Research in Social Sciences and Technology

https://ressat.org

E-ISSN: 2468-6891

Volume: 7 Issue: 2 2022

pp. 66-86

Platformisation of Education: An Analysis of South African Universities' Learning Management Systems

Kazeem Ajasa Badaru[*a] & Emmanuel O. Adu[a]

***** Corresponding author
Email: badruajasa97@gmail.com

a. University of Fort Hare, East London, South Africa.

Article Info
Received: March 8, 2022
Revised: May 14, 2022
Accepted: June 24, 2022

10.46303/ressat.2022.10

How to cite
Badaru, K. A., & Adu, E. O. (2022). Platformisation of Education: An Analysis of South African Universities' Learning Management Systems. *Research in Social Sciences and Technology*, *7*(2), 66-86
https://doi.org/10.46303/ressat.2022.10

ABSTRACT
Several studies have focused attention on the crisis of the COVID-19 pandemic and the impact on the traditional face-to-face teaching and learning activities across the globe. There is, however, little research regarding the platformisation of education with the aid of the learning management systems (LMSs) in the contexts of South African universities. With a thematic content analysis of the extant literature and a systematic review of universities' websites, this study explored and unearthed various LMS platforms which public universities in South Africa adopted and utilized before the outbreak of the COVID-19 pandemic and during the lockdown period. The findings revealed that the majority (46%) of South Africa's public universities used the Blackboard LMS while another 34 percent of the 26 universities used the Moodle LMS. The rest of the public universities in South Africa used one of the following LMS platforms: the Vula, Efundi, ClickUp, RUConnected, Sakai, SunLearn, Canvas, and D2LBrightspace. Furthermore, the study found that a few South African universities had moved from one LMS platform to another, especially during the period of lockdown precipitated by the pandemic; beginning from the year 2020. The LMS platforms serve the pedagogical needs of the universities in terms of facilitation of online interaction between instructors and students, dissemination of course materials, announcements, submissions, assessments, and grading of student assignments electronically. It is recommended that future studies should investigate the challenging factors responsible for the switch from one LMS platform to another across the public universities in South Africa.

KEYWORDS
COVID-19 pandemic; platformisation of education; learning management systems; South African universities; digital technologies

INTRODUCTION

"The Chinese character for crisis is the same character used for an opportunity. This is because within almost every crisis there is an opportunity of some kind if you can find it" (Brian, 2010, p. 4). This study was motivated by some assumptions. One is that every university in South Africa has adopted one LMS platform or another. Two, an assumption that there has been no single study that investigated the LMS platform each of the 26 public universities has adopted and utilised for teaching and learning in South Africa. The COVID-19 lockdown measures have presented opportunities to see the technology's potential for continuity of education through various online platforms. It was more of a tech-savvy progressive educational environment for the learners and their instructors connected through electronic means for delivery of lessons by logging onto available digital devices such as android phones, smartphones, iPad, tablets, and laptops (Maity et. al., 2021). The use of technological tools for educational purposes which is popularly referred to as the "EdTech or Edutech" was not strange in most educational institutions. However, the covid-19 outbreak caused a paradigmatic digital shift in education as swiftly regarded as Emergency Remote Teaching (ERT) (Angiolini et al., 2020).

Responses to the unprecedented disruption of education and other critical sectors in different nations across the globe informed the deployment of digital technology to ensure the continuity of the teaching and learning process in the form of a remote learning system. The increased rates at which schools, colleges, and universities shifted and are still shifting to online teaching and learning have become the principal learning portal (Foxcroft & Bosire, 2020). Thus, given the critical role that information and communication technology (ICT) has got to play in the enablement of teaching and learning activities as the covid-19 pandemic continues to ravage the entire world, South African schools, colleges and universities saw the need to prioritise e-learning technologies considered relevant and useful for a seismic structural shift in higher education (Foxcroft & Bosire, 2020; Mbhiza, 2021). Studies have emerged on the digitalisation of education during the COVID-19 lockdown and the online platforms which became the alternatives for teaching and learning as the world was forced to temporarily shut down educational institutions (Kang, 2021; Maske, 2020; Perez, 2020). Among the diverse platforms engaged to stem the adverse effects of the lockdown on educational systems, are the Learning Management Systems (LMSs). This study focuses on the LMS software in South Africa's higher institutions as the platform connecting lecturers with their students for teaching, learning, tests, examinations, and research supervision from various locations outside the campuses. Hence, the choice of the term *platformisation of education* in this study was to contextualise how the LMS platforms have served the inevitable continuation of educational activities by higher institutions amid the threatening COVID-19 pandemic.

In South Africa, the 2020/2021 academic calendar has begun amid the pandemic as educational institutions were confronted with the urgent need to improve their modes of online curriculums and course navigation, online examinations, increase student inclusion for remote learning and strengthen their capacity for ICT solutions in the time of crises (Vinas, 2020). The

deluge of the internet, communication devices, and software have provided educational institutions across the globe with several platforms [for remote interactions between educators and students] (Kakasevski et al., 2008). This technological phase has been described as the 'platform deluge' (Piromalli & Viteritti, 2019; Tsakeni, 2022). During the pandemic lockdowns, a lot of technologies were deployed through various LMSs and other digital platforms to carry on teaching and learning activities over a remote distanced location. LMS tools are very efficient and capable of conveying information between students and their teachers. The use of LMS tools in higher institutions of learning has witnessed tremendous development in the last decades (Weaver et al., 2008). Lecturers adopt the LMS platform for the creation of spaces for various levels of students, sharing of course content and/or materials, collection of assignments, posting student grades, hosting discussions, and doing a lot more (Kumar et al., 2019). The LMS is a set of software solutions that serve as a virtual classroom for online teaching and learning activities involving both the teachers and learners. This is essentially required in this socially distanced world where people have been constrained to live under some sets of lockdown protocols for their protection against infectious coronavirus (Maske, 2020).

The various LMS tools, deployed for teaching and learning in this period of social distancing, have not been given sufficient attention in the extant literature. This study conscientiously opens up discourses and uncovers deep insights into the use of various LMS platforms such as Moodle, Blackboard, and others. More specifically, this study aims to identify, analyse, and discuss the LMSs which have been adopted as online platforms for teaching and learning before and during the pandemic by each of South Africa's 26 public universities.

The Objective of the Study

The objective of this study was to identify and analyse various LMS platforms used by the 26 South African public universities before and during the lockdown; precipitated by the COVID-19 pandemic. Thus, this paper aims to contribute to the ongoing discourses concerning the adoption of technology for education, by identifying, analysing, and discussing the usefulness of the LMS tools available for educational use in South Africa's twenty-six public universities. By doing this, further insights are provided into the availability of the LMSs that can be beneficial to educators, students, school administrators, researchers, policymakers, and even the LMS companies regarding the pedagogical importance and adaptation of these platforms for remote instructional delivery.

