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A decade of *e*-Learning implementation Challenges at the College of Business Education in Tanzania

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ABSTRACT

The implementation of electronic learning (*e*-learning) in Tanzania's higher education institutions (HEIs) has flourished in recent years. The College of Business Education (CBE) embarked on an *e*-learning system Student Academic Register Information System (SARIS) and a Moodle system in the year 2011. However, the implementation of *e*-learning systems at CBE has had challenges and experiences that were neither properly reported nor documented for improvement. This study, therefore, aims at highlighting the decade long usage of the *e*-learning systems at CBE. The study adapted and extended the Andersson and Grönlund Conceptual Framework for *e*-learning in developing countries. During the wake of COVID-19 a total of 210 participants (12 teachers and 198 students) from four CBE campuses participated in the study and precautions of social distancing were observed. Data were collected using an in-depth interview and questionnaires. The analysis of qualitative data was conducted using content analysis and for the quantitative data the analysis was done on the frequencies as well as descriptive data through the Statistical Package for Social Sciences (SPSS) IBM version 23.0. The results revealed that amongst other factors, technology training, a conducive environment and readiness for *e*-learning pedagogy, posed some of the major challenges in the implementation of *e*-learning for both the teachers and students.

Keywords: *e-learning; teachers and students e-learning challenges; e-learning implementation; HEIs; CBE; Tanzania*

INTRODUCTION

Electronic learning (*e*-learning) systems have been and are still being implemented at varying times in many higher education institutions (HEIs) in Tanzania (Mtebe, 2014; Lashayo & Md Johar, 2017). The mode of teaching and learning in most of the HEIs has been slowly changing and able to benefit from the facilities obtained from *e*-learning, such as the access to online education materials - books, journal articles, and research publications. Students have an opportunity to improve their learning through self-regulated learning (SRL) since they are provided with online access to a variety of educational resources, collaborative learning, and can share educational projects with students from different locations of the world at their own pace to enhance their learning (Mwandosya, Mbise & Oyelere, 2019). The senior management of the higher education institutions in Tanzania seized this opportunity for enhancing education such that they spend a significant amount of funds and resources on the infrastructure to support the success of *e*-learning (Tedre, Ngumbuke & Kemppainen, 2010; Lwoga, 2014; Mwandosya, Calkin Suero Montero & Mbise, 2019). The traditional model of teaching and learning has been enhanced such that teachers and students can share learning content and class activities online (Voogt, 2014). E-learning implementation at CBE started in 2010 whereas before the implementation teaching and learning was bound in classrooms in a face-to-face scenario. Traditional face-to-face teaching and learning was mostly teacher-centered allowing teachers to be the source and master of learning materials, with students copying from the blackboards, whiteboards or printed hard copies of learning materials, limiting their innovative and creative abilities (Mwandosya *et al.,* 2020). However, despite the benefits which can be obtained from implementation of e-learning systems in higher education institutions, there is still missing studies for a well elaborated framework for the implementation of e-learning in Tanzanian higher education.

This study was conducted at the College of Business Education (CBE) in Tanzania. CBE is amongst the 579 higher education institutions under NACTE - the National Accreditation Council for Technical Education (National Council for Technical Education, 2018). CBE having four campuses situated in four strategic regions of Tanzania has a chance of attracting students from neighboring countries. The main campus is in Dar es Salaam city which is an economic hub of Tanzania and a former capital city. Most of commercial activities take place in Dar es Salaam, and it is also a port that serves landlocked countries including Zambia, Rwanda, Burundi, and Uganda. The second campus is in Dodoma city, the newly promoted capital city, and it is centrally located. The third campus is in Mwanza city, the second largest city in Tanzania after Dar es Salaam in the Northern zone bordering the shores of Lake Victoria. The last campus in the list is in Mbeya city, a city in the Southern zone with many tourist attractions bordering Malawi, Zambia, and DR Congo. The four campuses are joined by a Virtual Private Network (VPN) which is boosting the implementation of e-learning in all campuses.

Among the challenges still facing the traditional teaching and learning method at CBE, is the number of students in some classes which exceed a manageable size for teachers to deliver the lessons efficiently. Furthermore, the students 'understanding of the lessons has been adversely impacted due to their sheer number in a class, and for teachers it becomes almost impossible to determine the understanding and attend to challenges of individual students. The cause of many students in those classes is that some subjects normally cut across more than one department and are taught at the same time, at the same venue and by one teacher. During the time when the subjects that cut across are in session, all the students of those departments assemble in one class that can barely accommodate them all. Another obvious educational challenge at CBE has been the number of errors experienced during the processing of the examination results, due to the manual recording and processing of scores from the examination scripts. Apart from the errors, the manual processing of examinations also take an unnecessarily long time to accomplish. It is recurrent for students to complain that their examination results get inexplicably delayed and that when they are ultimately released, they are invariably laden with factual errors.

In a move by the management aimed at solving the identified educational challenges at CBE, there were several initiatives, for instance, to automate some of the educational related activities, thus enhancing their efficiency, and solving the challenges of manual processing. In the year 2004, the management and staff of CBE initiated the implementation of a Moodle system to accommodate *e*-learning at CBE. In the year 2009, the management of CBE and the government of the Netherlands, through the Niche project entered a partnership for ICT capacity building of teachers and improve the curriculum. The emphasis was on interactive and competency-based learning in keeping with the *e*-learning pedagogy. Also in 2009, one of the staff members in the computer department designed a Microsoft Excel application that automated the addition of course work scores and the end of semester examinations scores with ease and determined the final grades as well. The Microsoft Excel application helped in minimizing the time required to process examination results and minimized the errors due to manual calculations. The implementation of the Moodle system did not operate smoothly though, due to a few setbacks including, technical capacities of Information Technology (IT) personnel to support the Moodle system, motivation, stable technology infrastructure, computer availability, to staff and training.

