ARTICLE TITLE	CHALLENGES MITIGATING AGAINST EFFECTIVE ADOPTION AND USAGE OF E-LEARNING IN CURRICULUM DELIVERY IN SOUTH AFRICAN UNIVERSITIES
AUTHOR(S)	Oluwatoyin Ayodele Ajani
ARTICLE INFO	Oluwatoyin Ayodele Ajani. (2023) Challenges Mitigating Against Effective Adoption and Usage of E-Learning in Curriculum Delivery in South African Universities. *International Journal of Innovative Technologies in Social Science*. 2(38). doi: 10.31435/rsglobal_ijitss/30062023/8005
DOI	https://doi.org/10.31435/rsglobal_ijitss/30062023/8005
RECEIVED	19 May 2023
ACCEPTED	23 June 2023
PUBLISHED	27 June 2023
LICENSE	This work is licensed under a **Creative Commons Attribution 4.0 International License.**

CHALLENGES MITIGATING AGAINST EFFECTIVE ADOPTION AND USAGE OF E-LEARNING IN CURRICULUM DELIVERY IN SOUTH AFRICAN UNIVERSITIES

Oluwatoyin Ayodele Ajani
Centre for Excellence in Learning and Teaching (CELT)
Durban University of Technology
Durban, South Africa

ABSTRACT

The advent of the Fourth Industrial Revolution has brought about a significant transformation in the global education system. The incorporation and usage of diverse educational technologies facilitate the acquisition of knowledge in a tangible, effortless, and enjoyable manner, concurrently stimulating students' motivation to engage in the learning process. The advent of the COVID-19 pandemic has brought to light the importance of Information and Communication Technology (ICT) in the realm of education. The objective of this study is to investigate the implementation of e-learning in the context of higher education in South Africa, with a focus on challenges against effective adoption and usage of e-Learning in curriculum delivery. The significance of e-learning in revolutionising pedagogy through the usage of diverse learning technologies and online platforms for instruction, learning, and evaluation is undeniable. However, several obstacles have impeded the efficient integration of ICT in South African Higher Education Institutions. The research employed a systematic literature review methodology, drawing from diverse sources. Diverse educational institutions have reportedly encountered distinct obstacles in their efforts to successfully incorporate information and communication technology (ICT) into their instructional methodologies. The challenges that impede the efficiency of learning technologies include insufficient ICT resources, inadequate ICT skills, and power outages, among others. Consequently, the research suggests implementing tactics to improve the usage of information and communication technology (ICT) for electronic learning (e-learning) in academic establishments, in order to tackle the obstacles.

Introduction.

The integration of the Fourth Industrial Revolution into the education system has brought about a substantial transformation in the field of education. The integration of diverse learning technologies and platforms has been implemented in the educational context to augment the acquisition of knowledge and skills among students, thereby fostering a more tangible and significant learning experience. The acquisition of knowledge and skills is a dynamic process that involves the active engagement of students with various learning resources, including instructional materials, fellow students, and educators. This process leads to a transformation in

both cognitive and behavioural patterns. The notion of Learning 2.0 pertains to the usage of web-based tools to facilitate educational activities, thereby establishing a novel form of participatory medium that fosters diverse learning styles, including social learning (Gamede, Ajani & Afolabi, 2022). Learning 2.0 encompasses the usage of web-based tools, social networking platforms, collaborative approaches, and self-directed learning strategies. Efficient learning ought to enhance the calibre of the learning encounter, prioritise the student as the focal point, involve active participation, facilitate knowledge acquisition and modification, and ultimately influence the students' knowledge, attitudes, perceptions, and competencies. It is imperative for educators to equip students with practical skills that are applicable in their future employment, by integrating theoretical knowledge into real-life scenarios. According to Mlitwa (2006), the efficacy of teaching and learning is contingent upon various factors such as instructional methods, educational content, students, and educators. As such, technology alone cannot rectify these elements if they are substandard. The emergence of the COVID-19 pandemic has precipitated a swift and profound transformation across various industries, particularly within the realm of education. Universities in South Africa, similar to their global counterparts, have been impacted by lockdown measures which have significantly curtailed traditional in-person interactions between educators and students in the classroom. The usage of information communication technology has gained significant traction in this particular context, owing to the closure of educational institutions that have presented obstacles to students' learning. The usage of Information and Communication Technology (ICT) during the current period of lockdown has functioned as a viable means for individuals to maintain communication and pursue continued education through the usage of online platforms. The global and South African higher education institutions have been presented with diverse opportunities to implement a range of IT solutions and interventions, owing to the availability of various ICT resources and technologies. This has ensured the continuity of teaching and learning, as well as the evaluation of students' activities for the completion of the academic calendar. The primary objective of online learning during the pandemic was to mitigate the learning disparity that emerged as a result of the pandemic-related restrictions and lockdown measures.

The process of learning and teaching has been optimised through the concerted efforts of management, lecturers, students, institution administrators, and student support units, who have worked towards the efficient application of technology. The usage of technology amidst the COVID-19 outbreak and subsequent lockdown was widely acknowledged and valued by academic institutions and students globally, including those in South Africa. The rationale behind the acceptance was to capitalise on the usage of technology to facilitate in-person instruction, which is user-friendly, provides adaptability for both students and educators, and presents a controllable platform. Cranfield et al. (2021) posit that the integration of information technologies in learning and teaching yields numerous benefits. The integration of technology into the education system is fraught with challenges on a global scale, particularly within the realm of education. Despite the recognised benefits associated with the usage of Information and Communication Technology (ICT), there exist a number of constraints that impede the effective implementation of e-learning platforms in South Africa's tertiary education system. These limitations hinder both educators and students from fully experiencing the potential advantages of this technology. Several studies have identified a range of challenges that individuals may encounter in their efforts to engage with technology. These challenges include, but are not limited to, issues related to training, connectivity, face-to-face interaction, data, and access to appropriate devices. Additionally, personal challenges may also play a role in shaping an individual's ability to effectively engage with technology. The objective of the current research was to examine the obstacles hindering the successful implementation and usage of e-learning in South African universities, with a particular focus on institutions that have been historically disadvantaged. The implementation and usage of learning technologies by universities facing disadvantages is imperative in the development of effective and technology-driven e-learning platforms, which are essential for contemporary pedagogy. Several rural universities have implemented blended learning as a pedagogical approach, with some institutions adopting this method as early as 2006 (Sitar-Taut & Mican, 2021). According to Altalhi (2021), the implementation and usage of e-learning in rural universities continue to face significant obstacles, resulting in low adoption rates. The

objective of this study was to elucidate the obstacles to the successful implementation and usage of e-learning in rural universities in South Africa.

Theoretical framework.

Incorporating a suitable theoretical framework in a research endeavour serves to provide a foundational basis for comprehensively analysing the phenomenon under investigation. Thus, the adoption of an appropriate theoretical framework for this study is to strengthen the discursive understanding of the study. The education system worldwide is utilising diverse learning technologies to augment efficiency and productivity. Nonetheless, there is a notable opposition, particularly among academics in developing nations. Technology acceptance theories are usually adopted into various studies that relate to online learning or the use of learning technologies, by different scholars, in an attempt to promote the use of technologies in education (Ramirez-Correa et al., 2019). The study adopts the Unified Theory of Acceptance and Use of Technology (UTAUT) and Diffusion of Innovation Theory (DOI) theories to underpin the use of LMS as online learning during COVID-19 lockdown. These theories explain why academics should adopt LMS to deliver learning contents in higher institutions, especially during the COVID-19 pandemic, which restricts social gathering in large numbers. The Unified Theory of Acceptance and Use of Technology (UTAUT) is a theoretical framework that aims to explain and predict individuals' acceptance and usage of technology. The UTAUT model is a theoretical framework that is centred around technology and was formulated by Venkatesh, Morris, Michael, and Davis in the year 2003.

