



**UNIVERSITY OF NAIROBI**

**DEPARTMENT OF COMPUTING AND INFORMATICS**

**Determinants of adoption of e-learning Management Systems among students  
in TVET institutions in Kenya : A case of Nairobi County**

**BY**

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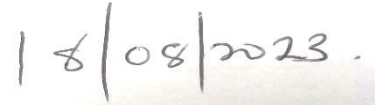
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## **DEDICATION**

This project report is dedicated to my Parents, Mr. Jannes Agallo and Mrs. Pecilla Agallo. My beloved wife and children, Barack, Brayden, Jade, Jannes for their support, patience and understanding while I was pursuing this worthy course.

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## ABSTRACT

Despite the incorporation of e-LMS in TVET institutions, there is still the use of traditional modes of teaching. There are many challenges in the adoption and application of these platforms in these institutions. This study sought to examine the determinants of adoption of e-LMS among students in TVET institutions in Kenya: a case of Nairobi county. The specific objectives of this study were to investigate different factors that influence user adoption of Learning Management Systems (LMS) in TVET institutions in Nairobi County; to propose a framework for user adoption of LMS in TVET institutions in Nairobi County based on existing frameworks and to evaluate the proposed framework for adoption in TVET institutions in Nairobi County. The study used the theory of reasoned action and the technology acceptance theory. This study utilized a descriptive survey research design. Target population were students in TVET institutions in Nairobi County, out of which a sample of 384 were chosen. Systematic sampling was used to choose the sample. The study gathered primary data by use of questionnaires. Descriptive statistics were run to provide general characteristics of the data. Thereafter, multiple regression model was used to explain the dependent variable in terms of the independent variables. The findings showed that attitude is statistically significant in explaining user adoption of LMS in TVET institutions in Nairobi County ( $\beta = 0.113$ ,  $p < 0.05$ ). The results revealed that user competence is statistically insignificant in explaining user adoption of LMS in TVET institutions in Nairobi County ( $\beta = 0.065$ ,  $p > 0.05$ ) and barriers have a statistically significant effect on user adoption of LMS in TVET institutions in Nairobi County ( $\beta = 0.176$ ,  $p < 0.05$ ). Overall, attitude, competence and barriers have a statistically significant effect on user adoption of LMS in TVET institutions in Nairobi County ( $p < 0.05$ ). The study proposed that TVET institutions in Nairobi County consider user attitudes, competencies and remove barriers to enhance user adoption of LMS. This study recommends that TVETs should enhance user capabilities to perform learning activities efficiently; the institutions' management should enhance platforms that are easy to interpret information output generated from learning management system; TVETs should provide adequate hardware for use of LMS and TVET institutions should consider user attitudes, competencies and remove external barriers to enhance user adoption of LMS.



# CHAPTER ONE

## INTRODUCTION

### 1.1 Introduction

This chapter presents general view of the study's subject, outlining the research problem's context and rationale. Furthermore, it highlights the importance of the study and outlines its research objectives. Lastly, the subsequent section of the chapter delineates the limitations, scope, and assumptions of the study.

### 1.2 Background

Development of ICTs is a significant pillar to the development of mankind, making it a global phenomenon (Mohammed & Abdulghani, 2017). Technology is inevitable in modern societies. According to Ghavifekr et al. (2019), ICT comprises of hardware, software, people and networks that enable the sharing of information. Advancements in ICT has changed how learning takes place in institutions. These institutions have embraced technology in their student application, registration, teaching, fee payments, examinations and other processes in the lifecycle of the learners. ICTs facilitates access to information.

Okello and Ayuya (2020) assert that ICTs are capable of enhancing accessibility of information; facilitating communication; enhancing learning and information sharing. ICTs enhance the interaction between learners and tutors, learners and learners, tutors and institutions, learners and institutions. The exchange of information occurs via use of computers, mobile phones and other ICT devices. These improve the learning process. According to Ayeni (2019) appropriate application and integration of ICT in learning institutions improves efficiency in the whole process.

Globally, the top two countries for ICT adoption in education are Sweden and Singapore. According to Ghavifekr et al. (2019), these two have the highest levels of innovation and digitization. ICTs have been absorbed by many nations in Europe, Asia, and North America in practically all areas of their business.. Lee et al. (2015) explained that integration of ICTs in learning has been a key pillar in Singapore's education system. All the stakeholders in the nation's

education system integrate and embrace ICTs in the learning process. A recent report by the British Broadcasting Corporation (BBC), acknowledges the more than one thousand universities that use iTunes U pages in learning (Caballé et al., 2010). The report indicates that there are hundreds of thousands of e-books in use by learners and tutors on ICTs platforms. Sintema (2020) predicted the emergence of e-campus. Malaysia and Peru have also integrated ICTs in their primary and secondary schools' curricula. The countries have thus embraced technology and want it to be part of students' entire learning process.

In Africa, Ghana has put the necessary regulatory and legal frameworks to the adoption of ICT and has invested heavily towards the operationalization of ICTs (Dawuda, & Ibrahim, 2021). According to Enu, et al. (2018) ICT forms a critical part of Ghana's education's blueprint. The country provided laptops for all kids; this is aimed at enhancing teaching and learning. It also cultivates interest among kids on use of ICTs. Schools' infrastructure has been enhanced to accommodate ICTs. ICT for Teacher Professional Development was created in Tanzania and the government adopted the Technological Pedagogical Content Knowledge framework (Kweka & Ndibalema, 2018). This was meant to increase the uptake of ICTs amongst teachers and encourage them to embrace and use ICTs in teaching.

