Preparedness of Staff and Students in Utilising Learning Management Systems in Health Sciences as Crisis Intervention during Lockdown

Vasanthrie Naidoo
ORCID iD: https://orcid.org/0000-0003-2740-5983

Shanaz Ghuman
ORCID iD: https://orcid.org/0000-0002-6707-9871

Nellie Naranjee
ORCID iD: https://orcid.org/0000-0002-4678-3114

Lavanya Madamshetty
ORCID iD: https://orcird.org/0000-0002-7033-364X

Jamila Khatoon Adam
ORCID iD: https://orcid.org/0000-0001-6266-699X

Maureen Nokuthula Sibiya
ORCID iD: https://orcid.org/0000-0003-1220-1478

Suresh Babu Naidu, Krishna
ORCID iD: https://orcid.org/0000-0003-3155-8878

Abstract

With the recent emergence of COVID-19 and the associated lack of adequate information on the epidemiology, therapeutic management or natural history of COVID-19, Higher Education Institutions (HEIs) around the globe have

DOI: https://doi.org/10.29086/978-0-9869936-5-7/2020/AASBS04
Chapter URL pp. 127 – 143: http://alternation.ukzn.ac.za/Files/books/series/04/05-naidoo.pdf

experienced profound structural changes in teaching and learning. It is important for academics and researchers at Higher Education Institutions to plan and apply appropriate self-directed learning and teaching principles to ensure effective teaching and learning outcomes. This demands a strong sense of responsibility and accountability, not only from a student perspective, but more importantly, from the perspective of the learning institution. South African Higher Education institutions have been equally affected, creating a strong sense of responsibility and accountability not only from a student perspective, but more importantly, from the perspective of the learning institution. The dynamics of learning and teaching environment, together with rapid changes in science and technology, have important implications for Higher Education and lecturers and students essential to be prepared to cope with the increasing complexity of Learning Management Systems (LMS). Learning institutions are now at the forefront of developing the skills of enquiry which encourages self-directedness and life-long learning through robust LMS, such as computer applications for the management, certification, tracing, broadcasting, and conveyance of informative online courses, tutorial plans, or education and personality development programs. In this chapter, we deliberate on the preparedness, problematisations and prospects for new insights and responses to infectious diseases, especially COVID-19, that confront the Health sciences curriculum within undergraduate and post-graduate programmes.

Keywords: Academic Staff, COVID19, Curriculum, Higher education, Structural change, South Africa

Introduction

Globally, economists and policymakers have bowed to the 1918 Spanish flu for management on the COVID-19 crisis, and some have been applauded by the example of its strong post-pandemic economic recovery. Representatives have also been persuaded to use lockdowns, school closures and HEI (called non-pharmaceutical interventions, or NPIs) in research roles, demonstrating that 1918's NPIs saved lives while assisting the subsequent economic recovery (Asquith 2020). Furthermore, all academic institutions around the world are grappling with the impact of the COVID-19 lockdown on their educational systems, and due to the emergence of COVID-19 and associated lack of

adequate information on the epidemiology, therapeutic management or natural history of COVID-19, and profound structural changes in teaching and learning have been experienced. It is important for academics and researchers at Higher Education Institutions to plan and apply appropriate self-directed learning and teaching principles to ensure effective teaching and learning outcomes. This demands a strong sense of responsibility and accountability, not only from a student perspective, but more importantly, from the perspective of the learning institution. While international and national government structures try to consolidate recovery plans in a proposition to save the calendar year, HEIs are responding to the lockdown and restrictions by driving digital learning and e-learning as ways of dealing with this crisis. However, in the 21st century and with the advent of the fourth industrial revolution (4IR), it is hard to imagine the turmoil within teaching and learning brought on by the unprecedented corona virus outbreak. Whilst, the 4th industrial revolution (4IR) has emerged, especially in the higher education sector bringing radical changes to the offering of its learning and teaching, (Manyonga & Ngubane-Mokiwa 2019),universities will still need to provide the right kind of resources and the right kind of people to drive the educational technology initiatives. This will also entail an understanding of how the discourse of Learning Management Systems (LMS) has influences curricula and pedagogy of the learning institution. There is certainly anxiety about the interaction between these technological developments that replaces face-to-face classroom interaction, which has been raised by policy-makers, academics and students alike. These and other concerns then raise the following question, 'How are LMS conceptualised particularly in terms of HEI curriculum and delivery?'