The Unified Theory of Acceptance and Use of Technology (UTAUT) appropriately explains the key concepts that can enhance the effective use of technology in any organisation. Ramon and Thannimalai (2021) assert that UTAUT is efficient in promoting an in-depth understanding of technology adoption and integration among groups of people in an establishment. According to Ramon and Thannimalai (2021), the theory provides more clarity for technology acceptance in any study than other similar theories, thus making it significantly appropriate for this study. Seemingly, Venkatesh et al. (2003: 428) posit that "various previous technology acceptance models have described an intention to use technology at 40 per cent among the technology users while UTAUT describes the intention to use technology among the technology users at 70 per cent". Therefore, the incorporation of the Unified Theory of Acceptance and Use of Technology (UTAUT) model in any research enhances the study through the methodical integration of eight fundamental theories that differentiate UTAUT as a suitable theory that comprehensively characterises the usage of diverse technologies in any establishment (Quigfei, Shaobo & Gang 2008). The model provides in-depth clarity on why users adopt and will use technology effectively despite variables that affect its use; hence, UTAUT is rich and significantly reliable to underpin any study (Ramon & Thannimalai, 2021). According to Venkatesh et al (2003: 429), "the model has four constructs that have been adapted to explain different factors influencing the behavioural intention of academics to use Moodle in this study. The aforementioned constructs are recognised as performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating condition (FC). According to Nikolopoulou et al (2020), the usage of UTUAT's fundamental concepts regulates factors such as age, gender, and the level of expertise of individuals who are inclined to adopt technology. According to Ventakatesh et al. (2003: 429), the constructs of performance expectancy (PE) and effort expectancy (EE) are integral to understanding user behaviour towards technology. PE refers to the user's belief that utilising technology to perform a job function will enhance their performance, while EE pertains to the user's perception of the ease with which they can use technology to perform a function. The concept of social influence (SI) pertains to the extent to which a user's perception of a technology is influenced by its perceived importance in performing a particular function. On the other hand, facilitating conditions (FC) refer to the user's belief in the degree to which organisational facilities can support the adoption and usage of said technology. Academic experts assert that the Utility, Ease of Use, Social Influence, and Trustworthiness (UTAUT) model enhances the acceptance and usage of technology for efficient educational delivery in higher education establishments, particularly in the current global pandemic epoch. This enables the provision of learning opportunities to students without geographical limitations (Nikolopoulou et al, 2020). Several studies have utilised the Unified Theory of Acceptance and Use of Technology (UTAUT) to validate its effectiveness in facilitating the adoption and usage of technology for educational purposes across various academic settings in tertiary institutions (Ramirez-Correa et al., 2019; Nikolopoulou et al.,

2020; Raman & Thannimalai, 2021).
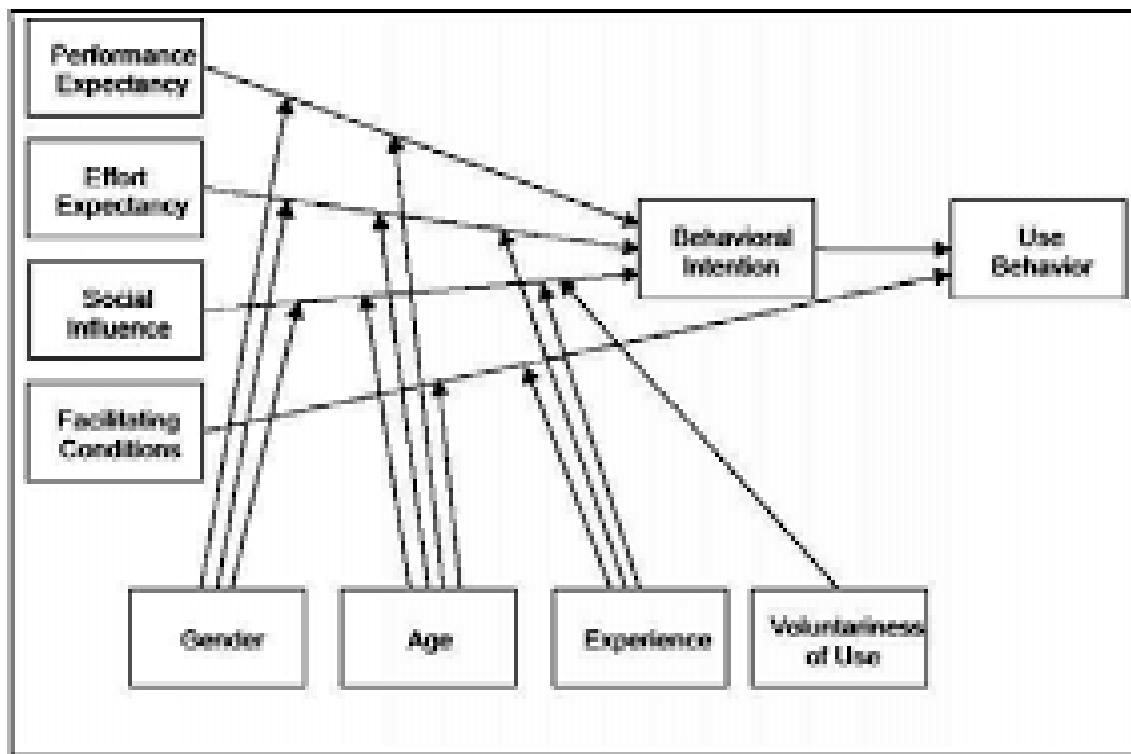
Fig 1. *Models of UTAUT (Ventakesh, 2003).*

The extant literature suggests that UTAUT is a viable framework for elucidating the means by which technology usage for teaching and learning among academics can be improved through the influence of behavioural intention. Venkatesh et al. (2003:428) explicate that the fundamental constructs of UTAUT are Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Condition. Performance Expectancy pertains to the extent to which academic staff members believe that the usage of Moodle LMS will enhance curriculum delivery. Effort Expectancy refers to the degree to which academic staff members believe that Moodle LMS will be facile to use for curriculum delivery. Social Influence denotes the perception of academic staff members that their peers should use Moodle LMS for curriculum delivery. Facilitating Condition is the degree to which academic staff members believe that organizational and technical resources are available to facilitate the use of Moodle LMS for teaching and learning.

How has e-learning been Implemented in Higher Education Institutions?

There has been a swift transformation in the realm of higher education with a concerted effort to implement an online learning approach by educators, as noted by Ng'ambi et al. (2016). In recent years, digital learning and online platforms have become increasingly prevalent among students, as noted by Henderson et al. (2017). The usage of the internet characterises online learning, which involves a physical separation between instructors and students. On the other hand, e-learning refers to a type of online learning that employs electronic media to facilitate both traditional classroom-based and remote learning approaches (Kumar Basak et al., 2018; Riahi, 2015). E-learning and mobile learning, commonly referred to as m-learning, are two distinct forms of digital learning. There exist several digital learning tools that can be categorised as both e-learning and m-learning tools. For further details on the comparison of these concepts, refer to Kumar Baset al. (2018). The present study delineates e-learning applications as interactive digital platforms that furnish students with information, tools, and resources, thereby facilitating and augmenting the delivery and administration of education (Kumar Basak et al., 2018). The efficacy

of digital technologies in facilitating pedagogy and enhancing student learning has been firmly established in academic literature (Camilleri & Camilleri, 2022).