The government of Kenya actively and persistently promotes Technical and Vocational Education and Training (TVET) programmes in an effort to accomplish the goals outlined in Vision 2030 (TVET Act, 2013). Youth and adults are prepared for the workforce through technical and vocational education and training, or TVET. This training involves learning, developing abilities, and using science to address issues. This choice was made in light of the realisation that the nation's development plan can only be best accelerated if its citizens are transformed via education into a highly productive and competitive workforce. In order to accomplish this goal, the government advocated through Vision 2030 that science, technology, and innovation be applied more aggressively in order to increase production and efficiency by creating a critical mass of talented children and adults in a range of technological sectors.

As a result, the Kenyan government is actively promoting the integration of e-learning in Kenyan technical institutions. The purpose is to provide an additional method of delivering education and

increase the accessibility of higher and middle education in Kenya. This initiative aligns with the goals outlined in Kenya Vision 2030, which considers the widespread implementation of e-learning in technical education as a strategic long-term plan. E-learning improves learning process accessibility, equity, and creativity. Additionally, it raises the standard of education.

The majority of TVET institutions have not fully embraced ICTs and technology in their operations. The learners must physically be present in class. The only information source is the tutor as well. The only recipients of the knowledge are the students. A change from the norm is necessary given the dynamic educational and professional environments nowadays. It is impossible to undervalue the contribution of ICT to the progress and development of the nation (Obwoye & Stela, 2016). E-learning should be used in the teaching-learning process when using ICTs to prepare TVET graduates and in their method of training. With the help of e-learning (an ICT-based learning environment), students, instructors, and trainees can communicate online without ever coming into contact in person (Sanseau & Auerbach, 2021). With e-learning, TVET teachers will be able to connect with students in a variety of settings by utilising the various ICT resources that are readily available. This would lessen the restrictions of time, space, and location that have grown to be a significant obstacle and challenge to the delivery of education, particularly for the working class.

The execution of e-learning in TVET Institutions is fraught with difficulties. According to the findings of Morgado, Lencastre, Freires, and Bento (2021), the main challenge lies in training educators to adapt their teaching methods rather than solely focusing on becoming proficient in the technical aspects of the e-learning system. Instructors and learners should possess necessary technical skills to effectively utilize e-learning technologies. The fast globalisation of information technologies has made it possible for LMS.

However, user adoption is largely responsible for the successful implementation and management of these systems (Bhullar & Chaudhary, 2020). Due to the technical nature of the academic programmes provided, numerous issues are preventing learners and teachers in TVET institutions from adopting this innovation successfully. Alkhatabi (2017) claims that impediments to user

adoption of LMS in many TVET schools in Kenya include competition and high cost of technology.

E-LMS are being used as a platform by a sizable number of Universities and TVET schools in Kenya to offer students online learning. Without having to attend classes or adhere to a strict schedule, this enables students to further their education while pursuing their own goals and keeping their own professions. E-learning combined with in-person instruction is already being used at several TVET colleges. The Co-operative University uses MUSOMI as an e-learning platform, whereas the Technical University of Kenya uses Moodle (Tarus et al., 2015).

However, these efforts are impeded by many challenges that pose a threat to this technical innovation. There is need for an effective framework to enhance e learning in TVET institutions in Kenya. The integration and adoption of these e learning systems is also slow. It was against these background that this research aimed to determine the determinants of LMS in TVET institutions in Kenya.

### **1.3 Problem Statement**

TVET institutions offer specialized programmes to students (Korshunov, Meshkova, Miroshnikov & Sverchkov,2018). These programmes are still being offered in the traditional mode where information from a sole tutor is relayed to students attending physical classes. The learners take up the role of recipients. 21st century technical and vocational training requires that graduates acquire up to date technical and technological skills (Satpathy and Mohapatra,2020). This is because the world is fast advancing to an ICT run global village, where most of the processes are enabled by technology and machines. There have been numerous complaints from employers that the caliber of graduates from TVET institutions is not ready to take up jobs in the dynamic business environment. This has been blamed on the obsolete and outdated methods of solving problems.

Multiple factors have been linked to the low availability of TVET and the low calibre of training. Among the contributing elements are things like a lack of use of contemporary technology, poor learning tools and resources, unqualified teachers, and insufficient teaching personnel. In order to increase student learning and performance, institutions have included e-learning into their face-to-

face, open, and remote learning curricula. However, user adoption of LMS in TVET institutions in Kenya has been a challenge.

Previous literature did not adequately address factors that enhance the adoption of LMS. Ibrahim and Ramadan (2021) investigated tutors perception to the usage of e learning. Findings showed that instructors were ready and receptive to the usage of technology; e-learning is characterized as the learning facilitated and upheld through the use of information and technologies. Rugg et al. (2017) examined user acceptance model for polytechniques in New Zealand. The findings revealed that one of the key factors that influence LMS acceptance is limit and dependability of the ICT framework. Salim, Abdullah and Ali (2018) evaluated the acceptance of e learning by academic staff in Malaysia. This research sought to explore the determinants of adoption of LMS among students in TVET institutions in Kenya.