Research Questions

- What LMS platforms have been in use at the public universities before and during the COVID-19 lockdown in South Africa?
- Which of these LMS platforms has the greatest number of public universities in South Africa?
- How useful are LMS platforms to the pedagogical practices of public universities in South Africa?

REVIEW OF LITERATURE

The Digital Technology, COVID-19 Pandemic and Platformisation of Education

The use of digital technologies for teaching and learning has also been advanced by scholars in the field of educational technology. Dhawan (2020) has, however, argued that most educators and learners in various educational institutions have never been involved in an online mode of learning. He noted further that until the period of the lockdowns that commenced in March 2020, they were only used for the traditional practices of teaching and learning in a face-to-face mode. It, therefore, became a huge challenge to change from offline mode to e-learning mode (Dhawan, 2020). Some technological tools for educational purposes are video conferencing, virtual tutoring, as well as learning management systems (LMS). However, the COVID-19 pandemic lockdown has brought to the fore the transformative impact of digital technology on education [in the last year] (Mail & Guardian, 2020). The number of technological tools available for use today is a marked difference between the previous pandemics and the COVID-19 pandemic currently ravaging the world. During the total lockdown that foisted social isolation on the world, people were able to stay connected with their families, friends, and colleagues with the abundant aid of digital technology. The COVID-19 pandemic caused the entire world to witness a mind-blowing increase in the use of online digital tools and several social media platforms (Perez, 2020; Waters & Hensley, 2020). These digital tools for communication could function as a social connector and a separator (Waytz & Gray, 2018). With the aid of digital technologies, education systems have become highly platformised whereby schooling, teaching, and learning activities are platform-based. In light of this, education is repositioned as a form of home-schooling mediated by technology tools, edu-businesses, and other institutions (Williamson et al., 2020).

Platformisation of education is a concept that has been theorised in a book titled ‘The Platform Society’ authored by van Dijck et al. (2018). The concept is used in studies that focus on how core values of educational practices are affected by the process of digitisation (Kerssens, n.d). In this study, platformisation of education refers to the provision of education (teaching and learning activities) using various forms of technology platforms such as the learning management systems (LMSs), Google classroom App, YouTube App, Facebook App, WhatsApp, and many others as experimented during the 2020 school closures owing the threats posed by the COVID-19 pandemic. These technology platforms have increasingly mediated how people interact commercially, socially, politically, culturally, professionally, and educationally ((Kumar et al., 2019). Platformisation has been conceptualized as ‘the penetration of infrastructures, economic processes, and governmental framework of platforms in different economic sectors and spheres of life’ (Kerssens & Dijck, 2021). Platformisation’s emphasis is about, as noted by Kerssens and Dijck (2021), “how platforms are not just ‘objects’ but the result of socio-technical and political-economic processes of development and implementation; they are technically integrated into the fabric of societal sectors, transforming their economic dynamics”. According

to Williamson et al. (2020), there are three interconnected economic, political, and educational processes involved in platformisation. They are the growth of a profitable EdTech global market, the problematisation of traditional classroom-based modes of schooling (which identifies digital technologies as the 'solution' to their shortcomings), and the concomitant establishment of educational online platforms as constitutive elements of the contemporary educational experience.

The Remote Learning in a Pandemic Period

Linden (2020) described the COVID-19 pandemic as a game-changer for compelling all national sectors, including higher education, to adjust to the new normal such as migrating from the traditional face-to-face classroom to the remote modes of teaching and learning. These modes entail the blended modalities of teaching and learning whereby there can be arrangements for contact classes, when possible, online learning in some cases, as well as delivery of printed study materials to learners in their various homes during the pandemic lockdown (Linden, 2020). Foxcroft and Bosire (2020) noted that "Puritans with a bias for quality in online learning are grappling with the practical reality of 'going live' so quickly" (para. 5). These puritans are persons who strongly believe in strict adherence to rules. They submitted further that "the pressure is being felt even in institutions where blended learning (a hybrid of contact and technology-enhanced learning and teaching) was already rapidly being adopted, long before COVID-19" (para. 5). Remote learning is an approach adopted by educational institutions across the globe as the response to the covid-19 lockdowns which have grounded socio-economic activities including learning and teaching.

It is important to note that the discussion on remote learning is central to the phenomenon of E-learning. While the two are not the same, they are more like consanguine sisters, as remote learning is enhanced by the availability of e-facilities. E-learning is a generic technological term that encompasses a broad range of information and communication technology (ICT) based applications and procedures such as computer/web-based learning, virtual or digital classrooms, digital collaboration, and networking (Ogbonna et al., 2019). It serves as a means of communication between educators, instructors, and learners; thereby allowing for resource sharing, coordination of work procedures and processes, and identifying who does what, when, how, and why. It also provides a platform for real-world simulations by which theoretical learnings are demonstrated within a practical environment. From April 2020, e-learning became the only feasible solution to the disruption of schooling whereby the teachers and learners were connecting from their various homes by using digital platforms for teaching and learning. It became a *Victor Ludorum* in the way the world had to forcefully switch overnight to some pedagogical approaches that are technologically based, for the continuity of education of the young ones, and as a panacea to the global crisis of the debilitating coronavirus pandemic (Dhawan, 2020). Remote Learning, being a *Victor Ludorum*, literally means a defeater of the coronavirus' adverse effects brought upon education which had forced schools and

colleges to temporarily close down. Even when schools were closed, remote learning through various online platforms helped ensure the continuation of teaching and learning without teachers and students meeting face-to-face in the physical classrooms.

More importantly, it is common to have e-learning taking place via the learning management systems (LMS) platforms. According to Ogbonna et al. (2019), LMS software facilitates deployment, management, tracking, and reporting interactions between teachers, learning materials, and learners. Marongwe and Garidzirai's (2021) study, on challenges of remote learning that students of rural-based universities in South Africa faced during the COVID-19 crisis, identified Blackboard and Moodle LMSs among the online learning platforms used in the provinces of the Eastern Cape, Limpopo, and Kwazulu Nata. The authors stated further that both Blackboard and Moodle LMS platforms were mainly deployed for discussions and assessments during the remote learning engagements. As shown in Figure 1 below**,** a typical cloud-based LMS platform has five main features namely; onboarding, courses, assessments, insights, and learning paths. Each of these features has its functionality matrices as presented in Table 1 below.

