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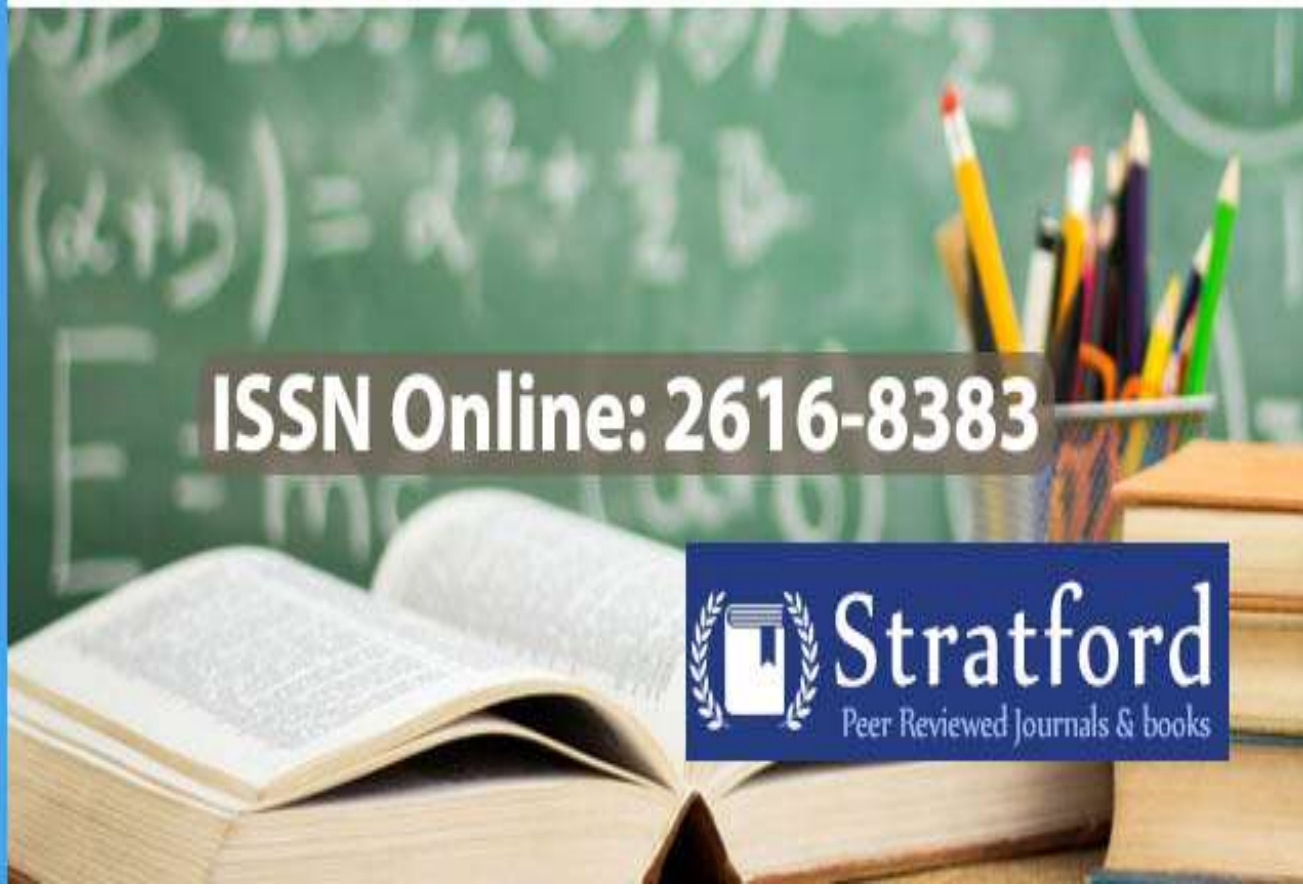

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The Influence of Level of Training in LMS and Student Utilization of LMS in Public Universities in Tanzania

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Abstract

This study investigated the influence of students' and lecturers' level of training in LMS on utilization of Learning Management Systems (LMSs) in selected public universities in Tanzania. Evidence from literature shows that although public universities in Tanzania are facilitated with the necessary technological infrastructure to enable student utilization of LMSs in learning, the adoption and utilization of LMSs across Tanzanian university curricula remains a challenge. In order to investigate level of training in LMS as a possible factor for the low adoption and utilization of LMS, convergent parallel mixed methods research design was employed. Data were collected through questionnaires, interview guides and an observation checklist. The target population consisted of 65,950 students, 53 deans, 83 heads of departments, 1,810 lecturers and 247 ICT staff from the selected Universities. Proportional quota sampling technique was used to select 398 students, 328 lecturers, 10 Deans, 10 HODs and 10 ICT Staff members to take part in the study. Quantitative data were analyzed using SPSS. Qualitative data were thematically analyzed and reported as-narrative stories and excerpts. The findings of the study revealed that level of training positively and significantly influenced Utilization of LMS (β=0.634, p=0.000). The study concluded that, there exists a positive and significant relationship between level of

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training and the utilization of LMS by students in public universities in Tanzania. Based on the findings and the conclusions the study recommended that the managements of the public universities in Tanzania should enhance the training programmes in LMS utilization for students and lecturers as one way of motivating the students and the staff to utilize the LMS in teaching and learning.

Key Words: *Training, Learning Management Systems, Utilization, Public University*

1.1 Background of the Problem

There exists enough evidence that LMS has turned to be a common application among HEIs over the globe, with differences remaining contextual and in terms of extent. For example, in the United States of America (USA) and the United Kingdom (UK) the LMS is currently used in universities as a more or less a requirement in academic educational knowledge delivery. Studies indicate that more than 90% of Universities and Colleges in the USA use the system and about 95% of Universities in the UK's HEIs have been using LMS (Al-Busaidi & Al-Shihi, 2017). Already, a relatively great potential have been recorded in most developing countries including the Middle East (Mirza & Alabdulkareem, 2016) and Africa (Lwoga & Komba, 2015; Raisamo & Mtebe, 2014). Although usage is still dawdling in developing countries, the system has recorded a great potential by 28.8% (Mirza & Al-abdulkareem, 2016) and has provided a solution to variety of issues in the educational deliverance (Al-Busaidi & Al-Shihi, 2017; Asiri, Mahmud, Abu & Ayub, 2012; Mirza & Al-abdulkareem, 2016).