The new technologies utilised in tertiary education have increased access and improved teaching efficiency and, more importantly, South African tertiary institutions have responded to the shifting societal and financial challenges in the last two decades, embracing the usage of instructional and integrated advanced information technologies as a means to enhance student learning and performance. Modern LMS are gaining popularity worldwide and many colleges and universities are moving towards a more technological mode of delivering education and training. Advances in networking technologies, multimedia, and the internet can have a substantial influence on instruction and teaching patterns in higher education. It should also be noted that critical thinking can and should be applied to all knowledge systems, whether it be discipline, transdisciplinary, interdisciplinary or multidiscipline-based and

often better knowledge is produced when complementarity is regarded as a useful approach (Amin & Dhunpath 2019). Given our contributions to academic teaching at a higher education institute, in this chapter, we address complications faced by staff and learners that are simple to operate on a daily basis and to intensify the alertness among educationalists on how old-fashioned, face-to-face learning environment can be transformed using advanced information technology (IT) tools to improve the value of education and learners' engagement in traditional class and innovative online methods. Ethical issues during COVID 19 are also deliberated.

Current Trends in Higher Education in South Africa

Traditionally, there have been two approaches to e-Learning in HEIs, namely distance learning utilised for learners located in remote places from the essential site, and computer-aided teaching, which involves the use of material mainly from computers (Parkes, Stein & Reading 2015). Furthermore, the same study notes that the use of internet technologies among staff and learners leads to an improvement of the presentation and acquaintance of computer-based learning or e-Learning. The use of online platforms plays a very dynamic role in the lives of learners and staff, and this has increased the attention of numerous instructive knowledge experts. Consequently, e-Learning has been known as an unavoidable tool that has emerged after information technology, and has been enduring to be combined into many university learning management programmes.

Digital knowledge is bieng promoted at HEIs, convincing education-alists to challenge existing conventional methods of teaching and learning in the higher education sector and the use of electronic learning environments has already been implemented at many educational institutions across the world over the last three decades, seeing a rapid advancement in computer and communications technology (Larsen 2012: 1). Although Kiviniemi (2014: 47) notes that the use of information technology and e-Learning platforms in HEIs has sustained to increase into novel innovative practices in teaching and learning, Moore, Dickson-Deane and Galyen (2011: 129-135) argue that online digital education has well exceeded the initial methods of distance education teaching approaches, which were frequently based on communication type courses, video conferencing and educational programmes broadcasted via television. Likewise, blended learning, which is the

combination of face-to-face instructions with the help of technology-based learning, is gaining popularity among academics (Namyssova *et al.* 2019). Notably, there is continuous evolvement of the higher education setting into a technologically rich environment to align itself with a technologically minded generation. In recent times, this has been evidenced by HEIs' LMS subsequent swift in technical novelty that has enabled merging between traditional face-to-face and technologically driven environments (Bowyer & Chambers 2017). Some of the methods of teaching and learning that are commonly used by HEIs throughout South Africa and ones that encourage larger audiences are Microsoft TEAMS, Skype and Zoom webinars (Ayandiran 2016; Bowyer & Chambers 2017).

Technology-driven Learning in Higher Education

Teaching and learning in HEIs are shifting dramatically and the scene is constantly evolving (Fig. 1). Planning, teaching and learning during the time of lockdown and developing strategies and tools that allow the staff and students is imperative to offer the effective educational experiences, which can be achieved with the help of information technology.