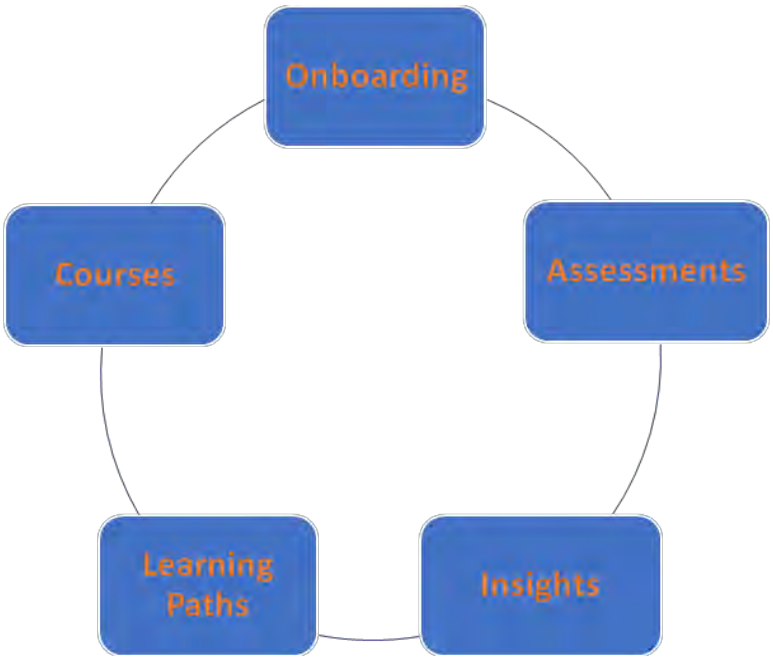

Figure 1. The Cloud-Based LMS Framework

Onboarding is one of the features of the LMS platform which is the action or process of integrating and familiarizing a new user with the software application. Other features of an LMS are courses, learning paths, insights, and assessments. Courses are e-learning programmes that an LMS software platform is designed to create, deliver and track by lecturers. The learning paths are a structured guide for learners to follow. They are a combination of courses that learners have to read through to master a particular subject or discipline. The availability of several but different learning paths suggests that there is more than one course in a given LMS.

Insights are a game-changing feature with reporting capabilities that give lecturers access to useful information that is needed for constantly improving course materials and content delivery for the benefit of the students. A built-in LMS assessment engine enables lecturers to monitor the online teaching and learning objectives and outcomes through the creation of assessments that concentrate on key aspects of students' academic progress and performances. An LMS is made of a server and a user interface (UI). The server enables the creation, delivery, and management of e-courses while the UI enables the users at their end to access and consume the available course materials for learning purposes. The LMS and the learning Management Content Systems (LMCS) enhance the provision and storage of curriculum contents, resources, and pedagogical instructions through university intranets, learning portals, and e-libraries. However, research has shown how the less privileged were unable to meet the basic requirements for them to actively participate in remote learning despite the ubiquitous nature of the digital transformation or the 'Internet of Things' (IoT) (Eder, 2020; Hash, 2021).

Table 1. Main Features and Functionality Matrices of a Cloud LMS

Features	**Functionality Matrices**
Onboarding	Seamless integration, student access, customisable and flexible, and interactive learning.
Courses	Course builder, course syllabus and lesson planning, course evaluation, Course/Programme mapping, faculty mapping, course planning, and availability management.
Assessments	Assessment planning, course assignments, course resources, quizzes and tests, survey, feedback, and polls; weightage-based grading, and transcripts.
Learning Paths	Learning pathways, personalised learning, social learning, mobile learning, and gamification.
Insights	Dashboards and reports, course analytics, leader boards, online notice board, and messaging.

Source: Adapted from Sriram (2019)

Table 1 shows the cloud LMS features with their various functionality matrices. By features, we mean those attributes that a typical LMS possesses and offers in terms of online affordances for students and lecturers while the functionality matrices are a variety of functions that each of the LMS features could be able to perform when accessed online.

Further, remote learning occurs synchronously or asynchronously and can be equally called remote training, virtual instruction, and distance education (Singh & Thurman, 2019). Synchronous learning, on one hand, involves online (real-time) interaction between teachers

and their learners specifically via delivery platforms, remote laboratories, and digital technologies for distance learning. It involves the exchange of information, knowledge, and ideas among participants at the same time. It is all about facilitating efficient teaching and learning; providing educators and learners with a variety of methods for information sharing, networking, and real-time collaboration (Ogbonna et al., 2019). Examples of synchronous modes in e-learning environments include live instructions from teachers and feedback from learners through the Zoom meeting application, Microsoft team's application, Skype, Google classroom, and virtual chat rooms which allow everyone to interact and work collaboratively together online at the same time. On the other hand, asynchronous learning is a design of instructions and methodology of delivery allowing learners to access content and actively participate in the learning activities outside the four walls of the classroom and most importantly at their own pace and convenience independent of their teachers. Hence, it is also known as self-paced, on-demand, or e-learning. Like synchronous learning, asynchronous learning equally needs a technology such as the Learning Management System (LMS) platform for learners to access instructional content from their various homes or destinations.

METHODOLOGY

The methodology section describes the research design, procedure for the search strategy, and criteria for inclusion and exclusion of journal articles and other publications, as well as the data analysis procedure.

Research Design

This study leveraged a desktop research design to review relevant publications and information from the government's database and public universities' websites as related to the LMS platforms in South Africa. A desktop research method uses available data in existence to understand the phenomenon under study (Johnston as cited in Marongwe & Garidzirai, 2021). A secondary-level analytical approach was used in reviewing the extant literature and other publications related to the research questions (Newman & Gough as cited in Watson, 2020). In addition, an attempt was made at a systematic review of the website contents regarding the LMS platforms which South Africa's public universities effectively used especially during the COVID-19 lockdown and school closures. Only the public universities in South Africa were in focus. The list of public universities, retrieved from the websites of both the Department of Higher Education and Training (DHET) and South Africa's National Research Foundation (NRF), shows that there are 26 public universities in South Africa. These public universities were distributed in such a way that each of the nine provinces, at least, has one. In addition to reviewing the extant literature, the websites of the 26 public universities in South Africa were then searched through and analysed for data as regards their LMS platform types.