The use of ICT provides a greater performance, visual observation, better perception and faster learning (Gui, Parma & Comi, 2018). Students are prepared with the help of parents at home through creative work. They also explore interesting topics on the Internet. According to Lawrence and Tar (2018), when ICT is adopted in the teaching process, teachers as assistants are instructing students while they are doing their tasks. According to Barassi and Treré (2012), there is a possibility of good interaction between teacher and student. Students have the opportunity to prepare presentation or projects with the use of the Internet, as well as to prepare school quizzes. They have the opportunity to communicate with each other by e-mail, facebook, Sky Drive, GeoGebra, Geometric Scatch Pade, Mindomo, and other interactive games. The use of ICT has its disadvantages and advantages. Its disadvantages are that it requires more preparation. Studies have been done on technology adoption and use context in HEIs in various countries as in the United States of America (USA), in the United Kingdom (Al-Busaidi & Al-Shihi, 2017) in the Middle and Far East (Fauzi, Ayub, & Shah, 2014; Mirza & Al-abdulkareem, 2016) also in Africa (Mtebe, 2014; Obadara, 2014) and Tanzania in particular (Komba, 2009; Lwoga & Komba, 2015; Raphael & Mtebe, 2013).

The LMS is the main system used in higher education institutions around the world (Persico *et al*, 2014). LMS is often used interchangeably with other terms such as Virtual Learning Environments (VLE), Course Management Systems (CMS), Managed Learning Environment

and Learning Platform. They all refer to the management of teaching and learning over the internet away from the physical classroom, by using the same common tools or software (Bednar et al., 2013). Some scholars differentiate between these terms. For instance, Black *et al.* (2007) distinguish between CMS and LMS, as the former focuses on course management rather than learning management. Others differentiate between LMS and VLE (Moore et al., 2011). This divergence, however, does not change the fact that they all share the same common tools and features.

Today, LMSs have become an integral component of the educational systems in most universities and interest is increasing in hybrid approaches that blend in class and online activities (Zanjani, Edwards, Nykvist & Geva, 2016). An LMS is not intended to replace the traditional classroom setting, but its main role is to supplement the traditional lecture with course content that can be accessed from campus or the Internet (Alokluk, 2018). While the potential benefits of augmenting the traditional class with LMS have been recognized and discussed by different authors for example, in USA by Al-Busaidi and Al-Shihi (2017), in the Middle East by Mirza & Alabdulkareem (2016) and in Africa by Lwoga and Komba (2015); Raisamo and Mtebe (2014). Although usage is still dawdling in developing countries, the system has recorded a great potential by 28.8% (Mirza & Al-abdulkareem, 2016) and has provided a solution to variety of issues in the educational deliverance (Al-Busaidi & Al-Shihi, 2017; Asiri, Mahmud, Abu, & Ayub, 2012; Mirza & Al-abdulkareem, 2016). What has remained largely unknown are student and teacher reactions to using a LMS as an addition to the traditional lecture.

In Iraq, many universities and colleges have been focusing on e-learning environment provided by LMS and much less on traditional methods as a result of the newly acquired capacity students and teachers to have access anywhere and anytime to internet (Kakbra & Sidqi, 2013). ICT and e-learning help teachers and students become actively engaged together in online collaborative work to enhance traditional learning methods. In Kurdistan of Iraq, an approximately good number of students and teachers have a continuous opportunity of entering into their universities web-portals. However, due to lack of LMSs, there is no interaction between them. Algahtani (2017) in a study to investigate the factors affecting the adoption of LMSs in the Kingdom of Saudi Arabian universities by female academic staff found that attitudes towards LMSs and their perceptions of the usefulness of the technology were the main internal factors that influenced the adoption of LMSs by female academics in Saudi Arabian universities. The study, however, concentrated only on attitude and perception as the only variables and since the study was conducted in Saudi Arabia, both conceptual and contextual gaps are created.

Lwoga (2014) argue that, even those considered as active and experienced users of LMS, institutions in Sub-Saharan Africa use a relatively small number of the features. For instance, only 8% of users used communication tools of Moodle LMS at The Open University of Tanzania (Bhalalusesa, Lukwaro, & Clemence, 2013). Similarly, majority of lecturers at the National

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University of Science and Technology of Zimbabwe have been using Sakai LMS as a course information transmission tool only (Dube & Scott, 2014). Lecturers upload course information for students to download just like any other digital resource repository. The same situation was observed at the University of Dar es Salaam in Tanzania whereby 30 lecturers who indicated that they were using Moodle LMS, used the system for uploading content and files only (SAIDE, 2013).

In Uganda, Bere, Deng and Tay (2018) conducted a study in which they discovered that a good number of Universities in Uganda are adopting the use of LMS to handle its needs of learning and teaching processes. They indicated that Muni University is among those Universities in Uganda which employs a Moodle as a Service for their over 20,000 students since 2014. The use of eLearning is increasing dramatically in Uganda, and most of institutions invest huge amounts in developing and deploying eLearning systems (Asuman, Khan & Clement, 2018). As far as LMS is concerned, it offers an integrated platform for educational materials, distribution and management of learning as well as accessibility by a range of users including lecturers, students and content makers. This study, however, points out that getting the required infrastructure and competence in creating the e-learning content remains the major challenge facing many HLIs thus hindering optimal use of LMS in Ugandan universities.

In Tanzania, Higher learning institutions (HLIs) are faced with challenges of adopting e-learning in education (Kisanga & Ireson, 2015). Studies have shown that the five major barriers to the adoption of LMS by Tanzanian Public Universities include; poor infrastructure; financial constraints; inadequate support; lack of e-learning knowledge and teachers' resistance to change. The government has expressed her commitment to solving these problems in many writings (NICTP, 2003, 2016; UDSM, 2013). This is why Lucian (2016) observes that a number of higher learning institutions in Tanzania have implemented Learning Management systems (LMSs) to manage online teaching and learning. However, more recent studies have pointed out that the use of LMS in many HLIs of Tanzania has not yet been effective enough to justify the value for money invested in e-Learning and hence guarantee a bright future of the LMS utilization (Lashayo & Gapar, 2017; Kira & Mahumbwe, 2015). This is contradicting the aspirations of many HLIs of Tanzania which are increasingly considering adoption of LMS as a viable teaching, learning and assessment tool. It is against this background that this study seeks to establish the determinants of student utilization of LMS in selected public universities in Tanzania

1.2 Statement of the Problem

It is a common knowledge that for one to be able to adopt a new technology such as learning management systems in learning there is need for perquisite knowledge and skills about the system. Lack of ICT skills and LMS knowledge among the instructors has been cited as a major setback to the adoption of LMS in most universities in sub-Saharan Africa. The world is moving

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from digital divide to digital citizenship where citizens are increasingly utilizing information Technology to engage responsibly in social and civic activities. As a result of this, many different technologies have been designed to support teaching and learning in HLIs and their role is a key topic for debate in contemporary education (Selwyn, 2011). In Tanzania, the NICTP (2016) recognizes the role of ICT in enhancing education, and advocates for the deployment of LMS in HLIs. For this reason, many HLIs have put in place strategies for harnessing the potentials of ICT in institutions of learning, and have deployed several ICT systems to enhance teaching and learning through technology. In addition, Tanzania has set The Educational Technology Strategy Vision so as "To ensure all institutional technology programmes are available to support an environment in which student achievement is enhanced through a set of information age tools and skills" (UDSM, 2013, p. 46). Among these strategies is the use of LMS for the enhancement of learning in the HLIs of Tanzania.