In a bid that solely aimed at resolving the technical related challenges, a decade ago, since the year 2011, the management of the College of Business Education, to ensure that the Moodle system and generally the *e*-learning project progressed, embarked on a project to build, and extend the Local Area Networks (LANs) at all its four campuses. The project was funded by the World Bank which provided access to more than 400 computers for academic and other members of staff at all four campuses of CBE in 2010. The top management team was provided with 60 laptops while the teachers and administrative members of staff each had access to an office desktop. In the library, some computers were installed for accessing online books and other library-related services. Due to insufficient space allocated for library services at CBE, only a few computers were

installed, a limited number of books, and this could not accommodate many students (see Figure 1). The ICT infrastructure was then extended to accommodate the virtual private network (VPN) so that the smooth communication and exchange of educational information among the four campuses of CBE through *e*-learning could be achieved and improve the library services obtaining online books to solve the library space challenges.

Figure 1: The crowded insufficient library space at CBE

The existence of the ICT infrastructure in all four campuses of CBE had brought about increased installations and usage of different software. Some of the notable software introduced earlier were the PASTEL, a software for accounting and bookkeeping for accounting purposes, the KOHA an information system for library services, the Students' Academic and Registration Information System (SARIS) and a Moodle system for an *e*-learning purposes. Most recently the accounting system written in Swahili - *Mfumo wa Ulipaji Serikalini* (MUSE) was introduced by the government to be used by all government institutions when a variety of payments are dealt with.

Teachers and students in all campuses of CBE started to use SARIS (see Figure 2) as an *e*-learning system mainly for students' registration, data management, and examination result processing, and a Moodle system mainly for access to and exchange of learning materials. The earlier challenges of the late delivery of examination results, inaccurate examination results, and slow processes of examination related activities was partially solved by SARIS. The subject teacher is responsible for setting, marking and posting scores of the individual and group assignments, class tests, and mid semester examinations into SARIS forming the coursework marks. For each subject, it is the coursework marks and the end of semester marks that are also posted to form the final examination scores. The advantage is that the addition and grading is done instantaneously without many errors as they were during the manual processing of examinations (see Figure 2 below – login window).

The SARIS as an *e*-learning system, despite its advantages and practicality, has disadvantages that cause usage acceptance issues from both the teaching staff as well as the students. The situation did not improve significantly since some of its applications were not yet functioning properly and the use of SARIS commenced before the appropriate training of teachers and students. Furthermore, some of the working parts of the software were found to be irrelevant to the teaching staff, and they expressed a need for their involvement when SARIS as a new software was introduced (Mwandosya, Montero & Mbise, 2019). To date, SARIS is still being used at CBE as the *e*-learning system despite its problems and challenges to both the teachers and students. Apart from the measures being taken by the management of CBE to rectify the SARIS software to improve its performance, little effort has been expended to: explore the requirements and experiences of teachers and students prior to the implementation of *e*-learning systems; and their overall usage of the learning management systems, in a bid to improve *e*-learning systems in

Tanzania's HEIs. Thus, it is the objective of this study to elaborate on the experiences of the challenges teachers and students face in their usage of *e*-learning management systems in Tanzania, from the viewpoint of the teachers and students, and their challenges and experiences in using *e*-learning management systems at CBE. The study also focused on obtaining an insight into their requirements for the proper design of the solution in the process of improving the SARIS, before any coding can be done by the programmers. This is important in the sense that by the time the writing of the code is finalized, it would have considered all the requirements, experiences and challenges of teachers and students and therefore highlighted the required amendments to suit the real needs from the actual stakeholders (the teachers and students).

Figure 2. The SARIS login interface

To fulfill the objective, the study sets out to answer the following research questions:

1. What are the challenges encountered in a decade of *e*-learning implementation at CBE in terms of the course design, technology, individual, and contextual aspects?
2. What are the teachers and students experience of an *e*-learning platform implementation in a decade of its use at CBE in terms of technology, course design, individual, and contextual aspects?

The impact of this study is in the importance of investigating the challenges encountered in using new technologies involving the day-to-day stakeholders. The findings from this study are expected to benefit policymakers in the education arena in Tanzania and elsewhere especially in developing countries through shared experience of the challenges in technology use to create a better education system.

LITERATURE REVIEW

A definition of *e*-learning encapsulates the use of information communication technology (ICT) to access, share, and distribute learning materials at any time regardless of the geographical area in which one is situated (Mtebe & Raphael, 2018). This implies that it is no longer necessary for teachers and students to be in physical classes to access learning sessions and exchange learning content. The face-to-face traditional mode of teaching and learning is enhanced by the online pedagogy in which teachers and students can share, distribute, and access learning content while miles away. This opportunity of using technologies in teaching and learning for the enhancement

of the process, has been adopted by several universities and other higher education institutions in many countries worldwide.

It has been reported in one of the studies that *e*-learning has the capability of increasing motivation for the students, deepening understanding of the subject matter, thereby promoting the lifelong learning and creativity (Webb, 2005). Other researchers highlight the benefit of the creative engagement of students and teachers in the *e*-learning situation. They also, assert that, *e*-learning provides an avenue toward delivering instructional materials in an open and distance learning (ODL) as well (Bakari *et al.,* 2010). Others introduce the importance of a knowledge management (KM) concept in an organization, this concept is beneficial to the organization especially in this competitive world of business whereby the organizational staff should be knowledgeable about all of the processes, products, services, and the activities that take place within and outside the organization (Wild *et al.,* 2002). Accordingly, *e*-learning is one of the best tools in making certain that the organization reaches its goal of knowledge management. It was also hinted that the advent of *e*-learning presented an opportunity for a cheaper and a more cost-effective approach to teaching and learning in Higher Education Institutions (HEIs) as well (Kituyi & Tusubira, 2013). Accordingly, e-learning has provided greater information access, in terms of communication, synchronous learning, increased cooperation and collaborations, cost-effectiveness, simulations, virtual experiences, and graphic representations (Sife, Lwoga & Sanga, 2007).

