# Adoption and use of ELearning in Tanzanian Higher Learning Institutions: A Structural Equation Model

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## ABSTRACT

Many higher learning Institutions (HLIs) in underdeveloped nations, especially in Tanzania, are not moving quickly enough to embrace eLearning. This study seeks to design a model for enhanced adoption and use of eLearning at Tanzanian higher learning Institutions. A quantitative cross-section survey design was used for data collection. Data were examined using SEM under AMOS software. The results showed that the level of eLearning adoption and use was significantly influenced by technological, user, pedagogical, social, and environmental factors. Based on this paper, policymakers and other stakeholders should embrace this model to give enough support for the adoption of eLearning and to enhance the performance in teaching and learning. To develop an appropriate, successful, effective, and long-lasting eLearning environment, decision makers can have a clear image of how to implement an appealing, conducive, and positive meaningful learning environment. As a result, the paper adds to the body of knowledge the factors (such as social, environmental, and human ones) that significantly affect the adoption of eLearning in Tanzania's HLIs. In addition, a model for the adoption and use of successful and improved eLearning in Tanzanian's HLIs and other countries with comparable features was developed and validated in the paper.

**Keywords**: *ICTs; ELearning, adoption and use; SEM; AMOS; Tanzanian HLIs*

## INTRODUCTION

Because of the spectacular development of information and communication technology, social, economic, and technological factors have been changing the context of higher education (ICT). The dynamic, diverse, interactive, and pervasive nature of ICT as well as its transformational power, influences what, how, where, and when people learn (Jones, 2011; Greenberg (2005) and Pargaonkar et al. (2019) distinguished between old ICT technologies that provide one-way communication, such as landline telephones, television, and radio, and current ICT technologies that provide greater interactivity and geographical coverage, such as cell phones, computers and associated services such as the internet, and related digital devices. To the level that technologies now interact in terms of receiving, processing, storing, and disseminating data and information in various formats such as texts, images, and sound, technological convergences are blurring the distinction between old and new ICTs.

There is currently not a single educational institution operating without integrating ICT technologies into its daily activities. The transition process raises several issues for educational systems, particularly how to best implement and use ICT applications, such as eLearning, to provide high-quality educational opportunities and outcomes (Baji et. Al., 2022).In this case, if effectively implemented, eLearning has become a dependable system in education (Tarus & Gichayo, 2015, Jameel et al., 2021).

Including technological, pedagogical, institutional, environmental, social, and human dimensions, eLearning is a multifaceted concept. The definition of eLearning varies across disciplines, but the majority places a heavy emphasis on technological support and how it helps in the learning process. It is asserted that the constituents of all factors from wide perspectives are necessary for the successful implementation of eLearning (Kisanjara 2020). These perspectives of technology,

human, pedagogical, administration, social and environmental have a big impact on how much eLearning is used in the classroom.

The understanding that eLearning is a valuable educational tool for enhancing instruction, administration, and educational activities at higher learning Institutions to address educational difficulties is the root of the relationship between eLearning and education (Perera et al., 2022). The connection also echoes earlier talks on the growth of ICTs, which emphasized the beneficial relationships between eLearning and access to education and development (Chirwa, 2018). Additionally, past practice contributes to the enthusiasm for the value of eLearning at African higher learning Institutions.

Many people believe that if many western countries saw the effectiveness of eLearning in education, eLearning would assist African higher learning Institutions in overcoming educational challenges (Obijiofor, 2009). Elearning is changing how higher education institutions carry out educational activities such as teaching, learning, and administration (Nokou et al., 2022; Lwoga & Komba, 2015). ELearning, for instance, has the potential to cut instruction time by as much as 60% (Setiyani, 2022). Similar estimates indicate that 46% of college students in Middle Eastern nations enroll in at least one online course (Baji et al., 2022). Furthermore, according to a recent study from the United Kingdom's Open University, eLearning consumes 90% less energy than traditional courses (Chirwa, 2018). Al-adwan and Smedley (2012) argue that eLearning allows an opportunity regarding where and when learning resources can be delivered or received. According to Allen and Seaman (2008), "in their 2007 survey of US higher education institutions, online registered students grew at a 13.7 percent rate in relation to 0.9 percent for the total students" Furthermore according to (Perera et al., 2022) "the use of eLearning tools and strategies in UK higher education institutions has the potential to increase productivity by up to 50%, according to a report published by IBM"

To incorporate eLearning in Tanzanian higher learning Institutions, several improvements have been implemented. "Some Tanzanian higher learning Institutions have reportedly implemented eLearning on an as-needed basis using a blended strategy" according to Kisanjara et al. (2017). To establish eLearning, additional Tanzanian higher learning institutions have started the fundamental process of enhancing their ICT infrastructure to include local area network (LAN) installation, the Internet, computer labs, and other amenities. Some institutions have adapted open source software like WEBCT, Blackboard, and Moodle to create eLearning systems as patches (Kisanjara et al., 2017). By considering variables from several dimensions, this study is developing a model for enhancing the application of eLearning in Tanzanian higher learning Institutions.

In higher learning Institutions and colleges around the world, eLearning is becoming more popular, although doing it successfully in underdeveloped nations is still difficult (Dintoe, 2018). For instance, research has shown how integrating eLearning technologies have failed and adoption rates for eLearning were reported to be 9.68 percent at the University of Dar es Salaam (UDSM) and 12.4 percent at the Open University of Tanzania (OUT), respectively (Raisamo & Mtebe, 2014). According to Sharpe et al. (2006) the 98% stated at Oxford Brookes University in the United Kingdom (UK) is higher than the started values.

Ad hoc eLearning operations without a sufficient model for successful adoption and use are one of the factors contributing to ineffective eLearning deployment (Lashayo et al., 2018). It is argued that existing models and frameworks have concentrated on technological, institutional, and pedagogical aspects with little regard for human, environmental, and social aspects (Song, 2020). There are not enough parameters covered by present models for poor nations to successfully integrate eLearning (Bourlova & Bullen, 2018).

In order to successfully implement eLearning in Tanzania, this problem and its related causes require the creation of an efficient model that tackles the stated obstacles across various dimensions (e.g Mtebe & Raphael, 2018). In order to boost the acceptance and efficacy of eLearning at teaching and learning, the goal of this research is to develop a model for bettering eLearning adoption and use by considering a wide variety of criteria. In conclusion, the main objective of this study is to develop a model for bettering the adoption and use of eLearning in Tanzanian higher learning Institutions using the structural equation modelling technique. As a result, this study will address the following two research questions.

1. *What factors influence eLearning adoption and use in Tanzanian higher learning Institutions?*
2. *How can eLearning adoption and use model in Tanzanian higher learning Institutions be best developed and validated?*

### Justification of the Study
This study contributes in a number of ways. First, there are not enough components in earlier models for implementing eLearning. In order to apply eLearning properly, successfully, and effectively, research is needed to build and validate a model (Kahiigi et al., 2013; Alqahtani et al., 2022). Second, by building a measuring and structural model that illustrates how these aspects are connected to one another and how eLearning adoption and use may be improved, our research adds to the body of knowledge. The study also created and verified an eLearning model that outlines the causal connections between variables that affect the extent to which eLearning is implemented.

