter) as a mode of instruction. The Technology Acceptance Model (TAM) was employed as a framework. The findings of this study are significant to stakeholders within and outside higher education as it contributes to the body of knowledge on the challenges and opportunities in the use of emergency remote teaching and learning during COVID-19.

In the following section, a brief review on the theoretical framework is presented, followed by review of related literature on the subject matter, methodology, findings, discussions and conclusion.

THEORETICAL FRAMEWORK

This study uses the Technology Acceptance Model (TAM) propounded by Davis.¹⁰ The framework is employed to explore lecturers' reflections on emergent possibilities of emergency remote teaching and learning in the context of the COVID-19 pandemic at a public university in South Africa. Its suitability for the study is premised on the supposition that the TAM focuses on the use of technology.

TAM, as a framework is based on two important concepts namely perceived ease of use (PEoU) and perceived usefulness (PU). The perceived ease of use as defined is the degree to which an individual believes that the use of a particular system would be effort-free, whilst the perceived usefulness is the degree to which a person believes that using a particular system would enhance his or her job performance. He also notes that the attitude of users towards the use of technology determines adoption or rejection of technology, and this also indirectly is influenced by both PEoU and PU. Accordingly, PU is also driven by system design and features, whilst PEoU is influenced by self-efficacy and effort reduction.¹⁰ The implication is that PEoU is dependent on human characteristics such as human beliefs on their capabilities as being the major determinant in the choice of technology acceptance. That is, the effort invested in the use of a particular technology is not difficult, then, there is a tendency of acceptance.

Studies conducted revealed the relationships that exist between the two concepts of TAM namely PEoU and PU.¹¹ TAM as adopted in this study is based on its relationship with the variables of the research namely lecturers' reflections in the use of ERTL. Basically, the study focuses on how lecturers perceive their use of various technologies in the delivery of their respective modules during the COVID-19 pandemic at a public university in South Africa.

Remote Online Learning

Remote online teaching and learning is used to refer to the type of learning that takes place outside the classroom where teachers and students remain connected online and engaged with the content whilst working in the comfort of their homes.¹² Online learning is a subcategory of distance learning, used to refer to web-based training, e-learning, internet/web-based learning, cyberlearning and virtual learning, among others.

¹⁰ Fred D.Davis, "Perceived usefulness, Perceived Ease of Use, and User Acceptance of Information Technology." *MIS Quarterly* (1989): 319-340.

¹¹ Oluwole Durodolu, "Technology Acceptance Model as a predictor of using information system'to acquire information literacy skills." *Library Philosophy & Practice* (2016); Venu Madhav Sunkara, and Rajasekhara Rao Kurra. "An analysis of learner satisfaction and needs on e-learning systems." *International Journal of Computational Intelligence Research* 13, no. 3 (2017): 433-444; Mulugeta Hayelom Kalayou, Berhanu Fikadie Endehabtu, and Binyam Tilahun. "The applicability of the modified technology acceptance model (TAM) on the sustainable adoption of eHealth systems in resource-limited settings." *Journal of Multidisciplinary Healthcare* 13 (2020): 1827.

¹² Kecia Ray, *What is Remote Learning? Tech & Learning*. (2020) <https://www.techlearning.com/how-to/what-is-remote-learning>

These terms are sometimes used interchangeably.¹³ It has been argued that well-planned online learning is carefully prepared, developed over approximately six to nine months and takes two or three iterations before academics are used to the process and have made the necessary changes.¹⁴ Accordingly, in planning effective online learning, consideration is given to the mode, pacing, student-lecturer ratio, pedagogical choices, synchrony of learning, academic and student roles, assessment roles, and mode of feedback, among others.¹⁵ Some scholars attribute this to useful means in transiting to the 4IR.¹⁶

However, the modus operandi of ERTL works in contrast to well-planned online learning due to the hasty and rushed shifts surrounding its online activities. Evidence of the application of emergency remote teaching and learning has been pictured during student protests in South Africa, displacement in Syria, Hurricane Katrina in the United States of America, and earthquakes in New Zealand.¹⁷ This approach to ERTL offers a temporary shift in the mode of instructional delivery to an alternative delivery mode because of crisis through the full application of remote teaching solutions for instruction that would have been delivered traditionally or through hybrid courses and will return to the status quo once the crisis is abated.¹⁸ Lecturers in a study on ERTL conducted during student protests at a South African university perceived this approach as an inferior strategy to learning. Some of the reasons attributed to online mode of instruction as an inferior strategy to learning as perceived by lecturers is the creation of a different set of accountability protocols that are less effective than face-to-face, lack of personal engagement, difficulty in conceptualizing teaching and learning through an online mode, issues with the use of online tools and digital divide among others.

Challenges of Remote Teaching and Learning

Online teaching and learning have been characterised by huge challenges. This was ascribed to the many requirements from academics namely, pedagogical and technical support as well as expertise in course development and facilitation skills, in addition to attitude to learning such skills.¹⁹ According to some researchers if the above-mentioned are not in place, then, the aim of online teaching and learning is defeated.²⁰ Digital inequality remains one of the greatest challenges associated with online learning, especially, the dichotomy that exists between persons with access to online resources as well as digital skills and those without.²¹ Evidence from scholars revealed such challenges as lack of infrastructure, inadequate hardware and software, slow internet connectivity, low bandwidth, internet costs, mobile phone subscription instability, and

¹³ Trace A. Urdan, and Cornelia C. Weggen. "Corporate eLearning: Exploring a New Frontier." (WR Hambrecht & Co., 2000).

¹⁴ Charles B Hodges, Stephanie Moore, Barbara B. Lockee, Torrey Trust, and M. Aaron Bond. "The Difference Between Emergency Remote Teaching and Online Learning." *Educause Review*, 27(1), (2020):1-9. <http://hdl.handle.net/10919/104648>

¹⁵ Barbara Means, Marianne Bakia, and Robert Murphy. *Learning Online: What Research Tells us About Whether, When and How*. Routledge, (2014). <https://doi.org/10.4324/9780203095959>

¹⁶ Peter Merisi, and Ansurie Pillay. "Emergency Remote Teaching in Higher Education: How Academics Identify the Educational Possibilities." *Alternation African Scholarship Book Series (AASBS)*, (2020): 74-91.

¹⁷ Laura Czerniewicz, Henry Trotter, and Genevieve Haupt. "Online Teaching in Response to Student Protests and Campus Shutdowns: Academics' Perspectives." *International Journal of Educational Technology in Higher Education* 16, no. 1 (2019): 1-22. <https://doi.org/10.1186/s41239-019-0170-1>

¹⁸ Hodges, Moore, Lockee, Trust, and Bond. "The difference between emergency remote teaching and online learning."

¹⁹ Merisi and Pillay. "Emergency Remote Teaching in Higher Education: How Academics Identify the Educational Possibilities."