## **1.4 Objectives of the Study**

### **1.4.1 General Objective**

This study examined the determinants of adoption of LMS among students in TVET institutions in Kenya.

### **1.4.2 Specific Objectives**

The specific objectives of the study were:

- i. To investigate factors that influence user adoption of (LMS) in TVET institutions in Nairobi County.
- ii. To propose a framework for user adoption of LMS in TVET institutions in Nairobi County.
- iii. To evaluate the proposed framework for adoption of LMS in TVET institutions in Nairobi county

## **1.5 Research Questions**

- i. Which are the factors that influence user adoption of LMS in TVET institutions in Nairobi County?
- ii. What framework could be proposed for user adoption of LMS in TVET institutions in Nairobi County?

- iii. How can the proposed framework for adoption in TVET institutions in Nairobi County be evaluated?

### **1.6 Justification of the Study**

An international issue is the use of ICTs in education. Especially relevant in light of the Covid-19 pandemic, the execution of e-learning in TVET institutions ensures better and improved ways of material distribution as well as an expansion of the available teaching and learning resources. ICT includes all methods for processing, storing, and communicating data. Computer-based learning and teaching increase learning effectiveness and interest, therefore addressing the issue of education quality.

By making use of great resources for both teaching and learning, e-learning can serve a wider range of students. This aids in achieving the goals set forth by TVET colleges as they are able to accommodate many students who are unable to advance to higher education levels through the conventional formal channels. Technical and vocational education strives to help students gain the knowledge, expertise, and practical skills (Damit & Mohd, 2021). TVET institutions in Kenya will be crucial to achieving vision 2030; therefore, it is crucial to research and assist them. TVET will be important in providing the skills needed to increase productivity, enhance income levels, and expand access to work possibilities if it is strengthened (Ali,2021).

This study investigated and developed a suitable framework on user adoption of LMS in TVET institutions within the County of Nairobi as they roll out e-learning platforms during Covid-19 period of which learning was paralyzed throughout the country. The research was carried out in TVET institutions within Nairobi county because of technological advancement in those institutions. This is lastly meant to advise those institutions' administration and the government via the Ministry of Higher Education about what ought to be done at the policy level to provide the institutions with the appropriate infrastructure and training.

### **1.7 Significance of the Study**

By studying determinants in user adoption LMS in TEVT Institutions in Kenya, the study would:

- i. Inform policy measures that influence the adoption of e-learning in TVET Institutions in Kenya.

- ii. Propose recommendations to the various challenges faced during trainings conducted through LMS in TVET institutions in Kenya;
- iii. Identify key success factors and enablers of user adoption of LMS in TVET institutions in Kenya;
- iv. Contribute to the existing knowledge base of technical education by expanding the understanding of information and communication technologies. This research aims to provide valuable insights and findings that can be utilized by researchers, academics, technology companies, and policy makers. By conducting research in this field, the study aims to improve the understanding and application of ICT in technical education, thereby supporting the advancement of the industry and facilitating informed decision-making..

### **1.8 Limitations of the Study**

This limits are elements that have an impact on the research but over which the researcher has no control (Heryana, 2019). Because the respondents supplied acceptable answers, it was challenging to regulate their attitudes, which was one of the study's shortcomings. To counteract this, the researcher urged respondents to be truthful in their answers to the survey questions. When gathering data, it was not possible to completely exclude out respondents' prejudices.

Obtaining data from students and staff was difficult because they felt that the information that was collected was highly classified and would unnecessarily expose them. To tackle this problem, assurances of confidentiality and exclusiveness were made.

The research was conducted in TVET institutions in Nairobi County. The county has better access to information communication technologies and network. This was not the case in the other counties in Kenya. Thus, the findings may not be used to generalize results expected in other counties, with poor ICT infrastructure and network.

### **1.9 Delimitations of the Study**

This research selected key principles emerging from literature that inform framework for user adoption determinants of e-LMS in TVET institutions. The study explored factors that affect user

adoption of LMS in TVET institutions in Kenya. The study acknowledges that there are various frameworks for user adoption in elearning. However, this study focused on to examining determinants of LMS among students in TVET institutions.

### **1.10 Assumptions of the Study**

It was presumed that the respondents would provide truthful responses to the questionnaire. Additionally, it was assumed that the participants would genuinely engage with the study and not be driven by other motives, such as attempting to impress their superiors or other external factors.



## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This section is a key aspect of the research process since it involves thoroughly examining and analyzing existing literature that pertains to the specific area of study. The chapter begins by discussing the theoretical foundations that underpin the study, providing a theoretical framework to guide the research process. The empirical literature is then explored, which encompasses previous studies and research conducted in the field of LMS adoption. This literature review critically evaluates the existing knowledge, identifies any gaps, and highlights the significance of the current study in addressing these gaps. Further, the literature review presents a summary of the noted literature gaps, emphasizing the need for further study in the area of user adoption of LMS in TVET institutions. By identifying these gaps, the study ought to contribute to knowledge and give new perceptions into the factors affecting LMS adoption in the specific context of TVET institutions in Kenya. Finally, the study presents a conceptual framework, serving as a graphical illustration of the interrelationships among the primary variables and concepts investigated.