## RELATED LITERATURE REVIEW

### Theoretical Review

The three studied theories including the Diffusion of Innovation (DOI), the Unified Theory of Acceptance and Use of Technology (UTAUT), and the Theory of Planned Behavior (TPB) presented in this section were determined to be relevant and appropriate based on their benefits to this study. This is because eLearning is a tool for education that needs to be examined from both a human and a technological aspect. These theories were selected in order to get comprehensive data from both a technological and a human (behavioural) perspective. The chosen theories complement one another and offer constructions from all angles to prevent bias (human, social, environmental, and technological). Table 1 outlines the theories' advantages and disadvantages based on an analysis of DOI, UTAUT, and TPB to determine the theoretical gap. Based on Table 1, three pertinent theories were examined and modified to form the basis of the current investigation.

**Table 1:** *Summarized Strengths and Weaknesses of the Theories*

| Theory | Strengths | Weaknesses | The gap |
|--------|-----------|------------|---------|
| DOI | If technology is not brand-new, it focuses assessing its state. It ignores environmental issues and places more emphasis on external elements like technology and user characteristics. | Institutional, pedagogical, and internal social characteristics were not captured. | Institutional, pedagogical, and environmental characteristics in the context of |
| UTAUT | It addresses the technological characteristics and external users but not social characteristics. Approximately 70% of the data is | Institutional, environmental, pedagogical, and internal social characteristics are not captured. Fails to explain the | |

| | empirically used to explain the assessment of actual eLearning usage. | technology's effectiveness. | eLearning adoption and use are not adequately addressed in theories. |
|---|---|---|---|
| **TPB** | It is concerned with the behavioural interest. It is concerned with the internal social and user characteristics. | External factors such as institutional, environmental, pedagogical, and social characteristics are not captured. Failure to explain the technology's effectiveness | |

*Source: Kisanjara et al. (2020)*

In the context of eLearning adoption and use, it was discovered that theories fail to address factors such as institutional, pedagogical, and environmental characteristics. As a result, there is a need to fill this gap in the conceptual framework, which will be tested in the current study, by addressing Institutional, Pedagogical, and Environmental characteristics.

### Empirical Review

Despite the significant contributions it can make to education, the adoption and use of eLearning has been found to be influenced by a variety of factors ranging from human, pedagogical, institutional, social, technological, and environmental. The applicability and impact on eLearning adoption and use, on the other hand, vary depending on the prospective adopters and their specific context of application, as well as the type of novelty. These variables were investigated based on their core characteristics, which are discussed in the subsections below. Variables have been studied in terms of their core characteristics, which are discussed in the subsections below.

***Technological Characteristics***: In his study, Njenga (2011) incorporated the theory of diffusion of innovation and unified theory of acceptance and use of technology. ELearning adoption and use was found to be positively influenced by perceived usefulness, self-efficacy, demonstrability, perceived ease of use difficulty, and compatibility. Munguatosha et al. (2011) used Vygotsky's social development theory to investigate social networked learning adoption in Tanzanian higher learning Institutions. The results showed that among the technological traits that influenced the adoption and use of social networked learning were ICT infrastructures and system interactivity. However, the literature has not yet identified any common technological traits that affect the adoption and use of eLearning (Chirwa, 2018).

Therefore, eLearning as an educational technology must be successfully adopted and not overly multifaceted to evade user confrontation. Ndonje (2013) found that technological traits like complexity, compatibility, and relative advantage are significant in a study on the adoption of eLearning in Tanzania. The DOI theory was used to explain the causal relationship between the constructs used in the study. The use and adoption of eLearning were found to be significantly impacted by the findings. On the other hand, Sanga (2010) employed grounded theory to assess eLearning for better adoption and use in HLIs. Users' satisfaction and acceptance of the eLearning system were found to be positively impacted by usability, maintainability, and deployability.

***Human Characteristics:*** Generally, it is acknowledged that human behaviour affect how eLearning is implemented, viewed, and used in educational settings. Using the DOI theory, Taha (2014) investigated the prerequisites for the adoption of eLearning in secondary schools in UK. The findings demonstrate that factors such as student characteristics (computer proficiency, motivation, and self-efficacy), teacher characteristics (attitudes, control over technology and pedagogy, and teaching style), technological characteristics (quality and effectiveness of

infrastructure), and design and content characteristics all have a significant impact on the adoption and use of eLearning (perceived ease of use, quality content). In order to predict international critical success of eLearning, Ordonez (2014) compares four countries: China, Spain, the United States, and Mexico. According to the findings, "course design, learning content, and prior knowledge are all significant predictors of eLearning success from the learner's perspective". Jang et al. (2021) asserts that human behavior toward eLearning have a significant impact on eLearning adoption and use.

According to Dowling et al. (2003), this is only true for specific types of collective assessment, in contrast to claims that user-related factors improve eLearning adoption and use for education quality. In the absence of encouraging social interactions, user-related factors cannot simply support eLearning adoption and use, claim Liao et al. (2022). The absence of essential interactivity component between students—is the most glaring criticism of the adoption and use of eLearning (Al-adwan & Smedly, 2012). Any technology must, in general, be tailored to specific user characteristics while considering additional supporting factors like pedagogical and social factors to be valuable.

***Pedagogical Characteristics:*** To increase accessibility, efficiency, and quality of teaching and learning, pedagogical characteristics have a significant impact on the adoption and use of eLearning. Users' eLearning skills are crucial pedagogical characteristics that have a significant impact on successful eLearning adoption and use, according to Perera et al. (2022) and Setiyani (2021). Quality and appropriate e-course contents are what determine whether or not eLearning is adopted and used; claim Mtebe and Raisamo (2014). Students' satisfaction with the eLearning system is increased when instructors, in particular lecturers, receive pertinent training that enables them to produce high-quality eLearning content. Similar to this, Khan (2005) supported as; factors from pedagogy considered being crucial aspects that straight affect adoptions and use of eLearning. However, in reality, eLearning is more often used as an add-on feature by developing country higher education institutions than it is integrated into didactic characteristics. Therefore, it is argued that learning entails teaching while taking didactic qualities such as course curriculum, e-content, and teaching strategies into account.

According to Anderson and Gronlund (2009), pedagogical characteristics must be explicitly stated and considered for eLearning to be implemented successfully. Ndonje (2013) found that to significantly affect eLearning's adoption and use, pedagogical characteristics must be specifically tailored to the medium because it differs from traditional settings in many ways. Empirical studies have shown that eLearning users' resistance to change is one of the reasons why many eLearning projects in educational contexts fail (Chirwa, 2018). This is because when eLearning was implemented, pedagogical concerns were not considered. When preparing to integrate any technology in an educational context, it is impossible to avoid pedagogical attributes with emphasis on didactic.