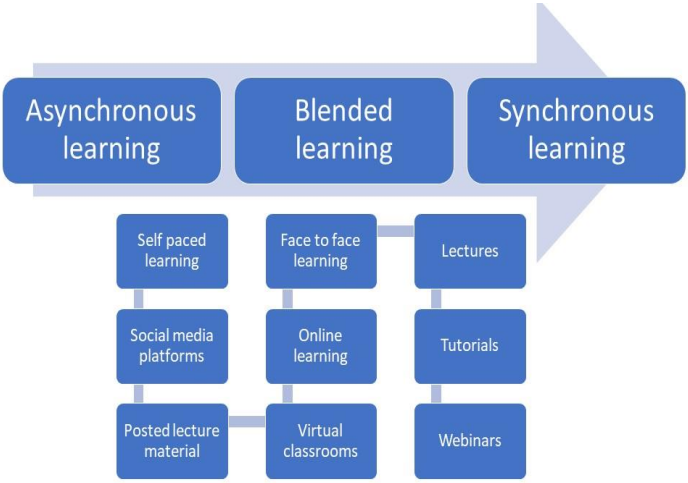

Figure 1. Different learning environments for learning

Apart from the ubiquity of digital technologies, many issues are responsible for this revolution, such as an increasingly varied student population, great demands on a skilled workforce and the need for more flexible learning environments, because of lifelong learning and pandemics like COVID 19 recently. In South Africa and globally, the higher education ecosystem is constantly changing and growing, driven by the influx of students from emerging economies such as China and India (OECD 2018). The intervention of online or e-Learning platforms has gained in popularity in the last two decades as an effective approach to accommodating an increasingly diverse student population and enriching the learning environment, with the incorporation of online teaching resources (Alammary, Sheard & Carbone 2014)

Blended Approach

Why We Need a Blended Approach

Technology brings more opportunities and challenges to teaching and learning. With technology being used from many years, traditional learning through face-to-face is being shifted to many other means of supporting knowledge delivery and innovative learning environment like blended learning, which is the combination of face-to-face instruction with the help of technology-based learning (Larsen 2012). Blended learning has substituted a great percentage of the outdated direct teaching environments (Veerasamy & Nabila 2020).

The benefits of Blended learning (BL) are as follows:

1. Assessment using BL has shown in many situations that is it more advantageous than direct or online instruction.
2. Students are more independent and autonomous in their learning, as they can learn and study at their own pace.
3. It is more preferable and effective, because it involves students in active learning, peer communication, processing the information gained through self-reflection and ‘checking their understanding, organizing their knowledge, and making connections with what they already know” (Garrison & Vaughan 2008).

During COVID 19 lockdown, blended learning is more beneficial because of the following reasons:

1. Assessment using BL has shown in many situations that it is are more advantageous than direct or online instruction.
2. It is combination of both direct and online learning.
3. Essentially it helps to establish learner engagement.
4. It reconstructs and substitutes traditional lesson interaction times.

Lecturer Preparedness during Lockdown

An LMS readiness evaluation is central to any HEIs, as this permits these organizations to generate strategies that will empower them to devise their goal line effectively and competently (Chaubey & Bhattacharya 2015). The questions that often surface are:

1. Are HEIs able to do engage successfully in LMS in the face of a crisis?
2. If we are able to engage, how is it possible to achieve our goal?
3. How can we measure and evaluate the implementation of LMS?

According to Verster, Collett and Van den Berg (2019), who explored multimodal interdisciplinary enhancement for the higher education curriculum, it was noted that lecturers in HEIs should:

1. Have the courage to explore and find their voices, rather than just drawing on traditional academic language and conventions.
2. Work collaboratively and tap into the resourcefulness of the collective, rather than as individuals.
3. Recognize the influences and value of engaging with multimodalities to find new ways of knowing and being.
4. Trust more in the process of attentive engagement with a depth of learning, rather than a superficial covering of content.

Lopes (2014) and Adzharuddin & Ling (2013), add that it is crucial to the accomplishment in altered models of digital learning and instruction for the lecturer or instructor to enable dynamic involvement and teamwork by learners in problem resolving and familiarity creation Furthermore, he agrees and further states that digitally based education approaches help to progress the educational process and report difficulties especially for academics, which are often connected to weak cooperative partnerships, deteriorating educational values, increasing budgets and augmented scholar statistics.