Numerous scholarly investigations have been conducted to examine the integration of technology within the educational environment (Alfadda & Mahdi, 2021; Bond et al., 2018; Khan et al., 2017; Camilleri & Camilleri, 2022). According to Czerniewicz et al. (2020), the advantages of incorporating technology in higher education include improved diversity of educational offerings, equitable access to education, as well as enhanced efficiency in the delivery of educational content and personalization of learning experiences. The shift from conventional methods of teaching and education to digital and blended formats is a complex undertaking that necessitates the development of institutional strategies, careful planning, and widespread adoption (Graham et al., 2013; Leow et al., 2021). The authors Ng'ambi et al. (2016) have delineated four thematic phases in the progression of technology-enhanced learning over the period spanning from 1996 to 2016. The fourth phase, which is characterized by the prevalence of mobile learning and social media, has been significantly influenced by marketization, digitization, and the unbundling of higher education, as noted by Czerniewicz et al. (2020).

The demand for online education has resulted in a shift from the conventional teacher-centered pedagogy to a student-centered approach, emphasising the acquisition of skills by students rather than the instructor's teaching methods (Camilleri & Camilleri, 2022). The conventional pedagogical approach employed in tertiary education, namely the lecture format, tends to relegate the student to a passive role, as the instructor assumes the majority of the speaking, questioning, and cognitive processing (Agyei & Razi, 2021; Leow et al., 2021; Camilleri & Camilleri, 2022). Innovative pedagogical approaches have emerged in recent years, including the practise of 'flipping the classroom' (Brown et al., 2016; Lento, 2016) and the implementation of gamification in educational settings (Bergdahl et al., 2018; Oliveira et al., 2022; Salloum et al., 2019).

During the 1990s, the concept of e-learning, which refers to the use of network technologies to facilitate online learning, emerged in various higher education institutions in South Africa (Ravjee, 2007). In the South African context, the implementation of e-learning practises has introduced novel terminology, policies, and frameworks, as well as financial considerations. The implementation of e-learning in universities encompasses a variety of ICT-enhanced practises, such as the provision of email services, access to online journals and networked libraries, and the creation of innovative software solutions to facilitate information management tasks in teaching, research, and administrative systems. According to Moll et al. (2007), e-Learning is characterised as a form of flexible learning that utilises information and communication technology (ICT) resources, tools, and applications. The primary focus of e-Learning is on accessing information, facilitating interaction among lecturers, students, and the online environment, promoting collaborative learning, and enabling the production of materials, resources, and learning experiences. The concept of e-learning involves the usage of technological interventions to facilitate teaching, learning, and assessment processes (Mlitwa & Van Belle, 2011; Camilleri & Camilleri, 2022). This approach enables students to enhance their problem-solving abilities while empowering educators to effectively disseminate and impart knowledge. According to Millham and colleagues (2014), electronic learning (e-learning) is a crucial tool for enhancing students' performance, engagement, self-regulation, flexibility, interest, and motivation. The approach encourages engagement and self-directed learning, facilitating the creation of knowledge, adaptation of learning speed, and attainment of intended educational objectives (Camilleri & Camilleri, 2022).

The Historical Background of e-learning Policies and Activities.

According to Mtshali (2020), e-learning provides students with the opportunity to access course material online, seek clarification through online inquiries, and receive individualised support beyond the regular instructional hours. The usage of technology-based pedagogical methods and tools has been found to facilitate effective teaching in an online setting, as evidenced by research conducted by Altalhi (2021) and Itasanmi et al. (2022). The COVID-19 pandemic necessitated a transition to online learning, which resulted in a shift away from traditional lecturer-centred pedagogy. Consequently, students were required to adjust to the demands of remote learning. A significant transformation that has occurred pertains to the influence of the internet on tertiary education. The availability of online courses has

witnessed a significant surge in student enrolments, which has been consistently increasing (Chen et al., 2018). This trend highlights the importance for universities to effectively engage with this platform. Comprehending the manner in which students acquire knowledge through online means and their involvement in the virtual learning milieu is of paramount importance in fostering elevated levels of student engagement, as posited by Khan et al. (2017). The integration of novel educational technologies to facilitate and bolster student learning is among the notable advantages that the fourth industrial revolution (4IR) offers to higher education, as posited by Lakhal et al. (2021). Various technology-based learning methods and tools have been identified in the literature, including blogs, virtual worlds, gamified learning, massive open online courses, wikis, simulations, podcasts, vodcasts, online discussion forums, and digital cases. These methods have been explored in studies conducted by Bergdahl et al. (2018), Salloum et al. (2019), Altalhi (2021), Cummings et al. (2015), Ohei and Brink (2020), and Dexter et al. (2020). Digital cases, for instance, require students to make choices while working through a case study, leading to pre-programmed outcomes. However, the mere adoption of educational technologies does not guarantee a significant level of student engagement and learning. It is imperative that instructors employ these technologies in a specific manner, as indicated by Bergdahl et al. (2018).

Following its independence, South Africa developed education policies aimed at enhancing the accessibility of educational opportunities for historically marginalised groups (Dumbrajs et al., 2013). Since 1994, the prioritisation of education reform has been aimed at advancing equality across all racial groups. Advancements have been achieved in the realm of education legislation, policy formulation, curriculum restructuring, and the adoption of novel approaches to education dispensation. Nevertheless, obstacles such as student performance and alignment with the demands of the labor market persist. The National Curriculum Statement (NCS) places emphasis on an education approach that is centered around the student and based on outcomes. Within the GET band encompassing grades 1-9, the conventional notion of "subjects" has been supplanted by "learning areas" that are interwoven across established disciplinary demarcations. The curriculum was subsequently revised to utilize simpler language, prioritize fundamental skills and content knowledge, and ensure logical advancement across grade levels. The implementation of Curriculum 2005 brought about modifications in the South African educational system, necessitating the need for lecturers retraining to equip them with the requisite skills for the recently introduced technology subject. The objective of the revised policies was to impart education that is tailored to the socio-economic background of the students and to furnish them with practical skills that can be utilized in real-world scenarios (Dumbrajs et al., 2013). Additional policies encompassed the Revised National Curricula Statements and Curricula Assessment and Policy Statements, signifying a phase of swift change and democratization.

According to Dumbrajs et al. (2013), the recent education policies in South Africa have incorporated indigenous knowledge into the curricula, but without being prescriptive. In 2004, the Department of Education at the national level released its White Paper on E-Education. Subsequently, in 2006, a think-tank was convened to assess the research and delivery requirements for the implementation of e-Learning in schools, as outlined in the aforementioned White Paper (Moll et al., 2007). Hence, it is imperative for educators to deliberately create avenues for students to acquire knowledge proficiently, which can be achieved through the usage of Information and Communications Technologies (ICTs), such as e-learning. According to Jaffer et al. (2007), the usage of Information and Communication Technologies (ICTs) in the field of education can result in societal changes and enhance the necessary competencies required for a nation. According to Mlitwa (2006), the usage of innovative technologies in teaching and learning can enhance the quality of activities and aid in the attraction of new students, thereby enabling universities to maintain their competitiveness. The South African National Plan for Higher Education places emphasis on the role of universities in fostering an information society by leveraging technology to advance knowledge and enhance education, thereby supporting the new education system.