#### **2.2. Theoretical Framework**

Reasoned Action Theory and Technology Acceptance Model served as guiding frameworks for this study. These models were particularly relevant in understanding the determinants of LMS in TVET institutions in Kenya. By adopting these theories, the study was able to examine the various aspects that influence user adoption of LMS within the TVET context. The theories provided a solid foundation for investigating and analyzing the key elements that shape the acceptance and utilization of LMS among users. Moreover, these theories contributed to the development and explaining the process of user adoption of LMS in TVET institutions. Overall, the usage of these theoretical frameworks enhanced the depth and validity of the study's findings, providing valuable insights for both researchers and practitioners. The theories were critical in the evaluation of the proposed framework for adoption of LMS.

##### **2.2.1 Theory of Reasoned Action**

Fishbein and Ajzen (1975) were the proponents of this theory, which highlights that a person's perceptions about an object are indirectly related to their behavioral intentions. These perceptions are shaped by the person's beliefs and evaluations concerning the specific object. The theory suggests that the entirety of a person's beliefs forms the informational foundation that influences their behavior towards a particular task. The theory comprises an individual's behavioral intention, attitude, and subjective norm. Both individual and social factors play a role in shaping the behavioral intention to engage in a specific activity. The social aspect is influenced by social norms, while the personal factor is influenced by the individual's personal attitude in relation to behavior (Ajzen & Madden, 1986). Users' expectations play key role in determining the quality of their behavior. Therefore, decision to participate in the activity or not is the user's behavioral intention (Liker & Sindi, 1997). Figure 1 illustrates the theory of reasoned action:

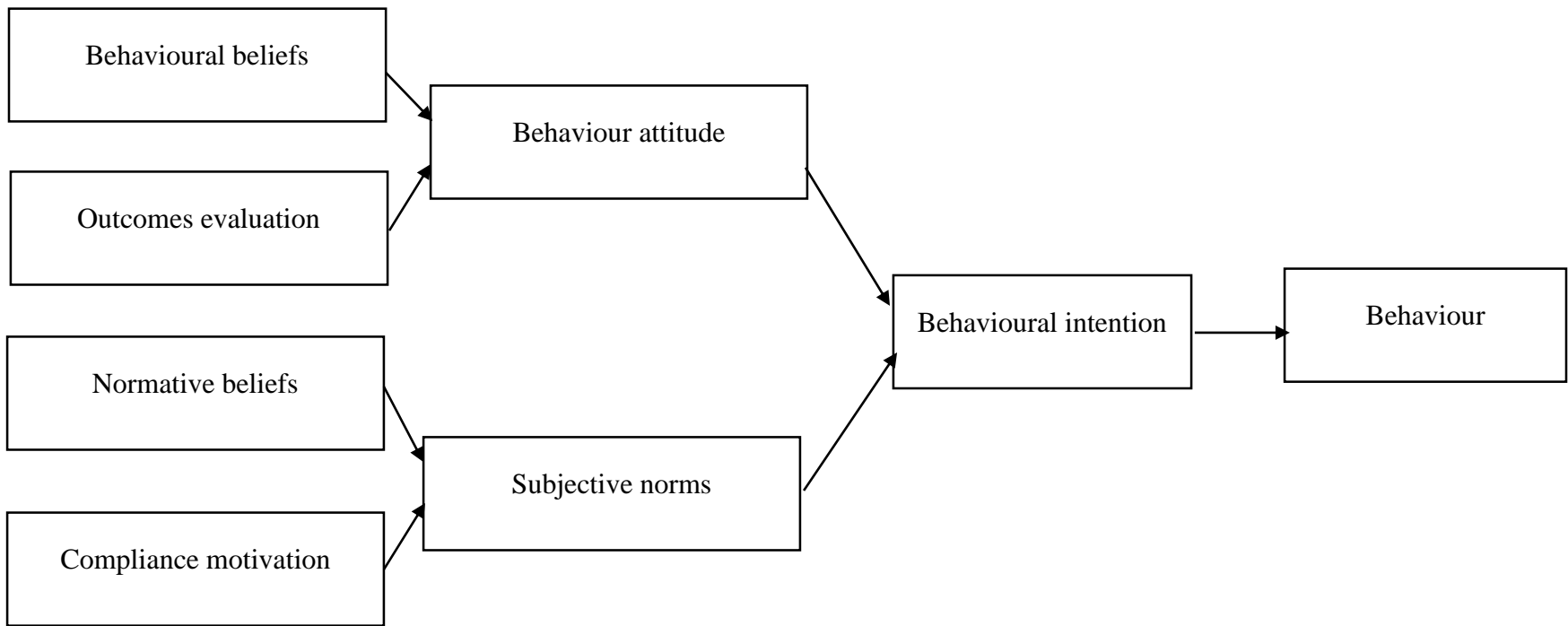


Figure 1: Theory of Reasoned Action

Source: Fishbein and Ajzen (1975).

This study has been applied by various scholars in study. This reasoned behaviour theory is applicable to this research as it indicates the behaviour of the system users in relation to the acceptance of LMS. The users must have the right attitude to enable the adoption of the framework. The users of the system have to be ready and willing to incorporate the framework in each of the procedures in learning management at the TVET institutions in Kenya. It would be important for the end users to be well trained and informed about the system and its capabilities. This will reduce rejection of the learning management system and enable its smooth implementation.