However, studies such as Mtebe and Raphael (2018) and Eriki, Talib and Lim (2015) show that although some LMSs such as Blackboard and Moodle are adopted and used successfully in some HLIs of Tanzania, other HLIs are not yet using the technology (Haki Elimu, 2015; Ngeze, 2016). In addition, studies such as Komba (2009); Lwoga and Komba (2015); Raphael and Mtebe (2013); Munguatosha, Muyinda and Lubega (2011) have claimed that public universities in Tanzania are facilitated with the necessary technological infrastructure, yet there are problems with the adoption and utilization of LMS across university curricula (Kisanga & Ireson, 2015). Previous studies for instance Mtebe, Dachi and Raphael (2011), Mtebe and Twakyondo (2012) and Lwoga (2014) have addressed barriers to ICT integration in HLIs such as low technical capabilities, limited access to computer labs created by strict timetables and high student-computer ratios, inadequate technical support and school policies. Contrary to the expectations of the government (NICTP, 2016) and the university community (UDSM, 2013), complains from students and lecturers (Mwalumbwe & Mtebe, 2017; Mtebe & Raphael, 2017; Kisanga & Ireson, 2015; Okey & Sam, 2019) about the limitations to the utilization of LMSs have continued unceasingly. There are, however, contending views among academicians about what digital LMS can achieve on the one hand, and students' poor level of LMS utilization on the other hand.

There is a good number of researches on adoption and use of LMS and e-learning in general done in private universities with few investigations taking a comparative approach between public and private universities (Matimbo, 2016). To the best of the researcher's knowledge, no study has dealt with influence of the LMS skills of the students and lecturers in the public universities in Tanzania which might be the reason for the limited utilization of the same. If this is not factored in, then the huge investment in ICT that the Tanzania government is making to improve teaching and learning in HLIs will be in vain. It is for this reason that this study sought to establish the influence of students' and staffs' level of training on LMS in public universities in Tanzania.

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1.3 Research Questions

How does the level of training of students and staff on the use of LMSs influence their adoption of LMS in learning in public universities in Tanzania?

1.4. Hypothesis

H_0: There is no statistically significant relationship between students' and staffs' training levels in the use of LMS and their utilization of LMS.

2.0 Literature Review

This section introduces the theoretical framework and the empirical review

2.1 Theoretical Framework

This study was underpinned in the Technology Acceptance theory. The theory was discussed on the basis of its evolution, fields of application, strengths, weaknesses and suitability to the study. This is an information systems theory that models how users come to accept and use technology. The theory suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it (preparedness), notably: Perceived usefulness (PU) defined by Fred Davis (1989) as the degree to which a person believes that using a particular system would enhance his or her job performance. Perceived ease of use was defined by Davis (1989) as the degree to which a person believes that using a particular system would be free from effort. Silvia and Dias (2007) argued that the Technology Acceptance Theory was proposed to focus on why users accept or reject the information technology and how to improve the acceptance of technological innovations that come their way. In this way, the theory offers, a support to foresee and explain the acceptance of technology in the field of education. Technology Acceptance Theory was designed to comprehend the causal relation between external variables of user's acceptance and the real use of e-Learning. Therefore, Technology Acceptance Theory was adopted in this study because of its capability of explaining the variables involved in determining the utilization of learning management systems in public universities of Tanzania. In order to mitigate the weaknesses of the Technology Acceptance Theory, the researcher employed two other supplementary theories on technology, namely, the Vygotsky' (1978) Social Constructivist Theory and the Diffusion of Innovation Theory by Rogers (1962). With these complementary theories in place, the researcher anchored the current study on Davis' (1989) Technology Acceptance Theory.

2.1.1 Technology Acceptance theory

Technology Acceptance theory was developed by Davis (1989). This is an information systems theory that models how users come to accept and use technology. The theory suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it (preparedness), notably: Perceived usefulness (PU) defined by

Fred Davis (1989) as the degree to which a person believes that using a particular system would enhance his or her job performance. Perceived ease of use was defined by Davis (1989) as the degree to which a person believes that using a particular system would be free from effort. Davis and Venkatesh (1996) add that the Technology Acceptance Theory is influential in predicting user acceptance and users' intentions, as well as the efficient usage of tools in the field of technology. In 1996, Davis and Venketesh made another adjustment to the Technology Acceptance Theory.

According to Momani and Jamous (2017), Technology Acceptance theory is also an extension of Theory of Reasoned Action (TRA) done by Davis. Technology Acceptance Theory did not include the TRA's subjective norms in its structure. It was developed after the introduction of information systems into organizations. It is developed in information technology field while Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB) developed in the psychology field, so that it is less general than TRA and TPB. The development for technology acceptance theory came through three phases: adoption, validation and extension. In the adoption phase, it was tested and adopted through a huge number of information system applications. In the validation phase, researchers noted that technology acceptance theory uses accurate measurement of users' acceptance behavior in different technologies. The third phase, the extension, where there are many researches introducing some new variables and relationships between various constructs of the technology acceptance theory.

Keil, Beranek and Konsynski (1995) developed Davis's Technology Acceptance theory into what they called the Usefulness/Ease of Use Grid, which was a 2×2 grid where each quadrant represented a different combination of the two attributes. In the context of software use, this provided a mechanism for discussing the current mix of usefulness and Ease of Use for particular software packages, and for plotting a different course if a different mix is desired, such as the introduction of even more powerful software.

2.1.2 Social Constructivist Theory

Social constructivism was developed by Vygotsky (1978). The theory states that, human development is socially situated and knowledge is constructed through interaction with others. Vygotsky believed in the central role that the community plays in the process of making meaning. Therefore, his theory stresses the fundamental role of social interaction in the development of cognition (Vygotsky, 1978). According to Vygotsky (1978) cognitive growth occurs first on a social level, and then it can occur within the individual. This is why social constructivists believe that the process of sharing individual perspectives - called collaborative elaboration - results in learners constructing understanding together and this construction cannot be possible alone within individuals (Meter & Stevens, 2000). Thus, an understanding of human thinking and knowledge depends on an understanding of social experience and the force of the cognitive process derives from the social interaction.