***Institutional Characteristics:*** The successful adoption and use of eLearning projects typically depends on institutional characteristics. It is therefore generally accepted that precisely established institutional characteristics can result in an efficient adoption and use of eLearning in educational contexts. Theoretical and empirical findings showing institutional variables have a substantial impact on the success of eLearning adoption and have been validated by studies (Turi et al.,2019 and Zia et al., 2020). For instance, 525 Kenyan university students were studied by Tarus and Gichayo (2015) to determine how pre-conditional factors influenced their adoption of eLearning. The results showed that the deployment of eLearning was significantly influenced by institutional factors. Using an experimental approach, Njenga (2011) investigated aspects affecting eLearning adoption in Western countries.

The results showed that institutional traits including management commitment and support, financing accessibility and ICT policy all had a significant impact on how well eLearning was implemented. Khan (2005) asserts that institutional traits including funding, dedication, constructive communication, and managerial support have minimal bearing on the adoption of eLearning. On the other hand, Rogers (2003) discovered that any innovation's adoption and use are significantly impacted by the multiple institutional stakeholders' ability to effectively communicate. These results, except for Murniati et al. (2020), show that the adoption and use of eLearning in education remain elusive in the absence of institutional characteristics. However, most higher learning institutions lack sufficient institutional traits like funding and commitment to the adoption and use of eLearning. The potential for institutional characteristics to enhance formal and informal eLearning adoption and use activities is because of supporting educational activities.

***Social Characteristics:*** Social elements in eLearning have the potential to enhance social networks in addition to education. Social traits are viewed as a tool that, when used effectively, can help learners feel less alone and promote social inclusion. The results of several studies clarified how social factors affect the adoption and use of eLearning (Busaka et al., 2016). The presence of interactivity, and increased motivational socially, according to Khan (2005), have an impact on how eLearning is adopted and used, particularly when it comes to teaching and learning. As stated by Users can connect, communicate, and exchange ideas while studying by using social networking sites like Twitter, blogs, and Facebook, claim Munguatosha et al. (2011). This promotes a more positive attitude toward the adoption and use of eLearning. Social networking sites allow users to enhance their status or image and higher education institutions to achieve social aspects of learning, in accordance with Vygotsky's social constructivist learning theory from 1978.

Nevertheless, most eLearning users are not sufficiently educated or aware of the benefits of social eLearning platforms in the context of teaching and learning. The results of a study by Sridharan et al. (2008) indicate that social qualities are among the key success factors in the adoption of eLearning in academic institutions because they foster beneficial interactions, discussion groups, and collaborations between users. According to Naveed et al. (2020) and Yu (2020), ignoring social factors creates a significant challenge that has a negative impact on eLearning adoption and use. Taha (2014) used a quantitative approach to examine the effectiveness of eLearning in UK secondary schools. The findings demonstrate that social presence as measured by subjective norm influences the use of eLearning, either directly or indirectly. According to the argument, there are two perspectives on the adoption and use of e-learning in relation to social characteristics: on the one hand, student interactivity through learning resources and facilities is a means of sharpening their skills and knowledge. As a result, the noted viewpoints demand high consideration as well as should be taken into account before eLearning is adopted and used through eLearning workshops and training.

***Environmental Characteristics:*** Environmental factors have a big impact on the use of eLearning. It has an impact on the acceptance and usage of eLearning in a variety of ways, both broadly and specifically. Yew & Jumbligan (2015), for example, researched the challenges with the implementation of eLearning in Malaysia. They argue that environmental factors like ICT infrastructure, including hardware and software, are required for the use of eLearning. Furthermore, Zhu & Mugenyi (2015) conducted research on the integration of eLearning in Tanzanian and Ugandan universities using the SWOT analysis technique. According to the findings, ICT infrastructure, such as internet access, bandwidth, and sustainable power, as well as general environmental factors, have a substantial impact on eLearning uptake and use.

The influence of environmental factors on eLearning adoption and use level is not unified internationally, according to the argument, because each study was done in distinct situations,

evaluating different environmental characteristics on eLearning adoption and use level. Furthermore, despite research addressing numerous aspects influencing eLearning uptake and use, environmental factors, notably ICT infrastructures, have gone unreported as empirical evidence in most contemporary Tanzanian university studies (Kisanga & Ireson, 2015). To address such empirical information vacuum, the current paper explored the impact of environmental variables, including ICT infrastructures, on eLearning acceptance and use in Tanzania.

**The Gap and Conceptual Framework Development**

The conceptual Framework was proposed as a framework for this investigation in relation to the conditions of SEM. Figure 1 was developed in response to gaps in both empirical and theoretical literature by including social, user, and environmental characteristics in addition to technological, institutional, and pedagogical characteristics found to predominate in most models and theories. As seen in Figure 1, the created conceptual framework has treated "eLearning adoption and use level" as a dependent notion. In Figure 1, elements from eLearning theories and empirical investigations were considered as independent variables. The six latent variables and their associated indicators are independent variables and are displayed in Figure 1. The level of eLearning adoption and use and related indicators determine the conceptual framework. Therefore, in this study, Figure 1 is the foundation for developing an eLearning adoption and use model using SEM. While UTAUT collected aspects from technological and user characteristics but not from social features, DOI exclusively captured factors from technological and user characteristics in the theoretical review. By incorporating technology and social factors, TPB goes beyond these theories. However, neither theory fully addressed institutional, educational, or environmental issues.

In a similar vein, the empirical evaluation finds that few research across contexts have adequately captured user, environmental and societal variables (Chirwa, 2018; Turi et al., 2019). The suggested Figure 1 in the current study addresses the identified theoretical and empirical shortcomings. Other academics (such as Rosenblit and Gros, 2011; Ali et al., 2013) concur that the overarching research objective of the current study should combine social, user, and environmental issues to establish a model for the successful deployment of eLearning in the context of Tanzanian.