### **2.2.2 Technology Acceptance Model (TAM)**

This model was developed by Davis (1986), it provides insights into how users perceive and accept technology. It explains the behavior of users when it comes to adopting computer innovations and caters to a diverse user population (Davis et al., 1989). According to the model, an individual's intention to use a technological innovation is influenced by their attitude towards using the innovation and the perceived usefulness of the technology (Davis, 1986). The individual's attitude towards a new technology is considered a crucial factor in their acceptance of the system, as it influences their intention to engage with the technology based on their positive perspective (Davis, 1986).

The use of technology can be estimated using both frequency of utilization and volume of utilization (Haidari, Yelken & Akay, 2019). The frequency and volume of technology use affect these two metrics. Volume of system usage refers to the amount of time spent using the system during a same period, whereas frequency of system usage is the frequency the user used the system during that time (Haidai et al., 2019). Figure 2 illustrates the technology acceptance model:

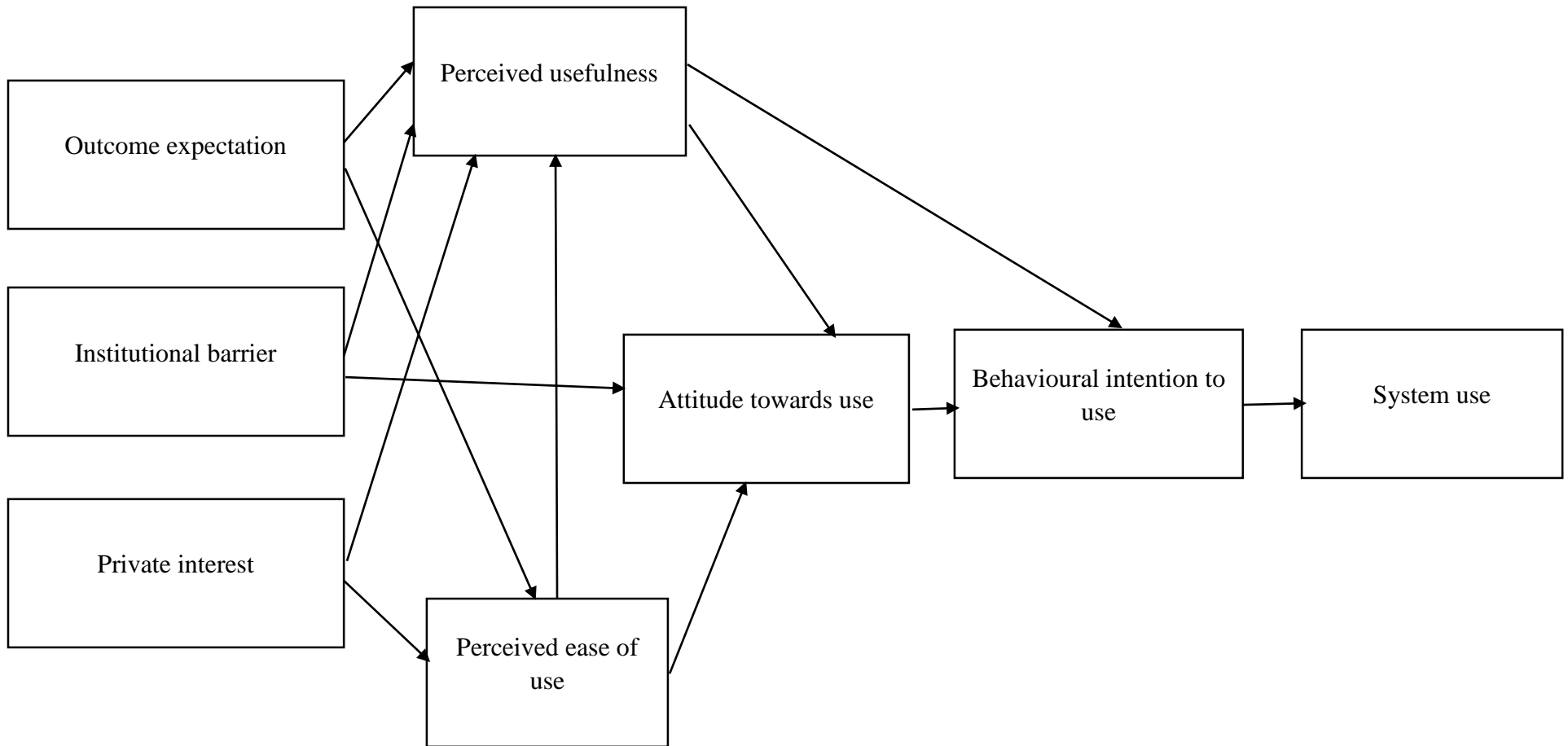


Figure 2: Technology Acceptance Model

Source: Venkatesh and Davis (1996)

Technology acceptance model is relevant to this study as the learning management system is applicable to the user of TVET institutions to enhance efficiency in their operations. The theory directs how the users will value the framework that will assist them. Therefore, the acceptance of the LMS is important for its implementation. This will enable it to solve the intended problems and enhance the learning process of TVET students.

## **2.3. Empirical Literature**

### **2.3.1 Factors that influence user adoption of LMS**

Ibrahim and Ramadan (2021) carried out a study where the primary objective was to explore tutors perception to the use of e learning in Pakistan. The study was quantitative and indicated that the empirical results indicated that teachers were ready and receptive to the use of technology. The research noted that e-learning is characterized as the learning facilitated and upheld through the use of ICT. The study did not propose a suitable framework for user adoption determinants.

