

Reflection on e-learning system of the Mzumbe University in Tanzania: Successes, challenges and way forward

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ABSTRACT

This paper explores the historical background of the Mzumbe University (MU)'s approach to e-learning since its inception in 2009. It reflects on the successes and challenges, lessons learnt from the MU experience and recommends a way forward. The paper is based on case study research, making the use of observation and secondary data generated from previous e-learning utilisation reports. It discusses trends in e-learning system adoption, deployment, implementation and utilisation at the MU. Findings indicate that awareness of the e-learning system, adoption rate and use have been increasing, leading to significant results such as receiving extensive coverage in the university agenda such that campaigns on its utilisation have been evident. Moreover, the results show the existence of some critical challenges including limited Information Communication Technologies (ICTs) infrastructure, inadequate ICTs didactical skills among students and teachers, lack of technical expertise in digital content design and production, as well as over-reliance on the traditional philosophy of teaching and learning. Based on the findings, it is recommended to encourage continuous user support, going beyond uploading and downloading the University's strategic policies. Despite the observed e-learning successes, the MU is still in need of an adequate, advanced and quality range of 21st century teaching and learning skills among teachers and students.

Keywords: *e-learning; learning; learning technology; blended learning; ICT; ICT policy*

INTRODUCTION

In the education sector, it is believed that competent teachers should be aware of, and adept at use of all the ground-breaking learning technologies integrated into their working environments. As such, teacher's ICTs-competencies are prerequisite conditions for successful integration of ICT in teaching and learning. These competencies include awareness, readiness and pedagogical-didactical aspects of ICTs (Aounters & Jans, 2009). However, technologies adoption-related learning theories provide frameworks for an understanding of learning experiences, process and challenges in which behavioural change over time, through individual and group backdrops of previous experiences are sustained (Schunk, 2012). The cognitive, time, motivation and environmental change factors in these frameworks, combined with technological innovation, are the basis of technology theories of teaching and learning and how they are implemented. These learning theories offer the basis for ICT integration in education. For example, in higher education, current teaching and learning are backed by emerging new, appropriate learning frameworks including engagement learning and constructivist alignment (Machumu & Zhu, 2019). In this setting, the promotion of human interaction in the context of collaborative activities and team learning, influences adoption, deployment and uses of innovative learning technology such as e-learning, online learning, blended learning, micro-learning, mobile

learning (Ghasia, de Smet, Machumu & Musabila, 2018) and the use of social media as vehicles for course content delivery. Innovative pedagogy such as blended learning, online learning, Massive Online Open Courses (MOOCs) and mobile learning are the outcomes of education-technology integration. These innovative pedagogies, for example, have been widely utilised in technologically advanced societies.

Moreover, studies have shown that the integration of innovative technology in education, facilitates active student engagement in authentic learning and collaborative activities (Kearsley & Shneiderman, 1999; Peralta & Priego, 2013). Scholars have argued that e-learning pedagogy has revolutionised teaching and learning in higher education (Dubey & Soni, 2019; Rodrigues et al., 2019). At Mzumbe University (MU), electronic learning is described as the use of computer-based learning technologies (online, blended and mobile learning) to deliver a wide range of solutions. These solutions aim to improve communication and presentation; and the efficiency and effectiveness of educational undertakings (MU, 2019; Almasi, Machumu & Zhu, 2018). The MU e-learning system provides opportunities for both students and teachers to interact with electronic resources and activities outside the classroom and with traditional face-to-face interactions inside the classroom. As such, the well-designed, arranged and executed, e-learning courses provide academic staff in the conventional face-to-face University with an opportunity to involve students both in online and in-class interactions, thus saving learning time and space. This paper offers a detailed reflection on the MU e-learning system by focussing on its successes and challenges since its inception in 2009, and the way forward.