However, several challenges have been encountered in the path of implementing an *e*-learning platform in different institutions across the globe. Referring to a typical example, in a study conducted at the Open University in Tanzania it was apparent that some of the *e*-learning challenges included lack of awareness, unreliable Internet availability, lack of training in *e*-learning, lack of proper learning materials in Moodle, high implementation costs, lack of funding and being used to the traditional paperwork culture (Bhalalusesa, 2013). A report in one of the studies also reveals that some of the challenges of *e*-learning implementation include inadequate ICT infrastructure, ICT policies, and the emergence of informal data operators (Lashayo & Md Johar, 2017). Some of the challenges in the implementation of *e*-learning in higher education institutions are uncommon and known as - *silent barriers* – and the adoption of technologies in teaching and learning should go together with the upgrade of teachers and students in terms of being ready for use of the technologies. The authors further warn that academic workload should be observed to allow teachers to properly accommodate technologies that should be commensurate with the workload, in the absence of which the workload could be a challenge or a *silent barrier* to the implementation of *e*-learning as one of the technologies (Gregory & Lodge, 2015).

There are many factors to be considered for a successful implementation of *e*-learning in developing countries such as Tanzania. In one study, the researchers noted infrastructure and human capacity, as factors to consider at the Tumaini University in Tanzania (Tedre *et al.,* 2010). It was also noted that one of the critical factors for the implementation of *e*-learning in higher education is to consider the technology infrastructure, (Lwoga, 2014). Specifically, to the Tanzanian context, several documented studies have noted the processes and challenges encountered in implementing *e*-Learning in Tanzanian universities (Tedre, Ngumbuke & Kemppainen, 2010; Lashayo & Olahraga, 2017; Lashayo & Md Johar, 2018; Mtebe & Raphael, 2018). The costs in the implementation of any *e*-learning are huge (Mtebe & Raisamo, 2014a), but the costs are supplemented by the benefits that the successful implementation of *e*-Learning offers to the community of a College especially, to the students and teachers. It was revealed from the Open University of Tanzania (OUT) for instance, that *e*-learning can be used to supplement face-to-face sessions at the University, thereby enhancing communication between the instructors and the learners and creating active engagement with the content (Mnyanyi, Bakari & Mbwette, 2010).

Most of the studies reveal challenges relating to *e*-learning implementation emanating from the costs, Internet availability and connectivity, lack of appropriate bandwidth, management staff readiness, and electrical power, just to mention a few. In most cases when considering the

challenges and experiences that teachers and students generally encounter in *e*-learning, individual challenges and experiences encountered at a personal level are often overlooked, rendering the study inadequately informed for the necessary step-up measures to be undertaken. This study, therefore, applied a conceptual framework for *e*-learning in developing countries to draw from the experiences and challenges in using *e*-learning at the College of Business Education in Tanzania (Andersson & Grönlund, 2009). The strength of the Andersson and Grönlund conceptual framework shown in Figure 3, is based on its wide consideration of a variety of important factors in determining the challenges of *e*-learning implementation in developing countries especially the students and teachers 'consideration.

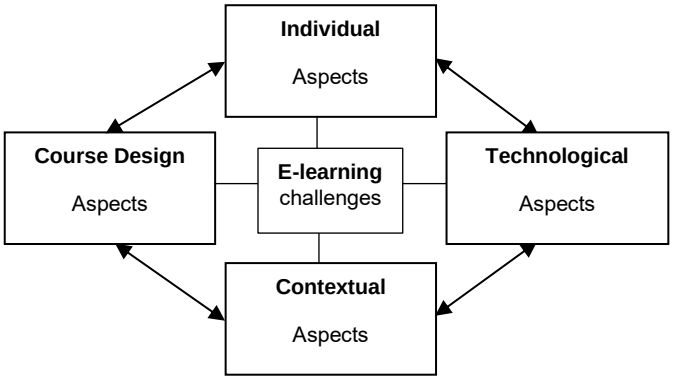

Figure 3: Research model extended from (Andersson & Grönlund, 2009) conceptual framework for *e*-learning in developing countries.

Furthermore, the conceptual framework provides an opportunity to record a wide base of challenges for future successful implementation of *e*-learning in higher education institutions in Tanzania.

Research Model

The success or failure of the implementation of technologies such as *e*-learning, in higher education institutions embraces many factors. Typical examples include readiness of teachers and students (Sife, Lwoga & Sanga, 2007; Mtega *et al*., 2012; Mtebe & Raisamo, 2014a) and infrastructure readiness (Tedre, Ngumbuke & Kemppainen, 2010; Lwoga, 2014). As a result, researchers have reported either the successful implementations of *e*-learning or the challenges that are associated with the implementation of *e*-learning (Mapuva, 2009; Sife *et al.,* 2007). One of the studies which thoroughly reviewed different types of challenges in the African context, identified thirty (30) specific challenges, grouped into four (4) categories including, course design, individual, technology and context (Andersson & Grönlund, 2009). Their findings revealed different settings of *e*-learning in developed countries as compared to developing countries. In this study, a research model was adapted but modified from Andersson & Grönlund (2009) to include more challenges apart from the experiences teachers and students have encountered in the decade of *e*-learning implementation at CBE.

The Impact of e-Learning Challenges

The implementation of *e*-learning in higher education institutions such as CBE is a type of project that involves attention to several factors to be successful. During the implementation of *e*-learning as projects in higher education institutions, researchers have identified a variety of challenges

(Farid *et al.,* 2014; Qureshi *et al.,* 2012) and success stories (Shraim, 2012). It is the author 's belief that different institutions encounter different experiences of success and challenges and such that it brings about the experiences that can be shared with others. The users of the new technology share a difference of opinion on what they think are the challenges and experiences in their use of the technology. As such, the implementation of an *e*-learning system at CBE was viewed differently by both the students and teachers and it is those views that are worth sharing prior to the successful introduction of any new technology to obtain the full advantages thereof. The following section

Course design and delivery

At the College of Business Education as in most academic institution of higher learning, courses are delivered in classrooms and teachers are the main source of learning materials. In Tanzania, the process of designing and developing course content in the curriculum is prepared by the individual institutions before being validated. The course content in the curriculum is prepared by a team of curriculum experts and once completed it is submitted to the National Accredited Council for Technical Education (NACTE) to be validated before its use. NACTE mandates that all the institutions under its umbrella use a delivery method of education that is competency based (National Council for Technical Education, 2018). Competency based education advocates that the teaching and learning is geared towards improving students 'skills and empowerment. Among the issues emphasized in the competency-based education model, are a manageable specific number of students in a class that should not exceed 50 in number. Contrary to the NACTE directives, the numbers of students in classes in many of the higher education institutions (HEIs) invariably exceed that specified limit. The larger the classrooms in terms of the number of students, the lower the expected quality of understanding by students (see Figure 4).