²⁰ Curtis J. Bonk and Graham, Charles. *The Handbook of Blended Learning: Global Perspectives, Local Design*. (Pfeiffer Publishing, 2006); Jared Keengwe, and Terry T. Kidd. "Towards Best practices in Online Learning and Teaching in Higher Education." *MERLOT Journal of Online Learning and Teaching* 6, no. 2 (2010): 533-541.

²¹ Drick Boyd, "What would Paulo Freire think of blackboard: Critical Pedagogy in an Age of Online Learning." *The International Journal of Critical Pedagogy* 7, no. 1 (2016).

student preparedness, among others which impede the effective execution of online learning.²² According to these researchers, maximizing the benefits of online learning and effective participation in the 4IR is determined by the above-mentioned challenges. 4IR is abbreviation used to refer to the fourth industrial revolution, a period of transformation characterised by massive deployment of technologies and automation of work previous executed by humans.²³ Thus, the implication is that reaping the benefits of online learning as well as participating effectively in the 4IR demands the provision of adequate ICT infrastructure (hardware and software), high speed internet connectivity, reduced data cost, satisfactory staff and students preparedness among others.

Educational Possibilities in Online Teaching and Learning

Despite the challenges associated with online teaching and learning, this approach has proven to be of great benefit to educational institutions in times of crisis resulting from contextual disruptions and pandemics around the world.²⁴ Arguments have been posited that online teaching and learning, including ERTL could therefore scale down costs brought about by expensive infrastructure, large class sizes and heavy teacher workloads, erase borders and bring people together.²⁵ Accordingly, innovative online learning platforms such as Moodle, Zoom, Microsoft Teams, Skype, and video conferencing can provide simultaneous interactions and a viable communication environment between students and teachers.²⁶ It is believed that online learning offers some useful advantages which include the ability for students to learn wherever they are, and at their convenience without restriction, as well as the opportunity to go through an already delivered lesson repeatedly for better understanding.²⁷

However, one major problem of e-learning is the relevance of pedagogies. Researchers have made strong claims about the move to online teaching without online pedagogies.²⁸ The application of traditional pedagogies in online teaching platforms could prove to be ineffective, as online teaching requires a pedagogy for online teaching.

- ²² Christian Kayembe, and Danielle Nel. "Challenges and Opportunities for Education in the Fourth Industrial Revolution." *African Journal of Public Affairs* 11, no. 3 (2019): 79-94; Emily Bagarukayo, and Billy Kalema. "Evaluation of eLearning Usage in South African Universities: A Critical Review." *International Journal of Education and Development using ICT* 11, no. 2 (2015); Dagogo William Legg-Jack,. "Readiness for the Fourth Industrial Revolution: Experiences of Students in Practical Courses During the COVID-19 Pandemic at a University in South Africa." In *Future of Work, Work-Family Satisfaction, and Employee Well-Being in the Fourth Industrial Revolution*, IGI Global (2020): 12-29. <https://doi.org/10.4018/978-1-7998-3347-5.ch002> ; Dagogo William Legg-Jack,. Digitalisation of Teaching and Learning in Nigeria Amid COVID-19 Pandemic: Challenges and Lessons for Education 4.0 and 4IR. *Ponte International Journal of Sciences and Research*, (2021): 77(10/1). <https://doi.org/10.21506/j.ponte.2021.10.10>
- ²³ Schwab, Klaus. *The Fourth Industrial Revolution*. Geneva: World Economic Forum, (2016).
- ²⁴ Negin Dahya,. "Education in Conflict and Crisis: How Can Technology Make a Difference? A Landscape Review." (2016). <https://inee.org/resources/landscape-review-education-conflict-and-crisis-how-can-technology-make-difference>; Joe Hallgarten, "Evidence on Efforts to Mitigate the Negative Educational Impact of Past Disease Outbreaks." (2020).
- ²⁵ Mary Kalantzis, and Bill Cope. "After the COVID-19 crisis: Why Higher Education May (and Perhaps Should) Never be the Same." *Educational Philosophy and Theory* 40, no. 1 (2020): 51-55. <https://doi.org/10.46786/ac20.9496> ; Jaco Du Preez, and Saurabh Sinha. "Higher Education Leadership in the Era of the Fourth Industrial Revolution." *The Thinker* 83, no. 1 (2020).
- ²⁶ W. T. Chinyamurindi, "Mar 17. Learning in the Time of Covid-19, Mail and Guardian." (2020). <https://mg.co.za/article/2020-03-17-learning-in-the-time-of-covid-19/>
- ²⁷ Melody W.Alexander, Allen D. Truell, and Jensen J. Zhao. "Expected Advantages and Disadvantages of Online learning: Perceptions from College Students who have not taken Online Courses." *Issues in Information Systems* 13, no. 2 (2012): 193-200; Stephen Armstrong, What are the Advantages and Disadvantages of Online Learning? (2013). <https://elearningindustry.com/advantages-and-disadvantages-of-online-learning> ; Isabelle Clover, Advantages and Disadvantages of eLearning. Retrieved from eLearning Industry: (2017). <https://elearningindustry.com/advantages-and-disadvantages-of-elearning>; Christopher Pappas, Advantages and Possible Limitations of Online Learning. (2015). <https://elearningindustry.com/advantages-and-possible-limitations-of-online-learning>.
- ²⁸ Derek Anderson, Sandra Imdieke, and N. Suzanne Standerford. "Feedback Please: Studying sSlf in the Online Classroom." *International Journal of Instruction* 4, no. 1 (2011):3-16; Mansureh Kebritchi, Angie Lipschuetz, and Lilia Santiago. "Issues and Challenges for Teaching Successful Online Courses in Higher Education: A Literature Review." *Journal of Educational Technology Systems* 46, no. 1 (2017): 4–29. <https://doi.org/10.1177/0047239516661713>.

A study that explored the experiences of academics in one of the South African Universities in the use of online learning reported a decline in students' performance and engagement, whilst in other studies, the online approach enhanced learning because students were exposed to different modes of teaching, which included the use of videos.²⁹ In another study, it was found that online teaching during the COVID-19 pandemic opened academics up to develop innovative pedagogies using various technological platforms; the flexibility of learning virtually, use of various online tools for an efficient and effective learning environment.³⁰

METHODOLOGY

The study which is located within the interpretive paradigm employed a qualitative case study design to answer the research questions posed. The study aimed to explore science and technology, lecturers' reflections on emergency remote teaching and learning as well as emergent possibilities in the use of ERTL at a South African university during the lockdown. The choice of case study design was premised on the fact that it affords the researchers the opportunity for an in-depth study of a single entity.³¹ The single entity, as considered in this study are the lecturers from the science and technology cluster at a public university in South Africa. The focus was to explore their experiences and interpretations of emergency remote teaching and learning and the possibilities in the integration of ICTs as a means of instruction during the COVID-19 through their own perception.³²