According to the literature study, eLearning dimensions comprise latent variables such as technological, user, pedagogical, institutional, environmental, and social aspects that influence the amount of eLearning adoption and use. These elements determine the regularity with which eLearning is utilized, user motivation, the efficacy of teaching and learning systems, and the quantity of eLearning users, all of which contribute to the successful adoption and use of eLearning. Figure 1 displays the links between latent and observable variables.
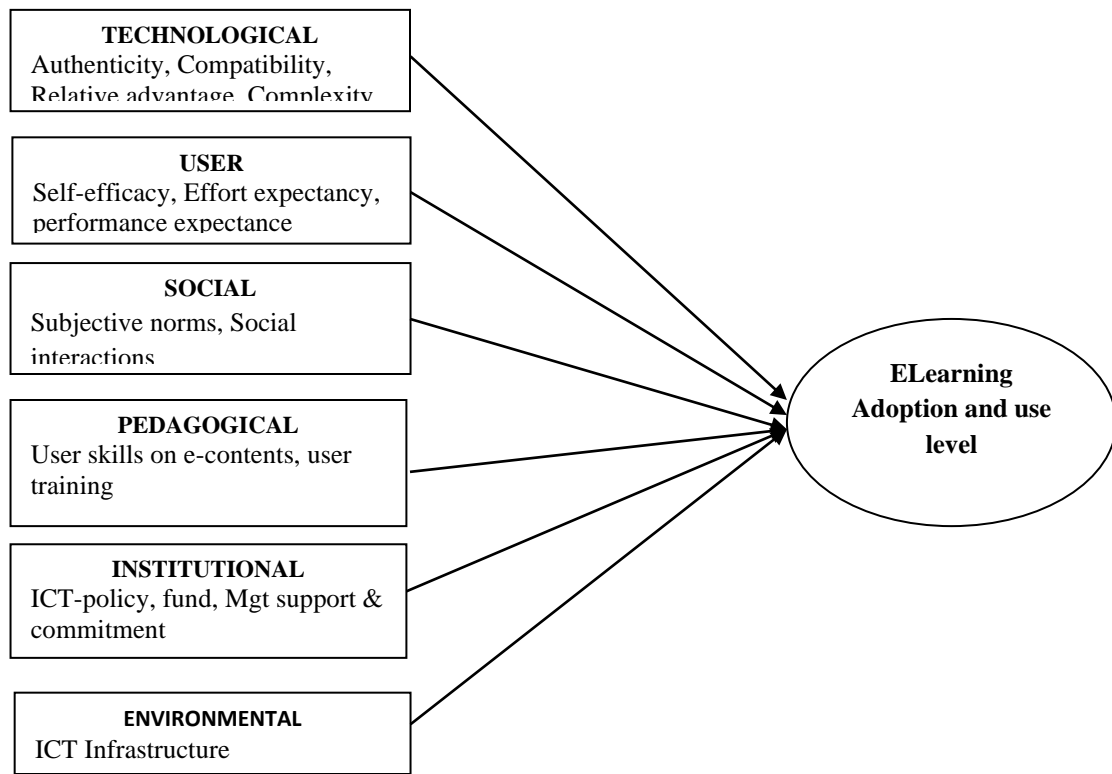
*Figure 1: A conceptual Framework (Adapted from Kisanjara et al. 2020)*

## 4. Hypotheses Formulated

### Technological Characteristics

**H1:** *The authenticity of using eLearning facilities and platforms has a significant impact on the level of eLearning adoption and use.*

**H2:** *The relative benefit of using eLearning has a significant influence on the level of eLearning adoption and use.*

**H3:** *The complexity of eLearning facilities and platforms has a significant impact on the level of eLearning adoption and use.*

### User Characteristics

**H4***: Self-efficacy of users in using eLearning platforms and facilities in learning process has a significant impact on eLearning adoption and use.*

**H5:** *Users' expectation of effort in using eLearning platforms and facilities in learning process has a significant impact on eLearning adoption and use.*

> *H6: Expectations of user performance from eLearning platforms and facilities in teaching and learning have a significant impact on eLearning adoption and use.*

### Social Characteristics

> *H7: User subjective norms have a significant influence on the level of eLearning adoption and use.*

> *H8: Social interaction via social networking sites has a significant impact on the level of eLearning adoption and use.*

### Pedagogical Characteristics

> *H9: Applicable user skills in e-content design eLearning have a significant impact on the level of eLearning adoption and use.*

> *H10: ELearning user training has a significant impact on the level of eLearning adoption and use. Institutional Characteristics*

### Institutional Characteristics

> *H11: The availability of funds influences the level of eLearning adoption and use.*

> *H12: The presence of an ICT policy in the university has a positive impact on the level of eLearning adoption and use.*

> *H13: Management support and commitment have a significant impact on the level of eLearning adoption and use. Environmental Characteristics*

### Institutional Characteristics

> **H14:** ICT infrastructures including internet, software, and local area networks computer hardware have significance influence on the level of eLearning adoption and use.

## METHODOLOGY

### Area of the Study

Eight public and private higher education institutions in Tanzania participated in this study, which were chosen at random from a total of thirty (30) higher learning Institutions. University of Dar es Salaam (UDSM), Sokoine University of Agriculture (SUA), State University of Zanzibar (SUZA), Zanzibar University (ZU), University of Iringa (UOI), Open University of Tanzania (OUT), St. Joseph University in Tanzania (SJUIT), and Mbeya University of Science and Technology were among the higher learning Institutions that were chosen (MUST).These higher learning Institutions were chosen because they have invested in ICT infrastructure to support the adoption and use of eLearning platforms and facilities. Additionally, the use of purposive sampling methods made sure that the sample institutions were selected in accordance with the study's purpose and that a substantial amount of data was gathered, enabling a researcher to generalize the results (Kisanjara et al., 2020). The university's nature is one of these characteristics (such as biological sciences, social sciences, technology and comprehensive). Other characteristics include mode of delivery (on-campus and online), geographic location (urban and rural), age (old and new), and

ownership (public and private) (private and public). These eight higher learning Institutions had a combined population of 58, 000 students and 6,896 academic staff (Kisanjara et al., 2020).

### Sampling procedure and Sample size

As shown in Table 2, a total of 400 students and academicians were stratified using the proportional stratification sampling technique. A complementary, simple random sampling was also used in selecting respondents who were randomly assigned to subgroups of varying sizes using the lottery method. A small piece of paper was used to assign a number to each member of their subgroups. These papers were folded and mixed in a box. Finally, samples were randomly selected from the box by folding pieces of paper in a random pattern.

The lottery method was used to reduce bias in the selection process, resulting in a representative sample. Furthermore, the population was divided into subgroups in which the lottery method was found to be more reliable than the computer-generated process (random number generator software) (Saunders et al., 2012; Kisanjara et al. 2020). The population magnitude of the separate groups is proportional to the extent of each sub-sample group. The equation nh = (Nh / N) * n was used to calculate the sample size for each subgroup. Where nh is the sample size for the sub-group h, Nn is the population size for the sub-group h, N is the total population size, and n is the total sample size based on previous studies (Trochim, 2006).

**Table 2:** *Show study population and Sample size*

| UNIVERSITY | STUDENTS | | ACADEMIC STAFF | | Total Population | Total Sample Size |
|---|---|---|---|---|---|---|
| | Population | Sample Size | Population | Sample Size | | |
| UDSM | 17,500 | 103 | 2350 | 18 | 19,850 | 121 |
| SUA | 8,988 | 53 | 1500 | 13 | 10,488 | 69 |
| OUT | 10,684 | 63 | 663 | 5 | 11, 347 | 68 |
| SJUT | 4,883 | 29 | 400 | 3 | 5,283 | 31 |
| UOI | 5786 | 34 | 850 | 7 | 6,636 | 41 |
| SUZA | 2,704 | 16 | 330 | 3 | 3034 | 19 |
| ZU | 2, 544 | 15 | 300 | 3 | 2, 844 | 18 |
| MUST | 4,909 | 29 | 503 | 4 | 5, 412 | 33 |
| TOTAL | 58,000 | 342 | 6,896 | 58 | 64, 896 | 400 |

*Source (Adapted from Kisanjara et al., 2020)*

### Data collection Instruments

A structured questionnaire with scales to measure eLearning uptake with items ranging from 1 (Strongly disagree) to 5 (Strongly agree) was used to collect data (Strongly agree). A total of 342 questionnaires were returned, with an 85.5 percent response rate (291 for students and 58 for academic staff). Cronbach's Alpha was used to determine the reliability of each variable, and the score was found to be 0.949, which is acceptable Ramasamy & Krishnan 2011). The items of the data collection tools were compared to the review of the relevant previous study to ensure the variables' validity. Confirmatory factor analysis (CFA), which demonstrates co-variation between observable and non-observable variables, was also utilized to establish the validity of the results.