A study that explored LMS in HEIs has found that when schemes are presented into more advanced societies, users should not experience problems such as low technical literacy, high capacities, manifold dialects and institutional restraints like deprived technical backing, structure and internet admittance. The study further states that for online teaching and learning to be truly inclusive and be a success in developing economies, we need to consider these contextual issues (Chaubey & Bhattacharya 2015). Especially crisis and catastrophe can happen any time; when they occur it is necessary that all educational institutions are prepared to handle it effectively, which can be done by preparing online videos for the content, accessing online resources and moving lectures to virtual teaching and learning based on IT tools.

Notable information technology (IT)-related tools which are advantageous for students and staff are indicated in Table 1.

Table 1. Information technology associated tools used in digital education

Tool	Purpose	Web link
MS-Teams	For collaborating and communication	https://products.office.com/en-US/microsoft-teams/group-chat-software
Moodle	For uploading documents, communicating, assignments	https://git.in.moodle.com/moodle/moodle.git
Screen castify	For creating video based on the content	https://www.screencastify.com/

OneDrive	For sharing information and storing (Like projects and assessments)	https://onedrive.live.com/about/en-za/signin/
Google classroom	Aims to simplify creating, distributing, and grading assignments in a paperless way	https://classroom.google.com/u/0/h
Zoom	Video conferencing, webinars	https://www.zoom

Student Preparedness

Within education debates, transformation in educational institutions has often been understood from an academic standpoint of inclusion, to transform their cultures to increase access, participation and academic achievement of students. Chiwandire (2019) notes that employing the principle of 'multiple means of engagement' is important in sensitising lecturers to consider that students vary in the behaviours in which they can be involved or inspired to learn, requiring of lecturers to provide multiple ways for their scholars to improve and become involved in the knowledge process.

The following three factors are vital for student preparedness.

Psychological Readiness

Psychological preparedness means captivating the right attitude for the effective application of any digital learning programme. Chaubey and Bhattacharya (2015) report that perspectives to digital learning, such as the way in which a learner observes, trusts, details and visualizes the e-Learning programme. The study resolved that efficacious employment of any LMS programme within an institution means having the right resources. Psychological readiness is well-defined by Chapnick (2000) as a type of readiness, which places emphasis on a person's ability and this can affect the

consequence of the e-Learning creativity. This type of willingness for students is observed as one of the most significant contributing reasons that could influence the employment process.

Technological Willingness

Technological readiness/preparedness means that participants possess the right technological skills to know how to use LMS. Findings from Chaubey and Bhattacharya (2015) demonstrate that most students come to tertiary institutions without previous knowledge of technology or computer skills and since technology is evolving all the time, it is vital that HEI prepares students adequately for a multimedia online platform, which will allow lecturers to engage with students.

Equipment Readiness

The fact that students demonstrate success in a conventional education and training classroom may not be an adequate predictor of success in an e-Learning classroom. Chapnick (2000) noted that, whilst digitally based education is appreciated by undergraduate learners, they lack the funds and equipment. It is therefore suggested that equipment be made accessible for this type of education in order to safeguard its accomplishment.

LMS Intervention Strategies during Lockdown

With the enforcement of the international and national lockdown periods of countries and states, universities have had no choice but to begin the process of planning online courses for their students. This huge adjustment to the teaching and learning dynamics of the learning environment has been a great challenge not only for lecturers and students, but also for the staff providing technical and didactic support at HEIs. One such unit working behind the scenes is the development tasked with assisting with ongoing training and learning support for lecturers and student with LMS.

There have been inherent challenges with the digital platform, of learning and teaching and university teaching and learning task teams are still busy exploring alternative solutions to ensure no student is left behind. Universities have looked to specialists in e-Learning and educational technology, and devised plans to provide ongoing workshops on helping lecturers to develop online courses to ensure continuity in learning. This

mapping out of educational tools may help HEIs deliver online learning, considering the capabilities different institutions have and the devices students may have access to. Whilst some HEIs have guaranteed that their organization, learning funds and communicating systems are associated with a transportable educational environment, some other less advantaged HEIs are still facing challenges to overcome the infrastructure issues.