The sample for the study consisted of nine participants that were purposively and conveniently recruited from the Science and Technology Cluster. They are a representation of lecturers from the Biological/Life Sciences, Natural Sciences, Physical Sciences and Technology Education. Purposive sampling is a deliberate selection of participants that possess the information required to respond to the questions asked.³³ On the other hand, convenience sampling is the collection of data from those willing to participate in a study and are the most approachable.³⁴ Considering a strict adherence to the COVID-19 protocol of social distancing, the study opted for a semi-structured questionnaire as a data generation instrument, which was designed on Google forms- an online medium. Some of the questions asked to elicit information included the effect of remote teaching on learning of practical modules, challenges to the learning of modules because of the lockdown due to COVID-19, and the availability of necessary digital tools and infrastructure at their current location to cater for remote learning. Data generated was analysed thematically. The data was read and reread to have a perfect understanding of participants' experiences. The next step was coding and noting similar categories. This was followed by grouping and naming before reporting. The Study also followed a strict ethical research protocol. Prior to the commencement of the research, ethical clearance was applied for and received from the University Ethics and Research Committee. The aim of the research was explained to participants on the Google form, and their confidentiality was granted. Consequently, all the data was reported anonymously in the format.

²⁹ Laura Czerniewicz, Henry Trotter, and Genevieve Haupt. "Online Teaching in Response to Student Protests and Campus Shutdowns: Academics' Perspectives." *International Journal of Educational Technology in Higher Education* 16, no. 1 (2019): 1-22. <https://doi.org/10.1186/s41239-019-0170-1>

³⁰ Shivangi Dhawan, "Online learning: A Panacea in the Time of COVID-19 Crisis." *Journal of educational technology systems* 49, no. 1 (2020): 5-22. <https://doi.org/10.1177/0047239520934018>

³¹ Bent Flyvbjerg, *Case study*. In K. Norman, Denzin, S. Yvonna, & Lincoln (Eds.), *The Sage Handbook of Qualitative Research* (2011). (4th ed., pp. 301–316) Thousand Oaks: CA: Sage.

³² Norman K. Denzin, and Yvonna S. Lincoln. "The Sage Handbook of Qualitative Research." (2005).

³³ L. L. Cohen, Manion, and K. Morrison. *Research Methods in Education* (7th ed., pp. 456–475). London, UK: Routledge (2011).

³⁴ Scholtz, Salome E. "Sacrifice is a Step Beyond Convenience: A Review of Convenience Sampling In Psychological Research In Africa." *SA Journal of Industrial Psychology* 47, no. 1 (2021): 1-12. <https://doi.org/10.4102/sajip.v47i0.1837>

RESULTS

This section presents the results from lecturers' reflections on ERTL in a university in South Africa. Two major themes emerged from the findings namely challenges and opportunities in the engagement of ERTL. Sub-themes related to the challenges included lecturers' lack of readiness and uncertainties associated with ERTL, students' internet-related issues and the inability to teach modules with practical components online.

Challenges to Emergency Remote Teaching and Learning

Lecturers' lack of readiness and uncertainties associated with ERTL

Participants in the study were vociferous about the challenges associated with emergency remote teaching and learning. This, they expressed in their various comments:

“Uncertainty and unclear modus operandi when it comes to online teaching, made us realise we are not ready for online teaching as a school.”

This comment indicates a lack of readiness from the participant to engage in the emergency remote teaching and learning. Another participant alleged that:

“...online teaching is different from face to face. For online teaching, there is the need to prepare in advance. The time frame is also a factor. One needs to find interactive ways of making the class interesting for online teaching. The time to prepare for online teaching was also limited.”

Findings from both comments above reveal that lecturers were not prepared to engage in the ERTL due to the time frame. From the first comment, the participant expressed uncertainty due to the lack of a given procedural approach to online delivery, whilst the second respondent complained about the issue related to the limited time for lecturers to prepare for the ERTL.

Students' Internet-related Challenges

Participants lamented on internet connectivity, data-related issues and training as it ensures students' participation in online learning. One participant said: *Internet connectivity issues mean not all students are on board*". On data and signal issues, another participant added that: *It might not be perfect due to data challenges and poor reception of signals*". From both comments, it is evident that internet connectivity, data and signal strength inhibits students' participation in the ERTL. Another participant articulated:

“The moratorium on working remotely with students on the basis that not all students have access to Moodle and other remote teaching and learning infrastructure has crippled me mentally. I am unsure how to proceed in the prevailing circumstances”.

Inability to Execute Practical Activities Online and the Need for Blended Learning

Participants expressed concern on how impossible it would be to teach the practical aspects of their Modules online and the need for a blended learning approach. A participant pointed out that:

“I can't develop a range of science process skills online. Regarding practical work, online teaching/learning is more of a minds-on and less of a hands-on activity. You can't teach and assess manipulative skills online e.g there is no better way of teaching and learning how to make a standardised 2 M nitric acid solution than practically making one in the lab. Managing a traditional classroom is different from managing an online class. It is not possible to develop and monitor active learning remotely”

The comment from the excerpt above revealed the difficulty associated with teaching and assessing modules that involve practical components online. The participant also stressed the possibility to manage and monitor active learning on ERTL. Similarly, another participant who commented expressed doubt on the possibility of teaching subjects that contain practical work. The participant posited:

“I am yet to understand the possibility of teaching practical subjects remotely. Currently, I still believe something has to be done for students to have access to laboratories to perform both hands-on and minds-on aspects of practical activities. This has been a big concern even when we had face-to-face lectures, and we were working on improving the status quo...to the point of initiating a project to check whether this is achieved by our new BEd curriculum. Students have not shown the appreciation of practical activities in their learning, which will or already does impact their teaching methods when they get into schools. The social interactions during instruction also play a very big role...so says social constructivism. Some form of interaction is still very necessary for these kinds of subjects...we definitely cannot go full remote instruction”.

The participant in the comment above further expressed concern on how students have not given much attention to the practical aspects of their module before the advent of the ERTL. According to the participant, there are some levels of social interactions that exists in traditional face-to-face learning that is crucial in students learning and are not possible in an online environment. Hence, the conclusion that remote learning is not feasible, and is suggestive of a blended learning approach because of the practical components involved. The last participant that commented on this, expressed concern about the lack of practical as well as the possibility of conducting assessment remotely. The participant said:

“.... I am concerned about the lack of hands-on followed by minds-on practical activities. With regards to remote assessments, I am concerned on whether the students will really do their work themselves.

Further analysis of the excerpt above reveals that the participant also expresses the uncertainty that clouds students' assessment regarding the right ownership of the work submitted by the student, which might be termed as academic dishonesty.

Opportunities for Improved Digital Skills and Use of Diverse Online Platforms by Lecturers and Students

Despite the challenges brought about by the COVID-19 pandemic, it has created opportunities for lecturers and students to improve on their digital skills knowledge. One of the participants expressed that the ERTL provided exposure to:

“Constantly practicing the effective use of digital skills provided by Zoom, Moodle and other digital platforms like google classroom.”