REVIEW OF CONTEXT (TANZANIA PERSPECTIVE) Vs EXPERIENCE (GLOBAL PERSPECTIVES)

Our Case: The Mzumbe University

Mzumbe University (<https://site.mzumbe.ac.tz/>) is a public University; hence it operates under the Ministry of Education, Science, Technology and Vocational Training. MU was established in 2001 by transforming the then Institute of Development Management (IDM Mzumbe) whose predecessor was the former Management Training Institute (MTI) which was established by Act No 15 of 1972 (MU, 2012b). Following increased demand for high level and middle level human resources arising from nationalization of private businesses, due to the Arusha Declaration of 1967 and the decentralization of government administration in 1972, MTI was merged with the then Institute of Public Administration of the University of Dar es Salaam into the IDM. The natural growth of the IDM over the years and changing national and international human resources needs led to the transformation and elevation of the then institute to a fully-fledged university in 2001, and became operational in March 2002 (MU, 2012a; Ghasia, 2009). In 2007, the MU was chartered under section 25 of the Universities Act. No. 7 of 2005 which repealed the MU Act No. 21 of 2001. The University has 60 years of experience in training management, administration of justice and good governance. MU started in 1953 as a local government school, training chiefs, native authority staff and councillors. After independence, the scope of its activities was expanded to include training of government officials, rural development officers and local court magistrates. In 1971, it was transformed into the Institute of Development Management (IDM) and later in 2006 into a fully-fledged University.

The University's main campus is located 25 km south-west of Morogoro Municipal centre, about 3.5 km off the Dar es Salaam–Zambia Highway. It is about 220 km away from Dar es Salaam, and within an hour's drive to the Mikumi National Park. The University, which is situated at the foothills of the Uluguru Mountain range on the eastern arc of Udzungwa range, shares a common border with Mzumbe Secondary School on the east. The University has Campus Colleges in Dar es Salaam and Mbeya. The Dar es Salaam Campus College is on Olympio Street in the Upanga

area; the Mbeya Campus College in the Mbeya City, Forest Area is within walking distance from the Dar es Salaam-Zambia Highway. The University also has training Centres in Morogoro Municipality and Mwanza cities. Moreover, MU is envisioned to be a hub of innovative learning technologies in the region because the MU main campus is built in a strategic area connecting the eastern, central and southern parts of the country. It is a dream of the university that it becomes a hub for scaling up e-learning implementation to other universities in the country as well as in corporate organizations and lower levels of education.

MU E-learning Utilisation and Experience

The deployment of the MU e-learning system started in 2009. Together with inspiration from Agder University in Norway, the implementation, adoption and use of e-learning at MU were facilitated by the systems administrator who attended a cyber-security workshop, part of which was conducted through Moodle (LMS) (Sesabo, Mfaume & Musabila, 2015; Ghasia, 2009). At MU, all of the deployment and adoption activities are handled by the Directorate of Information Communication Technology (DICT). The DICT is entrusted to oversee all issues related to ICT innovations, technology adoption, support services and ICT related capacity building at the university. Primarily, the e-learning system deployment is aimed at complementing the existing traditional face-to-face teaching and learning approach so as to enable lecturers to use both approaches in their academic delivery. It was thought that the successful utilisation of the e-learning system would help MU to address some of the related problems, including the ever-increasing number of students as well as the cost of production learning materials. The foreseen benefits of deploying the e-learning systems include the following:

-) Improved academic delivery;
-) Improved communications and interactions between students and lecturers as well as the university community as a whole;
-) Course availability anywhere and anytime even with tight scheduling
-) Indirectly enhanced IT literacy to students and staff;
-) Reduced university expenses for paper and ink.

To complement the efforts, the University Development Co-operation- Flemish Interuniversities Council (VLIR-UOS) supported by the government of Belgium conducted a series of training workshops to build capacity for the academic staff in order to strengthen quality teaching and learning, as well as to offer quality outputs that can be used in the 21st century working context. Since the inception of e-learning, there have been several successes and challenges as we reflect in this paper. We acknowledge the existence of similar reflections from other universities in Tanzania including the University of Dar es Salaam (UDSM); The Eastern and Southern African Management Institute (ESAMI) and the Muhimbili University of Health and Allied Sciences (MUHAS) as discussed by Mtebe & Raphael (2017) and Nagunwa & Lwoga (2012) respectively. However, it is argued that the MU experience is unique and helps to expand an understanding of struggles that universities in Tanzania undergo in their pursuit of enhanced teaching and learning experiences. As such, the motive to document the adoption, acceptance and implementation of the MU e-learning system is centered on the need for instructors to engage students in the learning activities which reflect real-life tasks and long-life learning.