Altameemi & Abdula (2021) carried out a survey on e-learning technologies. The study pointed out the features of learning technologies as being knowledge flow, flexibility of the systems and information sharing. Their study was a comparative study. It did not propose a framework for user adoption of LMS, a gap that the proposed study seeks to fill.

Salim, Abdullah and Ali (2018) performed research on the acceptance of e learning by academic staff in Malaysia. The research collected data via questionnaires. The study highlighted that management support, perceived usefulness, computer knowledge, perceived ease of use and willingness to adopt system as key variables in acceptance of e learning platforms. E-learning is essential to the progress of academic staff and students as well as the enhancement of teaching and LMS. The study did not however evaluate the existing frameworks in learning institutions.

Information technology is fundamental in upgrading the competitiveness of the economy of a country. Information technology affects the efficiency of firms. E-learning empowers students at all levels of learning to learn as they pursue their individual objectives (Haidari et al.,2019). The learners are now enabled to access material and learning sessions, without visiting physical classes, hence efficiency. This has been enabled by the numerous programs and courses which are offered online by higher learning institutions.

In a research study on structure of e-learning execution in developing nations, Kinyanjui (2019), pointed out that cost and poor internet framework significantly influence acceptance of e-learning in higher learning institutions. The research indicated that greater part of learners accept that their performance would improve with e-learning execution. The study did not consider proposing a framework for user adoption of LMS, a gap that the proposed study will fill.

Ali (2021) pointed out that learning Management System makes learning simpler and fulfilling. Through LMS use, the learners and tutors can achieve their objectives in a simpler way. They additionally suggested that educators and students ought to be given more computer access and professional help. This entails training and management support to the users of LMS. However, their study did not have any empirical backing therefore creating a gap that the proposed study seeks to fill.

Sudarwati and Rukminingsih (2018) investigates the strategies for eLearning in the digital era. The study sought to provide a solution for online examinations identification. The proposed system was presented to eLearning experts and students for prototyping. The impact and benefits of the system were then assessed. The study suggested that businesses and organizations be proactive in carrying out e-learning approaches through training. Their study was carried out in New York, in the United States of America.

Likewise, a study by Rugg, Petre, Lippmann, Riordan, Xing, Levitin and Wang (2017), on user acceptance model for polytechnics in New Zealand showed that one of the key factors that influence LMS acceptance is limit and dependability of the ICT framework. Their study was qualitative and found out that organizational support is crucial for learning systems user acceptance. The proposed study will propose a framework for user adoption of LMS (LMS) in TVET institutions in Kenya.

Lubis, Yusri and Gusman (2020) conducted a study and proposed a model to meet learning and distance learning innovations. The research employed questionnaires in collecting data. The proposed model was prototyped and tested in the gulf region. The research noted various factors that affect the adoption of technology. This factors comprise the cost of technology implementation, the ease of using technology for teaching and learning, and the users' attitude towards technology. Their study did not evaluate the existing frameworks on user adoption determinants of LMS; a gap which this study seeks to fill.

Oke and Fernandes (2020) noted that the productive use of innovation for teaching and learning aims is affected by three standard elements. The innovator is the educator or employee of a faculty. The components related with the representative are innovative capacity, instructive similarity, and social care. The speed of technological use can be actually extended on the off chance that the educator feels that the individual can use the technology, their instructive methods is dependable with current technology, and expecting the individual is familiar with the possibility of the workplace. Innovation is the idea of the actual technology. The decision of whether or not the technical endeavour can succeed is particularly essential. This is dependent on how detached it is from standard educational practises. The client's reliance on others to employ the innovation or other essential extra resources needed to do all things considered is a consequent perspective or attitude.

Context is the framework's accessibility with social support inside the classroom. Three elements make up the environment setting: human, technological, and societal support. However, a technologically sophisticated learning environment is insufficient and lacking to provide effective execution of innovation in higher education (Lajoie, Pekrun, Azevedo & Leighton, 2020). The employees' affirmation of development anticipates also playing a crucial role in the optimum application of LMS. Their pre-planned endorsement of such a framework would encourage its use and encourage students to employ LMS (Lund & Hauge, 2021). This infers concerning preparing that the government and institutions can begin different technological programs, its productive take-up will tremendously depend upon the instructors or educators who convey the innovation in their study halls (Parkman, Litz & Gromik, 2018).

### **2.3.1.1 Attitude**

As per Fishbein and Ajzen (1975), attitude pertains to an individual's inclination to consistently react favorably or unfavorably towards a specific object. Attitude is a combination of emotions and inclinations that influence a person's choices and decisions (Schafer & Tait, 1986). These emotional and dispositional aspects can be either positive or negative and play a key role in moulding the individual's perceptions and assessments of objects or individuals. The effective part generally addresses a person's passionate reaction or liking to an individual or item, the cognitive part comprises of an individual's real information about an individual or object, and the behavior



part affects an individual's actual knowledge toward an individual or object (Zimbardo et al., 1977).