The implication is that “practice makes man perfect”, and as a result, there would be perfection in the development of digital pedagogical knowledge in the use of these online platforms for teaching and learning. This has been confirmed because the outbreak of the pandemic has also empowered academics to search for improved knowledge in the use of online teaching as pointed out by this participant:

“My digital skills have improved during the last 2 weeks. Lots of learning happening on my side. I do know it is a better version and will hopefully improve with student feedback”.

Another participant commented:

“I have upskilled myself through online tutorials about online teaching”.

Also, another participant added:

“I learned lots of new tools and refreshed my digital pedagogy knowledge. Should the lesson be set up on Moodle works, it would ensure all students have to engage with the content, something that is difficult to achieve in large classes. After I uploaded my first YouTube video, I was so proud of the pedagogy.”

Another participant submitted:

“It has allowed me to acquire more skills for virtual learning that I wouldn't have ordinarily given much preference to, I have planned and sorted out my lectures for easy implementation. I have also converted my notes into tools for virtual learning”.

Similarly, another participant who enjoyed the privilege of developing digital skills articulates that:

“Redesigning materials from simple print or presentations to more interactive forms eg. integrating audio and short video with text summaries or introductions. Developing self-assessment quizzes to ensure engagement and learning. Rethinking practical activities to focus on skills that can be developed virtually”.

Another participant added:

“I have prepared the lectures which are simplified for online teaching.

The excerpts above reveal that the ERTL employed due to the COVID-19 pandemic created room for the participants to acquire more skills related to online learning which were not considered necessary prior to this time.

Furthermore, another participant believed the emergency remote learning created room for: *“improved technical skills by students; increased use of Moodle by students, anytime learning using recorded lectures”.* The implication is the students' ICT skills improved as well as their usage of the Learning Management System (Moodle). This is suggestive that the digital competency levels of students improved in the use of online learning platforms because they participated in the emergency remote learning.

Also, the ERTL also exposed lecturers to the use of other online applications for teaching and learning such as Moodle (Learning Management System), Zoom and WhatsApp. This is evident in some comments below.

“I am currently using Moodle to communicate with the PGCE students. I have conducted zoom meetings with postgraduate students. I use WhatsApp to communicate with PGCE (Postgraduate Certificate in Education) and other postgraduate students”.

“The majority do not have internet connectivity via computers so we use WhatsApp to reach them. All learning materials are also shared on the specific module WhatsApp groups.”

Another participant articulates that:

“I am delaying formal teaching until logistical issues are addressed. Making resources available for students who have access and want to learn but not setting any time limits or deadlines so that other students are not left behind. Creating WhatsApp groups for 'smaller' modules and encouraging students to connect with me this way. Sending pdf files to students via WhatsApp if this is more accessible to them.”

Analyses of the excerpts above reveal that learning resources during emergency remote teaching and learning were disseminated via Moodle, Zoom and WhatsApp platforms. The participant in the first comment articulates the use of Moodle, Zoom and WhatsApp in conducting ERTL with Post Graduate Diploma in Education students. According to the participant in the second excerpt, the choice of WhatsApp as a medium of online learning was premised on lack of internet connectivity on computers, whilst that of the second was based on flexibility so that students could have access to their learning materials anytime.

Flexibility with Due Dates

Another critical finding that emerged from the analyses of the data generated is the need for lecturers to be compassionate and caring with students, having understood the challenges associated with the ERTL.

One of the participants has this to say:

“I will be flexible with due dates for assignments in case some students do not get the announcements on time due to connectivity issues”.

The other participants expressed concern on a similar issue said that:

“...expectations are different (lowered) in terms of deadlines for completion/submission of assessment tasks, plagiarism and grading. Many students are technically challenged - problems with connecting via Zoom/skype, sending assignments via email, scanning handwritten assignments, using MS word/excel/ppt, completing assessments (e.g quizzes, chats) on moodle. Resistance to online teaching/learning by some students.”

From the analyses of comments from both participants above, it can be gleaned that these lecturers display some levels of compassion and patience with their students knowing the challenges confronting students' participation in the ERTL.

Training for Lecturers and Availability of ICT Infrastructure

Participants in the study remarked that the university provided training on online learning as well as information and communication technology infrastructure to enable them to engage in the ERTL. A participant said:

“Yes the university has provided training for staff and they have provided routers and sim cards for internet connection.”

Another participant narrated that:

I have access to a laptop and internet connection and thus, should be able to do remote teaching. I am still learning about digital teaching tools and their applications.”

Both comments are indicative of the provision of the needed training and ICT infrastructure for lecturers to ensure that they engage effectively in the ERTL.

DISCUSSION OF FINDINGS

This section presents the discussions of findings from the themes that emerged in the analyses of data generated. Two broad themes emerged namely, challenges and opportunities to ERTL. Challenges include lecturers' lack of readiness and uncertainties associated with ERTL, students' internet-related issues as well as inability to execute practical activities online and the need for blended learning. Whilst the opportunities created by the pandemic cuts across the improved digital skills and use of diverse online platforms by lecturers and students as well as training for lecturers. The other sub-theme that emerged is on lecturers'

flexibility on due dates with students. In the following section, the discussions on challenges are presented, followed by the opportunities, whilst that of flexibility comes at the end.

Lecturers' Lack of Readiness and Uncertainties Associated with ERTL

Participants in the study expressed concern about the uncertainties associated with ERTL and their lack of readiness to engage in the process. This finding agrees with another study that found that there was very limited time for institutions to provide online materials, technologies, and the necessary pedagogical support for online teaching and learning at the onset of the COVID-19 pandemic.³⁵

Students' Internet-related Issues

The study revealed internet-related challenges such as connectivity and data problems. These findings first, corroborate two other studies that revealed data and internet connectivity as issues related to why students find it difficult to participate in online learning during the lockdown in South Africa because of the COVID-19 pandemic.³⁶

The finding from both participants above confirms the assumption of another participant who raised an issue based on students' economic background that: "*the socio-economic situation in South Africa raises assumptions. For example, the assumption that university students do not have access to the internet at home.*" Also, the last finding validates other related results.³⁷ In their finding, it was reported that students' diversity in terms of socio-economic status is an impediment to swiftly switching to remote learning. According to them, there is a need to consider the peculiarity of the South African context, where such problems as data, internet connectivity and poor network signals constitute a challenge for students from low socio-economic backgrounds. It was propounded that only 24% of the population has access to the internet. Also highlighted as a challenge is the aspect of training.³⁸ The study indicated that students did not receive any training to participate in the emergency remote learning, thus, their participation is hampered. This result is in consonance with another finding which revealed that students missed many tasks, duties, and communications with teachers, which are essential in the educational process activities because of the inability to use some of the online tools.³⁹ Consequently, this will result in a negative attitude towards e-learning, since the students were not trained, which implies that the perceived ease of use is poor.⁴⁰

Inability to Execute Practical Activities Online and the Need for Blended Learning

It was revealed in the study that remote learning cannot cater for all aspects of science and technology modules due to the practical components involved; hence, it is suggestive that the inclusion of a blended learning approach will close the gap created by online learning of courses that have task-oriented activities. This finding is consistent with another result which revealed that there is difficulty in applying online learning

³⁵ Wei Bao, "COVID-19 and Online Teaching In Higher Education: A Case Study of Peking University." *Human Behavior and Emerging Technologies* 2, no. 2 (2020): 113-115. <https://doi.org/10.1002/hbe2.191>

³⁶ Bekithemba Dube, "Rural Online Learning in the Context of COVID 19 in South Africa: Evoking an Inclusive Education Approach." *REMIE: Multidisciplinary Journal of Educational Research* 10, no. 2 (2020): 135-157; Legg-Jack, «Readiness for the Fourth Industrial Revolution, 12-29.