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Social constructivism assumes that learning is a social process where individuals learn through interacting with other people (Pritchard & Woollard, 2010). This theory motivates learners to participate in forums discussing some teaching topics thus preparing a favourable ground for using the learning management systems in their educational process (Dukić & Mađarić, 2012). Therefore, according to the social constructivist theory, it is important that facilitators provide possibilities for online cooperation and conversation about various educational topics for their students (Smith, 1999). Sometimes social constructivism is referred to as a movement, a position, a theory, a theoretical orientation or an approach (Bognar, Gajger & Ivić, 2015). Psychologists remain unsure of its status. This however did not affect the findings of this study because the researcher focused on the current understanding of the theory that it motivates learners to work as a team. This theory was considered relevant to this study in that, it helped the researcher understand how collaboration in learning can enhance students' understanding of the use of LMS in learning. However, this theory was not considered the main theory for the study since it addresses the supporting part of the LMS adoption process and not the main concept which is technological aspect.

2.1.3 Diffusion of Innovation Theory

This theory was developed by Rogers (1962). This theory explains the user adoption of new technologies and how, why, and at what rate new ideas and technology spread. Diffusion of innovation theory is one of the oldest social science theories (Rogers, 1995). It originated in communication to explain how, overtime, an idea or product gains momentum and diffuses or spreads through a specific population or social system. The end result of this diffusion is that people as part of a social system, adopt a new idea, behaviour, or product. Adoption means that a person does something differently than what they had previously (i.e. purchase or use a new product, acquire or perform a new behaviour etc). The key to adoption is that the person must perceive the idea, behaviour or product as new or innovative, it is through this that diffusion is possible. Diffusion of innovation theory attempts to explain and describe the mechanisms of how new inventions in this case learning Management Systems are adopted and becomes successful (Clark, 2012). Mannan (2013) stated that not all innovations are adopted even if they are good, it may take a long time for an innovation to be adopted. He further stated that resistance to change may be a hindrance to diffusion of innovation although it might not stop the innovation, it will slow it down. Rogers (1995) identified five critical attributes that greatly influence the rate of adoption. These include: relative advantage, compatibility, triability and observability. According to Rogers, the rate of adoption of new innovations will depend on how the organization perceives its relative advantage, compatibility, triability, observability and complexity.

Different innovations tend to spread and get adopted at different rates based on these five characteristics; relative advantage, which is the extent to which the innovation is viewed to be

superior to its predecessor by the potential adopter, compatibility, which is the level to which its perceived to be consistent with existing belief values, its complexity is the degree to which it is sighted to be burdensome to understand, trial ability, which describes how easily potential adopters can explore the innovation and observability, being the extent to which the benefit of using the innovation is visible to potential adopters, (Rogers,2003). This theory was considered relevant to the study since it informed the rate at which universities are willing to adopt and implement LMS in their learning process. For this case, a university that is ready to implement and encourage utilization of LMS will attain competitive advantage over others. Since the study focuses on incorporation of technology in learning, this theory was considered relevant to the study being proposed as it sheds more light on the spread of this technology from one part of the world to another. However the theory was not considered the main theory underpinning the study since it only acts as a supporting theory to adoption of technology.

2.2 Review of Empirical

In Portugal, Cabral, Pedro and Gonçalves (2012) undertook a study to analyze the impact of ICT-related training in the adoption of learning management systems (LMS) for teaching practices by faculties in higher education institutions in Spain. This was a case of Lisbon University. The impact was obtained by the number of LMS courses created and managed by participants in ICT for teaching workshops and those who had not attended any workshops. Nearly 1320 LMS courses and 265 faculties were involved. The study employed a cross-sectional survey design. The study findings indicated that, there was positive and significant relationship between faculty staff ICT-related training and adoption of LMS by students. The study pointed that, infusing education resources, such as a LMS, may assist faculty courses and organizing content to engage students and decrease planning time, thus supporting the process of learning. The study indicated that, faculty training best practices are the ones based on the preferences, expertise level and particular needs of faculty members.

In Saudi Arabia, Quadri, Muhammed, Sanober, Qureshi and Shah (2017), embarked on a study to establish the Barriers Effecting Successful Implementation of Learning Management Systems in Saudi Arabian Universities. The study adopted survey research design with a sample size of 257 respondents who were; students and instructors. The aim of the study was to establish the barriers to adoption of LMS in the universities in Saudi Arabia. The findings revealed that, lack of ICT skills and LMS knowledge among the instructors was a major barrier to the adoption of LMS in the universities. The study pointed out that, lack of these skills was found to affect significantly on the confidence of Instructor in the use of technology and in most cases try to escape from using LMS.

In Iraq, Radif and McLaughlin (2015) conducted a study to establish the internal and external barriers influencing LMS implementation in higher education. The study set out to identify the most important internal and external barriers in adopting LMS as a higher education initiative in

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Iraq. Using a sample size of 90 respondents who were mainly IT staff, faculty and academic department heads, the study established that, Lack of or limited teachers' training; lack of commitment to constructivist pedagogy; lack of experience to use the technology; lack of technical support; lack of pedagogical training for teachers were the main challenges facing the implementation and usage of LMS in the higher learning institutions in Iraq.

Asiri (2012) carried out a study to determine Factors Influencing the Use of Learning Management System in Saudi Arabian Higher Education. The main purpose of the study was to present the theoretical framework underlying a research on factors that influence utilization of the Jusur Learning Management System (Jusur LMS) in Saudi Arabian public universities. The study adopted extensive review of already existing publications relevant to the study. The study findings indicated that, Technology skill and competence was found to play key roles in the adoption of technology in the field of educational instruction. The results were in agreement with the findings of Osika, Johnson, and Butearu (2009) which emphasized that the lack of technological competency is one of the main reasons for faculty members refusing to integrate new technology in their teaching. As such, the study found out that, faculty members need to have not only the basic skills to deal with technology effectively but also needed to have basic knowledge of virtual environments such as Jusur LMS.

In South Africa, Coleman and Mtshazi (2017) assessed the Factors affecting the use and non-use of LMS by academic staff. The purpose of the study was to identify the factors that affect the use and non-use of a LMS by lecturers in a South African university. The study involved a qualitative case study of lecturers, and utilized questionnaires for data collection. The study findings indicated that, t both internal and external factors are important in shaping use of LMS. Contrary to the literature, high levels of use were found amongst the respondents with a high perception of ease of use and usefulness. However, due to issues such as lack of ongoing training, more advanced features of the technology were not being utilized. It also emerged that patterns of use were affected by pre-existing practices and that the perception of the system was affected by differences to the previous system. The study indicated also that, when academic staff members do not feel they are competent enough to use technology, they tend to decline to integrate technology in their teaching (Sherbib Asiri *et al.*, 2012).