*Data Analysis*

AMOS in PASW was used to examine the data (Predictive Analytic Software). The data was cleansed and checked to eliminate minor coding issues. Before completing descriptive and inferential analysis, different tests such as composite reliability and validity were done using principal component analysis (PCA) to obtain data internal consistency. The primary data analysis approach, structural equation modeling (SEM), was utilized to test the assumptions generated in line with the conceptual framework in Figure 1, and a structural model of eLearning adoption and use was then described in the subsections that followed.

*Stages of Developing ELearning Adoption and use Model Using SEM*

In order to answer the second specific research question, the modelling process was carried out in four stages in SEM, as recommended by Hair et al (2006). These include (1) the development of a conceptual framework, (2) the testing of hypotheses, (3) the specification of a structural model, and (4) the evaluation of model validity. The structural model was then validated using a direct technique.

## RESULTS

The results of the composite reliability and validity odd at using CFA are summarized in this section. In addition, SEM was used to test the hypotheses developed in subsection 4 and finally, a structural model of eLearning adoption and use was specified.

### Reliability and Validity Test Results using CFA

To assess all constructs, Cronbach's alpha coefficient and Composite Reliability (CR, also known as Jöreskog's rho) were used to determine the study's reliability and validity. Table 3 shows that the reliability and validity are adequate. As shown in Table 3, reliability of all constructs meets established requirements using both criterion values of alpha and CR are all over 0.6, which is suggested as acceptable in exploratory research using SEM (Hair et al., 2006, Hair et al., 2014)

*Table 3: Reliability and convergent validity of Values Measured*

| Construct | | Reliability | | Convergence Validity (AVE) |
|---|---|---|---|---|
| | | Cronbach's alpha | Composite reliability (CR) | |
| Technological | Authenticity | .787 | .712 | .550 |
| | Relative Advantage | .921 | .901 | .590 |
| | Complexity | .832 | .729 | .550 |
| User | Self-Efficacy | .870 | .679 | .612 |
| | Effort Expectancy | .931 | .942 | .595 |
| | Performance Expectancy | .823 | .809 | .568 |
| Social | Subjective Norms | .747 | .779 | .582 |
| | Social Interaction | .851 | .842 | .695 |
| Pedagogical | User Skills on e-contents | .723 | .789 | .661 |
| | Training of Users | .749 | .786 | .564 |

| | | | | |
|---|---|---|---|---|
| Institutional | Availability of Funds | .746 | .718 | .611 |
| | Availability of ICT Policy | .971 | .906 | .592 |
| | Mgt supports & commitment | .639 | .821 | .759 |
| Environmental | Availability of ICT infrastructure | .799 | .814 | .615 |

*Source: Analysis Data 2021*

Confirmatory factor analysis (CFA) was used to evaluate construct internal validity. Finally, the value of CR and AVE showing the model fit of CFA were calculated, as was the correlation between latent which represents the constructs. Convergent validity of used measures for all constructs is greater than 0.5, which is acceptable according to Fornell and Larcker (1981: 39–50).

### Hypotheses Testing Using SEM

Structural equation modeling (SEM) was used to test hypotheses in data analysis The SEM assesses each construct's and variable's effect on the extent of eLearning adoption in the context of higher learning Institutions in Tanzania.

***Table 4:*** *Results of Hypotheses Tested*

| Indicators of ELearning Adoption and use Level | Variables/Items Tested | | Estimate | S.E | C.R | P | Decision |
|---|---|---|---|---|---|---|---|
| Frequency use, Motivational use & Effectiveness in use | <— | H1: Authenticity | 0.027 | 0.125 | -1.22 | 0.560 | Rejected |
| Frequency use, Motivational use & Effectiveness in use | <— | H2:Relative Advantage | 0.15 | 0.020 | 2.25 | 0.023** | Accepted |
| Frequency use, Motivational use & Effectiveness in use | <— | H3: Complexity | 0.301 | 0.050 | 1.78 | 0.002*** | Accepted |
| Frequency use, Motivational use & Effectiveness in use t | <— | H4:Performance Expectancy | 0.212 | 0.231 | 3.45 | 0.014** | Accepted |
| Frequency use, Motivational use & Effectiveness in use | <— | H5: Effort Expectancy | 0.420 | 0.011 | 2.43 | 0.012** | Accepted |
| Frequency use, Motivational use & Effectiveness in use | <— | H6: Self Efficacy | 0.325 | 0.021 | 2.44 | 0.013** | Accepted |
| Frequency use, Motivational use & Effectiveness in use | <— | H7: Subjective Norms | 0.061 | 0.114 | -1.42 | 0.167 | Rejected |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Frequency use, Motivational use & Effectiveness in use | <— | H8: Social Interactivity | −0.152 | | 1.32 | 0.034**. | Accepted |
| Frequency use, Motivational use & Effectiveness in use | <— | H9: Skills on e-content | 0.776 | 0.221 | 2.12 | 0.001*** | Accepted |
| Frequency use, Motivational use & Effectiveness in use | <— | H10: Training of Users | 0.054 | 0.022 | 1.66 | 0.011** | Accepted |
| Frequency use, Motivational use & Effectiveness in use | <— | H11:Availability of Funds | 0.470 | 0.121 | 3.11 | 0.000*** | Accepted |
| Frequency use, Motivational use & Effectiveness in use | <— | H12:Availability of ICT policy | 0.034 | 0.020 | 1.64 | 0.031** | Accepted |
| Frequency use, Motivational use & Effectiveness in use | <— | H13: Mgt support & Commitment | 0.321 | 0.011 | 2.43 | 0.012** | Accepted |
| Frequency use, Motivational use & Effectiveness in use | <— | H14: ICT Infrastructure | 0.262 | 0.114 | 2.42 | 0.000*** | Accepted |

**\*\*, \*\*\*, indicate significance level at less than 4%, 1% respectively (Data Analysis, 2021)**

### Technological Hypotheses and ELearning Adoption and use Level

Table 4 shows how all technological factors/variables, such as authentication, relative advantage, and complexity, influence the level of eLearning adoption and use. Because their p-values are less than 0.05, the two hypotheses (H2 and H3) tested show a significant improvement in eLearning adoption and use level. This increases the frequency with which eLearning is used, as well as the motivation with which it is used and the effectiveness with which it is used. Only hypothesis (HI) of technology authenticity is recommended, as shown by a p-value of 0.560 > 0.05. This suggests that authenticity had no bearing on the level of eLearning adoption and use.

### User's Hypotheses and Level of ELearning Adoption and use

All user factors/variables measured, such as self-efficacy, effort expectancy, and performance expectancy, were tested to determine their influence on eLearning adoption and use level, as shown in Table 4 (Hypotheses H4, H5 & H6).  Because their p-values are less than 0.05, the results show that there is a significant improvement in the level of eLearning adoption and use. These factors increase the frequency, motivation, and effectiveness of eLearning.