³⁷ Nomalungelo Ngubane, Sibonelo Blose, Pinky Mthembu, and Tholani Hlongwa. "Transitioning From Face-to-Face to Remote Teaching in the Context of COVID-19 Pandemic: Reflections of South African Emerging Academics." *Technology-Based Teaching and Learning in Higher Education During the Time of COVID-19* (2020): 54-73.

³⁸ Wondwosen Tamrat, and Damtew Teferra. "COVID-19 Poses a Serious Threat to Higher Education." *University World News* 9 (2020).

³⁹ Mohammad Mahyoob, "Challenges of e-Learning During the COVID-19 Pandemic Experienced by EFL Learners." *Arab World English Journal (AWEJ)* 11, no. 4 (2020).

⁴⁰ Davis, "Perceived Usefulness, Perceived Ease of Use, And User Acceptance of Information Technology." 319-340.

in the study of practical sessions and courses.⁴¹ According to them, there is a limited level of interaction between students in the online course learning environment when compared to a traditional face-to-face class. According to a scholar, the use of digital gadgets seems like an extended arm for students, but there is no replacement for teacher-student interaction; hence to solve the issue related to inclusion, there is a need for a blended approach, which is an integration of face-to-face and online learning experiences.⁴² Certainly, blended learning facilitates interaction, improve collaboration and social relationships among learners and between learners and teachers.⁴³ Also found was an expression of uncertainty in the areas of assessment with respect to students' ownership of work submitted. This result corroborates a study where academic dishonesty was reported as a challenge associated with online learning.⁴⁴ Assessment in online learning is considered a challenge for institutions that operates face-to-face learning, as the control shift towards the students makes it hardly possible to ensure that students are not cheating.⁴⁵ In this regard, the adoption of an online approach for the learning of modules with practical components is not considered useful according to TAM, since its usage for the learning of practical modules is not completely possible.⁴⁶

Opportunities for Improved Digital Skills and Use of Diverse Online Platforms by Lecturers and Students

The study found that the ERTL because of the COVID-19 pandemic created room for the participants to acquire more skills related to online learning which were not considered necessary prior to this time. And as a result, there is the development of knowledge on how to plan for virtual learning (technological pedagogical knowledge), which is seen in how both participants converted their learning materials for online-ready delivery resources. According to the second excerpt, the development of learning materials for virtual compatibility is to allow for skills that can be developed virtually. There is no doubt that the outbreak of the COVID-19 pandemic came as a disruption to the traditional face-to-face approach to teaching and learning, but it exposed lecturers to new digital pedagogical skills. These findings are consistent with those of other scholars who found that the outbreak of COVID-19 exposed lecturers to diverse digital pedagogies that aided the improvement of their professional practice.⁴⁷ According to them, lecturers undergo the process of online learning to embrace new ways of teaching as well as understand remote pedagogies and their benefits for quality teaching and learning. Accordingly, these academics got exposure to online learning platforms which if applied effectively, may stimulate learning.⁴⁸ Also, students improved on their online usage. This then will alter their attitude towards the acceptance of ERTL, otherwise, it is not considered usable according to TAM's PEOU.⁴⁹

⁴¹ Marwa Mohamed Zalat, Mona Sami Hamed, and Sarah Abdelhalim Bolbol. "The Experiences, Challenges, and Acceptance of E-Learning As Tool for Teaching During the COVID-19 Pandemic Among University Medical Staff." *PLoS One* 16, no. 3 (2021): e0248758. <https://doi.org/10.1371/journal.pone.0248758>

⁴² D. Randy Garrison, and Norman D. Vaughan. *Blended Learning in Higher Education: Framework, Principles, and Guidelines*. John Wiley & Sons, 2008.

⁴³ Tiziana Guzzo, Patrizia Grifoni, and Fernando Ferri. "Social Aspects and Web 2.0 Challenges in Blended Learning." In *Blended Learning Environments for Adults: Evaluations and Frameworks*, pp. 35-49. IGI Global, 2012.

⁴⁴ Fiseha M. Guangul, Adeel H. Suhail, Muhammad I. Khalit, and Basim A. Khidhir. "Challenges of Remote Assessment in Higher Education in the Context of COVID-19: A Case Study of Middle East College." *Educational Assessment, Evaluation and Accountability* 32, no. 4 (2020): 519-535. <https://doi.org/10.1007/s11092-020-09340-w>

⁴⁵ Albert Munoz, and Jonathon Mackay. "An Online Testing Design Choice Typology Towards Cheating Threat Minimisation." *Journal of University Teaching and Learning Practice* 16, no. 3 (2019): 5.

⁴⁶ Davis, "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology." 319-340.

⁴⁷ Shivangi Dhawan, "Online Learning: A Panacea in the Time Of COVID-19 Crisis." *Journal of educational technology systems* 49, no. 1 (2020): 5-22. <https://doi.org/10.1177/0047239520934018>; Ngubane, et al., "Transitioning from Face-to-Face To Remote Teaching in the Context Of COVID-19 Pandemic, 54-73.

⁴⁸ W. T. Chinyamurindi, "Mar 17. Learning in the Time of Covid-19, Mail and Guardian." (2020). <https://mg.co.za/article/2020-03-17-learning-in-the-time-of-covid-19/>

⁴⁹ Davis, "Perceived Usefulness, Perceived Ease of Use, And User Acceptance of Information Technology." 319-340.

From the result of the study, it was also revealed that both lecturers and students were exposed to the use of different online platforms such as Moodle, Zoom and WhatsApp platforms. This finding is consistent with a recent study where it was revealed that diverse online platforms such as Moodle (Learning management system), Zoom and WhatsApp were employed in the delivery of teaching and learning during the COVID-19 pandemic.⁵⁰ Accordingly, the application of emergency remote teaching and learning from the analyses of the various comments above prove beneficial to participants. The implication according to TAM is that participants' attitude in the adoption of online technology, is invariably positive since it improved their competency level due to usage.⁶ For students, the process also aided access to learning materials anytime. This finding aligns with another study where it was found that the use of online learning during the pandemic created room for students to learn the use of different e-learning platforms such as Moodle, Zoom and WhatsApp among others.⁵¹ This approach to learning makes it easy for students to access learning resources anytime and anywhere. This confirms the definition of the construct, perceived usefulness of technology, as the participants affirm that the ERTL has exposed both lecturers and students to the improvement and use of diverse virtual platforms in the performance of different educational tasks.