Search Strategy and Selection Criteria

The literature review strategy was based on Webster and Watson's guidelines (Amin & Soh, 2020) suggesting that it is important to begin a literature search with articles published in the leading journals to ensure the reliability of findings. Over 100 journal articles and publications related to the concepts of platformisation of education, remote teaching, and learning, as well as digital technology in education such as the use of LMS platforms were identified using the electronic databases such as Scopus, Google Scholar, Sage Publication, ScienceDirect, Elsevier, and others. While only those published between 2018 and 2021 were selected for inclusion in the study, however, a few other publications outside the range of the aforementioned years were also considered relevant in the drafting of the literature review section of the study. Other selection criteria for inclusion were as follows: empirical studies published by peer-reviewed journals should have been conducted with either primary or secondary data (Watson, 2020), and produced results on platformisation of education and the LMS tools. The search words such as "Platformisation", "Platformisation of education," "Learning management systems in South African universities", "Public universities in South Africa", "COVID-19 lockdown", and "Digital technologies" were entered separately into the database search engines to unearth those relevant publications. In the end, 28 relevant journal articles were finally selected and included in the findings of the study.

Data Analysis

The study used a thematic analysis approach (Braun & Clarke as cited in Watson, 2020) to organise the related literature and findings on the LMS platforms used in South Africa's public universities. Data on LMS platforms were extracted from the universities' websites and presented in a tabular form for analysis. The Excel spreadsheet and chart were also used for analysis to diagrammatically show the identified LMS platforms and the number of South Africa's public universities utilising such LMS platforms. It is imperative to note that this study never required an ethical clearance since it did not involve human participation.

FINDINGS

What LMS platforms have been in use at the public universities before and during the COVID-19 lockdown in South Africa?

The findings, in Table 2 above, reveal that the majority of South African public universities (46%) utilised the Blackboard LMS, while the Moodle LMS was used by 34 percent of the 26 South African public universities that were analysed in this study. The rest of the public universities in South Africa used one of the following LMS platforms which include Vula, Efundi, ClickUp, RUConnected, Sakai, SunLearn, Canvas, and D2LBrightspace.

Table 2. LMS Platforms available at the Public Universities in South Africa

S/N	University	LMS Platform	Source
1.	University of Cape Town	Vula	https://vula.uct.ac.za/portal
2.	The University of Fort Hare	Blackboard	https://learn.ufh.ac.za/webapps/login
3.	University of the Free State	Blackboard	https://ufs.blackboard.com
4.	University of Johannesburg	Blackboard	https://www.uj.ac.za/corporateservices /ads/CAT/Pages/Services.aspx
5.	University of KwaZulu-Natal	Moodle	https://learn2021.ukzn.ac.za/
6.	University of Limpopo	Blackboard	https://tmlearn.ul.ac.za/
7.	University of Mpumalanga	Moodle	https://www.ump.ac.za/
8.	Nelson Mandela University	Moodle	https://ltcollab.mandela.ac.za/LT-Help/i-Learn-Moodle
9.	North West University	eFundi	http://services.nwu.ac.za/ctl/student-efundi-support
10.	University of Pretoria	clickUP and Blackboard	https://www.up.ac.za/student-affairs/news/post_2906988-up-shows-strong-adaptability-to-online-teaching-and-learning-survey
11.	Rhodes University	RUconnected	https://ruconnected.ru.ac.za/login/index2.php
12.	Sefako Makgatho Health Sciences University	Blackboard	https://www.smu.ac.za/stss/blackboard
13.	Sol Plaatje University	Moodle	https://www.spu.ac.za/index.php/elearning
14.	University of South Africa	Sakai	https://mooc.unisa.ac.za/portal
15.	University of Stellenbosch	SUNLearn	https://africavarsities.com/sunlearn-login learn.sun.ac.za
16.	Walter Sisulu University for Technology	Moodle Blackboard	https://www.wsu.ac.za/index.php/component https://wiseup2.wsu.ac.za/#

17.	University of Venda	Moodle	https://myuniven-moodle.univen.ac.za/
18.	University of the Western Cape	iKamva (Sakai)	https://ikamva.uwc.ac.za/portal
19.	University of the Witwatersrand	ulwazi (Canvas)	https://www.wits.ac.za/ulwazi/
20.	University of Zululand	Moodle	https://learn.unizulu.ac.za/
21.	Cape Peninsula University of Technology	Blackboard	https://myclassroom.cput.ac.za/
22.	Central University of Technology, Free State	eThuto (Blackboard)	https://ethuto.cut.ac.za/#
23.	Durban University of Technology	Moodle	https://tlzprod.dut.ac.za/login
24.	Mangosuthu University of Technology	Moodle & Blackboard	https://moodle.mut.ac.za/login/index.php https://www.mut.ac.za/student-portal/
25.	Tshwane University of Technology	Blackboard & D2L Brightspace	https://mytutor.tut.ac.za/ https://mytutord2l.tut.ac.za
26.	Vaal University of Technology	Blackboard (VUTela)	https://blackboard.vut.ac.za/

Which of these LMS platforms has the greatest number of public universities in South Africa?

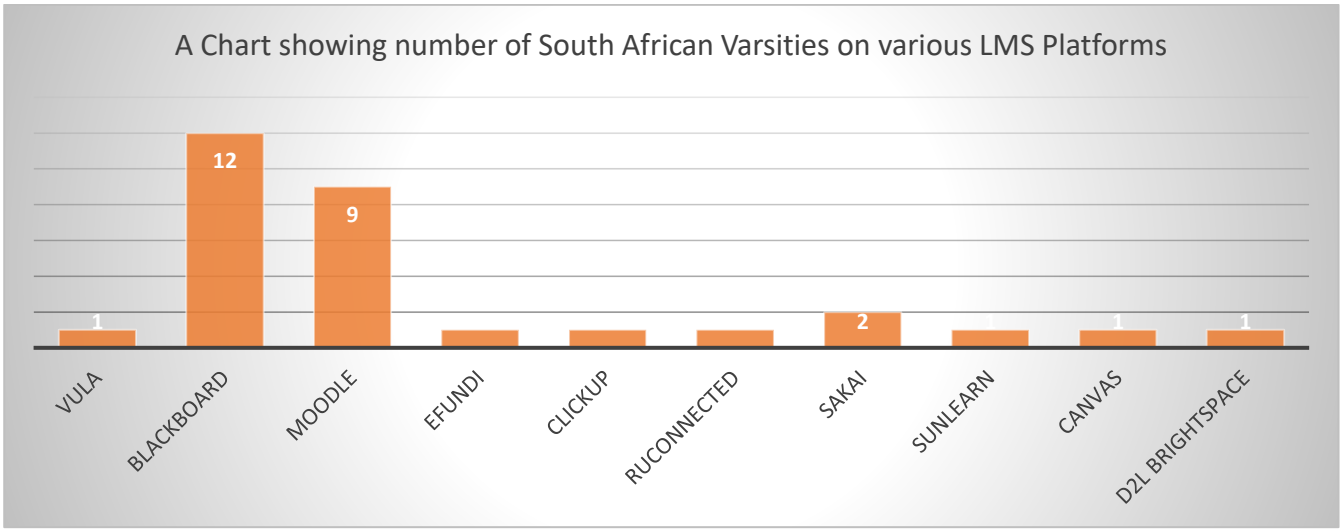

Figure 2. LMS Platforms and Number of South African Varsities using them

As depicted in Figure 2 above, a vast majority of South African universities (12) are running their online teaching and learning platforms on the Blackboard LMS. Moodle LMS has nine (9) universities for their online teaching, learning, and digital communication. Sakai LMS has only two (2) universities while the remaining LMSs each have one (1) university on their platforms. The notable finding from Figure 2 is that the Blackboard LMS has the highest number of public universities in South Africa.