Surveys conducted across South African HEIs have projected that amongst 10% and 15% of scholars do not have access to proper data (Bowyer & Chambers 2017). Therefore, universities have put in additional measures to report the tasks confronted by students, such as the lack of access to laptops and data. A contingency plan comprises providing learners with laptops. Some universities are considering beginning mobile computing, which will allow students to have access to informative data. These mobile devices will be loaded with educational content and pre-loaded with the required learning tools before being delivered via the South African Post Office to students who need it. Finalisation of agreements between HEIs with major telecommunications service providers such as Telkom, MTN, Vodacom and Cell C at zero rate its library and LMS from 15 April 2020 will be effective and this will assist learners to access data.

Ethics in Teaching and Learning: Are we Prepared?

In line with the national lockdown put in place by the government at midnight on Thursday 26 March 2020 to stop the spread of COVID-19, all South African higher education institutions adhered to the restrictions of the lockdown period. This unique situation raised a number of concerns and uncertainties for the continuation and delivery of learning to students. Universities have an ethical obligation towards its students to provide them with the necessary systems of support to cope and pass their qualification. Through this viewpoint, digital learning platforms have become a vital method or alternative to learning distribution owing to the landscape of the education setting, to reach its audiences. During the last two decades, online education has become very popular. Due to the upsurge in its usage, distinct interest has grown regarding its ethical issues of online learning (Toprak *et al.* 2010). According to Bowden and Smythe (2008:19), ethical behaviour is communally and ethically tolerable, which is correspondent with right activities of the society. In other words, ethics is a chaperone to making decisions between right and wrong.

Many universities do not have an online system of support in place and it will take a while to develop such a system. Also, instructional ethics needs granting educational chances to everyone on an equal basis; ignoring nationality, gender, ideological differences or mental/physical infirmities. Ethics in digital learning, taking into consideration the number and diversity of students in these surroundings demands a policy harmonizing different prospects and studying how the users perceive the process. It is mainly the task of the HEIs to create and nurse the related outlines. This is critical for both the successful functioning of the system and meeting the outlooks of the users.

Vast literature available endorses that the ethical considerations in digital learning are based upon and include communal and political influence, cultural diversity, prejudice, geographical diversity, learner diversity, digital divide, etiquette and legal issues (Khan 2005). As reputes, learner range and the e-Learning environment must answer to different learning styles. As well individual differences, special needs of the learners such as disabilities also need to be taken into attention. Bearing in mind that diverse learners have changed learning needs, the instructor, course designer and moderators must be sensitive and innovative about involving them in the e-Learning environments.

The universities have to provide the necessary systems of support such as access to internet in the form of data, taking into consideration the network connectivity in the student's residential area. Aslani (2013) contends that it is important that students continue with their studies remotely wherever possible, using the many remote tools available and for lecturers and facilitators to provide them with good support. However, access to both laptops and data is a challenge for many students. Work is currently being done at a national level at the Durban University of Technology (DUT) to provide students with access to both laptops and data, which is a challenge for many. Work is currently also being done at a national level with different companies to provide students with access to South African-hosted websites, including all educational sites, for as long as they are unable to attend campus. However, there is still a lot of work to be done.

Besides Toprak *et al.* (2010) other studies also suggest that scholars desire to use novel technologies that offer improved instructional opportunities, but it is a fact that all learners may not have the essential technologies. This is related with the digital gap that underlines the status of

information accessibility in the e-Learning sphere. Khan (2005, quoted in Toprak *et al.* 2010:83), outlines the digital divide as the gap between those who have access to the Internet and other information technologies and those who do not. The motives may be economic, social, physical or topographical. Connected to the economic difficulties, institutions may support students to have better laptops and access to data. Some campaigns in association with technology companies that provide computer systems more economically can be utilised. In this way, the students have better advantages in accessing the latest information related to his course content.

Universities must deliver education that is impartial to all students, regardless of their socio-economic backgrounds. Toprak *et al.*'s (2010:85) study found that investigations should be conducted related with learning styles, hardware ownership, physical disabilities of students. Students have their own styles for expressly gathering and organising material for their education purposes, and they have diverse learning needs due to their dissimilar educational and societal backgrounds. This is why teachers, course designers, and discussion moderators must be sensitive about the students' learning behaviour and be innovative about teaching methodologies.