### Social Hypotheses and Level of ELearning Adoption and use

Table 4 shows how all social factors/variables measured, such as subjective norms and social interaction, influence the level of eLearning adoption and use. Only one of the two hypotheses, H8, which is social interaction, was tested, and the results show that there is a significant improvement in the level of eLearning adoption and use, as the p-value is > 0.05. The use of

social interaction in eLearning increases the frequency, motivation, and effectiveness of eLearning, and thus the level of adoption and use. The results show that hypothesis H7 is rejected because the p-value is greater than 0.05. This means that subjective norms had no bearing on the level of eLearning adoption and use.

### Pedagogical Hypotheses and Level of ELearning Adoption and use

All pedagogical factors/variables measured, including user skills on e-contents and user training on eLearning usage, were tested against eLearning adoption and use level, as shown in Table 4. (Hypothesis H9 and H10). Because their p-values are less than 0.05, the results show that there is a significant improvement in the level of eLearning adoption and use. These factors increase the frequency, motivation, and effectiveness of eLearning. As a result, pedagogical factors must be considered, as they equip users with skills on e-content and through training prior to using eLearning in teaching and learning.

### Institutional Hypotheses and Level of ELearning Adoption and use

Table 4 shows the results of all institutional factors/variables assessed, including the availability of funds, ICT policies, management support, and commitments to eLearning adoption and use (Hypothesis H11, H12 and H13). Because their p-values are less than 0.05, the results show that there is a significant improvement in the level of eLearning adoption and use. These factors increase the frequency, motivation, and effectiveness of eLearning. In general, institutional factors such as funds, ICT policy, and management commitment and support are important to consider when implementing eLearning effectively.

### Environmental Hypothesis and Level of ELearning Adoption and use

Table 4 shows that ICT infrastructure is the only environmental factor/variable that was measured, as indicated by H13. It is compared to the level of eLearning adoption and use. Because the p-values are less than 0.05, the results show that there is a significant improvement in the level of eLearning adoption and use. The availability of ICT infrastructure has an impact on eLearning adoption by increasing the frequency, motivation, and effectiveness of eLearning. When planning to implement eLearning, it's important to keep environmental factors in mind.

### Developing the ELearning Adoption and use Model Using SEM

The final model result based on the tested hypothesis is shown in this section. The level of eLearning adoption and use is the dependent variable from the hypotheses, and the relationship between the latent factors as independent variables is shown in Table 4. The findings show how much effect each factor has in favor of the adoption of eLearning in Tanzanian higher education institutions. As a best practice for integrating eLearning in Tanzanian higher learning Institutions, Figure 2 shows the identified components and their relationships. All observed variables had model loadings above 0.6, indicating a significant contribution from latent variables with a respectable level of construct validity. The results also demonstrate that each latent as independent variable significantly influences the degree of eLearning adoption. This indicates that there is an increase in the frequency of use, motivation for use, and effective use of eLearning in higher learning Institutions for each observed variable. As a result, the level of eLearning adoption and use in Tanzanian higher learning Institutions improves. Table 5 summarizes the overall model fit based on the findings and complements the results in Figure 2.

**Figure 2:** *ELearning Adoption and use Model Developed using SEM (Data Analysis, 2021)*

**Key: Description of Variables:** *H1: Authenticity, H2: Relative advantage, H3: Complexity, H4: Performance Expectancy, H5: Effort expectancy H6: Self efficacy, H7: Subjective Norms, H8: Social Interaction, H9: E-content skills,. H10: Training of Users, H11: Availability of Funds, H12: Availability ICT policy, H13: Mgt supports & Commitment H14: ICT Infrastructure, MOT_USE: Motivational to use eLearning, FR_USE: Frequency of use, EF_USE: Effectiveness of using.*

**Table 5:** *Model fit summary of eLearning Adoption and use*

| Model Status | CMIN | DF | P-VALUE | CMIN/DF | GFI | CFI | RFI | NFI | IFI | RMSEA |
|---|---|---|---|---|---|---|---|---|---|---|
| Standard Model | 705.836 | 512 | .000 | 1.867 | .970 | .950 | 0.890 | .904 | .792 | .052 |
| Model saturation | .000 | .000 | | | | | | | | 0.146 |

| Model Status | CMIN | DF | P-VALUE | CMIN/DF | GFI | CFI | RFI | NFI | IFI | RMSEA |
|---|---|---|---|---|---|---|---|---|---|---|
| Independence model | 3092.103 | 467 | .000 | 8.721 | .235 | .235 | | | 0.00 | |
| | "All the above indices should be near to 1.0 and  0 ≤ RMSEA ≤ 0.1" are recommended values for model fit (Hooper, Cooughlan & Nullen, 2008; Kline, 2005) | | | | | | | | | |

*Source: Analysis of Data 2021*

Table 5 illustrates that all values of all indices were acceptable when considering suitability of the extent of 400 samples in relation to SEM criteria and other indices criterion. For instance, according to McDonald & Ho  (2002), if the sample size is between 237 and 400, the proposed P-values for significance are.000, and the acceptable RMSEA is between 0.05 and 0.08. Like this, indices like GFI, AGFI, NFI, RFI, and IFI should have values that are approximate to 1. All outcomes indicate the mode of fit is important and appropriate. The p-values represent the significance levels at 0.00.

**DISCUSSION OF KEY FINDINGS**

**Findings from Determined Factors**

Idealistically, higher learning Institutions should consider eLearning adoption and use as one of the concerns related to contemporary educational reform. Numerous studies contend that careful consideration and a lot of work are needed for the efficient and effective deployment of eLearning (see Njenga, 2011; Zia et al., 2020; Tarus & Gichayo, 2015). According to Yu (2020), the adoption of eLearning in higher learning Institutions will be successful if management, academic staff, ICT professionals, and students are all involved. The criteria that guarantee a successful and efficient procedure are not consistent, despite the crucial necessity of eLearning adoption. Many elements influence the adoption of eLearning conditional to the innovation, prospective adopters, and particular circumstances (Rogers, 2003). Regarding aspects that were identified and the variables that were observed, the study's results in this case addressed the first research question.

*Technological Characteristics:* The results showed that among the crucial and important elements for a successful adoption and use of eLearning are eLearning capability, availability of eLearning facilities and platforms, strong interaction, eLearning user friendliness, and accessibility. These factors were discovered to be reliable technological construct indicators and to be crucial for eLearning user adoption. The findings also show that technological construct has a direct positive impact on eLearning adoption and use, such as increasing the frequency of use, motivation to use, and effectiveness of use. ELearning would be easily accessible after considering all these elements; this conclusion is comparable to (ESIB, 2003; Tarus & Gichayo, 2015; Kisanjara, 2020). To increase the accessibility and frequency of eLearning, Tarus and Gichayo (op. cit) found that spaces like facilitating classrooms and resident halls, for instance, need to be implemented network facilities. To encourage users to continue using eLearning, for example, the accessibility and functionality of web based as important technology in learning requires easy and interactive platforms. While ESIB (2003) argues that eLearning adoption and use must ensure that all necessary facilities and platforms, such as internet connectivity and computers, are available, adequate, capable, and interactive, so that users increase their frequency of use.