Training for Lecturers and Provision of ICT Infrastructure

It was highlighted in the study that lecturers were trained, and certain ICT infrastructure was provided for them to ensure the effective execution of ERTL. This result highlights a similar finding in a study where it was reported that to ensure academics proceeded effectively with the delivery of their lectures remotely, several sessions of training were carried out.⁵² In ensuring effectiveness in the use of online platforms for teaching and learning, there is a need to further develop staff digital pedagogies.⁵³ As argued by the World Bank, staff need to be supported technically, socially and morally so that they can effectively deliver online classes.⁵⁴ Hence, considering the provision of TAM, such training will influence the attitudes of lecturers thereby leading to Ease of Use.

Flexibility with Due Dates

The result from the study also revealed that lecturers were flexible with their students on due dates considering the challenges associated with the ERTL. This finding agrees with Merisi and Pillay whose study also revealed the need for academics to be concerned and care for their students' participation in online learning.⁵⁵ This also resonates with the concept of the caring teaching approach which recognises that 'teachers' pedagogical orientations are more 'moral and emotional' than technical and methodological.'⁵⁶

CONCLUSION AND RECOMMENDATIONS

The outbreak of the COVID-19 pandemic brought several disruptions to economies globally. Many organisations and institutions were shut down as a result of the lockdown imposed to curb the spread of the virus. Higher educational institutions in a bid to circumvent the effect of the lockdown resulting from

⁵⁰ Legg-Jack, Digitalisation of Teaching and Learning in Nigeria amid COVID-19 Pandemic, 77. <https://doi.org/10.21506/j.ponte.2021.10.10>

⁵¹ Nelly Mwale, and Joseph Chita. "Higher Education and Programme Delivery In The Context Of COVID-19 and Institutional Closures: Student Responses to the Adoption of E-Learning at A Public University in Zambia." *Technology-Based Teaching and Learning in Higher Education During the Time Of COVID-19* (2020): 9-33.

⁵² Ngubane, et al., "Transitioning from Face-to-Face to Remote Teaching in the Context Of COVID-19 Pandemic, 54-73.

⁵³ Kebritchi, et al., "Issues and Challenges for Teaching Successful Online Courses in Higher Education, 4-29.

⁵⁴ World Bank. Remote Learning and COVID-19 The Use of Educational Technologies at Scale Across an Education System as a Result of Massive School Closings in Response to the COVID-19 Pandemic to Enable Distance Education And Online Learning. (2020). Retrieved from <https://documents1.worldbank.org/curated/en/266811584657843186/pdf/Rapid-Response-Briefing-Note-Remote-Learning-and-COVID-19-Outbreak.pdf>

⁵⁵ Merisi and Ansurie. "Emergency Remote Teaching in Higher Education, 74-91.

⁵⁶ K. Gholami and K. Tirri. "The Teachers' Perceived Dimensions of Caring Practice: A Quantitative Reflection on the Moral Aspect of Teaching." *Education Research International* (2012).

the COVI-19 pandemic resorted to emergency remote teaching and learning. Although the disruption ushered in some challenges, there seemed to be some inherent educational possibilities. The study located in the interpretive paradigm adopted a case study design, with the Technology Acceptance Model explored lecturers' reflection on emergency remote teaching and learning at a university in South Africa.

The findings suggest two major themes related to the reflections of lecturers based on the ERTL namely, challenges and opportunities. On the challenges, the study found that the ERTL was inhibited by lack of preparedness by lecturers, inability to teach modules with practical components online, lack of training for students in the use of online tools and platforms, lack and poor internet connectivity as well as data bundle issues. For opportunities, it was highlighted that ERTL has created rooms for improved digital skills in the use of diverse online platforms by lecturers and students, training for lecturers' as well as the provision of ICT infrastructure, the provision of training and certain ICT infrastructure by the university to ensure the effective implementation of ERTL, exposure to diverse technologies and online platforms which aided the development of e-learning pedagogies. For students, the ERTL exposed them to the use of various online platforms as well, whilst the study pointed out the need for a blended learning approach for modules that involves practical components.

From the findings of the study, it is obvious that the post-COVID-19 period has revealed the inherent challenges associated with ERTL and the possible opportunities to tap from. The peculiarity of the South African context has been brought to the fore, where those from disadvantaged backgrounds tend to suffer challenges in this aspect of learning. Besides, having made several preparations to migrate from contact to online learning, it will be difficult for higher education to completely return fully to face-to-face learning. Therefore, the study recommends the need for the government to collaborate with stakeholders in other sectors, such as civil societies, businesses, policymakers, institutional regulatory bodies, educational professionals and the international community to ensure increased access to digital infrastructure for students, especially those from disadvantaged backgrounds. Also, training should be carried out by the university and other concerned stakeholders for lecturers and students in the use of online tools and platforms.

BIBLIOGRAPHY

- Alexander, Melody W., Allen D. Truell, and Jensen J. Zhao. "Expected Advantages and Disadvantages of Online Learning: Perceptions From College Students Who Have Not Taken Online Courses." *Issues in Information Systems* 13, no. 2 (2012): 193-200.
- Anderson, Derek, Sandra Imdieke, and N. Suzanne Standerford. "Feedback Please: Studying Self in the Online Classroom." *International Journal of Instruction* 4, no. 1 (2011):3-16.
- Armstrong, Stephen. What are the Advantages and Disadvantages of Online Learning? (2013). <https://elearningindustry.com/advantages-and-disadvantages-of-online-learning>.
- Bagarukayo, Emily, and Billy Kalema. "Evaluation of eLearning Usage in South African Universities: A Critical Review." *International Journal of Education and Development using ICT* 11, no. 2 (2015).
- Bao, Wei. "COVID-19 and Online Teaching in Higher Education: A Case Study of Peking University." *Human Behavior and Emerging Technologies* 2, no. 2 (2020): 113-115. <https://doi.org/10.1002/hbe2.191>
- Black, Paul, and Dylan Wiliam. "Developing the Theory of Formative Assessment." *Educational Assessment, Evaluation and Accountability (formerly: Journal of Personnel Evaluation in Education)* 21, no. 1 (2009): 5-31. <https://doi.org/10.1007/s11092-008-9068-5>
- Bonk, Curtis, .J. & Graham, Charles. *The Handbook of Blended Learning: Global Perspectives, Local Design*. (2006). Pfeiffer Publishing.
- Boyd, Drick. "What would Paulo Freire Think of Blackboard: Critical Pedagogy in an Age of Online Learning." *The International Journal of Critical Pedagogy* 7, no. 1 (2016).