Quality standards should not be compromised during the lockdown period. Procedures must be in place to ensure the integrity of the assessment and the qualification. Almseidein and Klaif.Mahasneh (2020:219) state that HEIs should have e-Learning policies, guidelines on especially legal issues like preventive privacy, plagiarism and copyright issues. The students and instructors' opinions are different about the regulations for cheating/ plagiarism. Some requirements are necessary for the more effective and efficient use of online courses. However, students' involvement in the online courses should not be taken into consideration in student assessment. Aslani (2013:215) concurs by stating that teachers who work in electronic environments encounter great challenges in terms of providing electronic content. It is not only the books and learning facilities that are important. Providing a reliable network accompanied with effective software programs is vital, while network security and ethical issues come to the foreground. This COVID 19 pandemic has brought to light that new learning methods are likely to continue to develop and will continue to change aspects of learning delivery methods considerably. It should also be expected that ethical issues will also arise continually. Preparations should be made to mitigate the effects of ethical issues before they appear, not after.

Conclusion

Income development is a central attention in the design digital environment. This study deliberates the benefits and challenges related to learning management systems at DUT, South Africa. The changing context of our delivery of programmes requires that we carefully consider revising our original curriculum plans without comprising the outcomes of our programmes. As we change from direct to online modes for learning and teaching, we are expected to make decisions about the planned curriculum and how we deliver this within the confines imposed on us by the global crisis. However, online education is permeating higher education, convincing educators to challenge existing assumptions of teaching, learning in higher education, and explore a combination of instructional methods available to them. Even though students may display a positive defiance towards e-Learning, educational technology trends are advancing endlessly with recent training and learning needs. Overall, HEIs have to institute additional measures to address the challenges faced by learners and staff, such as the dearth of access to devices and data while working remotely from home.

Authors' Contributions.
All authors equally contributed to the writing of the chapter.
Conflict of Interest.
Authors declare no conflict of interest.
Funding information.
No direct funding from the NRF project was received for this research.

References

Adzharuddin, N.A. & L.H. Ling 2013. Learning Management System (LMS) among University Students: Does it Work? *International Journal of e-Education, e-Business, e-Management and e-Learning* 3: 248 – 252.

Alammary, A., J. Sheard & A. Carbone 2014. Blended Learning in Higher Education: Three Different Design Approaches. *Australasian Journal of Educational Technology* 30: 440 – 454.

Almseidein, T.A. & O.M. Klaif.Mahasneh 2020. Awareness of Ethical Issues when Using an e-Learning System. *International Journal of Advanced Computer Science and Applications* 11: 128 – 131.

Amin, N. & R. Dhunpath 2019. Curriculum without Borders: Transdisciplinary, Interdisciplinary and Multidisciplinary Teaching in Higher Education. *Alternation* 27: 1 – 5. Available at: https://doi.org/10.29086/2519-5476/2019/sp27e1 (Accessed on 16 June 2020)

Aslani, G. 2013. Identification and Management of Ethical Challenge in e-Learning Systems. *Procedia - Social and Behavioral Sciences* 83: 214 – 218.

Asquith, B.J. 2020. What can We Learn from the 1918 Pandemic? Careful Economics and Policy Lessons from Influenza. Policy Paper No. 2020–2022. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research. Available at: https://doi.org/10.17848/pol2020-022 (Accessed on 4 August 2020.)

Ayandiran, E.O. 2016. *Facilitation of the Development of a Blended e-Learning Model for Nursing Education in a Resourced-constrained Educational Setting in Nigeria.* University of KwaZulu-Natal, Howard College.

Bowden, P. & V. Smythe 2008. Theories on Teaching & Training in Ethics. *EJBO - Electronic Journal of Business Ethics and Organization Studies* 13,2: 19 – 26

Bowyer, J. & L. Chambers 2017. Evaluating Blended Learning: Bringing the Elements Together. *Research Matters: A Cambridge Assessment Publication* 23: 17 – 26.

Chapnick, S. 2000. Are you Ready for e-Learning. Available at: https://nurhadiw.files.wordpress.com/2010/08/are_you_ready_for_elearning.pdf (Accessed on 16 June 2020)

Chaubey, A. & B. Bhattacharya 2015. Learning Management System in Higher Education. *International Journal of Science Technology & Engineering* 2: 158 – 162.