Ahmed and Hasan (2018) undertook a research study that focused on examining the attitudes of teachers towards the adoption of information communication technology (ICT) in Syria. The research sought to investigate the effect of access to technology, personal attributes of the teachers, and cultural perceptions on their willingness to adopt ICT in their teaching practices. By analyzing these factors, the study aimed to gain insights into the challenges and facilitators that influence the adoption of ICT among instructors in Syria. The study pointed out that accomplishment of any technology in an instructive program relies on the perspectives of faculty. The study fell short of propose a framework for user adoption of LMS; a gap which this study seeks to fill.

According to Lajoie et al. (2020), employees who possess a positive attitude towards innovation not only feel comfortable using it but also exhibit a higher willingness to overcome any obstacles that may arise. This finding aligns with the reasoned action and technology acceptance theories, which emphasize the significance of attitude in the acceptance of technology. In other words, when employees hold a positive attitude towards innovation, they are mostly likely to embrace new technologies. As indicated by Rugg et al. (2017), generally, attitude of the employees reflected toward computer innovations straightforwardly affected the degree of computer use.

### **2.3.1.2 Pedagogical Beliefs toward E-learning**

To foster a shift towards more effective integration of innovation, particularly e-learning, it was important to investigate the perspectives and assessments of actual educators regarding innovative teaching methods (Ali, 2021). When educators align their instructional approaches with the chosen technology, such as e-learning, it enhances the likelihood of increased utilization of innovation within the learning environment (Oke and Fernandes, 2020). Ajzen and Fishbein (1975) defined beliefs as the knowledge individuals possess about a particular object. Belief frameworks encompass an individual's views about themselves, the physical and social world, and other people (Rokeach, 1976). In the context of education, views about e-learning encompass the knowledge and opinions that educators hold regarding the practice of e-learning and its overall objectives.

Winter, Costello, O'Brien and Hickey (2021) explored teacher beliefs and use of technology in Indiana State, the United States of America. The study identified Pedagogical Beliefs among the factors that affect technology adoption. The study concluded that instructor's beliefs impact on educator's innovation integration. The educators' own beliefs regarding e-learning strategy and guidance media are without a doubt a basic marker for the study hall utilization of innovation (Songkram & Chootongchai, 2020). The instructors' conduct beliefs about e-learning likewise decidedly anticipate the helpfulness and simplicity where it is utilized (Mugonya, Kalule & Ndyomugyenye,2021) .

### **2.3.1.3 Competence Level in Using LMS**

Holm, Lorenz and Nielsen (2020) stress that the absence of technological skill is one of the principle explanations behind employees declining to incorporate new technology in their teaching. Employees need to have not just the essential abilities to manage technology effectively, yet additionally need to have fundamental information on virtual environments like LMS (Holm et al.,2020)

Also, Alghaberi (2019) observed that most of educators who viewed themselves as able users in utilizing electronic technology oftentimes utilized it in their teaching, the greater part (78%) of the members were viewed as acquainted with teaching instruments in online innovation, and degree of teachers' abilities or abilities fundamentally anticipated staff participation in online guidance. Chien (2021) express that the aim of a teacher to utilize innovation is fundamentally affected by computer self-adequacy. Then again, self-viability is firmly and emphatically connected with computer competence (Chien,2021). Thus, assuming the employees have an adequate abilities and information to utilize all LMS elements or devices, they will in this manner utilize the LMS for teaching purposes.

### **2.3.1.4 External Barriers Faced by Faculty Members**

External obstructions in the evaluation refers to challenges that potential users may encounter while attempting to use a LMS for teaching and learning. These obstacles that learners and workers must overcome can be divided into organisational, technological, and social obstacles. According

to Hassall and Lewis (2017), organisational hurdles refer to a plan for the organisation to facilitate the use of technology in conducting studies. Technological obstructions are restricted admittance to valuable, applicable, and required hardware and software (Popova, 2017). Social barriers are characterized as how much peers support or deter the user to utilize technologies (Hassall & Lewis, 2017).

Innovation and human facilities straightforwardly affect the expanding level of user's consideration toward utilizing technology (Bezai et al., 2021). Any e-learning environment's technological capabilities have a big role in whether or not employees choose to use the LMS. Some of the considerations in implementing e-learning are logistics-related, which include factors such as determining the required equipment for instructional delivery, ensuring appropriate hardware for both students and staff, identifying essential computer software, and establishing reliable methods of Internet connectivity (Hassall & Lewis, 2017). These logistical aspects are key for the successful implementation of e-learning, as they enable seamless access to educational resources and effective communication between learners and educators.

Sorce and Issa (2021) explained that administrative and technical help goes about as a significant hindrance to the employees' and student's utilization of computer technology. In order to ensure optimal utilization of LMS (LMS) by employees and students, it is essential to identify and address existing organizational, technological, and social barriers. Singh, Sahni, and Kovid (2020) highlighted that limitations significantly impede the adoption of computer-aided communication. Therefore, these findings underscore the importance of addressing external barriers that hinder employees from effectively utilizing LMS. By addressing these barriers, organizations can create an environment that promotes the seamless integration and utilization of LMS for enhanced learning outcomes. Trying to lessen these current barriers seems, by all accounts, to be critical for the effective execution of LMS in TVET institutions.