In Tanzania, Kisanga and Ireson (2015) examined the barriers and strategies on adoption of e-learning in Tanzanian higher learning institutions: Lessons for adopters. The aim of the study was to examine barriers of adopting e-learning and the best strategies to address them. Data were gathered from a series of semi-structured interviews with e-learning experts from two HLIs in Tanzania. In the study, seven e-learning experts from two HLIs were involved in face-to-face, semi-structured interviews. They were purposively selected based on their professional roles, expertise, academic qualification and their direct involvement in e-learning programmes in a HLI. The study findings revealed that lack of e-learning knowledge to most education

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stakeholders was a major drawback in the adoption of E-learning. The study indicated that, lack of computer knowledge to some teachers was found to slow down e-learning uptake in the studied institutions. Converting print-based materials to electronic format by most of teachers was a challenge. The study further revealed that users of e-learning, particularly teachers did not want to show their weaknesses on ICT skills, which led to another problem, that is, resistance to change.

2.3 Conceptual Framework

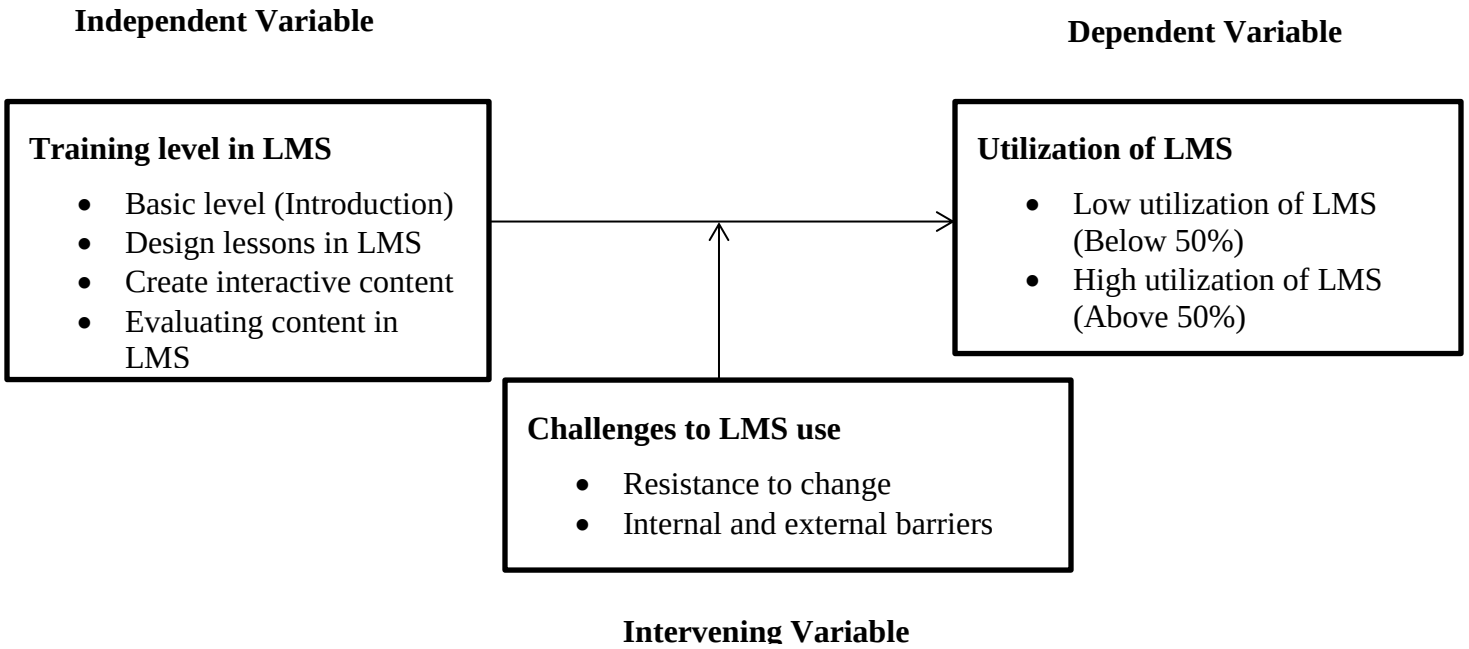

Figure 1: Conceptual Framework

3.0 Research Design and Methodology

This study adopted a mixed methods design, specifically the convergent parallel mixed methods research design. Mixed methods research is a type of research in which a researcher or team of researchers combines elements of qualitative and quantitative approaches (for instance use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the purpose of breadth and depth of understanding and corroboration (Johnson, Onwegbuzie & Turner, 2007). In the quantitative design, this study used a cross-sectional survey. A cross-sectional survey is considered to be an appropriate method for this study than a longitudinal design because of its ability in collecting data from respondents of different characteristics and backgrounds within a short period of time (Cohen, *et al.*, 2011; Edmonds and Kennedy 2013).

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This study targeted all the five chartered public universities situated in Dar es Salaam City of Tanzania (TCU, 2018). These universities are the University of Dar es Salaam, the Open University of Tanzania, Ardhi University, Muhimbili University of Health and Allied Science and Dar es Salaam University College of Education. The study targeted these five universities because they were the main public universities located in Dar es Salaam with the highest number of students and also as a result of uniformity of policy and easy of accessibility to data for research. The study targeted 65,950 students; 53 deans; 83 heads of departments; 1,810 lecturers and 247 ICT staffs in the five public Universities.

This study adopted Yamane (1967) formula to calculate the sample size for students and lecturers to respond to the study questionnaire. As for the Deans, Heads of Departments and ICT staffs, a purposive sampling of ten interviewees from each university were selected to take part in the study. The sample size for this study was 756 respondents from the five public universities in Dar es Salaam. This study adopted the use of both probability and non-probability sampling techniques for quantitative and qualitative approaches respectively under convergent parallel mixed methods design.

This study used both quantitative and qualitative instruments to collect data. Quantitative instruments included questionnaires, while qualitative instruments comprised of an in-depth interview guide and observation checklists. After quantitative data was obtained through questionnaires, it was made ready for analysis through editing, handling blank responses, coding, categorizing and keyed into computer software called statistical package for social sciences (SPSS) version 20.0 for analysis. Qualitative data collected was analyzed using content analysis. A multivariate regression model was used to show the relationship between the independent variables to the dependent variable as follows;

$$\mathbf{Y = \beta_0 + \beta X + \epsilon}$$

Where;
Y =Student Utilization of Learning Management Systems
X = Training Level of Students and Staff
In the model, β_0 = the constant term while the coefficient β was used to measure the sensitivity of the dependent variable (Y) to unit change in the predictor variable X. The error (ϵ) term captures the unexplained variations in the model.

4.0 Findings and Discussions

4.1 Demographic Characteristics

Based on the demographic information findings, majority (99) of the students were males constituting 53.8% of the respondents while the females were (85) constituting 46.2%, and thus there were more male students in the public universities in Dar es Salaam compared to female students. Regarding the ages of the students, majority (88) constituting 47.8% of all the students

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who took part in the study were 25 years and below, 33.7% others indicated that they were between the ages of 26-35 years old while 12.0% of them were between the ages of 36-45 years. Only 5.5% of the students were above 45 years old. The results imply that most students in the public universities in Tanzania are young which could be attributed to the fact that most of the students complete their secondary schools at the age of about 19-20 years before they join university.