Figure 4: A crowded class unsuitable for Competency Based Learning

The implementation of *e*-learning at CBE necessitates a change in the way educational materials are delivered to the students due to its nature of online access. This change in course design means that the learning materials need a special digital format and quality so that when it is accessed online, it will be easily understood by the students without the presence of teachers. This differs from the face-to-face delivery method of learning, where teachers are physically present in classes such that when a student does not understand and needs assistance, they can easily ask for clarification from a teacher. A student accessing learning materials online needs a clear and easily understandable type of learning materials, given the physical absence of teachers. Both the teachers and the students must adapt to the *e*-learning system which among other things provides the possibility of teaching and learning without the physical presence of teachers and students in classes. The need for the shift in mindset to suit *e*-learning is a challenge to both the teachers and the students, as some of them still prefer the use of the face-to-face type of teaching and learning.

Individual aspects

Though several HEIs in Tanzania have embarked on implementing technology infrastructure, allowing the usage of new information systems, there are challenges that these information systems still pose to the users. In 2012 the first time SARIS was introduced at the College of Business Education (CBE), no formal training was provided to either teachers or students, rendering individual teachers and students to face challenges and thus reluctant to accept it (Mwandosya, C. Suero Montero & Mbise, 2019). Some of the individual teachers have been reluctant to use new technologies, such as SARIS for processing examination results at CBE, claiming to be more comfortable with manual processing. It was the same story with the students, who cited struggling to access the services of SARIS. Determining the readiness of the users to use new technologies is mandatory for the success and smooth transition and subsequently the implementation of *e*-learning technology in any HEI (Al-araibi & Mohd, 2016). Studies related to the importance of individual readiness of both teachers and students in HEIs to use new technologies in the education sector have been well documented (Akaslan & Law, 2011; Cheon *et al.*, 2012). The readiness of the eventual users of the technology in higher education institutions minimizes the individual challenges that they might face when it is the other way around. Use of the new technologies is feared by some individuals who for some reason are skeptical that using new technologies makes them vulnerable to viruses, theft, and loss of their data and information. It is with this fear that *e*-learning has been unpopular to some individual teachers and students. Also, some individual teachers are not comfortable with the devices and Internet availability to access the application online.

Technological aspects

The available technology supporting *e*-learning in many HEIs has been a major determinant of the challenges facing e-learning. The availability of a stable technology infrastructure is necessary for successful implementation of *e*-learning (Tedre, Ngumbuke & Kemppainen, 2010; Lwoga, 2014). Users of the system need not get stranded and unable to access and use the information systems, they should have unlimited access for its successful utilization. One of the success factors for the uptake of any new technology in HEIs and elsewhere in organizations, is the smooth transition from the introduction of that new technology which include training for its intended users *(Kayanda et al.,* 2020). The smooth transition goes hand in glove with introducing to the users the reasons for acquiring that intended technology and if possible, involving them in the process of acquiring it, as well as, advising them of the benefits that they may gain from the new technology, and training them before the new technology is introduced formally (Mwandosya & Montero, 2017). The success of *e*-learning needs an infrastructure that is stable with minimum outage, that is the local area network (LAN), or wide area network (WAN) configured in such way that the access to *e*-learning does not hamper the users in accessing it. Furthermore, care should be exercised to ensure that a reliable standby support system is in place to avoid the adverse effects of possible power outages.

Contextual aspects

The contextual settings of an HEI in which e-learning is being implemented matters, as well as the context of the society in which *e*-learning is taking place, such as culture, norms and traditions, laws and regulations as well as infrastructure. For an *e*-learning system to take place effectively there should be a shift in the organizational or university settings. For example, in face-to-face teaching in most of the developing countries such as Tanzania the teacher is the central focus of everything in the class in terms of what to teach on a particular day, and how to deliver it, while the students remain on the receiving end practically being spoon-fed. Contrary to *e*-learning settings the source of learning can be the students as well as technology that enable them to access abundant learning resources which they can share with their fellow students as well as the teachers. In the same angle of observation of culture in educational settings, sometimes it depends on how

the organization is structured in terms of the strategies and their attitude towards technology in the mission of education. Some organizations do not consider the investment in technology infrastructure as having long time goals, rather they look at the immediate benefits as opposed to the future return on investment. The investment on *e*-learning needs funding since the activities related to *e*-learning normally require a huge investment, which in some instances need political as well as government backing through policies such as, the education and training policy (MoEVT, 2014).

RESEARCH METHODOLOGY

Research Design and Area of Study

The study utilized a mixed method framework, whereby data was collected qualitatively and quantitatively. Combining the two types of data allows for benefit from both the detailed, contextualized insights of qualitative data and the generalizable, externally valid insights of quantitative data. The strengths of one type of data often mitigate the weaknesses of the other. A mixed-methods approach is a research methodology in its own right. As stated by Creswell (2014), a mixed-methods research design is a research design that has its own philosophical assumptions and methods of inquiry (Creswell, 2014)**.**

The case study design was adopted, and conducted at the College of Business Education (CBE) in Tanzania which is amongst the 579 higher education institutions under NACTE the National Accreditation Council for Technical Education (National Council for Technical Education, 2018). NACTE is the only institution mandated by the government of Tanzania to oversee the non-university higher education institutions in Tanzania. The list of higher education institutions keeps changing as some institutions are either added or dropped from the list due to several reasons. The College of Business Education (CBE) has four campuses situated in four strategic regions of Tanzania -the main campus in Dar es Salaam city, the second campus in Dodoma city, the third campus in Mwanza city, and the last campus in Mbeya city. The four campuses are joined by a Virtual Private Network (VPN) enabling communication and sharing of college information among these campuses to be as smooth as possible.