LMS platforms' usefulness to the pedagogical practices of public universities in South Africa

Vula

This is the learning management system used for online collaboration and learning system by the University of Cape Town (UCT). The university's website defines "Vula" as "Open", implying several possibilities as provided by Vula LMS and its Open Source origins. Its primary purpose is to provide support for UCT courses as well as 'promote networking for other UCT-related groups and societies' (University of Cape Town, 2021). Vula LMS provides an online space for teaching and learning in a manner that enables lecturers to create responsive and engaging learning experiences for their students. It is an online LMS that is available and accessible 7 days per week on a 24-hour basis. It encompasses integrated features for facilitation of open communication, creation of digital courses, additional resources for engagement, and interaction of students with one another as well as with their lecturers as they would do in a physical classroom [offline] (University of Cape Town, 2021). Through the Vula LMS, UCT lecturers and students have defied the obstacle imposed by the COVID-19 pandemic by running webinars for teaching and learning, as well as workshops and training during the lockdown period. As the initiative of the university's Centre for Innovation in Learning and Teaching (CILT), Vula LMS according to the UCT website is set up for the following: (i) Creation of a course website including administrative, assessment, sharing of communication, and resources; (ii) Development of a resource site to cater to the shared interests of faculty members and their students; and (iii) Creation of a project or task-related site with a provision for a central place for collection of and reflection on data for collaboration among faculty members and their students.

Blackboard

The University of Fort Hare's (UFH) LMS is the Blackboard. It is a web-based online learning platform for lecturers and instructors to use for the integration of a broad range of pedagogical and course administration tools (University of Fort Hare, 2021). The Blackboard LMS is used by the university to keep learning materials for particular courses or programmes which students can access via the internet at their own convenient time everywhere. It further aims to facilitate interaction and communication among students on one hand and between students and their instructors on the other hand. Before the pandemic, the institution used the blackboard for the augmentation of face-to-face learning, in the form of supportive learning materials through the

use of various media. As the pandemic is still very much with us, the Blackboard LMS provides some sort of blended learning environment for students and faculty staff members. The Blackboard LMS provided opportunities for the continuation of academic activities at the UFH during the social distancing and lockdown protocols imposed by the COVID-19 pandemic on the country in particular and the world at large (Linden, 2020).

The University of the Free State (UFS) also utilises Blackboard as its learning management system (LMS) or the online environment that complements the face-to-face classroom for the delivery of courses considered to be a blended learning model. Before the outbreak of the pandemic, the institution had two approaches to learning which include the blended approach for students based on campus and the distributed approach of learning which is fully an online distance education programme for off-campus students. The University of Johannesburg equally adopts Blackboard as its learning management system for the provision of a robust teaching and learning experience for both academic staff and students concerning access to materials for lectures and study guides, facilitation of lecturer-student interaction and communication, making announcements, assignment submissions, as well as doing grading and assessments electronically (University of Johannesburg, 2020).

Moodle

The University of KwaZulu-Natal (UKZN) offers Moodle as the LMS platform since 2016 when the university decided to replace paper-based note-taking by the students with electronic course materials and lecture notes. The decision was to facilitate the acquisition of digital skills by students and demonstrate confidence in the use of electronic media after graduation. The use of Moodle LMS avails lecturers the opportunities to upload course materials for students to access and make downloads at their convenience (the University of Kwazulu-Natal, n.d.). As far back as 2002, UKZN authorities had implemented the use of the Open Learning System (OLS) to replace the WebCT, otherwise known as the proprietary learning management system. The decision to switch from the use of the WebCT to implementing the OLS was due to huge costs (Jackson, 2008). Also, the University of Mpumalanga (UMP) has adopted the Moodle LMS as a supplementary online learning platform with the face-to-face modes of teaching before the outbreak of the COVID-19 pandemic. Makhaga's findings corroborate this point of usefulness revealing that lecturers develop learning contents and notes by using PowerPoint slides, and audio-visual presentations and deliver all on the Moodle LMS for students to access and use for learning, assessments, and examinations (Makhaga, 2020). One of the UMP lecturers buttressed this finding by stating that the use of digital technologies such as Moodle was not new to UMP. The lecturer argued that remote working was better and safer than manual given the prevalence of the deadly COVID-19 pandemic (Makhaga, 2020). It is advantageous for its flexibility and employees can work from anywhere and anytime of the day. The Nelson Mandela University (NMU) also adopts i-Learn/Moodle as the institution's Learning Management System. The NMU's Moodle LMS provides some interesting default roles for each of the users: teachers, non-editing teachers (teaching assistants), Students, and guests. Teachers/instructors' default role

allows for them to add resources, course materials, and other activities, perform changing of course settings, and grade student submissions of assignments and other activities.