Consequently, there arose a necessity to incorporate Information and Communication Technologies (ICTs) in South African universities in order to enhance global competitiveness, foster innovation, and cater to the learning styles and preferences of digital natives who seek to engage in an active and authentic learning environment. The term 'digital natives' was coined by Prensky in 2001 to describe the contemporary cohort of students who have been immersed in technology from a young age. These individuals are considered to be proficient in the digital language of computers, video games, and

the Internet, akin to native speakers of a language (Thinyane, 2010). According to Hoijtink (2015), individuals aged 18 to 24 who have grown up in a digital environment are commonly referred to as digital natives. These individuals possess a high level of proficiency in utilizing various digital technologies such as computers, the internet, video games, smart phones, and tablets. Additionally, they engage in social media interactions more frequently than other age groups and demonstrate a remarkable ability to quickly adapt to emerging technologies. According to the author's projections, the number of smart phone users in South Africa is expected to reach 48.4 million, while mobile internet subscriptions are predicted to reach 35.3 million. Additionally, it is anticipated that there will be 5.1 million activated tablet devices and 2.1 million households with fixed internet subscriptions in the country by 2018.

Historically, South Africa has emulated Western practices; however, the impact of Asian nations is evident in the correlation between e-commerce and social media, as noted by Hoijtink (2015). According to Thinyane (2010), the learning process of digital natives differs from that of digital immigrants due to their distinct language and cognitive abilities. This implies that the traditional methods of teaching may not be as effective for digital natives as they were for digital immigrants. The cognitive and educational tendencies of Digital Natives encompass rapid information acquisition, parallel processing, multitasking, a preference for recreational activities over academic pursuits, a predilection for visual aids and non-linear access to information, optimal performance in networked environments, and a strong inclination towards immediate gratification and frequent reinforcement. According to the literature, individuals who did not grow up with digital technology, commonly referred to as Digital Immigrants, tend to approach tasks in a methodical and deliberate manner, focusing on one task at a time and valuing individual effort. It is suggested that Digital Immigrants should be encouraged to develop their digital literacy skills, and that educational institutions should consider adapting their teaching methods to better align with the learning styles of Digital Natives.

Emerging educational modalities, such as e-learning, game-based learning, webinars, and Massive Open Online Courses (MOOCs), are indicative of the profound societal transformation resulting from digitization. Thus, given that the e-learning approach organizational both learning and teaching, it is deemed suitable for accommodating the needs, preferences, and requirements of students. According to Du et al. (2013), e-learning facilitates a student-centred approach to education and fosters collaborative, communicative, and interactive activities, thereby enhancing the educational experience and effectiveness. Additionally, e-learning enables students to apply their knowledge in novel situations through the usage of case studies, role playing, and simulations. According to Bosch (2009), individuals who are considered digital natives may exhibit reluctance towards conventional teaching and learning approaches due to their strong attachment to technology. As a result, e-learning has emerged as a viable alternative for contemporary universities. A study conducted by Brown and Czerniewicz investigated the organization of Information and Communication Technologies (ICTs) in teaching and learning within Higher Education Institutions (HEIs) in the Western Cape Province of South Africa. The study revealed that a mere 2.15% of students reported never or rarely using a computer for any of the 18 computer-based learning activities. These findings suggest that students in South Africa may have comparable experiences to their counterparts around the globe, as reported by Thinyane (2010).

The South African government's objective Is to attain fair admission to Higher Education for students who were previously disadvantaged, encompassing individuals from varied racial, social, and educational backgrounds. This is because education is a catalyst for social transformation, as stated by Jaffer et al. (2007). According to Macgregor's (2008) account, the implementation of educational technologies such as e-learning in South Africa commenced in the year 2002. Information and Communication Technologies (ICTs) are utilized 7organizes ways for educational purposes. However, the degree of institutional support, funding, adoption, and personnel varies among universities. The proposal of the SA curriculum restructuring in 2003 has led to a surge in interest in e-learning services and platforms. Jaffer et al. (2007) posit that enhancements in the educational process can be attributed to pedagogical approaches, curriculum design, assessment methods, and organizational structure. Consequently, it is imperative for educators to allocate resources towards these facets in order to enhance the learning experience, augment retention rates, and ultimately elevate academic performance.

According to Venter et al. (2012), students enrolled in South African universities place significant importance on the use of electronic communication channels to interact with their instructors and peers. The usage of Educational Technologies (ETs) is valued for its potential to enhance students' engagement and motivation towards learning. According to Mlitwa (2006), e-learning can be classified

as a Social Technical Network (STN) due to its incorporation of technologies that facilitate user collaboration and construction. The integration of computer technology, network infrastructure, educational materials, instructors, students, and mediators within a learning management system (LMS) constitutes an e-learning system that can be classified as a system of technological networks (STN). Hence, the objective of this investigation is to examine the obstacles that hinder the implementation of e-learning in South African higher education establishments. This study sheds light on the obstacles that impact the adoption of e-learning in various educational institutions, and subsequently provides suggestions for addressing the identified challenges.

Challenges of e-learning Implementation in South Africa.

South African students face a range of challenges that stem from their diverse backgrounds, languages, and racial identities. These challenges are compounded by economic disparities, infrastructure deficiencies, limited access to educational resources, a shortage of skilled instructors, misconceptions about job loss among managers, and difficulties in content creation by instructors. The implementation of pedagogical approaches can be challenging, particularly in the context of sizable cohorts, and the acquisition of comprehensive understanding of students' challenges can be arduous. Consequently, students, particularly those hailing from disadvantaged socio-economic backgrounds, may experience academic delays. The complexities of modern education necessitate a multifaceted approach, such as blended learning, which is characterized by its innovative nature and ability to effectively address issues related to class and cultural diversity, students' prior educational experiences, heightened demand for education, and evolving learning requirements.

The policy documents of post-apartheid South Africa advocate for equal opportunities in the education sector. However, there exists a discrepancy between policy and practice, as noted by Rohleder et al. (2008). The implementation of e-learning methodology presents a viable solution to address the issue of equitable access to education, which remains a significant obstacle in South Africa. According to Brown et al. (2008), in order to effectively tackle the challenges at hand, it is recommended to engage in collaborative efforts, joint research projects, and the sharing of best practices and approaches. The following section delves into the execution of Learning Management Systems (LMSs) and social software across various universities in South Africa. Several scholars have identified challenges to e-learning in South Africa. According to Jaffer et al. (2007), there are several factors that can affect the academic performance of students, including differences in academic preparedness, large class sizes, multilingualism in a first language context, inadequate curriculum design, diversity in school backgrounds, and variations in academic ability. According to MacGregor's (2008) assertion, the obstacles of e-learning include limited bandwidth and inequitable accessibility.