Area - Site and Participants

In this study, 12 teachers and 198 students from all the four campuses of CBE participated. In accordance with the available records the CBE population is 198 teachers and 8700 students respectively. The teachers were purposively selected, and for the students 400 questionnaires were distributed randomly among those students who have at least used the *e*-learning for one semester. From the 400 questionnaires, only 198 were returned . Using an *e*-learning system for one semester was adequate to enable the students to air their views on the functionality of the *e*-learning platform. The student questionnaire had 29 items in five parts, namely (a) introduction and demographic background information, (b) technological related items, (c) course design related items, (d) context related items, and (e) individual related items. The questions in each item were ranked on a 7-point Likert scale ranging from 1=Strongly disagree to 7=Strongly agree. For the teachers, the entries were ranked on a 5-point Likert scale ranging from 1=Strongly disagree to 5=Strongly agree. The demographic details of participants are described in the following section.

Demographic details of the student participants

A total of 198 students agreed to be part of the exercise. See Tables 1 to 3 below for details of the participants.

Table 1: *Students' gender*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	87	43.9	43.9	43.9
	Female	111	56.1	56.1	100.0
	Total	198	100.0	100.0	

As one of the HEIs in Tanzania, CBE has grown to the extent that students are enrolled starting from the Certificate level up to the Postgraduate level as indicated in Table 2 below.

Table 2: *Students' education level*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Postgraduate	3	1.5	1.5	1.5
	Bachelor	30	15.2	15.2	16.7
	Diploma	36	18.2	18.2	34.8
	Certificate	129	65.2	65.2	100.0
	Total	198	100.0	100.0	

The distribution of students by campus is shown in Table 4 below.

Table 3: *Students' campus*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Dar es Salaam	100	50.0	50.5	50.5
	Dodoma	30	15.0	15.2	65.7
	Mwanza	35	17.5	17.7	83.3
	Mbeya	33	16.5	16.7	100.0
	Total	198	99.0	100.0	

The Dar es Salaam campus enrolls the bulk of the total student population (50%) compared to the other campuses. This may be because Dar es Salaam is the commercial capital where most of the foreign diplomatic offices are situated.

Data Collection Techniques

Data for this study was collected first by conducting in-depth interviews with 12 teachers (three teachers from each campus) and a focus group discussion (FGD) with 32 students (8 students from each campus). The interviews and FGDs were conducted in each of the campuses separately. After the in-depth interviews and FGDs a questionnaire that included some items extracted from the student FGDs was sent to the students. The interview guide questionnaire was prepared and validated and had themes related to technology usage in education; digital course content design; the contextual environment considerations in implementing e-learning; and individual preparedness in adapting to new ways of teaching and applying technologies. The content of FGDs with the students included experience in adapting to new technologies in learning; challenges encountered in using *e*-learning; and the improvement suggestions for *e*-learning pedagogy at CBE. Finally, the questionnaires were prepared to start with the students whose items were extracted from both the in-depth interviews and FGDs to gain more views from the student 'participants.

To answer RQ_1, the study employed in-depth interviews for teachers. The main reason for using the in-depth interview data collection technique was its ability to provide deep insight of one's feeling on a subject of interest (Denscombe, 2010). In other words, they open some of the ideas that might have not been covered or understood well in the questionnaires.

To answer research RQ_2, which was specifically intended for the students - the main target group in this study, their experience of *e*-learning at CBE was sought.

Validity and Reliability of Data

The items on the questionnaire were adapted and modified from a study by Harpur & de Villiers (2015), which resembles the current study specifically as it narrates the user experience in using educational technologies such as mobile learning and features of mobile learning (Harpur & De Villiers, 2015). Mobile learning is an advanced form of *e*-learning (Korucu & Alkan, 2011). Two research assistants were employed to assist in the checking of the data by conducting mini research whereby a group 20 students and 12 teachers were asked to fill in the questionnaires and comment on the items for improving them before sending them to all the participants.

Data Analysis

The analysis of quantitative data was conducted using the statistical package for social sciences SPSS version 23.0 descriptive analysis. The qualitative data was analyzed using the content analysis method by coding, summarizing into themes, and finally grouping the themes.

Research Ethics Consideration

The research ethics were considered in pursuing the study, especially in being transparent starting from the aim of the study, what is expected of the study and how the whole exercise was planned and conducted especially in the trying times of the deadly disease COVID-19. The following guidelines were given to the participants.

1. Freely to participate or deny participating in the exercise.
2. Free to air their view about the conduct of the study and provide suggestions for improvements.
3. Information security and anonymity assurance.
4. Right to seek any clarifications in the interview and questionnaire on items not clear.
5. Seek their consent in recording the teachers 'interviews and the students 'FGDs.

FINDINGS

The study was based on two research questions: research question one (RQ_1) asked – What are the challenges in a decade of *e*-learning implementation at CBE in terms of course design, technology, individual and context? And research question two (RQ_2) asked – What are the teachers and students 'experiences of an *e*-learning platform implementation in a decade of its use at CBE?

RQ_1 was in the form of questionnaires whereby both the teachers and students were asked in terms of the five components of challenges identified by Andersson and Grönlund (2009) namely, course design, technology, individual, and context.

The findings are summarized in Table 4 below.

Table 4: *Teacher responses on the e-learning challenges on the indicated themes*

Theme	Statement
Technology challenges	— "*Technology is a challenge for me… I have not been trained enough to be able to master using technology in classes"*. **Informant 1** —" *I try to use PowerPoint slides I prepared but whenever I download from the Moodle system, I get a number of errors"*. **Informant 2** — "*I normally forget my SARIS and Moodle system passwords such that I send my results straight to the head of department"*. **Informant 3** — "*The technology infrastructure at the beginning in 2010, was having many downtimes but in recent years it has been improving though more efforts are needed to make it even better"*. **Informant 4** — "*The SARIS e-learning system has some of the expected functionalities not working properly, there is a need for making it fully integrated and working system"*. **Informant 5** —" *Technologically, the classes are not yet ready as the access to SARIS and Moodle systems from there is not that smooth"*. **Informant 6**
Course design	— "*The curriculum contents are not well set to be applied in teaching and learning through SARIS and Moodle systems, there should be a room for much improvement"*. **Informant 1**
Course design	— "*The course contents do not really reflect the skills development for the students".* *"The related tasks in the modules are not directly necessitates the use of technology for the students as they reflect knowledge-based type of learning"*. **Informant 2** — "*There is mismatch between the curriculum contents and the available technology related tools in the classes". For example, Wi-Fi, LAN", etc.* **Informant 3** —" *Teachers normally have little time from being allocated a certain module to teach to the date he/she commences teaching in classes"*. **Informant 4**