The default role for non-editing teachers/teaching assistants allows such instructors to view course contents and perform grading of student submissions. The default role for students enables them to view course resources or materials, take part in course activities, as well as appear in the grade book. There is also a default role for a guest who can only access the course page, and learning materials but cannot be allowed access to participation in teaching and learning activities, as well as view submissions made by students. However, only the instructor can make the guest's default role accessible (Nelson Mandela University, 2019). At the NMU, the use of the Moodle LMS has facilitated a drastic reduction in the classroom use of paper materials as course contents are being provided in electronic forms to students; the installation of a new e-learning platform (LMS), called "Incoko" meaning "conversion" in isiXhosa at the institution's School of Business for a paperless content delivery mode and supervision request form (Nelson Mandela University, 2019). There is evidence that Walter Sisulu University (WSU) has adopted Moodle either in place or in addition to the Blackboard previously used as the electronic platform for teaching and learning. According to a member of the institution's E-Learning task team, Munienge Mbodila:

> For WSU, moving to Moodle is still in the line in enabling the use of new technologies to promote excellence in teaching and learning using technology; Moodle, which is the LMS we use- is going to become central to the blended learning approach at WSU. Students and staff must familiarise themselves with the platform (Sigodi, n.d.).

eFundi

The North-West University (NWU) adopts 'eFundi' as its institutional e-learning platform, otherwise known as the learning management system, for connecting registered students with lecturers online. Through the eFund LMS, students can access course resources, and do submission of assignments and tests, and. It further serves as a communication platform through which lecturers release and circulate announcements relating to course materials, test results, and others (North-West University, 2021). **clickUP:** University of Pretoria's (UP) transition to remote (online) teaching and learning during the national Covid-19 lockdown was seamlessly effective using the institution's LMS called clickUP. Reports available on the clickUP LMS showed that UP's academic programmes continued remotely on 4th May 2020. Lecturers reportedly, within the first 4 weeks, uploaded "443GB of content to 3, 158 online courses and that 34, 818 out of 35, 939 (96.8%) undergraduate students used the LMS actively. Students accessed their courses 5, 100, 000 times during May 2020" (University of Pretoria, 2020).

RUconnected

Rhodes University's 'RUconnected' is the institutional Learning Management System where students access course materials to learn remotely. Thus, it is the institutionally supported virtual learning space for teaching, learning, and assessment activities and resources (Rhodes

University, 2021). Monnapula-Mapesela (2020) revealed that RU officially commenced its online teaching and learning on 4th May 2020. Before the outbreak of the pandemic, the 'RUconnected' has always been used to supplement face-to-face contact classes for both full-time and part-time students of the institution. The RUconnected online LMS allows students to engage in their courses and submit their tasks during the block contact sessions (Rhodes University, 2021).

Sakai

The University of South Africa's (UNISA) LMS is known as Sakai which is provided for faculty staff members and students to have access to various online tools for communication, assessment, content delivery, and many more. The major elements of a Sakai LMS site are accessible using the ***Access keys*** such as the content, the tools, my sites, and note (the University of South Africa, n.d.). **SUNLearn:** The SUNLearn is the learning management system that serves as an electronic platform for teaching, learning, and assessment at Stellenbosch University. The customised SUNLearn LMS provides a fit-for-purpose platform for students and their lecturers to be engaged in both academic and extra-curricular materials (Elikplim, n.d.). **iKamva (Sakai):** The University of the Western Cape's (UWC) institutional LMS is known as iKamva. It is understood that this particular LMS may be technically supported by Sakai, notwithstanding the naming (iKamva). This platform aims to enhance face-to-face teaching and learning activities by providing valuable online resources for self-study, reflection, and assessments (University of the Western Cape, 2021). **ulwazi (Canvas):** The University of the Witwatersrand's (Wits) LMS is codenamed 'ulwazi'. The online teaching and learning platform at the Wits uses Canvas LMS Cloud to provide the needed online support for students and lecturers during the difficult period of the COVID-19 pandemic school shutdown. This platform empowers faculty staff members to design learning experiences and provide educational materials to ensure that students engage and interact as they access various dedicated course sites (University of the Witwatersrand, 2020).

DISCUSSION

From the current analysis of the LMS platforms available in South Africa's public universities, it is observed that there are a few South African universities that had to migrate from the Blackboard LMS to another one especially during the COVID-19 crisis of school closures while others had to complement the Blackboard LMS with an additional type of LMS platform, for reasons best known to them, as presented in *Table 2*. However, the compelling factors responsible for the choice of one LMS platform over another by the public universities in South Africa are not within the purview of this present study. The LMS platforms have been meticulously reviewed and found useful for pedagogical practices at the public universities in South Africa; among which are the facilitation of online teaching and learning, communications and announcements, creation of course resources and dissemination, submissions of assignments, as well as assessment and grading of student submissions. In a nutshell, the LMS platforms provided support for face-to-face teaching and learning before the pandemic; and

during the pandemic, they provided alternate platforms for the continuation of teaching and learning activities amidst the lockdown. This finding was in tune with the submission of Kang (2021), Maske (2020), and Perez (2020) that online platforms were the alternatives for teaching and learning activities when the world shut down educational institutions in face of the COVID-19 crisis.

Our analysis of the LMS platforms in the 26 public universities shows that Blackboard and Moodle are prominently used more than others. This finding is supported by Momani's assertion, in a comparative study of Moodle and Blackboard LMSs, that the two LMS platforms are famous and widely used globally, especially among universities as well as other educational institutions (Momani, 2010). This is further affirmed by a related study from South Africa in which Marongwe and Garidzirai (2021) found that rural universities, in the provinces of Eastern Cape, Limpopo, and Kwazulu natal; mainly used Blackboard and Moodle LMSs for class discussions and assessments as the COVID-19 remote learning platforms. This current study also found that some of these universities in South Africa had switched from the Blackboard to other LMS platforms. This observation is buttressed by an empirical study conducted by Moonsamy and Govender in South Africa which indicated that academic staff, who were trained for Blackboard LMS, had to switch to the Moodle LMS because the former was not user-friendly and difficult to navigate through use (Moonsamy, 2018). In another study conducted on four major LMS platforms, including the Blackboard, at Tulane University in the United States, the officials of the private research institution affirmed Blackboard LMS as the best of all (Squillante, 2014). Again, this corroborates the finding of this study that Blackboard was the most widely used LMS platform in South Africa's public universities. Similarly, a study has also confirmed the dominance of Blackboard LMS over others at the twenty-eight (28) public universities in Saudi Arabia (Aldiab et al., 2019). According to the Saudi authors, twenty-five universities representing 89% were using Blackboard while others used Moodle representing 7%, and D2L representing 4% respectively. Most interesting was the global survey on LMS usage conducted by Kuran et al., (2017) which found that Blackboard was most popular with 33% in the US and Canada, followed by Moodle at 20% while Canvas LMS was 20%. While in Europe, Moodle was found to be the most popular with 65%, and Blackboard was just 21% (Kuran et al., 2017). All of these empirical findings suggest that Blackboard mostly serves the educational needs of universities for online engagements of lecturers and students.

Limitations of the Study

This paper is not without a few limitations. In our analysis, we were unable to investigate the challenges of the LMS platforms used by the universities. Another limitation of this study is that we did not investigate the user-friendliness of each of the LMS platforms used by the universities and more importantly, investigating the teaching and learning experiences of lecturers and students with the LMS platforms was not considered in this study. As it were, the findings of this study cannot be generalised because they resulted from a review of South Africa's public

universities' websites and relevant literature on LMS platforms adopted for teaching and learning before and during the COVID-19 lockdown.