METHODOLOGICAL APPROACH

In this paper, documentary analysis and non-participant observation were employed to collect relevant data. Regarding documentary analysis, MU e-learning utilization reports and extracts from Moodle log files between 2010 and 2018 were analysed to identify the adoption trends. Also, literature reviews of various research work conducted at MU were undertaken to enhance our understanding of the situation. Moreover, e-learning workbooks provided opportunities for

reflection on the known best practices of the e-learning users at MU. Likewise, relevant MU policy documents including the distance and e-learning policy as well as the MU corporate strategic plans were reviewed and analysed. In addition, structured non-participant observation was used to obtain information regarding Information Communication Technologies facilities and infrastructure which are used in support of teaching and learning through the e-learning system. The findings from the MU case are presented and analysed through content and thematic analyses.

RESULTS

E-learning System Adoption, Utilisation and Practices

The MU e-learning system uses the Modular Object-Oriented Dynamic Learning Environment (Moodle) platform which is a free and open-source learning management system (LMS) that supplements face to face teaching and learning. The standard approach entails encouraging teachers to enrol in their courses and then to upload course content: resources such as lecture slides and activities including discussion forums, quizzes and assignments. Subsequently, students are engaged in varied learning activities, including uploading assignments, e-tests, downloading learning resources as well as participating in discussion forums. Results show that remarkable progress has been achieved from the academic year 2012 onward. In addition, courses or subjects taught via blended pedagogy increased widely with some indication of fluctuation. Figure 1 shows the number of courses or subjects registered in the e-learning system for the period reviewed. It should be noted that the sharp drop from eighty-seven to forty-four subjects was caused by the shift from Moodle 1.9 to 2.4.

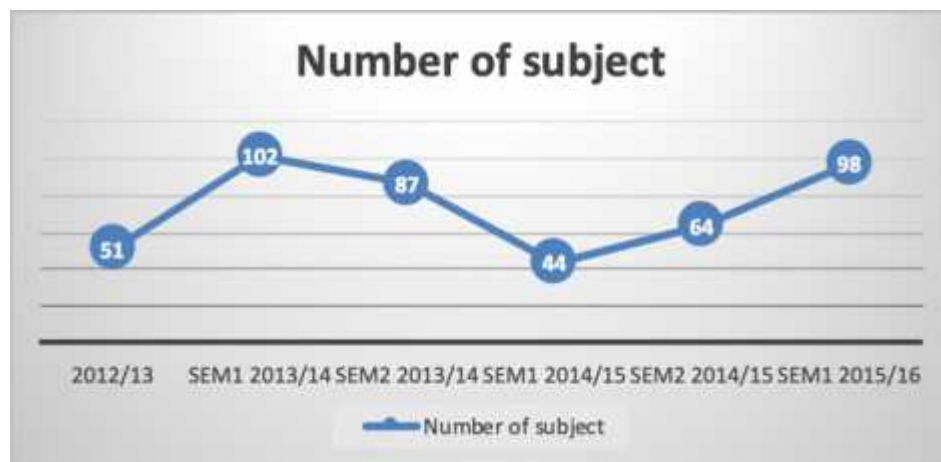


Figure 1: Overall utilisation at MU (subjects with content and activities)

In Figure 2 below, the data shows that several subjects were registered in the system. It highlights how eager students are to use the system. Regardless of whether there is content or not, the data in Figure 2 demonstrates how students have accessed the subjects. This suggests that students are aware and opt to learn via e-learning pedagogy. Unfortunately, the majority of the courses are neither populated with resources nor activities. It is sufficient to indicate that students are more inclined engage in e-learning pedagogy than their teachers.