	—" *The contents of the curriculum do not closely involve students as stakeholders in the teaching and learning arena as they have experience what is needed out there"*. **Informant 5**
Context	—" *Still the teachers as well as the students at CBE are not fully introduced to conducting classes or teaching and learning using mobile devices in classrooms"*. **Informant 1** —" *The face-to-face mode is dominant in CBE classes and in fact most of the students and some teaching staff prefer this type of teaching and learning"*. **Informant 2** —" *Not all students have laptops and mobile devices connected to internet and therefore teaching an online class miss some of the students for sure"*. **Informant 3** —" *The available LAN and Wi-Fi network services need expansion in terms of the quality of services"*. **Informant 4**
Individual	—*I feel that to effectively use technology in classroom needs a lot of good preparations and arrangement of equipment well before the class starts*. **Informant 1** *"I normally get stuck using my mobile device and laptop for teaching purposes*‖. **Informant 2** —*I also have problems in accessing the SARIS and a Moodle system, I bet I need more training than I have already acquired*. **Informant 3** —" *The SARIS and Moodle e-learning systems miss the interactive teaching and learning part"*. **Informant 3**

The following section highlights the experiences that students indicated in response to the questionnaire items.

Technology related experiences

The teachers and students at CBE had been using technologies in classrooms and at an individual level for over one decade. Some of the teachers have their own blogs from which they inform their students to access some of the class materials. Students have their own way from which they share learning materials apart from the formal *e*-learning systems at CBE. One of the ways they share is through WhatsApp in case someone is not in the class they can access the materials from their colleagues through WhatsApp.

Generally, technology use at CBE has been taken positively by the students. As shown in Table 5 below, the majority believe that the use of technology in learning enhances the way they access, share, and use the learning materials among themselves. Some of the issues that students have raised in connection with technology is that training was not adequate regarding the use of *e*-learning (evidenced by **Mean=4.9141** and a **Standard Deviation=2.09851**). The lack of *e*-learning training for the students is reflected through their response on the challenges they face whenever they want to access *e*-learning (**Mean=5.0051** and a **Standard Deviation=2.05877**). Finally,

students have issues on the user friendliness of an *e*-learning system at CBE whereby it may be a hindrance to the successful usage of an *e*-learning system to them.

Table 5: *Students 'responses on technology use in learning*

Statements	N	Mean	Std. Deviation
Using technologies in the teaching and learning is a step towards enhancement of the education system	198	5.6061	1.81543
E-learning technology at CBE has improved the teaching and learning	198	4.7626	2.23021
E-learning implementation at CBE has improved self-regulated learning (SRL) skills for the students and teaching skills for the teachers	198	5.0000	1.83867
Using E-learning technology is a challenge for most of the students at CBE	198	5.0051	2.05877
Not enough training was done before the introduction of the E-learning at CBE which has hindered the successful usage of E-learning for learning purposes	198	4.9141	2.09851
The access to teaching and learning materials through E-learning platform of CBE is not user friendly	198	4.5859	2.09428
Valid N (listwise)	198		

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The Course Design

One of the most crucial activities for any educational institution is the course design. It is the course design that will determine the type of technology to be used in an educational setting. It is expected that the course design will contain learning content, learning outcomes, and the related tasks which determine the kind of learning techniques to be used. Also, the course design indicates what teaching means are expected to be used. Therefore, the course design plays an important role in determining the quality of education and the labour market requirements of the graduates expecting to be employed (M. Triki, 2016).

The results shown in Table 6 below, indicate that students agree on the item/statement that the course content are suitable for the *e*-learning pedagogy (**Mean=4.1818** and **Std. Deviation**=**1.97633**), but on the other hand, they express that though they are well structured for *e*-learning, and that they can be downloaded, most of the materials cannot be opened and are not well prepared for easy understanding (Mean=**4.8434** and Std.Deviation=**2.02290**). Furthermore, the quality of multimedia learning materials was observed to have poor sound quality which made it impossible for the students to understand what was being said. The challenges observed through the questionnaires will be used for the improvement of the *e*-learning systems at CBE.

T*able 6:* *Student responses on course design in learning*

	N	Mean	Std. Deviation
The course content at CBE is designed suitable for the recently introduced E-learning pedagogy	198	4.1818	1.97633
The curriculum contents are well designed to encourage technology usage in teaching and learning environment	198	4.4848	1.92954
The design of the curriculum contents/materials encourage skills development and innovations for the students	198	4.5758	1.83917
The course design is not for online access as they are bringing challenges to students	198	4.5505	2.14807
The learning materials intended for the students are downloaded but most of them cannot be opened and are not well prepared for easy understanding	198	4.8434	2.02290
The learning materials especially recorded ones have poor sound quality and inadequately prepared hindering the students to understand the contents as expected	198	4.8535	2.04114
Valid N (listwise)	198		

Context

In any mission of transforming organizational activities, say resorting to new ways of conducting organizational transactions, a conducive environment could be a crucial factor for the learning organization, whereby the emphasis is directed to collective ideas as an organization to change the way of conducting activities through the five disciplines (Senge, 1990). In organizational consideration of a new environment, an organization should start accommodating the new environment by nursing a new business world view shifting from the current mental models of doing businesses to a new mental model considering the world environment (Senge, 1990). In higher education institutions in Tanzania, there has been an influx of mobile technology infrastructure environments to accommodate systems such as e-learning and learning management systems (Lwoga, 2014; G. I. Mwandosya, Suero Montero, *et al.,* 2019b). At CBE, there is a presence of local area networks and wireless networks in each campus despite the challenges in their day-to-day operations as indicated by students in Table 7 below.