***Institutional Characteristics:*** The results of this study demonstrate that top management support and commitment to eLearning adoption and use, a relevant and operational ICT strategy, and funding availability are the most critical institutional features to consider in eLearning adoption and usage. The current study's findings suggest that institutional characteristic has direct influence on the successful and effective adoption and use of e- learning. These findings are consistent with those made by Baji et al.(2022) and Jameel et al. (2021) who found that institutional variables significantly affect the adoption of eLearning. For instance, Tarus and Gichayo (2015) discovered that ICT Policy offers a direction and guide for the adoption and use of eLearning in higher education institutions. The deployment and upkeep of the eLearning platform and facilities, as well as user training on how to use eLearning, were found to require enough financial allocation in order to sustain adoption and usage activities.

According to Awidi (2008), the institution has to have well defined strategic plans that outline ICT policies that promote adoption and usage strategies for eLearning (2008). In contrast to previous research findings, Kisanjara et al. (2020) argued that institutional management commitment is not an important factor in facilitating adoption and use at their higher learning Institutions. The discrepancy in the results is due to the fact that previous similar studies used homogeneous sample and sampling techniques, whereas the current study used heterogeneous sample and sampling techniques, which allowed for the collection of in-depth and valid information from multiple perspectives without bias.

***Pedagogical Characteristics:*** ELearning and e-content integration, user training, and learner assistance are all blatant signs of a pedagogical framework. This in turn has a big influence on how well eLearning is adopted and used. The study's findings also demonstrated that providing academic staff with relevant eLearning training helps them to develop and use top-notch eLearning products. The frequency, effectiveness, and motivation of using technology are also increased via eLearning training. Similarly, the results indicate that an eLearning training plan for guidance, as supported by the results, should be implemented in order for user training on eLearning usage to be successful and efficient (Mtebe & Raisamo, 2014 and Zhu & Mugenyi, 2015).

According to the results of a survey done by the Bahraini Ministry of Education, students prefer digital information and classes created with multimedia (2007). Mtebe & Raisamo (2014) found that academic staff should create excellent course contents that convene planned educational benefits, relevant to learners' knowledge, skills, and capability to increase students' motivation and occurrence of applying eLearning, as well as their satisfaction and effectiveness in using eLearning. Course quality positively affects learners' happiness with and usage of eLearning, according to Tarus and Gichayo (2015). Taha (2014) found that 73.3% of the sampled students believed that the combination of eLearning and e-content had a favorable effect on student engagement and learning.

***User Characteristics:*** The study's findings show that the user characteristics items are a trustworthy predictor of user construct. The three most important factors to consider while implementing eLearning are self-efficacy, performance expectations, and effort expectations. The findings also show that user attributes have a big impact on how much eLearning is used in institutions, which increases its efficiency, motivation, and frequency. The findings of this study support those of prior studies (Alqahtani et al., 2022; Iskander, 2013). Self-efficacy, effort expectations, and performance expectations of users were discovered to have a considerable influence on the adoption and usage of eLearning (Taha, 2014). The results of this study are supported by those of Jang et al. (2021), showing that user attributes are connected. Self-efficacy, effort expectations, and performance expectations on utilizing eLearning, for instance,

are pertinent qualities associated to user motivation, effectiveness, and frequency in using eLearning as a consequence of successful eLearning adoption and use.

Following this discussion, it should be noted that as students and academic staff are the main parties immediately impacted by eLearning technologies in educational settings, they should be given special consideration. Users should be able to anticipate effort, performance, and effectiveness from their usage of the technology when it comes to eLearning. Iskander (2013) discovered that students rarely used eLearning and that a sizable portion of them thought it was not worthwhile since the adoption and use plan failed to take acceptable user characteristics into account.

***Social Characteristics:*** Social aspects are essential in the application of eLearning in the educational context. Subjective norms and social interaction were the variables tested and considered to measure the social construct in this study. In addition to prior technological, institutional, user, and educational aspects, social variables also have an impact on the adoption and usage process (Munguatosha et al., 2011; Buc & Divjak, 2016). According to Munguatosha et al. (2011), who concur, one social element, such as subjective norms and social interaction, is necessary for employing eLearning to accomplish social aspects of learning in accordance with social constructivist learning theory (Vygotsky,1978).  For instance, social software tools facilitate cooperative teaching and learning, participation in online forums, chatting, and sharing of pertinent knowledge (Nokou et al., 2022 and Liao et al., 2022). Similar to this, the seventh component of Khan's (2001) approach, which addressed social assortment, took into account a range of aspects of eLearning users, including social interaction and subjective norms. Contrary to earlier studies, the results of this investigation demonstrate that subjective norms are a negligible element in influencing the levels of eLearning adoption and use, as they have no impact on motivation, efficacy, or frequency of use.

Like the results of this survey, Al-adwan & Smedley (2012) showed that 62 percent of students said that face-to-face interaction with professors was a crucial component of their education and enhanced their status and prestige. Song (2020) found that students who frequently use eLearning in their coursework may find it challenging to build social skills and behaviors and to engage in interactions that are socially useful. They are supported by and coincide with Turi's (2019) findings. It is feasible to draw the conclusion that many researchers did not apply eLearning while accounting for social issues. By including social aspects into the created model for adopting eLearning in Tanzania, this study fills up this knowledge vacuum.

***Environmental Characteristics:*** This study's eLearning environment considered ICT facilities such as internet connection, adequate bandwidth, local or wide area networks with hardware and software, sustainable energy, and employees from ICT units/departments. The study's findings reveal that the availability of ICT sections/directorates, bandwidth, the sustainability of power, and the availability of internet access are all good markers of environmental construct. These elements have also been demonstrated to have a major influence on eLearning uptake and utilization. Previous research and studies on eLearning uptake and utilization backed up these conclusions (Othman & Musa, 2012; Amandu et al., 2013; Zhu & Mugenyi, 2015; Kisanjara 2020).

In addition to the facts stated above, Zhu and Mugenyi (2015) assert that the adoption of eLearning is dependent on a number of factors, including the accessibility and availability of computers and the Internet, as well as general considerations such as energy. Although he agrees, Berhanu (2010) warns that failing to address cross-cutting concerns and build an environment supportive of ICT infrastructure and effective assistance will jeopardize eLearning rollout. High bandwidth availability, according to Kisanjara et al. (2020), leads to dependable

access to eLearning platforms and facilities in place, and is a crucial component in eLearning acceptance and utilization. As a result, in order to cover a knowledge vacuum, this research focused on environmental variables.

### Findings Based on Model developed and Validated

The creation of a suitable and effective eLearning deployment paradigm for Tanzanian higher learning Institutions was deemed essential. The structural model created and validated using SEM, specifically CFA, and displayed in Figure 2 in section 5 serves as the foundation for the eLearning adoption and use model. The acceptability of each independent variable/item on the influence of dependent variables in mechanics is shown by the p-value in Table 4. The importance of creating models has been shown in prior study (Khan, 2005; Dabbagh, 2005; Njenga, 2011; Madar & Willis, 2014; Tarus & Gichayo, 2015). These research, however, do not have unified models. Lack of consistency in a model refers to the particular circumstances under which it was developed, prospective users, the technology itself, and other elements that affect the adoption and use of eLearning (Njenga, 2011). In this regard, the study's findings are consistent with earlier findings in the following ways: Technological, users, pedagogical, institutional, social, and environmental were the main variables that influenced the development of eLearning adoption and use models.