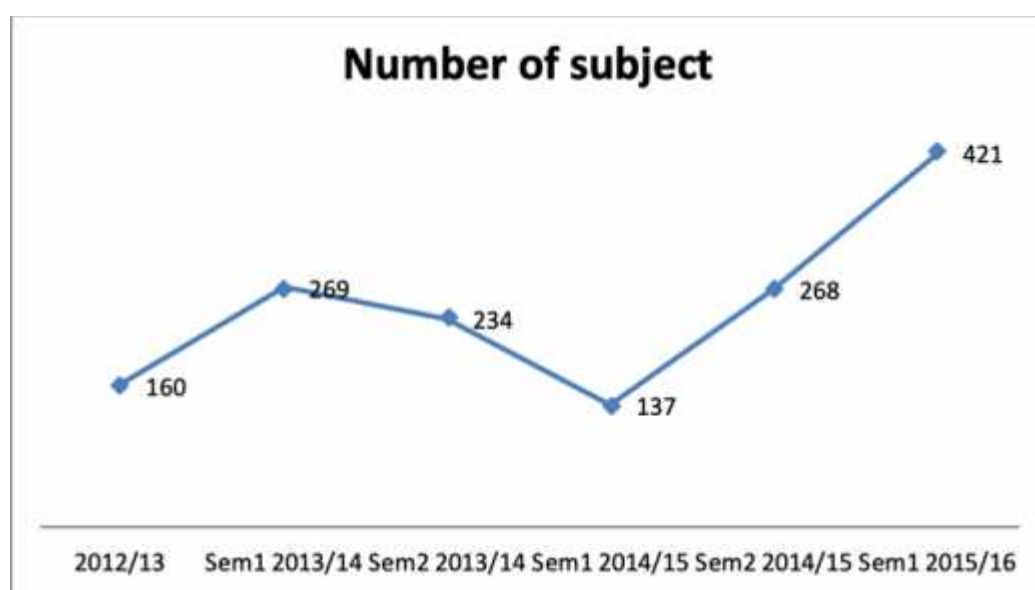


Figure 2. Overall trend on subjects accessed by students (having and not having) content uploaded

MU E-learning Utilisation by Units

The organogram of MU demonstrates several faculties (Faculty of Science and Technology; Faculty of Social Sciences) and schools (School of Public Administration and Management; School of Business) from which the data on e-learning utilization were derived. These units have specific programmes and some courses are delivered via the e-learning platform. It was found that there is an increase in the system adoption based on courses uploaded with the learning materials from one university unit to others. For example, in the Faculty of Social Sciences (FSS), there has been an impressive increase in courses in the system with content, compared to the Faculty of Science and Technology (FST) which recorded a drastic decrease. Figure 3 provides summary results.



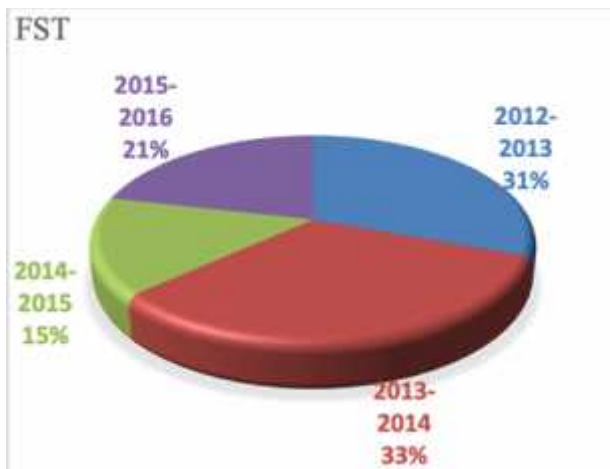


Figure 3. Courses with content within two observed faculties (FSS and FST) 2012-2016

E-learning Success at Mzumbe University

Based on our results, the following has been observed as impressive achievements regarding the deployment of e-learning systems at MU. First, the university has adopted e-learning systems as one of the teaching and learning strategies. As such, before its inception in 2009, there was neither plan nor strategy related to the adoption of either e-learning or distance education approaches. Hence, the inclusion of an e-learning agenda in the third and fourth University Corporate Strategic Plans (CSP-2012-2017) signifies an achievement. Significantly, the inclusion of the e-learning pedagogy agenda in CSP paved the way for the creation of the dedicated policy - Mzumbe University Information System Integrated Policy - MUISIP- 2014, explicitly dealing with distance and e-learning matters. Notably, one of the MU commitments stipulated in the CSP is to ensure that at least two-thirds of the subjects are loaded with content into the e-learning platform (Moodle). The e-learning policy directs the university to establish an academic unit to oversee proper system deployment. The two documents inspire the University into leveraging from the modern technologies and tools in order to expand the University reach beyond its borders, as well as to enhance teaching and learning experiences. Both the CSP and MUISIP align with the National Information Communication Technology (ICT) Policy of 2016 and the Tanzania Development Vision 2025 which emphasise the desire to unleash the potentials brought by the deployment of ICTs in education delivery.