Chiwandire, D. 2019. Universal Design for Learning and Disability Inclusion in South African Higher Education Curriculum. *Alternation Special Edition* 27: 6 – 36. Available at: https://doi.org/10.29086/2519-5476/2019/sp27a1 (Accessed on 4 August 2020.)

Garrison, D.R. & N.D. Vaughan 2008. *Blended Learning in Higher Education: Framework, Principles, and Guidelines.* New York: John Wiley & Sons.

Khan, B.H. 2005. *Managing e-Learning: Design, Delivery, Implementation, and Evaluation.* London: IGI Global.

Kiviniemi, M.T. 2014. Effects of a Blended Learning Approach on Student Outcomes in a Graduate-level Public Health Course. *BMC Medical Education* 14: 47.

Larsen, L.J.E. 2012. Teacher and Student Perspectives on a Blended Learning Intensive English Program Writing Course. Doctor of Philosophy, Iowa State University. Available at: https://lib.dr.iastate.edu/cgi/viewcontent.cgi?article= 3382&context=etd (Accessed on 28 July 2020.)

Lopes, A.P. 2020. *Learning Management Systems in Higher Education. EDULEARN14 Conference.* Proceedings of EDULEARN14 Conference – IATED Publications, 5360 – 5365.

Manyonga, B. & S. Ngubane-Mokiwa 2019. Curriculum Development: An Enriched Approach for Twenty-First Century Open Distance Learning. *Alternation* 27: 37 – 64. Available at: https://doi.org/10.29086/2519-5476/2019/sp27a2 (Accessed on 28 July 2020.)

Moore, J.L., C. Dickson-Deane & K. Galyen 2011. e-Learning, Online Learning, and Distance Learning Environments: Are they the Same? *The Internet and Higher Education* 14: 129 - 135.

Namyssova, G., G. Tussupbekova, J. Helmer, K. Malone, M. Afzal & D. Jonbekova 2019. Challenges and Benefits of Blended Learning in Higher Education. *International Journal of Technology in Education* 2,1: 22 – 31.

OECD 2018. How is the Global Talent Pool Changing? Education Indicators in Focus. Available at: http://www.oecd.org/education/50495363.pdf (Accessed on 4 August 2020.)

Parkes, M., S. Stein & C. Reading 2015. Student Preparedness for University e-Learning Environments. *Internet and Higher Education* 25: 1 – 10.

Toprak, E., B. Ozkanal, S. Aydin & S. Kaya 2010. Ethics in e-Learning. *Turkish Online Journal of Educational Technology-TOJET* 9: 78 – 86.

Veerasamy, S.M.D.R. & T.C. Nabila 2020. Blended Learning in Higher Education: A Critical Review. *The Online Journal of Distance Education and e-Learning* 8: 18.

Verster, B., K. Collett & D. van den Berg 2019. Creative Meaning-making through a Multimodal, Interdisciplinary Exploration: Lessons for Higher Education Curriculum Enhancement. *Alternation* 27: 139 – 160. Available at: https://doi.org/10.29086/2519-5476/2019/sp27a6 (Accessed on 28 July 2020.)

Dr. Suresh Babu Naidu, Krishna
Department of Biomedical and Clinical Technology
Durban University of Technology
sureshk@dut.ac.za

Dr. Vasanthrie Naidoo
Psychiatry Nursing
Faculty of Health Sciences
Durban University of Technology
VasanthrieN@dut.ac.za

Dr. Shanaz Ghuman
Environmental Health Community Health Studies
Faculty of Health Sciences
Durban University of Technology
Shanazg@dut.ac.za

Mrs. Nellie Naranjee
Nursing, Faculty of Health Sciences
Durban University of Technology
NellieN1@dut.ac.za

Prof. Jamila Khatoon Adam
Department of Biomedical and Clinical Technology
Durban University of Technology
adamjk@dut.ac.za

Prof. Maureen Nokuthula Sibiya
DVC Teaching and Learning
Durban University of Technology
dvcteachingandlearning@dut.ac.za

Mrs. Lavanya Madamshetty
Faculty of Accounting and Informatics
Durban University of Technology
lavanyam@dut.ac.za