In addition, the results indicated that majority (32) constituting 17.4% were pursuing science programs, 16.3% were pursuing education programs, 15.8% of the students were into computer science programs, the results also show that 14.1% of the students were pursuing programs in social sciences, 12.5% were into arts programs, while 12% were pursuing engineering programs. According to the findings, another 12% of the students indicated that they were pursuing some other programs other than the ones listed. Concerning year of study, majority (63) representing 34.2% of the students were in their second year of study, 55 students constituting 29.9% were in their third year of study, 13.6% of the students were in year 1 of study, 21 students constituting 11.4% of all the students interviewed were in their fourth year in their respective universities. Based on the results, 9.8% of the students were in year 5 of study and only 1.1% of the students indicated that they were in their sixth year of study.

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4.2 Influence of Students' Level of Training on Utilization of LMS

Descriptive Statistics

Table 1: Descriptive Statistics for Level of Training

	SD	D	Ne	A	SA			
Statement	**%**	**%**	**%**	**%**	**%**	**M**	**SD**	**N**
Log in to my profile on my own	1.10	2.20	4.90	53.80	38.00	4.26	0.74	184
Access study materials on LMS on my own	6.00	2.70	2.70	40.80	47.80	4.22	1.05	184
Attempt assignments and upload them on my own	4.30	4.30	3.30	46.20	41.80	4.17	1.00	184
Communicate to my lecturers and fellow students on my own	4.90	5.40	4.90	44.60	40.20	4.10	1.05	184
Participate in discussions/group work through LMS on my own	5.40	4.90	2.70	46.20	40.80	4.12	1.05	184
Access my assignment grades through LMS on my own	1.10	1.60	2.20	59.20	35.90	4.27	0.69	184
Average						**4.19**	**0.93**	

NB: *SD=Strongly Disagree; D= Disagree Ne= Neutral; A= Agree; SA= Strongly Agree; M= Mean; SD= Standard Deviation.*

The results in Table 1 show that most of the students were confident that they could Log in to their profiles on their own without seeking the assistant of anyone as indicated by (M= 4.26 and SD= 0.74). This implies that most students in public universities in Tanzania are already adopting the use of LMS in learning since most of them are able to log into their profiles without assistance. This means that, in as far as the level of training in LMS is concerned; most students already have basic knowledge on the use of LMS in public universities in Tanzania. The results are consistent with the findings of Zanjani, Edwards, Nykvist and Geva (2016) which confirmed that today LMSs have become an integral component of the educational systems in most universities and interest is increasing in hybrid approaches that blend in class and online activities. The results also show that most of the students agreed that they were able to access study materials on LMS on their own as indicated by (M= 4.22 and SD= 1.05). This implies that most students in public universities in Tanzania are already making progress in as far as the use

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of LMS in learning is concerned. The results imply that, it becomes easier for students to embrace the use of LMS when they can operate the system on their own.

The study in addition found out that most of the students who took part in the study were in a position to attempt their assignments and upload them all by themselves as indicated by (M= 4.17 and SD= 1.00). This means that strides have been made by public universities in Tanzania in incorporating LMS in learning and many students have been embracing the use of the e-learning method. This is supported by the fact that majority of the students interviewed indicated that they were in a position to attempt their assignments on LMS without seeking assistance. he results in the Table further show that most of the students were able to communicate to their lecturers and fellow students through LMS on their own as indicated by (M= 4.10 and SD= 1.05). The result imply that the use of LMS by public university students in Tanzania is already at an advanced stage where students can do literally most of the things on their own on LMS. The study also discovered that most of the students could participate in discussions/group work through LMS on their own as represented by (M= 4.12 and SD= 1.05). The results imply that the use of LMS in education among public universities in Tanzania is active and the training in LMS is going on in the universities and students are embracing it. This is confirmed by the fact that most of the students can be able to participate in discussions/group work through LMS on their own.

Finally, the study established that most of the students were able to access their assignment grades through LMS on their own as indicated by (M= 4.27 and SD= 0.69). The results imply that the use of LMS is already fully incorporated into learning in public universities in Tanzania. The overall average mean and standard deviation for the results was 4.19 and 0.93 respectively implying that most of the students were in agreement with the statements presented to them concerning the level of training they possessed LMS; however, their responses were spread about the mean. The findings are consistent with the findings of Lashayo and Johar (2018) which indicated that, the introduction of e-learning in developing countries and Tanzania in particular, is since year 1990. These systems brought up a considerable change in terms of how the teaching and learning are being conducted and in doing so, it saves time, it saves cost, it increases pace of sharing learning materials and making learning to be location-independent. In Tanzania, current study shows that only 46% of both public and private owned universities have e-learning systems in place.

In addition to this interview guides were served to the deans, HODs and ICT Staffs in which they were asked to indicate the trainings they were giving their students as preparation for using the LMS and from al the five universities the response was;

''...Our students are given an online manual kit (eg. Moodle User Manual) together with a hands-on training on how to use the Moodle; in addition, we also provide a continuous support to both students and staff from the IT support staff''.

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Inferential Statistics

Table: 2: Correlation Matrix

		Utilization of LMS	Level of Training
Utilization of LMS	Pearson Correlation	1.000	
	Sig. (2-tailed)		
Level of Training	Pearson Correlation	.785**	1.000
	Sig. (2-tailed)	0.000	

** Correlation is significant at the 0.01 level (2-tailed).

Results in Table 2 show that the Level of training and Utilization of LMS were positively and significantly associated ($r=0.785$, $p=0.00<0.05$) which was found to concur with the findings of a study conducted by Cabral, Pedro and Gonçalves (2012) which indicated that there was positive and significant association between faculty staff ICT-related training and adoption of LMS by students.

Table 3: Model Fitness for Level of Training on Utilization of LMS

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.785[a]	.617	.615	.28148

a. Predictors: (Constant), Level of Training

The model fitness results presented in Table 3 show that the coefficient of determination R Square was 0.617 and R is 0.785 at 0.000 significance level. The model indicates that level of training of students and staff on the use of LMS explains 61.7% of the variation in utilization of LMS by students in public universities in Tanzania. This means that, 61.7% of the utilization of LMS by students is influenced by the level of training of students and staffs have on the use of LMS in learning.

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Table 4: ANOVA for Level of Training on Utilization of LMS

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	23.228	1	23.228	293.175	.000[b]
	Residual	14.420	182	.079		
	Total	37.648	183			

a. Dependent Variable: Utilization of LMS

b. Predictors: (Constant), Level of Training

The ANOVA results presented in Table 4 show that the model was statistically significant in explaining the influence of level of training of students and staff on use of LMS on utilization of LMS by students in public universities in Tanzania as indicated by a p-value of 0.000.