The results of this study are shown in Figure 2, where the loading weights of more than 0.4 show that all of the observed variables (factors) appear to strongly influence each of the unobserved variables (factors). A factor loading of at least 0.3 was advised by DiStefano et al. (2008) for a strong connection between the observed and unobserved variable. All observable variables in this situation are accurate measures of unobserved variables, as illustrated in Figure 4 in section 5. The results also show that there is a sufficient correlation between all of the latent (unobserved) variables. According to experts, there is at least a 0.5 correlation between each item and its corresponding construct, while there is at least a 0.3 correlation between items belonging to the same construct (Coromina, 2014).

The fact that there is at least a 0.5 correlation between the constructs utilized to affect the level of eLearning adoption is proof of their dependability. For instance, according to McDonald & Ho (2002), "If the sample size is between 237 and 400, the RMSEA requires to be in the range of 0.05 and 0.08, and the suggested p-value for significant should be.000. Similar to this, Table 4 in Section 5 asserts that indices like GFI, AGFI, NFI, RFI, and IFI need to have values nearby 1. According to Fornnell & Larker (1981), "the covariance of more than 50% is acceptable for a model's convergence validity, which is backed by the model's acceptable co-variations". Researchers like Hu & Bentler (1999) and Yu (2002) suggest that "the RAMSEA is within this range". According to the findings of this study, the conversional structural model final goodness of fit is (GOF, 0.98), which is corroborated by Hair et al (2006). With this proof, it is worthwhile drawing the conclusion that the model's applicability was examined and approved in accordance with statistical and theoretical principles.

### Validity of the Current Model in Comparison to Earlier, Similar Models

Table 6 compares the validity of the designed model used in this study to the validity of a few other related models found in the literature. For example, according to (Bashir, 2018), the comparative fit indices (CFI) of the current model are (0.95) higher than those of the eLearning adoption models by Lashayo et al., (2018) and the eLearning acceptance model by Bashir in terms of construct validity (2018). The current model's goodness of fit index (GFI) is also (0.97) higher than the GFIs of comparable existing models found in the literature.

The current eLearning adoption and use model's average variance extracted (AVE) value was (0.678) higher and acceptable than the AVEs of earlier, existing models that were like it, according to the findings of this study's convergence validity and reliability tests. Furthermore, the current model's composite reliability (CR) value was (0.87), which was discovered to be at the highest permissible level among the CR values of existing comparable models (Table 6). Based on this comparison, Table 6 shows that similar existing eLearning models are adequate for validity tests. However, the current approach to eLearning adoption and use has a very high level of validity, which leads to a very high level of acceptability.

**Table 6:** *Comparison of validity tests of the current model to existing similar models*

| Previous Similar Models | Tests of Construct validity | | | Tests of Convergent Validity and Reliability | | |
|---|---|---|---|---|---|---|
| | CFI> 0.90 | GFI > 0.95 | RMSEA< 0.08 | AVE> 0.5 | CR | Level of acceptance |
| | 0.94 | 0.89 | 0.061 | >0.54 | 0.79 | Adequate |
| Model for ELearning Adoption (Lashayo et al., 2018) | | | | | | |
| Acceptance mode for eLearningl (Bashir, 2018) | 0.901 | 0.82 | 0.064 | >0.58 | 0.67 | Adequate |
| ELearning adoption and use model (Current study) | 0.95 | 0.97 | 0.056 | >0.678 | 0.87 | Extremely adequate |

*Source: Researchers'' Own Construction (2021)*

## IMPLICATION OF THE STUDY

The factors in this study's developed model play an important role. The research resulted in significant theoretical and practical contributions to knowledge. Theoretical contributions are presented first, followed by practical implications contributions.

### Theoretical Implication

The elements of the created model have a considerable impact on how eLearning is implemented at higher learning Institutions in Tanzania. Researchers that study the adoption and use of eLearning have recently found that the factors that affect it have only been addressed superficially and with insufficient data. This work therefore contributed to the theoretical implications by building and validating theoretical models that concentrate on appropriate, successful, and effective eLearning adoption and use. By creating and testing a model that incorporates all associated aspects and that the influence explains the level of eLearning adoption and use in Tanzanian higher learning Institutions, as verified by the findings, this work has led to a better theoretical understanding of the factors of eLearning (Hair et al. 2014).

### Practical Implication

By considering environmental, user, and societal aspects that had previously been disregarded in eLearning adoption and use models, the results of this study contributed to the body of knowledge. These results encourage stakeholders to develop eLearning training programs for pertinent environmental and social concerns that academic staff and students can identify with and work proudly and contentiously on, raising their prestige and image. As these have been

identified as crucial elements in the adoption and use of eLearning, stakeholders should also create a suitable environment that includes infrastructures like internet connectivity, bandwidth, and dependable electricity.

The results of this study revealed that institutional factors have a negative impact on the adoption and use of eLearning. This means that ICT policy, training, commitment, and management support all have a negative impact on the adoption of eLearning. As a result, higher learning Institutions and policymakers should consider prior user training, reformulate appropriate ICT policies, and commit to and support eLearning adoption and use activity within higher learning Institutions. To successfully deploy eLearning and enhance academic staff and student performance in their professional activities, Ministry of Education decision-makers should adopt this paradigm. They can have a distinct vision for developing both a suitable and successful eLearning environment that is conducive to meaningful learning and that lasts for a long time.

## LIMITATION AND FUTURE RESEARCH DIRECTION

In this study, we aimed to evaluate current eLearning's situation and provide a framework for its acceptance in Tanzanian higher education institutions. The research approach was therefore adjusted to specifically address this issue in Tanzanian higher education institutions. The results of this study might not be relevant to other institutions of higher learning abroad or even to other institutions in    Tanzania, such secondary schools and colleges. First, there is potential for future research in the areas that are not key to the design of this study. Second, to understand why they vary, future study might examine the adoption and use rates of eLearning among Tanzanian higher education institutions.

## CONCLUSION

This study created and tested a model that includes the elements that are essential for enhancing the adoption and use of eLearning. This is due to the ad hoc nature of eLearning adoption and use in Tanzania and the lack of suitable criteria outlined in a model to act as a foundation for eLearning adoption and use improvement. This study helped identify the variables that affect the degree of eLearning adoption in Tanzanian higher learning Institutions. The study has also demonstrated how these connected aspects have a big impact on how much eLearning is implemented. The crucial elements that significantly influence the adoption and use of eLearning are its technological, user, pedagogical, institutional, social, and environmental characteristics. The study found that some of the identified factors, such as environmental, user/human, and social factors, had not been properly considered in earlier studies as a contribution to the body of knowledge. In addition, a model for eLearning adoption in Tanzanian higher education institutions and other countries with comparable features was built and confirmed in the study. Future studies should examine the level of eLearning acceptance and usage in different Tanzanian higher education institutions to better understand the extent of eLearning adoption and use because technology is always evolving.

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