In general, the use of *e*-learning system at CBE has been favorable, for example on the item of innovative learning (**Mean=4.4293** and **Std.Deviation=2.11414**), the support in case of downtime (**Mean=4.3737** and **Std.Deviation=1.96717**), and the support from the management (**Mean=4.5909** and **Standard Deviation=2.16556**). In response to the infrastructure readiness and *e*-learning readiness quite a number of students were not satisfied, for example, preferring the physical meetings with their teachers rather than through *e*-learning (**Mean=4.3182** and **Standard Deviation=2.04884**), e-learning preparations in terms of awareness and readiness for the students (**Mean=4.7677** and **Standard Deviation=2.04928**), and finally, the access challenges during examination processing (**Mean=4.9293** and **Std.Deviation=2.12671**).

Table 7: *Student responses on an e-learning environment at CBE Campuses*

	N	Mean	Std. Deviation
The environment at CBE encourages the use of E-learning system as an innovative way to improve the innovative learning	198	4.4293	2.11414
The E-learning infrastructure at CBE is well supported and have minimum rate of downtime	198	4.3737	1.96717
The management of CBE puts more efforts to make that the implementation of an e-learning system successful	198	4.5909	2.16556
The culture that the students are accustomed of (physical meetings in classrooms) deny the successful implementation and usage of E-learning	198	4.3182	2.04884
Some students feel that the E-learning system implementation at CBE was not ready enough to be undertaken in terms of infrastructure and readiness of students	198	4.7677	2.04928
The support of an E-learning system is not satisfactory since during the examination processing the access to it is not stable and thereby diminishes the good intentions of implementing it in the first place	198	4.9293	2.12671
Valid N (listwise)	198		

Individual

Each student's individual feelings towards the use of an *e*-learning system at CBE are treated as important since it is from these feelings that the requirements for future improvement can be accommodated.

The responses of students regarding how they felt about the implementation of an *e*-learning pedagogy as shown in Table 8, opened several avenues for the improvement of an e-learning system at CBE. A typical example is the challenge of accessing the system, and the majority felt that the system is not user-friendly in terms of access (**Mean=5.4040** and **Standard Deviation=2.06700**) especially during uploading and downloading of examination results. The challenge could be overcome by having a stable and constant network infrastructure with appropriate IT support personnel to ensure minimum downtime. The structure of the facilities of the *e*-learning system had not been complete as compared to face-to-face teaching and learning in classroom (**Mean=4.8485** and **Standard Deviation=2.01448**) such that it had not been a motivating factor to students (**Mean=5.0404** and **Standard Deviation=1.99196**). Despite the existence of challenges in *e*-learning, the positive improvements in *e*-learning signify innovation in the learning process (**Mean=4.6061** and **Standard Deviation=1.94763**).

Table 8: *Student responses on the overall e-learning implementation at CBE*

	N	Mean	Std. Deviation
I am satisfied with the way I interact with the E-learning system in my learning	198	4.4596	2.13406
I feel like the E-learning system at CBE has inflicted the sense of innovations in the teaching and learning environment	198	4.6061	1.94763
I am confident that the E-learning implementation experience at CBE has changed the way shared learning materials can reach students and thereby have improved the learning	198	4.5859	2.06990
The E-learning system has not well introduced to the students and therefore not a motivation for a successful learning	198	5.0404	1.99196
I find the E-learning system not well structured and complicated not easily helpful as compared to face-to-face teaching and learning in classrooms.	198	4.8485	2.01448
It is very difficult to access E. -learning due to poor network connections and instability of the system especially during examination processing in uploading and downloading of the examination results	198	5.4040	2.06700
Valid N (listwise)	198		

DISCUSSION

The implementation of *e*-learning systems in higher education in Tanzania has been associated with a variety of challenges. In earlier studies the challenges ranged from the fact that lecturers and the students had not been using the Moodle system and despite the efforts to encourage them, very few actually used the application; lack of proper introduction of the systems to the potential users; and training issues (Mtebe, 2014; Mtebe & Kondoro, 2016). At CBE, the problem was not the issue of reluctance to use the systems but rather that the introduction of the *e*-learning pedagogy was not that smooth hence the training was not adequately conducted for users before they started to use it. One of the major interesting challenges was that of the quality of the shared learning materials, and it was evident that the prepared learning materials did not match the *e*-learning pedagogy. The initial course design was not meant for the *e*-learning pedagogy, but rather the dominant face-to-face pedagogy still taking place at CBE, and for that matter in most of the HEIs in Tanzania. The technology related challenges that exist in most of the HEIs in Tanzania, have been inherited from previous undertakings, for example, management ability to handle new investment, skills, and training. It is for these reasons that the challenge in the overall implementation of e-learning systems in HEIs in Tanzania still exists, and therefore there is a need for the HEIs to understand and deal with them accordingly. As described, in his book, The Fifth Discipline -The art & Practice of the Learning Organization, that —"*today's problems comes from yesterday's solutions*" (Senge, 1990).

The technology-related challenges in HEIs in Tanzania, has been the major reason why implementation of *e*-learning has witnessed some unsuccessful stories. At the College of Business

Education (CBE), major technological related challenges include access to the system during uploading and downloading of examination related materials, access to the learning materials, and the frequent downtime of the system. In a study by Lwoga (2014), on infrastructure related challenges, the factors leading to the successful implementation of an *e*-learning system/learning management systems are detailed. Some of the important issues to consider before any implementation of an *e*-learning system in Tanzanian HEIs, includes the human capacity, and the infrastructure (Tedre, Ngumbuke & Kemppainen, 2010).

The challenge on the quality of the course design as far as the College of Business Education is concerned was that of the quality of learning materials. The students had difficulties not only in accessing them but even if downloaded they could not open them. Also, once opened the multimedia learning materials were not audible as the sound was not clear. Vovides *et al.,* (2007) noted that the hard copies of learning materials that student's access can be available with the same content online through an *e*-learning system, allowing for flexibility to access them at the student's pace, and self-regulated learning are enhanced. In another study, Mcgee & Reis (2012) noted that for a course to be effective and well determined on whether to apply technology (online) or not, its design should start from defining the objectives before coming up with course activities, assignments and assessments.

The challenges with the individual assessments on the *e*-learning system emanated from the lack of training before the start of using the system. Another factor of which the students complained was that of lack of motivation for using the system, such that they felt that a face-to-face teaching and learning mode to be a preferred one. There was a feeling of innovations in the learning process as far as the students were concerned but then the number of challenges had been a hindrance to an *e*-learning success.