Table 5: Regression Coefficient for Level of Training on Utilization of LMS

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.536	.150		10.268	.000
	Level of Training	.634	.037	.785	17.122	.000

a. Dependent Variable: Utilization of LMS

LT= 1.536+ 0.634X

Where **X**=Level of Training of Students and Staff on use of LMS

The regression coefficient results in Table 5 show that the level of training of students and staff on LMS use positively and significantly influences utilization of LMS by students in public universities in Tanzania (β=0.634, p=0.000). The gradient coefficient shows the extent to which a unit change in the independent variable causes a change in the dependent variable which is the change in utilization of LMS by students due to a unit change in the level of training of students and staff LMS use. This implies that a unit improvement in level of training of students and staff on LMS use results into an improvement in Students' utilization of LMS by 0.634 units. These results are in agreement with the findings of Quadri, Muhammed, Sanober, Qureshi and Shah (2017) which discovered that lack of ICT skills and LMS knowledge among the instructors was a major barrier to the adoption of LMS in Saudi Arabian universities. The study pointed out that, lack of these skills was found to affect significantly on the confidence of Instructor in the use of technology and in most cases try to escape from using LMS.

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4.3 Influence of Staffs' Level of Training on Utilization of LMS

Descriptive Statistics

Table 6: Descriptive Statistics for Level of Training

	SD		D		Ne		A		SA			
Statement	**f**	**%**	**f**	**%**	**F**	**%**	**f**	**%**	**f**	**%**	**M**	**SD**
Log in to my profile on my own	0	0.00	1	1.10	5	5.50	53	58.20	32	35.20	4.27	0.62
Upload study materials on LMS on my own	6	6.60	3	3.30	0	0.00	35	38.50	47	51.60	4.25	1.09
Upload, mark and grade assignments on LMS on my own	3	3.30	3	3.30	5	5.50	43	47.30	37	40.70	4.19	0.93
Communicate to my fellow lecturers and students through LMS on my own	6	6.60	6	6.60	6	6.60	39	42.90	34	37.40	3.98	1.14
Give and monitor discussions/group work through LMS on my own	5	5.50	4	4.40	2	2.20	44	48.40	36	39.60	4.12	1.04
Give assignment grades through LMS on my own	1	1.10	2	2.20	2	2.20	56	61.50	30	33.00	4.23	0.70
Average											**4.17**	**0.92**

NB: *SD=Strongly Disagree; D= Disagree Ne= Neutral; A= Agree; SA= Strongly Agree; M= Mean; SD= Standard Deviation*

The results in Table 6 show that most of the lecturers were confident that they could Log in to their profiles on their own without seeking the assistant of anyone as indicated by (M= 4.27 and SD= 0.62). This implies that most lecturers in public universities in Tanzania are already adopting the use of LMS in teaching students since most of them are able to log into their profiles without assistance. This means that, in as far as the level of training in LMS is

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concerned; most lecturers already have basic knowledge on the use of LMS in public universities in Tanzania. The results are consistent with the findings of Zanjani, Edwards, Nykvist and Geva (2016) which confirmed that today LMSs have become an integral component of the educational systems in most universities and interest is increasing in hybrid approaches that blend in class and online activities. The results also show that most of the lecturers agreed that they were able to access study materials on LMS on their own as indicated by (M= 4.25 and SD= 1.09). This implies that most lecturers in public universities in Tanzania are already making progress in as far as the use of LMS in learning is concerned. The results imply that, it becomes easier for lecturers to embrace the use of LMS when they can operate the system on their own.

The study in addition found out that most of the lecturers who took part in the study were in a position to attempt their assignments and upload them all by themselves as indicated by (M= 4.19 and SD= 0.93). This means that strides have been made by public universities in Tanzania in incorporating LMS in learning and many lecturers have been embracing the use of the e-learning method. This is supported by the fact that majority of the lecturers interviewed indicated that they were in a position to attempt their assignments on LMS without seeking assistance. The results in the Table further show that most of the lecturers were able to communicate to their students and fellow lecturers through LMS on their own as indicated by (M= 3.98 and SD= 1.14). The result imply that the use of LMS by public university lecturers in Tanzania is already at an advanced stage where students can do literally most of the things on their own on LMS. The study also discovered that most of the lecturers could give and monitor discussions/group work through LMS on their own as indicated by (M= 4.12 and SD= 1.04). The results imply that the use of LMS in education among public universities in Tanzania is active and the training in LMS is going on in the universities and lecturers are embracing it. This is confirmed by the fact that most of the lecturers could be able to give and monitor discussions/group work through LMS on their own.

Finally, the study established that most of the lecturers were able to Give assignment grades through LMS on their own as indicated by (M= 4.23 and SD= 0.70). The results imply that the use of LMS is already fully incorporated into learning in public universities in Tanzania. The overall average mean and standard deviation for the results was 4.17 and 0.92 respectively implying that most of the lecturers were in agreement with the statements presented to them concerning the level of training they possessed LMS; however, their responses were spread about the mean. The findings are consistent with the findings of Lashayo and Johar (2018) which indicated that, the introduction of e-learning in developing countries and Tanzania in particular, is since year 1990. These systems brought up a considerable change in terms of how the teaching and learning are being conducted and in doing so, it saves time, it saves cost, it increases pace of sharing learning materials and making learning to be location-independent. In Tanzania, current study shows that only 46% of both public and private owned universities have e-learning systems in place.

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Table 7: Descriptive Statistics for Utilization of LMS

Statement	SD %	D %	Ne %	A %	SA %	M	SD	N
Our students have embraced the use of LMS in Learning.	3.80	6.00	7.10	48.40	34.80	4.043	1.002	184
Our university has been using LMS in learning for the past 10 years.	4.30	4.90	6.50	48.90	35.30	4.060	1.004	184
The lecturers in our university are using LMS in their routine teaching program.	4.30	4.90	6.00	38.60	46.20	4.174	1.041	184
In our university students engage in online discussions through the use of LMS.	4.30	6.00	4.90	49.50	35.30	4.054	1.017	184
In our university students get learning materials and charts online through the use of LMS.	5.40	6.00	7.10	45.70	35.90	4.005	1.079	184
The number of students and lecturers opting to adopt LMS in learning and teaching has been increasing tremendously	4.30	5.40	6.00	44.00	40.20	4.103	1.032	184
Average						**4.073**	**1.029**	

NB: *SD=Strongly Disagree; D= Disagree Ne= Neutral; A= Agree; SA= Strongly Agree; M= Mean; SD= Standard Deviation.*

The results in Table 7 show that most of the students were confident that, despite the challenges facing utilization of LMS in public universities in Tanzania, many students had embraced the use of LMS in Learning as indicated by M= 4.043 and SD=1.002. This implies that public university students in Tanzania are against all the odds embracing the utilization of LMS in learning. However the utilization is not yet at one hundred percent mark. The results are consistent with

the findings of Lucian (2016) which found that a number of higher learning institutions in Tanzania had implemented Learning Management systems (LMSs) to manage online teaching and learning; however, LMS adoption by students in most of HLIs were yet to justify the value for money invested in e-Learning and hence guarantee a bright future of the LMS utilization.