- Chinyamurindi, W. T. "Mar 17. Learning in the Time of Covid-19, Mail and Guardian." (2020). <https://mg.co.za/article/2020-03-17-learning-in-the-time-of-covid-19/>
- Clover, Isabelle. Advantages and Disadvantages of eLearning. Retrieved from eLearning Industry: (2017). <https://elearningindustry.com/advantages-and-disadvantages-of-elearning>.
- Cohen, L., L. Manion, and K. Morrison. *Research Methods in Education (7th ed., pp. 456–475)*. London, UK: Routledge (2011).
- Cuban, Larry. *Teachers and machines: The classroom use of technology since 1920*. Teachers College Press, 1986.
- Czerniewicz, Laura, Henry Trotter, and Genevieve Haupt. "Online Teaching in Response to Student Protests and Campus Shutdowns: Academics' Perspectives." *International Journal of Educational Technology in Higher Education* 16, no. 1 (2019): 1-22. <https://doi.org/10.1186/s41239-019-0170-1>
- Dahya, Negin. "Education in Conflict and Crisis: How Can Technology Make a Difference?: A Landscape Review." (2016). <https://inee.org/resources/landscape-review-education-conflict-and-crisis-how-can-technology-make-difference>
- Davis, Fred D. "Perceived Usefulness, Perceived Ease of Use, And User Acceptance of Information Technology." *MIS Quarterly* (1989): 319-340.
- Denzen, Norman K., and Yvonna S. Lincoln. "The Sage Handbook of Qualitative Research." (2005).
- Dhawan, Shivangi. "Online learning: A Panacea in the Time Of COVID-19 Crisis." *Journal of Educational Technology Systems* 49, no. 1 (2020): 5-22. <https://doi.org/10.1177/0047239520934018>
- Du Preez, Jaco, and Saurabh Sinha. "Higher education leadership in the era of the fourth industrial revolution." *The Thinker* 83, no. 1 (2020).
- Dube, Bekithemba. "Rural Online Learning in the Context Of COVID 19 in South Africa: Evoking an Inclusive Education Approach." *REMIE: Multidisciplinary Journal of Educational Research* 10, no. 2 (2020): 135-157.
- Durodolu, Oluwole. "Technology Acceptance Model as A Predictor of Using Information System' to Acquire Information Literacy Skills." *Library Philosophy & Practice* (2016).
- Flyvbjerg, Bent. Case study. In K. Norman, Denzin, S. Yvonna, & Lincoln (Eds.), *The Sage Handbook of Qualitative Research* (2011). (4th ed., pp. 301–316) Thousand Oaks: CA: Sage.
- Garrison, D. Randy, and Norman D. Vaughan. *Blended Learning in Higher Education: Framework, Principles, and Guidelines*. John Wiley & Sons, 2008.
- Gholami, K., and K. Tirri. "The Teachers' Perceived Dimensions of Caring Practice: A Quantitative Reflection on the Moral Aspect of Teaching." *Education Research International* 2012 (2012).
- Giandhari, Jennifer, Sureshnee Pillay, Eduan Wilkinson, Houriiyah Tegally, Ilya Sinayskiy, Maria Schuld, José Lourenço et al. "Early Transmission of SARS-CoV-2 in South Africa: An Epidemiological and Phylogenetic Report." *International Journal of Infectious Diseases* 103 (2021): 234-241. <https://doi.org/10.1016/j.ijid.2020.11.128>
- Guangul, Fiseha M., Adeel H. Suhail, Muhammad I. Khalit, and Basim A. Khidhir. "Challenges of Remote Assessment in Higher Education in the Context Of COVID-19: A Case Study of Middle East College." *Educational assessment, evaluation and accountability* 32, no. 4 (2020): 519-535. <https://doi.org/10.1007/s11092-020-09340-w>
- Guzzo, Tiziana, Patrizia Grifoni, and Fernando Ferri. "Social aspects and Web 2.0 challenges in blended learning." In *Blended Learning Environments for Adults: Evaluations and Frameworks*, pp. 35-49. IGI Global, 2012.
- Hallgarten, Joe. "Evidence on efforts to mitigate the negative educational impact of past disease outbreaks." (2020).
- Hodges, Charles B., Stephanie Moore, Barbara B. Lockee, Torrey Trust, and M. Aaron Bond. "The difference between emergency remote teaching and online learning." (2020). *Educause*

review, 27(1), 1-9.<http://hdl.handle.net/10919/104648>

- Kalantzis, Mary, and Bill Cope. "After the COVID-19 crisis: Why higher education may (and perhaps should) never be the same." *Educational Philosophy and Theory* 40, no. 1 (2020): 51-55. <https://doi.org/10.46786/ac20.9496>
- Kalayou, Mulugeta Hayelom, Berhanu Fikadie Endehabtu, and Binyam Tilahun. "The applicability of the modified technology acceptance model (TAM) on the sustainable adoption of eHealth systems in resource-limited settings." *Journal of Multidisciplinary Healthcare* 13 (2020): 1827.
- Kayembe, Christian, and Danielle Nel. "Challenges and opportunities for education in the Fourth Industrial Revolution." *African Journal of Public Affairs* 11, no. 3 (2019): 79-94.
- Kebritchi, Mansureh, Angie Lipschuetz, and Lilia Santiago. "Issues and Challenges for Teaching Successful Online Courses in Higher Education: A Literature Review." *Journal of Educational Technology Systems* 46, no. 1 (2017): 4–29. <https://doi.org/10.1177/0047239516661713>.
- Keengwe, Jared, and Terry T. Kidd. "Towards best practices in online learning and teaching in higher education." *MERLOT Journal of Online Learning and Teaching* 6, no. 2 (2010): 533-541.
- Keis, Oliver, Claudia Grab, Achim Schneider, and Wolfgang Öchsner. "Online or face-to-face instruction? A qualitative study on the electrocardiogram course at the University of Ulm to examine why students choose a particular format." *BMC medical education* 17, no. 1 (2017): 1-8. <https://doi.org/10.1186/s12909-017-1053-6>
- Legg-Jack, Dagogo William. "Readiness for the Fourth Industrial Revolution: Experiences of Students in Practical Courses During the COVID-19 Pandemic at a University in South Africa." In *Future of Work, Work-Family Satisfaction, and Employee Well-Being in the Fourth Industrial Revolution*, IGI Global (2020): 12-29. <https://doi.org/10.4018/978-1-7998-3347-5.ch002>
- Legg-Jack, Dagogo William. Digitalisation of Teaching and Learning in Nigeria amid COVID-19 Pandemic: Challenges and Lessons for Education 4.0 And 4IR. *Ponte International Journal of Sciences and Research*, (2021): 77(10/1). <https://doi.org/10.21506/j.ponte.2021.10.10>
- Li, Cathy, and Farah Lalani. "The COVID-19 pandemic has changed education forever." In *World economic forum*, vol. 29. The rise of online learning during the COVID-19 pandemic| World Economic Forum (weforum.org), (2020). <https://www.weforum.org/agenda/2020/04/coronavirus-education-global-covid19-online-digital-learning/>.
- Mahyoob, Mohammad. "Challenges of e-Learning during the COVID-19 Pandemic Experienced by EFL Learners." *Arab World English Journal (AWEJ)* 11, no. 4 (2020).
- Means, Barbara, Marianne Bakia, and Robert Murphy. *Learning online: What research tells us about whether, when and how*. Routledge, (2014). <https://doi.org/10.4324/9780203095959>
- Merisi, Peter, and Ansurie Pillay. "Emergency Remote Teaching in Higher Education: How Academics Identify the Educational Possibilities."(2020). *Alternation African Scholarship Book Series (AASBS)*: 74-91.
- Mgqwashu, Emmanuel. "Universities can't decolonise the curriculum without defining it first." *The Conversation* 22 (2016): 1-4.
- Mhlanga, David, and Emmanuel Ndhlovu. "Socio-economic implications of the COVID-19 pandemic on smallholder livelihoods in Zimbabwe." (2020).<https://10.20944/preprints202004.0219.v1>
- Mpungose, Cedric B. "Emergent transition from face-to-face to online learning in a South African University in the context of the Coronavirus pandemic." *Humanities and Social Sciences Communications* 7, no. 1 (2020): 1-9. <https://doi.org/10.1057/s41599-020-00603-x>
- Munoz, Albert, and Jonathon Mackay. "An online testing design choice typology towards cheating threat minimisation." *Journal of University Teaching and Learning Practice* 16, no. 3 (2019): 5.
- Mwale, Nelly, and Joseph Chita. "Higher education and programme delivery in the context of COVID-19 and institutional closures: Student responses to the adoption of e-Learning at a public university