Brown et al. (2008) have emphasised that the usage of e-learning is restricted by a variety of factors such as diverse organizational contexts, practices, and cultures, infrastructural limitations including the proportion of internet users to PCs, bandwidth, slow internet speeds, and high costs, demographic disparities, cell phone subscription, LMS instability, underutilization of interactive web potential, unequal access, negative perceptions towards e-learning, lack of management support, insufficient time and resources, and oversubscribed internet systems. Mlitwa and Van Belle (2011) identified several challenges in the implementation of technology in institutions. These include insufficient technical support, limited infrastructure and network capacity, inadequate coordination and technological support, technology instability, resistance to change, cumbersome administrative processes, access issues, low literacy levels, troubled network systems among institutional users, and inadequate user support. Other studies lack institutional support. The challenges faced in the implementation of e-learning in academic institutions include the absence of an integrated e-learning business strategy, the lack of an e-learning culture, the exclusion of academia from e-learning development programmes, negative instructor attitudes, technological challenges, insufficient pedagogical strategies, cost and quality concerns, inadequate university policy, training, motivation, and incentives, inadequate preparedness, absence of facilitating conditions, logistical issues, insufficient management and ICT support, weak ICT skills, limited resources, and low computer and internet access. These challenges have been identified by Isabirye and Dlodlo (2014) and OERAfrica (2014).

It is widely recognized that there are various analogous obstacles, including but not limited

to limitations in infrastructure, disparities in demographics, staffing challenges, organizational hurdles, student-related difficulties, and pedagogical concerns. Nevertheless, certain academic institutions encounter distinct obstacles such as insufficient time and resources, inadequate curriculum development, training, scarcity of information and communication technology (ICT) proficiency, and limited user engagement.

The use of Learning Management Systems in various institutions.

The University of Pretoria (UP) was an early adopter of e-learning, having implemented the WebCT LMS in 1998. Prior to this, the university had already been offering long-distance programmes since 1995, utilizing various technologies such as video conferencing, broadcasting, multimedia, and web-based courses. As per the report by OERAfrica in 2014, the University of Pretoria has a student population of more than 48,000 who are based on campus, in addition to over 24,000 part-time and distance students who are not located on campus. The Department of Telematics Learning and Education Innovation provides support to academic instructors in the development of learning design activities. The University of South Africa (UNISA) employs e-learning as a means of disseminating educational materials and promoting engagement, while also utilizing mobile technology to enable communication among students. According to OERAfrica (2014), the 'myunisa' platform has over 200,000 active students who are currently enrolled. This platform utilizes the Sakai platform, which is an Open Source Software (OSS), and has been customized to cater to the needs of users for administrative functions, academic collaboration, and tuition-related interaction, as noted by Venter et al. (2012). Out of the total population of students who utilized the system, 96% of them accessed it. Among these users, 13% actively participated in discussions, 64% were identified as frequent users, 23% were categorized as occasional users, and the remaining 10% were classified as infrequent users. The platform was primarily employed for administrative functions in a passive capacity, thereby indicating that its potential has not been fully realized. There exists a necessity to augment the number of engaged students in order to enhance the process of acquiring knowledge.

The University of Cape Town (UCT) utilized WebCT and Moodle as their learning management systems, which were later customized by Sakai in 2006 under the OSS Vula project. Presently, these systems are being employed by approximately 25,000 students and instructors from the University of South Africa and North-West University. The Learning Management System (LMS) facilitates pedagogy through the dissemination of notes and announcements, serving as a conduit for transmission rather than creation. The instructional design of courses is developed through the usage of e-learning and simulation methodologies. The process of deciding to adopt a Learning Management System (LMS) involved educators who possess the autonomy to opt for proprietary, in-house systems or abstain from utilizing any such system. According to Mlitwa (2006), educators are unable to allocate sufficient time towards the exploration and implementation of the system and pedagogy. The interfaces are designed to be simplistic by the designers, the helpdesk service is characterized by professionalism and efficiency, and the elimination of tedious administrative tasks is prioritized. Additionally, the adoption and usage of the system is facilitated by the lecturer assistants, as noted by Mlitwa and Van Belle in 2011. The Science instructor's ability to effectively utilize the system is hindered by the reluctance of instructors to adopt it, as well as a lack of promotion and support for system usage. The suboptimal working condition of the computers, absence of pertinent software programmes, and unavailability of a helpful lab instructor further contribute to this issue. The elevated rate of turnover observed in the LMS can be attributed to compatibility concerns.

The University of Stellenbosch (US) and Cape Peninsula University of Technology (CPUT) employ a proprietary Learning Management System (LMS) known as WebCT for the purpose of facilitating knowledge transfer (Mlitwa, 2006). The implementation of the system in the United States occurred without prior consultation with academic professionals, resulting in limited involvement of instructors. The Learning Management System (LMS) is widely utilized at universities in the United States due to its mandatory intake clause. Cape Peninsula University of Technology (CPUT) currently does not possess a formal policy or platform that enables users to exercise choice in selecting their preferred Learning Management System (LMS). The University of Western Cape (UWC) employs an internally developed open-source software known as KEWL.

The limited interactive engagement between social and technical factors in the context of Learning Management System (LMS) adoption and usage can be attributed to the lack of comprehension of potential benefits by academics and their reluctance to embrace change, as noted by Mlitwa (2006).

Nelson Mandela Metropolitan University (NMMU) employs the SharePoint 10 content and document management system to facilitate the dissemination of courses for the purpose of sharing and collaboration in blended learning environments, as noted by Ssekakuubo et al. (2011). The platform exhibits reduced flexibility and a restricted range of interactivity options, leading to its replacement by Moodle. According to OERAfrica (2014), the University of Johannesburg (UJ) has a student population exceeding 45,000 individuals who are enrolled in full-time, part-time, and face-to-face learning programmes. These students are distributed across seven campuses. The course delivery is supplemented by a commercial Learning Management System (LMS), which provides additional assistance to students in large classes through the provision of online resources. Educators are provided with assistance in the area of instructional design, thereby facilitating the usage of the platform. The Moodle platform has been utilized by the University of Kwazul Natal (UKZN) for the purpose of facilitating teaching and learning activities for both instructors and students since 2010, as reported by Sibanda and Donnelly (2014). The platform is utilized by educators to disseminate course materials, administer assignments, communicate important updates, facilitate peer discussions, and provide various interactive learning opportunities. The absence of supplementary assistance for students poses a difficulty in utilizing and embracing the system.

The Tshwane University of Technology (TUT) implemented the 'electronic campus' as their initial Learning Management System (LMS) in 2011. The previous system was substituted with Blackboard (MyTutor), a digital platform utilized by educators to share course materials, including lecture notes, homework assignments, and academic evaluations. Tshwane University of Technology (TUT) provides a range of systems to facilitate access to online video tutorials, TUT4life for students to access TUT mail and wireless internet, a system for checking grades, and an instructor portal for accessing instructor-related information. According to Mlitwa's (2006) observations at universities in the Western Cape, the potential for e-learning to function as a comprehensive socio-technical network was not fully realized due to a lack of engagement with the technical aspect on a socio-technical agency basis. The correlation between technology and organizational transformations is negligible. According to Brown et al. (2008), there was a greater incidence of media usage within the fields of Science, Engineering, and Health.

The implementation of Educational Technologies (ETs) has yielded favorable outcomes for various projects at the University of Cape Town (UCT). According to Jaffer et al. (2007), the usage of a computer tutorial resulted in enhanced comprehension of mathematical literacy skills and concepts, as well as improved retention. The usage of interactive spreadsheets proved to be a successful pedagogical approach as it prioritized the subject matter over procedural concerns. Furthermore, the provision of online feedback resulted in an enhancement of the students' article quality. The implementation of computer-assisted marking technologies has enabled the provision of feedback, thereby addressing challenges associated with large and diverse classes. Additionally, instructors are able to save time through online marking and the electronic capture of results. The educators were granted entry to the academic progress of their students and they discovered that prompt feedback was advantageous. Extraterrestrial beings have successfully resolved certain challenges that were deemed difficult to address through conventional face-to-face (f2f) techniques.