Second, the programme is underway to establish several courses taught via online, e-learning and blended learning. For example, since inception of the e-learning system, the university has successfully managed to offer one postgraduate programme - the Master of Science in Health Monitoring and Evaluation - partially online. The programme is offered in collaboration with the University of California, San Francisco, USA. Furthermore, the system plays a vital role in connecting teachers and students, to assess and evaluate students' works as well as offering communicative tools between both parties. In particular, some of the sessions offered by the distance learning lecturers occur purely online.

Third, following successful installation and use of an e-learning system at the main campus, Morogoro, the system has been deployed at two MU campuses (cf., Mbeya Campus and the Dar

es Salaam campus). At both campuses, academics have been trained on how to utilise the system as well as how to encourage student engagement with e-learning systems to achieve intended learning outcomes.

Fourth, attracting and forming the partnership with the VLIR-UOS project for infrastructural and skills development support, especially in pedagogy, proved successful. The results show that several academics have attended and engaged in workshops such as digital content creation and podcast design for teaching and learning. Significantly, through the combined efforts of the local and external experts, the university is in the process of establishing the centre of excellence which will be responsible for all innovative and didactical technologies to support teaching and learning.

Fifth, following education-technology integration and some awareness creation among academic staff, the university, through its internal fund and external support, has embarked on motivating staff to engage students in e-learning. Moreover, several MU staff have been trained at the level of Masters and PhD in the area of innovative learning technologies.

E-learning Challenges at Mzumbe University

Several challenges have impacted the smooth adoption, deployment and implementation of the e-learning system at MU. First, the slow adoption process is one of the significant challenges faced by the DICT and the university at large. As previously described, in 2009, the e-learning concept was not as prominent as it is today; the effect of being a new concept means it was neither visualised nor prioritised as one of the university's strategies. To make it worse, the university neither had expertise in the area nor had a plan to venture into innovative use of teaching and learning technologies.

Second, limited ICT infrastructure was and remains a challenge; the number of computers in the computer laboratories are not adequate and there is the problem of limited connectivity and bandwidth (512kbps). Further, in the beginning, there was no wireless connectivity at MU at the time when not all staff offices were equipped with computers or network connection. Despite the setbacks, the DICT was not discouraged; instead, they used the e-learning deployment challenges to justify the need for service improvement. Hence, the system that was deployed served as a catalyst for installation of the local area network (LAN) in all offices as well as extending installation of wireless hotspots in all critical areas of the university, including the library and lecture rooms.

Third, lack of expertise in e-learning and didactical skills remain a challenge, as the decision to adopt the system of e-learning was not planned. It started with technology deployment before development of the expertise. To date, the university lacks individuals with expertise in e-learning, blended learning, online learning, and distance-learning. Other skills are highly demanded in areas including e-curriculum development, e-course design, quality assurance and controls as well as content creation.

Fourth, although, the MU e-learning system is regarded as a way of facilitating teaching and learning at the University, its implementation lacks a well-defined approach and procedures. For example, the available Distance and E-learning Policy (part of MUISIP - 2014) fall short of procedures, processes and standards. A guiding document is required to govern the following:

- 1) How the e-learning content is developed, designed and deployed;
- 2) How users (students and teachers) are managed and supported;
- 3) How most of the learning technologies are developed;
- 4) How learning technologies are customised, deployed and accessed;

- 5) How teacher-pedagogical training are designed and customised;
- 6) To provide the ready-made approaches and rules for students and guest users of the MU e-learning platform.

LESSONS LEARNED FROM MU E-LEARNING DEPLOYMENT

The e-learning deployment project at MU has never been a smooth process due to over-reliance on the traditional face-to-face approach to teaching and learning. Thus, as described above, the project provided the technocrats, educators, students as well as the University management with some challenges and lessons to be learnt. The following are some lessons worth sharing with academia and the general public:

First, it takes more than just the learning technology. From the present authors' experience in deploying the e-learning and other IT related services at MU, we have learnt that for the e-learning system to be fully adopted, it requires more than just the technology. While technology offers the means to facilitate communication, interaction and sharing of learning resources, much is needed to ensure that the right content and activities are developed and organized in such a way that pedagogical and didactical values are incorporated. Hence, more factors including skilled human capital as well as political and policy environments must be conducive to the realization of the deployment goals as attributed by Chambo et al.(2013) and (Jaffer et al., 2007). For example, MU has a number of ICT systems rich in functionality to fulfil user and organisation needs, yet they are underutilised. Likewise, the current (even the previous Moodle) platform has enough features that can facilitate the required learning processes, yet not all lecturers are using the platform. Historically, it took a while for the MU-staff to adopt the university mail system as well as an academic records information system despite their rich features. Likewise, there are other services including the university library information system that are underutilised. We recommend that, before deploying the e-learning system in an academic institution such as a university, there should be well-defined strategies and procedures within a well-defined milestone with responsible personnel to oversee the process. Significantly, we argue that the success of any information system depends on the availability of quality technologies (hardware and software), the right people mandated with distinct roles and responsibilities, as well as rules and procedures to direct people into using the technologies effectively. If users are left to behave the way they want to, the opportunity to use the technologies will fail to realise and bear the anticipated fruits.

Second, never underestimate the organization's cultures and values. As revealed by previous studies, the culture of an organization influences the attitude of the staff (Heydari et al., 2016; Lopez-Nicolas & Meroño-Cerdán, 2009). To some organisations, adapting innovative technologies, acquiring or sharing new skills and expertise constitute the pride of the employee. Our experience with MU varies from campus to campus due to the culture. While at some campuses it was easy to deploy and train system users, others required executive directives for them to accept and start using the system. Likewise, changes in the organizational leadership of various aspects of university life significantly affect the projects as suggested by Macharia & Nyakwende (2010). Hence, it is vital for the e-learning change managers and project leaders to explore and address organizational cultural dynamics for the successful deployment of the system.

Third, user support is a continuous process. Often, there is an assumption that by training users right after the systems are deployed it is enough for them to adopt, use and become productive. Our experience is that the majority of users never practice after leaving the training venue. Also, of the remaining few who practice, none will remember 100% of the training content after a week. Also, we have found that training manuals and demos are never used but are stored on shelves.

Likewise, it is evident that changes in the technologies and techniques are occurring too quickly; users do not have enough time and skills to respond or adapt to every new change and discovery promptly (Kambiara, 2011). Hence, we recommend having regular reflection seminars and training for systems' users to exchange ideas for improvement. Reflection sessions help to create a feeling of togetherness and involvement. Specifically, we argue that content generation workshops are more helpful to users than any other form of seminars and training because they are hands-on, and they enable educators and students to start using the system immediately, benefiting from the content developed during the workshop.

Fourth, teaching through e-learning systems is more than just an act of uploading lecture notes for the students to download. We have learnt that there is a growing discussion around the world concerning the definition and parameters of e-learning; several descriptions of the terms and technologies that constitute e-learning are available in the public domain (Dubey & Soni, 2019; Rodrigues et al., 2019). There are various concepts that are associated with e-learning including blended learning, mobile-learning and MOOCs. Furthermore, our experience shows that we tend to narrow the definition of the system by just concentrating on the effect of technologies. The best way to visualise the e-learning deployment should go beyond technological effects. The actual definition should include the soft parts of the systems such as curriculum development, assessment methodologies, quality control, student support services and management, as well as content generation and administration. Depending on the deployment approaches, scope and targeted audience, the technologies should be used to facilitate the system in its broadest sense. In this regard, at MU, we still have a lot of things to do regarding e-learning utilization. For example, the use of techno-pedagogy would serve to improve utilization of e-learning among e-course teachers by advising and scaling up the knowledge and skills through the incorporation of various activities such as publishing coursework, enhancing student e-portfolios, developing micro-credentials courses, designing micro-learning content. However, for e-learning to be a viable and feasible solution for teaching and learning not only for MU but also for other poorly resourced countries, many features need to be explored and leveraged (Roy, 2015).