in Zambia.” *Technology-based teaching and learning in higher education during the time of COVID-19* (2020): 9-33.

- Ngubane, Nomalungelo, Sibonelo Blose, Pinky Mthembu, and Tholani Hlongwa. “Transitioning from face-to-face to remote teaching in the context of COVID-19 pandemic: Reflections of South African emerging academics.” *Technology-based teaching and learning in higher education during the time of COVID-19* (2020): 54-73.
- Pappas, Christopher. Advantages and Possible Limitations of Online Learning. (2015). <https://elearningindustry.com/advantages-and-possible-limitations-of-online-learning>.
- Ray, Kecia. *What is remote learning? Tech & Learning*. (2020) <https://www.techlearning.com/how-to/what-is-remote-learning>
- Sansa, Nuhu A., Analysis for the Impact of the COVID - 19 to the Petrol Price in China (March 2, 2020). Available at SSRN: <https://ssrn.com/abstract=3547413> or <http://dx.doi.org/10.2139/ssrn.3547413>
- Scholtz, Salome E. “Sacrifice is a step beyond convenience: A review of convenience sampling in psychological research in Africa.” *SA Journal of Industrial Psychology* 47, no. 1 (2021): 1-12. <https://doi.org/10.4102/sajip.v47i0.1837>
- Schwab, Klaus. *The Fourth Industrial Revolution*. Geneva: World Economic Forum, (2016).
- Sunkara, Venu Madhav, and Rajasekhara Rao Kurra. “An analysis of learner satisfaction and needs on e-learning systems.” *International Journal of Computational Intelligence Research* 13, no. 3 (2017): 433-444.
- Tamrat, Wondwosen, and Damtew Teferra. “COVID-19 poses a serious threat to higher education.” *University World News* 9 (2020).
- Tang, Chun, and Lee Chaw. “Readiness for blended learning: Understanding attitude of university students.” *International Journal of Cyber Society and Education* 6, no. 2 (2013): 79-100. <https://www.learnstechlib.org/p/209223/>.
- Urduan, Trace A., and Cornelia C. Weggen. “Corporate elearning: Exploring a new frontier.” (2000). WR Hambrecht & Co.
- Waghid, F. “Action research and educational technology: Cultivating disruptive learning.” *South African Journal of Higher Education* 32, no. 4 (2018): 1-11. <https://doi.org/10.20853/32-4-3097>
- World Bank. Remote Learning and COVID-19 The use of educational technologies at scale across an education system as a result of massive school closings in response to the COVID-19 pandemic to enable distance education and online learning. (2020). Retrieved from file:///E:/PC/Rapid-Response-Briefing-Note-Remote-Learning-and-COVID-19-Outbreak.pdf
- Zalat, Marwa Mohamed, Mona Sami Hamed, and Sarah Abdelhalim Bolbol. “The experiences, challenges, and acceptance of e-learning as a tool for teaching during the COVID-19 pandemic among university medical staff.” *PLoS One* 16, no. 3 (2021): e0248758. <https://doi.org/10.1371/journal.pone.0248758>

ABOUT AUTHORS

Dagogo William Legg-Jack, currently, is a Postdoctoral Research Fellow in Directorate of Research Development and Innovation Walter Sisulu University, Mthatha, South Africa. He obtained his Masters and PhD in Technology Education in Science and Technology Education Cluster, University of KwaZulu-Natal (UKZN), South Africa. Dagogo has worked twice as a Contract lecturer in the Department of Technology Education, Science and Technology Education Cluster UKZN. In Nigeria, he has also served as a teacher in high schools, where he taught Technology-based subject. He also functioned as a lecturer in the Department of Metal Work Technology, School of Secondary Education (Technical), Federal College of Education (Technical), Omoku, Rivers State, Nigeria for about twelve years. Dr Legg-Jack has supervised students’

research projects both at Nigerian Certificate of Education and undergraduate levels. He is a mentor to research students at Honours, Masters and Doctorate levels. Moreover, he has participated in seminars and conferences both within and outside South Africa and has published articles in peer reviewed journals that focus on skills development, poverty reduction as well as wealth creation. Some of his recent publications is titled “Readiness for the Fourth Industrial Revolution: Experiences of Students in Practical Courses During Covid-19 Pandemic at a University in South Africa”, Digitalisation of Teaching and Learning in Nigeria amid COVID-19 Pandemic: Challenges and Lessons for Education 4.0 and 4IR.

Prof. Clever Ndebele is currently the Senior Director: Learning and Teaching at Walter Sisulu University. He has extensive experience in higher education studies with more than 10 years’ experience at senior management level in the area of teaching and learning at several universities in South Africa. Has participated in several (NRF) research projects on academic staff development in collaboration with other universities and has also been involved in Teaching Development Grant National collaborative projects (namely PGDHE for educational development practitioners and PGDHE for academics). He is also a member of the CHE National Standards and Reviews Committee and the CHE Peer Advisory Group on Reconceptualising Teaching and Learning (RELATE). Prof Ndebele currently oversees academic staff development and student academic support and coordinates the University Capacity Development Programme, the New Generation of Academics Programme, National Siyaphumelela Student Success project and Future Professors Programme at Walter Sisulu University.