The research has identified certain gaps pertaining to the efficacy of ETs in addressing educational challenges in South Africa. These gaps include the determination of appropriate contexts for the implementation of ETs, as well as the identification of specific situations in which ETs can be effectively utilized. Jaffer et al. (2007) posit that students may encounter challenges in comprehending theory-driven courses owing to their limited practical knowledge and experience. The usage of simulations facilitated the provision of practical insights to students at the University of Cape Town, thereby creating an environment for authentic learning. The primary emphasis was placed on fundamental educational components and establishing connections between theoretical concepts and practical applications. An educational technology (ET) was employed to influence the design of curricula, affording students with simulated and role-playing experiences that are challenging to deliver in face-to-face (f2f) settings. Empirical encounters facilitated the application of theoretical concepts to tackle certain predicaments. There are still forthcoming challenges in the

identification and conceptualization of methods through which extraterrestrials can enhance learning experiences, curriculum, and pedagogical designs.

South Africa is widely recognized as a nation characterized by significant levels of inequality, with deep-seated divisions along lines of race, wealth, background, and identity. As such, individuals within this context are compelled to construct their own sense of identity. The study conducted by Rohleder et al. (2008) examined students from the University of the Western Cape and the University of Stellenbosch. The participants reported that the development of virtual communities equipped them with the necessary skills to navigate a heterogeneous society. The participants provided affirmative responses and expressed their intention to engage in future collaborative endeavors due to the educational benefits and potential for individual development. The usage of discussion forums and chat rooms within the Learning Management System (LMS) facilitated the cultivation of adaptability, ingenuity, cooperation, correspondence, and engagement, thereby augmenting the educational experience. The usage of e-learning as a medium has been found to provide students with a rewarding and enriching personal experience. Additionally, students have attributed the instant accessibility to information and their facilitators as a benefit of using this medium. The students derived satisfaction from engaging in cooperative activities with peers from varied racial and socioeconomic backgrounds.

Blended learning was advocated by students on the basis of their belief that face-to-face sessions hold significant importance. The inquiry into the means of establishing a community of practice that transcends surface-level engagement within a tangible setting persists. According to Mlitwa and Van Belle's (2011) research, subjective personal perceptions played a significant role in the varying levels of adoption of Learning Management Systems (LMS) by 21 instructors from UWC, UCT, US, and CPUT in the Western Cape Province. The study was conducted over a period of two years and involved interviews with the instructors. The participants' perception of e-learning was that it primarily served as a tool for content storage and management of assignments, as well as facilitating communication, rather than being primarily focused on the goals of teaching and learning. Educators express concerns regarding the possibility of their positions being substituted, while students exhibit tendencies to avoid attending classes. The pedagogical function of the Learning Management System (LMS) is often overlooked due to a lack of distinction between LMS and e-learning. Consequently, the potential to cater to diverse learning styles and teaching paradigms remains untapped. In future research, the Activity Analysis and Development (ActAD) framework will be utilized alongside empirical findings as a means of comparative data for investigating e-learning and Learning Management System (LMS) adoption.

According to Mohamed and Peerbhay's (2012) research, dental students at UWC expressed a favorable attitude towards the implementation of e-learning. According to the perceptions of the students, advanced learning was found to be encouraged, serving as a valuable supplement to instructors. Additionally, it was noted that this approach broadened their knowledge base, while the information provided was deemed relevant, informative, and helpful. The knowledge and expertise acquired served as a valuable resource in guiding their approach towards studying and adequately preparing for both theoretical and practical examinations. The challenges encountered in accessing the LMS included a shortage of computers, unsuitable software versions, computer malfunctions, viral infections, lack of internet connectivity, time constraints arising from workload, and sluggish internet connections that resulted in difficulties with downloading and accessing websites. The recommendation is for faster internet connectivity due to the adverse effects of resource scarcity, which can lead to negative attitudes and reduced engagement with online resources. The promotion of active learning through e-learning is recommended, with the suggestion that the subsequent implementation phase should incorporate interactive elements such as self-assessment and discussion boards. This is proposed as a means of incentivizing greater levels of active engagement. The approach that prioritises the student's needs employs a system of management for administrative purposes. It provides students with personalised tools that enable them to construct, present, reflect, and collaborate. Additionally, it fosters networks among students taking the same course and those in related fields.

Millham et al. (2014) have reported that the implementation of self-regulating e-learning as an intervention for suboptimal academic performance in science subjects has resulted in notable enhancements in students' grades. The program offers multimedia and simulation resources,

operates on a self-paced and self-regulated basis, and promotes student-led knowledge construction. This approach has been found to be more effective than the traditional face-to-face method. The implementation of self-regulated learning strategies promotes the process of knowledge construction, ultimately resulting in enhanced academic achievement in the field of science. The e-learning intervention has demonstrated favorable outcomes, particularly for students with high potential, despite facing obstacles such as equipment-related problems and inadequate proficiency in fundamental IT skills. The presence of incomplete marks posed a challenge to conducting a comprehensive analysis of grade performance and hindered the establishment of a correlation between assessment scores and pertinent statistical data. The study conducted by Sibanda and Donnelly (2014) aimed to assess the effect of e-learning on academic performance. The findings indicated a positive correlation between the introduction of online learning and an improvement in students' performances. The study further revealed that students' academic engagement increased over time as they became more acquainted with the online learning platform. The younger cohort of students demonstrated a rapid and proficient adjustment to the learning environment, resulting in heightened levels of engagement and subsequently, an improvement in academic performance.

Conclusion.

The topic of e-learning usage and integration was deliberated upon, with an emphasis on recognising obstacles and providing suggestions for improvement. The dearth of scholarly investigations pertaining to the usage of Social Software for academic objectives in Africa is comparatively lower than that of developed nations. The implementation of the SS approach is suggested as a means to facilitate educational activities that enhance the learning process. The Technology Adoption Model (Venter et al., 2012) posits that the adoption of a system is impacted by several factors, including attitudes, perceived ease-of-use, perceived usefulness, and user behavioural intentions. Consequently, it is imperative for institutions to ensure that these aforementioned factors are conducive to the efficacious implementation of e-learning. A forthcoming study aims to assess the progress of technology integration among educators at TUT and other South African academic institutions through the administration of surveys. Our study aims to investigate the impact of social software on learning outcomes in South African educational institutions. The research concurs with existing scholarly works that electronic learning (e-learning) can be advantageous for higher education institutions (HEIs) in creating and delivering diverse module/course materials, as well as evaluating students' performance. The research findings align with the notion that several obstacles hinder the successful adoption of e-learning in numerous South African tertiary institutions, similar to other African counterparts. Nonetheless, it is imperative for universities to tackle these challenges in order to optimise the usage of Moodle by academic professionals.

Recommendations.