Fifth, start by examining the organizational needs of the institution before talking about technologies to be used. As described in the previous paragraphs, e-learning is more than just the technology. Unfortunately, institutions (MU included) tend to be fascinated with the technologies rather than business realities during planning for the e-learning deployment. Consequently, we are bombarded with marketing norms and speeches to such an extent that the actual educational needs of the learner tends to be forgotten (Jaffer et al., 2007). Our experience at MU shows that there have been several times when we were tempted to adopt a technology for which we never had a business case (Machumu, Mohamed, & Musabila, 2018). Specifically, the literature concerning the failure of information technology projects suggests that having fuzzy project goals and not being transparent with business needs is the prime factor for at least 50% of failures (Alami, 2016). Hence, it is vital to first investigate the organizational needs before making technological choices.

Sixth, aligning the e-learning initiatives with the overall organizational strategies and policies is a crucial factor for success. Studies reveal that one of the factors that lead to the failure of most of the IT related projects is the lack of linkage to the overall business objectives and strategies (Terrace, 2011; Ellis, 2008). Specifically, one of the challenges that the DICT faced was the lack of institutional direction towards e-learning. Consequently, it proved to be hard to institutionalise the e-learning initiatives into the whole university. As previously presented, before 2012, the university had no vision for e-learning; priorities and its budget focused in other directions (Ghasia, 2009; Machumu & Zhu, 2019). Specifically, the university strategic plan that ended in 2012 had no mention of targets directed at e-learning. In such an environment, the DICT had to manage and administer the technologies that were neither planned nor prioritized by the university. Hence, despite conducting several capacity building training to all university staff and

the top management, the rate of adoption was too slow. Significantly, it was after the inclusion of the e-learning agenda in the 3rd MU strategic plan that the university started to participate in the deployment activities, and hence the situation improved.

Lastly, educators are more reluctant to change than the students. Upon successfully installing and customizing the e-learning platform, both educators and students were trained on how to use Moodle in teaching and learning. However, It was observed that the majority of students were ready to use the system but they were hindered by the lack of commitment from the educators as detailed in the previous sections. It seems that despite some minor technological and infrastructural challenges, students adapt to the online learning and distance learning environment more easily than educators (Gwebu & Wang, 2008). Probably, the nature of activities carried out by the students is similar to other Internet services; there are no significant additional skills required to work with Moodle. On the contrary, for the lecturers to efficiently apply the system, it requires some extra effort and a change of mindset from teacher-centred to student-centred learning. Hence, more efforts should be concentrated on training the educators to play a more leading role in e-learning transformation projects.

CONCLUSION AND RECOMMENDATIONS

In this paper we have described the e-learning deployment project at MU by highlighting key decisions, challenges as well as lessons to be learnt. While the aim of deploying such a system was to enhance teaching and learning experiences by improving communication, engagement, interaction and sharing of resources among education stakeholders, much is yet to be realized due to the challenges identified. In fact, e-learning systems, if well-designed, deployed and executed, would allow the platform and e-courses to provide academic staff in traditional face-to-face universities with opportunities to engage students both in online and in-class interactions, and save learning time and space. The adoption, deployment and utilization of the e-learning system at MU were not a plug and play process. The journey faced several challenges of which the most were inadequate infrastructure, technological problems and know-how, and lack of support services to both academic staff and students. Most of these challenges can reduce motivation to engage in meaningful learning via e-learning. This implies that these challenges are lessons for any institution considering deploying such systems.

While the MU context and the deployment experience is unique, our findings are consistent with similar studies, not only within Tanzania but also from the global perspective such as that of Roy (2015) and Gwebu & Wang (2008). From Tanzania for example, studies conducted in other universities including the UDSM and MUHAS, as identified earlier, demonstrate several e-learning successes and barriers to success. Our results combined with the findings from similar studies in Tanzania and other countries in Africa help to expand knowledge concerning e-learning deployment. Significantly, the focus should be directed towards eliminating barriers to the efficient and effective use of e-learning by promoting an awareness of its advantages. Also, e-learning provides an excellent temporary or permanent solutions for the creation of virtual learning classes in resource-constrained contexts. In practice, reflections such as this help practitioners, policymakers and other stakeholders to take necessary precautions. It can be concluded that for successful deployment of any information technology related system three key aspects need to be addressed:

- (a) the availability of an adequate and quality range of skills and technologies
- (b) having a conducive working environment that is guided by quality assured rules and procedures that ensure the technologies being deployed are efficiently handled by users, so as to achieve the overall organization goals.
- (c) executive management that provides the necessary support, encouragement, motivation and enforcement in leading the deployment of projects.

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