CONCLUSION AND RECOMMENDATIONS

In this study, an attempt was made to unearth how the twenty-six (26) public universities in South Africa confronted the conundrum of the COVID-19 pandemic by providing 'platformised' education (digital modes of teaching and learning) via various LMS tools. The novelty of this study is the fact that it has identified and discussed the various LMS platforms used by the 26 public universities in South Africa. Each of these universities has adopted at least one LMS platform for online engagements and interactions between the faculty members and their students. Prominent among the LMSs adopted by South African universities are the Blackboard, Moodle, Canvas, and Sakai. This study has, therefore, contributed immensely to the body of literature on the platformisation of education and digitalisation of teaching and learning activities with the aid of the LMSs. More importantly, this study has contributed to the discursive analysis regarding the platformisation of education vis-à-vis the adoption and utilisation of the learning management systems (LMSs) in higher education institutions. In light of the aforementioned findings, it is apposite to recommend that future studies need to investigate the challenging factors responsible for the switch from one LMS platform to another, particularly by a few public universities in South Africa. There is also a need to investigate the user-friendliness of the LMS platforms for teaching and learning for the purpose of reporting the students' and lecturers' experiences with their university's choice of the LMS platform.

REFERENCES

Aldiab, A., Chowdhury, H., Kootsookos, A., Alam, F. & Allhibi, H. (2019). Utilization of Learning Management Systems (LMSs) in higher education system: A case review for Saudi Arabia. *Energy Procedia*, *160*, 731-737. https://www.sciencedirect.com/science/article/pii/S1876610219312767

Amin, N. A. Z. B. M. & Soh, O. K. (2020). A Review of Research on the Effects of Music upon Second Language Acquisition. *Universal Journal of Educational Research*, *8*(1), 191-201. https://www.hrpub.org/download/20191230/UJER24-19514643.pdf

Angiolini, C., Ducato, R., Giannopoulou, A. & Schneider, G. (2020). Remote Teaching During the Emergency and Beyond: Four Open Privacy and Data Protection Issues of 'Platformised' Education. *Opinio Juris in Comparatione*, *Studies in Comparative and National Law* 1(1), 46-72.

Brian, T. (2010). *How the Best Leaders Lead*, American Management Association, United States of America.

Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems*, *49*(1), 5-22. https://dx.doi.org/10.1177%2F0047239520934018

Eder, R. (2020). The remoteness of remote learning: A policy lesson from COVID19. *Journal of Interdisciplinary Studies in Education*, *9*(1),168-171.

Elikplim, E. (2021). SUNLearn: How to Log into Stellenbosch University's Learning Management System. https://africavarsities.com/sunlearn-login

Foxcroft, C. & Bosire, S. (2020). Nelson Mandela University's conundrum. News. https://news.mandela.ac.za/Opinion-pieces/Opinion-pieces-archive/Nelson-Mandela-University%E2%80%99s-conundrum

Grimaldi, E. & Ball, S. J. (2021). Paradoxes of freedom. An archaeological analysis of educational online platform interfaces. *Critical Studies in Education*, 1-16. https://doi.org/10.1080/17508487.2020.1861043

Hash, P. M. (2020). Remote learning in school bands during the COVID-19 shutdown. *Journal of Research in Music Education*, *68*(4), 381-397. https://doi.org/10.1177/0022429420967008

Jackson, C. (2008). University of KwaZulu-Natal Learning Management System (LMS) Review. https://researchspace.ukzn.ac.za/bitstream/handle/10413/12608/LMS.pdf?sequence=1&isAllowed=y

Kakasevski, G., Mihajlov, M., Arsenovski, S. & Chungurski, S. (2008). Evaluating usability in learning management system Moodle. In *Iti 2008-30th international conference on information technology interfaces,* (pp. 613-618). IEEE.

Kang, B. (2021). How the COVID-19 Pandemic Is Reshaping the Education Service. *The Future of Service Post-COVID-19 Pandemic, Volume 1*, 15. https://library.oapen.org/bitstream/handle/20.500.12657/46838/2021

Kerssens, N. (n.d.). Platformisation of Education. Governing the Digital Society, Utrecht University. https://www.uu.nl/en/research/governing-the-digital-society/special-interest groups/platformisation-of-education

Kerssens, N. & Dijck, J. V. (2021). The platformization of primary education in The Netherlands. *Learning, Media and Technology*, 1-14. https://doi.org/10.1080/17439884.2021.1876725

Kumar, P. C., Vitak, J., Chetty, M. & Clegg, T. L. (2019). The platformization of the classroom: Teachers as surveillant consumers. *Surveillance & Society*, *17*(1/2), 145-152. https://ojs.library.queensu.ca/index.php/surveillance-and-society/index

Kuran, M. Ş., Pedersen, J. M. & Elsner, R. (2017). Learning management systems on blended learning courses: An experience-based observation. In *International conference on image processing and communications* (pp. 141-148). Springer, Cham, 2017, September. https://doi.org/10.1007/978-3-319-68720-9_17

Linden, A. (2020). UFH Online Teaching and Learning during lockdown: Milestones and plans. https://www.ufh.ac.za/news/News/UFHOnlineTeachingandLearningDuringLockdownMilestonesandPlans

Mail & Guardian. (2020). Digital Education with an eye on the future. Special Reports. https://mg.co.za/special-reports/2020-06-19-digital-education-with-an-eye-on-the-future/

Makhaga, C. (2020). Online Teaching is the new normal- UMP Lecturer. Newsletter.https://www.ump.ac.za/News-and-Events/Newsletter/June-2020/ONLINE-TEACHING-IS-THE-NEW-NORMAL-%E2%80%93-UMP-LECTURER

Maity, S., Sahu, T. N. & Sen, N. (2021). Panoramic view of digital education in COVID-19: A new explored avenue. *Review of Education*, 9(2), 405-423. https://doi.org/10.1002/rev3.3250

Marongwe, N., & Garidzirai, R. (2021). Together but Not Together: Challenges of Remote Learning for Students Amid the COVID-19 Pandemic in Rural South African Universities. *Research in Social Sciences and Technology*, *6*(3), 213-226. https://doi.org/10.46303/ressat.2021.39

Maske, P. (2020). Importance of LMS Software During Covid-19 Pandemic. Paradiso. https://www.paradisosolutions.com/blog/importance-lms-software-covid-19-pandemic.