This discursive study centres on the improvement of e-learning in numerous higher education institutions in South Africa. This research investigates the results of previous studies conducted by Elmahadi and Osman (2013), Mtebe and Raisamo (2014), Mpungose (2017, 2018), Kumar et al. (2020), Mpungose and Khoza (2020), and Maphose, Jita, and Dube (2020) in order to propose tactics for improving the efficient usage of e-learning in South Africa, as suggested by Tagoe (2012), Bhalalusesa et al. (2013), and Chioma et al. (2018). Encouraging the incorporation of e-learning in the educational process can facilitate the delivery of curriculum.

It is recommended that the Department of Higher Education and Training in South Africa allocate sufficient funds to Higher Education Institutions (HEIs) to ensure the provision of essential resources for Moodle. It is recommended that the current policy frameworks pertaining to online learning be revised in order to incorporate comprehensive technical support for academic staff engaged in e-learning. The updated policy aims to facilitate the usage of Moodle as the primary platform for all educational activities and evaluations within the academic community.

The promotion of the Fourth Industrial Revolution (4IR) in education necessitates the ongoing professional development of academics to ensure proficient usage of technology. Sufficient and consistent professional development opportunities are necessary for academics to effectively address

the quality of online teaching, online classes, and assessments. According to Ajani (2019), the provision of professional development opportunities can enhance the capacity of educators to effectively engage in online teaching and assessments. Insufficient technical resources and intermittent internet connectivity continue to pose significant obstacles to higher education institutions (HEIs) and academics in South Africa. One potential strategy for ensuring higher education institutions (HEIs) have sufficient technological resources is to promote the development of public-private partnerships.

The development of curricula for higher education institutions involves the consideration of both traditional and online teaching methods, with the aim of incorporating learning technologies into the delivery of the curriculum. It is imperative that the curriculum is effectively designed to accommodate online curriculum materials and evaluations. These have been specifically crafted to advance the objectives of sustainable development.

REFERENCES

1. Agyei, C., & Razi, Ö. (2021). The effect of extended UTAUT model on EFLs' adaptation to flipped classroom. *Education and Information Technologies, 27*, 1865–1882. https://doi.org//10.1007/s10639-021-10657-2.
2. Ajani, O. A. (2019). Understanding Teachers as Adult Learners in Professional Development Activities for Enhanced Classroom Practices. AFFRIKA Journal of Politics, Economics and Society, 9(2), 195-208. https://doi.org/10.31920/2075-6534/2019/9n2a10.
3. Ajani, O. A. (2021). Using Moodle for Curriculum Delivery in Higher Institutions during the Covid-19 Pandemic. *International Journal of Innovation, Creativity and Change*, 15(4), 708-724.
4. Alfadda, H. A., & Mahdi, H. S. (2021). Measuring students' use of Zoom application in language course based on the technology acceptance model (TAM). *Journal of Psycholinguistic Research, 50*, 883–900. https://doi.org/10.1007//s10936-020-09752-1 PMID:33398606.
5. Altalhi, M. (2021). Toward a model for acceptance of MOOCs in higher education: The modified UTAUT model for Saudi Arabia. *Education and Information Technologies, 26*(2), 1589–1605. https://doi.org/10.1007//s10639-020-10317-x.
6. Bagarukayo, E., Weide, T. P. V., Mbarika, V. W., & Kim, M. S. (2012). The Impact of Learning Driven Constructs on the Perceived Higher Order Cognitive Skills Improvement: Multimedia vs. Text" *International Journal of Education and Development using ICT, 8:120*-130.
7. Bergdahl, N., Fors, U., Hernwall, P., & Knutsson, O. (2018). The use of learning technologies and student engagement in learning activities. *Nordic Journal of Digital Literacy, 13*(2), 113–130. https://doi.org/10.18261//issn.1891-943x-2018-02-04.
8. Bond, M., Marín, V. I., Dolch, C., Bedenlier, S., & Zawacki-Richter, O. (2018). Digital transformation in German higher education: Student and teacher perceptions and usage of digital media. *International Journal of Educational Technology in Higher Education, 15*, Article 48. https://doi.org//10.1186/s41239-018-0130-1.
9. Bosch, T. E. (2009). Using online social networking for teaching and learning: Facebook use at the university of Cape Town. Communication: *South African Journal for Communication Theory and Research,* 35:185–200.
10. Brown, C. A., Danvers, K., & Doran, D. T. (2016). Student perceptions on using guided reading questions to motivate student reading in the flipped classroom. *Accounting Education, 25*(3), 256–271. https://doi.org/10.1080//09639284.2016.1165124.
11. Brown, C., Thomas, H., van der Merwe, A., & van Dyk, L. (2008). *The Impact of South Africa's ICT Infrastructure on Higher Education*. Proceedings of the 3rd International Conference on e-Learning.
12. Camilleri, M. A., & Camilleri, A. C. (2022). Learning from anywhere, anytime: Utilitarian motivations and facilitating conditions for mobile learning. *Technology, Knowledge, and Learning.* Advance online publication. https://doi.org//s10758-022-09608-8.
13. Chen, B., Bastedo, K., & Howard, W. (2018). Exploring design elements for online STEM courses: Active learning, engagement & assessment design. *Online Learning Journal, 22*(2), 59–76. https://doi.org/10.24059//olj.v22i2.1369.
14. Cranfield, D. J., Tick, A., Venter, I. M., Blignaut, R. J., & Renaud, K. (2021). Higher education students' perceptions of online learning during COVID-19 – A comparative study. *Education Sciences, 11*(8), 403. https://doi.org/10.3390//educsci11080403.
15. Cummings, C., Mason, D., Shelton, K., & Baur, K. (2015). Active learning strategies for online and blended learning environments. In J. Keengwe & J. J. Agamba (Eds.), Models for improving and optimizing online and blended learning in higher education (pp. 58–82). IGI Global. https://doi. org/10.4018/978-1-4666-6280-3.ch004..

16. Czerniewicz, L., Agherdien, N., Badenhorst, J., Belluigi, D., Chambers, T., Chili, M., De Villiers, M., Felix, A., Gachago, D., Gokhale, C., Ivala, E., Kramm, N., Madiba, M., Mistri, G., Mgqwashu, E., Pallitt, N., Prinsloo, P., Solomon, K., Strydom, S., … Wissing, G. (2020). A wake-up call: Equity, inequality and Covid-19 emergency remote teaching and learning. *Postdigital Science and Education, 2*(3), 946–967. https://doi.org/10.1007//s42438-020-00187-4.

17. Dexter, S., Clement, D., Moraguez, D., & Watson, G. S. (2020). (Inter)Active learning tools and pedagogical strategies in educational leadership preparation. *Journal of Research on Leadership Education, 15*(3), 173–191. https://doi.org/10.1177//1942775120936299.

18. Gamede, B. T., Ajani, O. A., & Afolabi, O. S. (2022). Exploring the adoption and usage of learning management system as alternative for curriculum delivery in South African higher education institutions during Covid-19 lockdown. *International Journal of Higher Education*, *11*(1), 71-84.

19. Graham, C. R., Woodfield, W., & Harrison, J. B. (2013). A framework for institutional adoption and implementation of blended learning in higher education. *The Internet and Higher Education, 18*, 4–14. https://doi.org//10.1016/j.iheduc.2012.09.003.

20. Hwang, Y., Al-Arabiat, M., & Shin, D. H. (2016). Understanding technology acceptance in a mandatory environment: A literature review. *Information Development, 32*(4), 1266–1283. https://doi.org//10.1177/0266666915593621.