The experiences of the teachers and students while using the *e*-learning system at CBE had both good and bad connotations. The upload, access, and ability to download learning materials from the Moodle system and SARIS *e*-learning systems had been applauded by them, though challenges in access was a matter on which to complain. Notable examples include, slowness of the system during uploading (teachers' bad experience) and downloading of examination results (students' taken to troubleshoot), access difficulties such as password expired issues (both teachers' and students' bad experience), difficulty in opening the uploaded materials (students' bad experience), *e*-learning training program for both teachers and students (good experience for both), a new way of sharing teaching and learning materials (good experience for both the teachers and the students), fast processing and delivery of examination results (good experience for both the teachers and the students), the results coming out with numerous errors and missing some details (bad experience for both the teachers and the students).

Due to the number of challenges that have been observed in the course of using SARIS as an *e*-learning system, the management of CBE in collaboration with the IT department, resorted to developing another *e*-learning system known as College of Business Education students' information system (CoSIS) (see Figure 5) which was solely aimed at correcting the errors observed in SARIS and at this time after getting inputs from the end-users (teachers and students) of the system. In this way, the involvement of users of the system provided the necessary input for the programmers to take care of the long-standing challenges of SARIS. Initially, when SARIS was being installed at CBE, the end-users were not involved at all such that it was one of the reasons for its unpopularity.

Figure 5: The CoSIS interface

CONCLUSION

The emphasis on *e*-learning pedagogy in higher education institutions in the developed economies and in emerging economies, despite reported challenges, is geared towards advancing the education sector (Iqbal & Ahmad, 2010; Mohammed *et al.*, 2017). To report on the variety of challenges facing the implementation of *e*-learning pedagogy in different HEIs in Africa seems crucial at this point in time, to provide solutions for the best and enhanced education through *e*-learning (Moubayed *et al.,* 2018).This study contributes to the scientific knowledge using the extended *e*-learning challenges model by Anderson & Grönlund to highlight the variety of challenges in the implementation of *e*-learning in higher education institutions in Tanzania, specifically at the College of Business Education. In this vein, the challenges are identified and better placed for authorities and practitioners to look for solutions. For example, the problem of technology acquisition can be dealt with by making certain that the end-users are involved from the moment an idea of acquiring a new technology is conceived. Use of the *e*-learning system has been adopted in many HEIs in Africa, including Tanzania (Mtebe, 2015; Mtebe & Raisamo, 2014b). To a great extent the much-developed *e*-learning implementation and usage in HEIs in Tanzania is attributed to ICTs integration in education (Kihoza *et al.,* 2016). There have been many studies that identified the importance of such moves in enhancing the education sector (Urh *et al.,* 2015; Vovides *et al.,* 2007; Wild *et al.,* 2002). However, the implementation of such systems has faced numerous varieties of challenges for example, huge costs in acquiring the systems (Mtebe, 2014). There are a variety of challenges ranging from infrastructure, training, awareness, teachers 'and students 'readiness, among others (Mapuva, 2009; Tedre, Ngumbuke & Kemppainen, 2010; Qureshi *et al.*, 2012). In this study, the emphasis was the narration of challenges related to technology, course design, individual feelings on *e*-learning, and the context. The author concludes that with any introduction of technology, there should be involvement of stakeholders who know their problems thoroughly such that their contribution can reduce or minimize the errors while using the system. The minimum the number of challenges to the e-learning infrastructure, the greater the motivation to use the *e*-learning system and the enhancement of the education sector, specifically HEIs.

One of the lessons learnt here is that user involvement in the acquisition of the new technology is vital for the successful implementation of the technologies such as the *e*-learning system pedagogy (Mtebe & Raisamo, 2014b; Mwandosya, C. Suero Montero & Mbise, 2019).

The study findings, therefore, implies that to implement a successful *e*-learning system in HEIs in Tanzania, the first thing to do is to consider the *e*-learning requirements of teachers and students as major stakeholders, an *e*-learning matching curriculum, quality of the courses and training on the usage of *e*-learning, and a reliable as well as stable technology infrastructure for its successful transition and implementation**.**

Limitations

There are about 577 HEIs in Tanzania, and most of them have *e*-learning systems, but the study was conducted at the College of Business Education (CBE) only. The author believes that although CBE has similar conditions to other HEIs as far as *e*-learning is concerned, some variations in the outcome would have been experienced if more HEIs were involved. The methodology used provided an insight to the challenges and experiences encountered by teachers and students, but a more concrete determination of the analysis that involved hypothesis testing and conclusions, could provide insights into a variety of interesting outcomes for the readers to digest and get more knowledge. Good examples include the design science research (DSR) framework which is a kind of methodology famous for the development of artifacts to facilitate solving practical problems facing certain environments. Examples include the design and development of mobile education MobileEdu for solving computer science learning in Nigerian universities (Oyelere *et al.,* 2018). Other examples include mobile technology for street traders (Mramba *et al.,* 2016), mobile technology for SSF (Misaki, Apiola & Gaiani, 2016), and mobile technology for interaction (Gomera, Suhonen & Oreku, 2020). Also, the mobile education tool for innovative teaching and learning by (Mwandosya, C. Suero Montero & Mbise, 2019). Furthermore, in this study, an extension to Anderson and Grönlund framework has considered the four factors, course design; technology; context; and individual assessment while there are other factors that could be considered as challenges for example, infrastructure and readiness. (Tedre, Ngumbuke & Kemppainen, 2010; Lwoga, 2014; Mtebe & Raphael, 2018).

Future Work

The future studies are expected to yield practical solutions that would resolve challenges encountered at CBE and to suggest an *e*-learning framework that would involve more HEIs in the determination of the collective challenges and experiences for more general solutions and feedback to policy makers. Also, considering the ongoing COVID-19 pandemic situation which demands operating from the home environment, future studies should concentrate on designing and developing curriculum and technologies in keeping with online education involving the users (teachers and students). The mobile applications design and development could be an emphasis so that the learning can take place at anytime, anywhere (Misra & Srivastava, 2016).

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