Mbhiza, H. (2021). Shifting Paradigms: Rethinking Education During and Post-COVID-19 Pandemic. *Research in Social Sciences and Technology*, *6*(2), 279-289. https://doi.org/10.46303/ressat.2021.31

Momani, A. M. (2010). Comparison between Two Learning Management Systems: Moodle and Blackboard. *Online Submission*, 1-10. https://files.eric.ed.gov/fulltext/ED509728.pdf

Monnapula-Mapesela, M. (2020). Update on remote/online teaching and learning delivery. Latest News. https://www.ru.ac.za/cvrtt/latestnews/03may2020updateonremoteonlineteachingandlearningdelivery.html

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*, *14*(7), 3069-3082. https://doi.org/10.29333/ejmste/91623

Nelson Mandela University. (2019). A Quick Tour of Moodle for Instructors. https://ltcollab.mandela.ac.za/LT-Help/i-Learn-Moodle/Instructor-Quick-Tour

North-West University. (2021). eFundi Support- Support Academic Support and Development. Centre for Teaching and Learning (CTL). http://services.nwu.ac.za/ctl/student-efundi-support

Ogbonna, C. G., Ibezim, N. E. & Obi, C. A. (2019). Synchronous versus asynchronous e-learning in teaching word processing: An experimental approach. *South African Journal of Education*, *39*(2). https://doi.org/10.15700/saje.v39n2a1383

Perez, S. (2020). *Report: WhatsApp has Seen a 40% Increase in usage due to COVID 19 Pandemic*. https://techcrunch.com/2020/03/26/report-whatsapp-has-seen-a-40-increase-in-usage-due-to-covid-19-pandemic/

Piromalli, L. & Viteritti, A. (2019). The platformisation of higher education in Italy: Three case studies and a research agenda. *VOLUME II*, 258-264. Proceedings of the 1st International Conference of the Journal Scuola Democratica Education and Post-Democracy 6-8 June 2019, Cagliari, Italy. https://www.researchgate.net/profile/Federico-Batini/publication/337334298

Rhodes University. (2021). Call for Applications: Postgraduate Diploma in Higher Education for Academic Developers. https://www.ru.ac.za/teachingandlearning/resources/callforapplications/

Shava, E. (2022). Reinforcing the Role of ICT in Enhancing Teaching and Learning Post-COVID-19 in Tertiary Institutions in South Africa. *Journal of Culture and Values in Education*, *5*(1), 78-91. https://doi.org/10.46303/jcve.2022.7

Sigodi, O. (n.d.). WSU welcomes new E-Learning platform. Walter Sisulu University. https://www.wsu.ac.za/index.php/component/content/article/286-wsu-newsletter/304-wsu-welcomes-new-e-learning-platform?Itemid=437

Singh, V. & Thurman, A. (2019). How many ways can we define online learning? A systematic literature review of definitions of online learning (1988-2018). *American Journal of Distance Education*, *33*(4), 289-306.

Squillante, J., Wise, L. & Hartey, T. (2014). Analyzing blackboard: Using a learning management system from the student perspective. *Mathematics and Computer Science Capstones*, pp.1-51. https://digitalcommons.lasalle.edu/cgi/viewcontent.cgi?referer=https://scholar.google.com/&httpsredir=1&article=1020&context=mathcompcapstones

Sriram, S. (2019). Top 5 Features of a Cloud LMS all Higher Education Institutions need. eLearning Industry.https://elearningindustry.com/ways-learning-management-systems-revolutionized-homeschooling

Tsakeni, M. (2022). STEM Education Practical Work in Remote Classrooms: Prospects and Future Directions in the Post-Pandemic Era. *Journal of Culture and Values in Education*, *5*(1), 144-167. https://doi.org/10.46303/jcve.2022.11

University of Cape Town. (2021). Information and Communication Technology Services. http://www.icts.uct.ac.za/vula-uct

University of Fort Hare. (2021). University of Fort Hare Blackboard manual. https://www.ufh.ac.za/sites/default/files/UFH%20BB%20User%20Manual.pdf

University of Johannesburg. (2020). Centre for Academic Technologies (CAT) Services. https://www.uj.ac.za/corporateservices/ads/CAT/Pages/Services.aspx

University of Kwazulu-Natal. (n.d.). Introduction of Online Learning Management System (Moodle) 2016-2018.

https://coh.ukzn.ac.za/Files/Media/Documents/Announcement%20Documents/Online%20Learning.pdf

University of Pretoria. (2020). UP shows strong adaptability to online teaching and learning-Survey. Student Affairs. https://www.up.ac.za/student-affairs/news/post_2906988-up-shows-strong-adaptability-to-online-teaching-and-learning-survey

University of South Africa. (n.d.). Unisa open learning. Welcome. https://mooc.unisa.ac.za/portal/site/!gateway

University of the Western Cape. (2021). Online Platform (iKamva). Centre for Innovative Education & Communication Technologies (CIECT). https://www.uwc.ac.za/study/learning-and-teaching/centre-for-innovative-education-and-communication-technologies

University of the Witwatersrand. (2020). Online resources. ulwazi. https://www.wits.ac.za/teaching-and-learning/online-resources/

Van Dijck, J., Poell, T. & De Waal, M. (2018). *The platform society: Public values in a connective world*. Oxford University Press, Oxford, UK.

Vinas, D. (2020). Accelerating digital transformation in private education. Africa Global Funds. https://www.africaglobalfunds.com/analysis/analysis-and-strategy/accelerating-digital-transformation-in-private-education/

Waters, S., & Hensley, M. (2020). Measuring Rural P-12 Teachers' Attitudes, Perceptions, and Utilizations of Social Media. *Research in Social Sciences and Technology*, *5*(3), 25-54. https://doi.org/10.46303/ressat.05.03.2

Watson, E. (2020). # Education: The Potential Impact of Social Media and Hashtag Ideology on the Classroom. *Research in Social Sciences and Technology*, *5*(2), 40-56. https://doi.org/10.46303/ressat.05.02.3

Waytz, A. & Gray, K. (2018). Does online technology make us more or less sociable? A preliminary review and call for research. *Perspective on Psychological Science* 13(4), 473–491. https://doi.org/10.1177/1745691617746509

Weaver, D., Spratt, C. & Nair, C. S. (2008). Academic and student use of a learning management system: Implications for quality. *Australasian journal of educational technology*, *24*(1), 30-41. https://doi.org/10.14742/ajet.1228

Williamson, B., Eynon, R. & Potter, J. (2020). Pandemic politics, pedagogies and practices: digital
technologies and distance education during the coronavirus emergency. Learning, Media and Technology, 45(2), 107-114. https://doi.org/10.1080/17439884.2020.1761641