21. Itasanmi, S. A., Oni, M. T., Ekpenyong, V. O., Ajani, O. A., & Omorinkoba, O. G. (2022). Academic staff's motivation for online teaching in Nigerian universities: Empirical evidence from the university of Ibadan. *International Journal of Learning, Teaching and Educational Research*, *21*(7), 345-365.

22. Khan, A., Egbue, O., Palkie, B., & Madden, J. (2017). Active learning: Engaging students to maximize learning in an online course. *Electronic Journal of e-Learning, 15*(2), 107–115.

23. Khechine, H., Lakhal, S., Pascot, D., & Bytha, A. (2014). UTAUT model for blended learning: The role of gender and age in the intention to use webinars. *Interdisciplinary Journal of e-Skills and Lifelong Learning*, *10*, 33–52.

24. Kumar Basak, S., Wotto, M., & Belanger, P. (2018). E-learning, M-learning and D-learning: Conceptual definition and comparative analysis. *E-Learning and Digital Media, 15*(4), 191– 216. https://doi.org/10.1177//2042753018785180.

25. Lakhal, S., Khechine, H., & Mukamurera, J. (2021). Explaining persistence in online courses in higher education: A difference-in-differences analysis. *International Journal of Educational Technology in Higher Education, 18*, Article 19. https://doi.org/10.1186//s41239-021-00251-4.

26. Lento, C. (2016). Promoting active learning in introductory financial accounting through the flipped classroom design. *Journal of Applied Research in Higher Education, 8*(1), 72–87. https://doi.org/10.1108/JARHE-01-2015-0005.

27. Leow, L. P., Phua, L. K., & Teh, S. Y. (2021). Extending the social influence factor: Behavioural intention to increase the usage of information and communication technology-enhanced student-centered teaching methods. *Educational Technology Research and Development, 69*, 1853–1879. https://doi.org/10.1007//s11423-021-10017-4.

28. Maatuk, A. M., Elberkawi, E. K., Aljawarneh, S., Rashaideh, H., & Alharbi, H. (2022). The COVID- 19 pandemic and E-learning: Challenges and opportunities from the perspective of students and instructors. *Journal of Computing in Higher Education, 34*(1), 21–38. https://doi.org//10.1007/s12528-021-09274-2 PMID:33967563.

29. MacGregor, K. (2008). South Africa: Universities not far behind the curve. *http://www.universityworldnews.com/article.php?story=20080807153150438*. 10th August 2008 Issue No: 40. Accessed 4th April 2015.

30. Mlitwa, N. (2006). *E-learning and Learning Management Systems (LMS) in a changing higher education environment.* "Transforming IS & CS Education and Research in a changing Higher Education Environment" conference. Capetown.

31. Mlitwa, W. & Van Belle, J. W. G. D. (2011). *Mediators for lecturer perspectives on learning management systems at universities in the Western Cape, South Africa*. In Proceedings of the Pacific Asia Conference on Information Systems (PACIS 2011), 2011, Brisbane, Australia. Brisbane: AIS Electronic Library.

32. Mohamed, N. & Peerbhay, F. (2012). Introducing dental students to e-learning at a South African University. *African Journal of Health Professions Education*, 4:123-127.

33. Moll, I., Adam, F., Backhouse, J., & Mhlang, E. (2007). Status Report on ICTs and Higher Education in South Africa. http://www.judybackhouse.com//pdfs/saide_status_of_elearning_in_sa.pdf.

34. Mtshali, N. (2020, August 8). How Covid-19 could change the higher education sector permanently. *Independent Online.* https://www.iol.co.za//news/opinion/how-covid-19-could-change-the-higher-education-sector-permanently-438ed3fc-617c-43ab-8fda-d962ee009266.

35. Ng'ambi, D., Brown, C., Bozalek, V., Gachago, D., & Wood, D. (2016). Technology enhanced teaching and learning in South African higher education – A rearview of a 20-year journey. *British Journal of Educational Technology, 47*(5), 843–858. https://doi.org//10.1111/bjet.12485.

36. Nikolopoulou, K., Gialamas, V., & Lavidas, K. (2020). Acceptance of mobile phone by university students for their studies: An investigation applying UTAUT2 model. *Education and Information Technologies, 25*, 4139–4155. https://doi.org//10.1007/s10639-020-10157-9.

37. OERAfrica, (2014). Case studies: delivering eLearning in South Africa. *http://www.oerafrica.org//supporting-distance-learners/case-studies-delivering-elearning-   south-africa*. Accessed on 7th November 2014.

38. Ohei, K. N., & Brink, R. (2020). The use of instructional ICT web technologies in higher education systems to support students' academic success. *Mousaion,* 37(2), 1–27. https://doi.org//10.25159/2663-659X/5975.

39. Oliveira, W., Hamari, J., Shi, L., Toda, A., Rodrigues, L., Palomino, P., & Isotani, S. (2022). Tailored gamification in education: A literature review and future agenda. *Education and Information Technologies*. Advance online publication. https://doi.org//10.1007/s10639-022-11122-4.

40. Pandey, J. (2019). Deductive approach to content analysis. In M. Gupta, M. Shaheen, & K. P. Reddy (Eds.), Qualitative techniques for workplace data analysis (pp. 145–169). IGI Global. https://doi. org//10.4018/978-1-5225-5366-3.ch007.

41. Raman, A., & Thannimalai, R. (2021). Factors impacting the behavioural intention to use e-learning at higher education amid the Covid-19 pandemic: UTAUT2 model. *Psychological Science and Education, 26*(3), 82–93. https://doi.org/10.17759//pse.2021260305.

42. Ramírez-Correa, P., Rondán-Cataluña, F. J., Arenas-Gaitán, J., & Martín-Velicia, F. (2019). Analysing the acceptation of online games in mobile devices: An application of UTAUT2. *Journal of Retailing and Consumer Services, 50*, 85–93. https://doi.org/10.1016//j.jretconser. 2019.04.018.

43. Ravjee, N. (2007). The politics of e-learning in South African higher education. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 3 (4); 27-41.

44. Riahi, G. (2015). E-learning systems based on cloud computing: A review. *Procedia Computer Science, 62*, 352–359. https://doi.org//10.1016/j.procs.2015.08.415.

45. Salloum, S. A., Alhamad, A. Q. M., Al-Emran, M., Monem, A. A., & Shaalan, K. (2019). Exploring students' acceptance of e-learning through the development of a comprehensive technology acceptance model. *IEEE Access: Practical Innovations, Open Solutions, 7*, 128445–128462. https://doi.org//10.1109/ACCESS.2019.2939467.

46. Sibanda, M. & Donnelly, S. (2014). The Impact of E-Learning on Student Performance: A Case Study of an Entry-Level Module at a South African University. *Mediterranean Journal of Social Sciences*, 5: 478-485.

47. Sitar-Taut, D. A., & Mican, D. (2021). Mobile learning acceptance and use in higher education during social distancing circumstances: An expansion and customization of UTAUT2. *Online Information Review, 45*(5), 1000–1019. https://doi.org//10.1108/OIR-01-2021-0017.

48. Universities South Africa. (2021). *Public universities in South Africa.* https://www.usaf.ac.za//public-universities-in-south-africa/.

49. Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *Management Information Systems Quarterly, 27*(3), 425– 478. https://doi.org//10.2307/30036540.

50. Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer acceptance and use of information tech- nology: Extending the unified theory of acceptance and use of technology. *Management Information Systems Quarterly, 36* (1), 157–178. https://doi.org//10.2307/41410412.