This study discovered also that most of the Public universities in Tanzania had been using LMS in learning for the past 10 years as indicated by M= 4.060 and SD= 1.004. This implies that LMS is not a new technology among public universities in Tanzania and therefore most of the students are already well conversant with the use of LMS. The results are consistent with the discovery made by Lwoga (2015) that in Tanzania most of higher learning institutions started implementing ICT enabled LMS in 1998 and have been investing in the technology with an attempt to enhance teaching activities and learning processes. The University of Dar es Salaam, for instance, began using the Blackboard in 1998 which aimed at integrating the face to face learning with the online learning. The results are further consistent with the findings of Lwoga, E. T. (2014) who indicated that, the adoption of e-learning systems is becoming popular in higher learning institutions across the world including African universities; as a key higher learning institution that focuses on business and management studies in Tanzania, Mzumbe University (MU) has invested in ICT infrastructure to enhance its teaching and learning activities since the early 2000s.

The study further discovered that the lecturers in public universities in Tanzania were using LMS in their routine teaching program as indicated by M= 4.174 and SD= 1.041. The results imply that most lecturers in public universities in Tanzania have discovered the importance of integrating the use LMS in education. This also means that as more lecturers embrace the use of LMS in teaching, more and more students will definitely follow suit. The results are consistent with the findings of Padumadasa (2012) who found that self-efficacy had positive effects on acceptance and usage of technology. Indications are that the more students believe that they have the ability to operate in e-learning environment, the more they will use the e-learning systems.

In addition, the study found that in most of the public universities in Tanzania the students were engaging in online discussions through the use of LMS and indicated by M= 4.054 and SD= 1.017. This implies that most students in the public universities in Tanzania are already in a position to use LMS on their own to take part in discussions showing that strides have been made by universities in Tanzania towards incorporation of LMS in education. The results are in agreement with the findings of Ngeze (2016) which indicated that, students in University of Dodoma were already using LMS in learning and students were found to use their own laptops and mobile devices (mobile phones and tablets) to access LMS. Students preferred being connected to the Internet using wireless modems than going through the college Local Area Network (LAN). To improve the use of the system, students suggested on improving the University network and training users on how the system works.

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Similarly, the study found out that majority of the students were confident that in their universities they were receiving learning materials and charts online through the use of LMS from their lecturers as indicated by M= 4.005 and SD= 1.079. This means that public universities in Tanzania have already embraced the use of LMS in learning and there is serious engagement between students and lecturers through LMS. Finally, the results show that most of the students who took part in this study agreed that the number of students and lecturers opting to adopt LMS in learning and teaching had been increasing tremendously in their universities as can be confirmed by M= 4.103 and SD= 1.032. This implies that the use of LMS in learning has been on the increase by both students and lecturers despite the number of challenges facing the usage of LMS in their universities. The overall average mean and standard deviation of the results was 4.073 and 1.029 respectively implying that students were in agreement with most of the statements about LMS utilization even though their responses were spread about the mean. The findings on utilization of LMS in Tanzania are consistent with the findings of SAIDE (2013) which established that in University of Dar es Salaam in Tanzania 30 lecturers were using Moodle LMS to upload assignments on LMS for their students.

Inferential Statistics

H_0: There is no statistically significant relationship between students' and Staffs' training levels in the use of LMS and their utilization of LMS.

The hypothesis was tested by using multiple linear regression and determined using p-value. The acceptance/rejection criterion was that, if the p value is less than 0.05, we reject the H_0 but if it is more than 0.05, then H_0 is not rejected. Therefore, the null hypothesis was that there is no statistically significant relationship between students' and staffs' training levels in the use of LMS and their utilization of LMS. Results in Table 5 showed that the p-value was 0.000; this was supported by a calculated t-statistic of 17.122 which was larger than the critical t-statistic of 1.96. The null hypothesis was therefore rejected. The study hence adopted the alternative hypothesis that there is statistically significant relationship between students' and staffs' training levels in the use of LMS and their utilization of LMS.

5.0 Conclusion

The third objective if this study was to establish the influence of the level of training of students and university staff on the utilization of LMS by students in public universities in Tanzania. Based on the findings the study concludes that most of the students in public universities in Tanzania have certificate in LMS training and so are in a position to utilize LMS in learning on their own without having to seek assistance from their instructors. Most of the students in Tanzanian public universities participate in discussions/group work through LMS on their own this imply that some progress has been made in the adoption of LMS by these universities.

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Based on the correlation results, the study concludes that there is positive and significant association between students' and staffs' level of training in LMS use and the adoption of LMS by students in public universities in Tanzania ($r=0.785$, $p=0.00<0.05$). The conclusion is consistent with the conclusion made by Cabral, Pedro and Gonçalves (2012) that there was positive and significant association between faculty staff ICT-related training and adoption of LMS by students. Based on the regression analysis results, the study concludes that the level of training of students and staff on LMS use positively and significantly influences utilization of LMS by students in public universities in Tanzania ($\beta=0.634$, $p=0.000$). Quadri, Muhammed, Sanober, Qureshi and Shah (2017) shared similar sentiments when they found that lack of ICT skills and LMS knowledge among the instructors was a major barrier to the adoption of LMS in Saudi Arabian universities. The study concludes further that, an improvement in the level of training by students and university staff leads to improvement in the level of LMS adoption by students.

6.0 Recommendation

The findings indicated that students' and staffs' levels of training in LMS positively and significantly influence the utilization of LMS by students in Tanzania. This study hence recommends to the universities' managements that they should strive to put in place funds geared towards providing basic training to the students and lecturers on the use of LMS. Based on the findings and conclusions it suffices to recommend that managements of public universities in Tanzania should focus their participation in workshops designed to promote the acquisition and development of basic technical and pedagogical skills for using LMS courses at elementary level. This study also recommends that, the lecturers and instructors in public universities in Tanzania should mostly focus their energies and concerns in developing the essential skills required to use the LMS basic functionalities. This is because it has been established by this study that students' perception of the teacher ICT competence level affects the usage of LMS by students. Therefore, it is necessary that the university management ensure the teaching staffs are trained on ICT skills so as to encourage students to adopt the usage of LMS.

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