Hadullo, Oboko, and Omwenga (2018) conducted a study that highlighted several quality challenges in the delivery of e-learning. There is a noticeable gap in embracing e-learning in growing countries. There is a rising interest in integrating online learning as a supplementary approach to conventional teaching methods. In this context, the research focuses on exploring the

utilization of e-learning within a developing country setting. The study offers valuable insights and recommendations that can enhance the quality and effectiveness of e-learning practices. By investigating e-learning in a developing country, the research aims to identify potential challenges and opportunities unique to such contexts (Hadullo et al.,2018). Findings could contribute to the advancement of e-learning practices and pedagogies in growing nations, promoting more inclusive and accessible educational opportunities. By understanding the specific barriers faced by developing countries in adopting and implementing e-learning, the study can propose relevant solutions and strategies that can facilitate the successful integration of online learning in these regions (Hadullo et al.,2018).

### **2.3.1.5 Demographic Factors**

Training,gender and computer experience have been identified as influential factors that determine the adoption of technology among employees and students in TVET institutions (Ahadzadeh, Wu, Ong & Deng, 2021). These factors play a role in shaping individuals' attitudes and readiness to embrace technology, with differing levels of influence observed based on demographic characteristics. Understanding the impact of these demographic factors can help inform strategies and interventions to enhance technology adoption and utilization in TVET institutions.

In a study conducted by Opoku (2018), intriguing gender differences in technology usage were discovered. The research findings demonstrated that both men and women exhibited competence in using computers. However, the study revealed that men tended to utilize technology more frequently than women. Moreover, female participants perceived technology as less crucial in their daily activities compared to their male counterparts. The findings by Opoku (2018) provide valuable insights into the distinct perspectives and behaviors concerning technology adoption among genders. The fact that both men and women demonstrated similar levels of competence and positive attitudes towards computers indicates that there might not be inherent differences in their abilities or perceptions about technology.

However, the significant difference in technology usage frequency between men and women suggests that there are other underlying factors influencing their behaviors. It could be related to social and cultural norms, gender roles, or even disparities in access to technology and digital

resources. Exploring these factors in more depth is crucial to understanding why such variations exist. The study also highlighted the perception of technology's significance in daily activities among male and female participants. This difference in perceived importance might be attributed to varying interests, preferences, or needs related to technology use between genders. These findings underscore the importance of further research and investigation into gender-related differences in technology adoption. Understanding these distinctions can inform the design of more inclusive and gender-sensitive technology initiatives. By recognizing and addressing the underlying factors, educators, policymakers, and technology developers can develop a more equitable and diverse technological landscape that caters to the demands and preferences of all individuals, regardless of gender. Additionally, promoting equal access and opportunities for technology education and training can contribute to bridging the gender gap in technology usage and advancing digital literacy for all.

In a study conducted by Lee, Hsu and Chang (2019) in Taiwan, the main focus was on exploring teachers' efficacy in using technology. The study employed a quantitative approach and collected data through questionnaires from 558 respondents. The results indicated that male users exhibited a higher level of confidence in utilizing technology compared to female users. However, the study did not propose a framework for user adoption of LMS, which is a gap that the present research aims to investigate.

Furthermore, research has shown that training and professional development play a significant role in achieving effective execution of technology in higher education (Hughes, 2021). Employees who participated in in-house training sessions and workshops are more likely to apply their newly acquired knowledge compared to those who did not receive such training (Esfijani & Zamani, 2020). Hence, it can be deduced that increased participation of both genders would likely result in a higher utilization of LMS. A notable obstacle to integrating technology in higher education is the lack of specialized training in using technology for teaching and learning (Hughes, 2021). Expounding on the inference, when individuals, regardless of gender, actively engage in professional development programs and workshops that focus on e-learning, they gain valuable knowledge and skills related to the effective use of LMS. These learning opportunities equip educators and learners with the necessary tools and strategies to make the most out of technological

resources in educational settings. As a result, they become more confident and competent in incorporating LMS into their teaching and learning processes.

#### **2.4 Summary and Gaps to be filled by the Study**

From prior researches, not much has been done to examine the determinants of LMS among students in TVET institutions in Kenya.. For the reviewed studies, most of the authors agree that various variables would impact the LMS acceptance; either positively or negatively. The summary of the empirical studies is given as:

<b>Author</b>	<b>Title</b>	<b>Findings</b>	<b>Research Gap</b>
Ibrahim and Ramadan (2021)	tutors perception to the usage of e learning in Pakistan	Teachers have shown a positive and enthusiastic response towards the utilization of technology in education. The concept of e-learning refers to a learning approach that is enhanced and facilitated through the usage of ICT. ICT has transformed the traditional classroom setting into a dynamic and collaborative space where students can actively participate and access educational resources with ease.	The proposed study seeks to fill the knowledge gap that arose from the absence of a framework for adoption of e-LMS.
Altameemi & Abdula (2021)	survey on adoption of e learning technologies	features of learning technologies as being knowledge flow, flexibility if the systems and information sharing	The suggested research aims to narrow this gap by presenting a methodology for user adoption of LMS.

Salim, Abdullah and Ali (2018)	the acceptance of e learning by academic staff in Malaysia.	Management support, perceived utility, computer literacy, perceived usability, and system adoption readiness are important factors in how well e-learning systems are received.	The study did not however evaluate the existing frameworks in learning institutions, a gap that this study seeks to fill
Ali (2021)	Effective learning Management System	Through LMS use, the learners and tutors can achieve their objectives in a simpler way	their study did not have any empirical backing therefore creating a gap that the proposed study seeks to fill
Sudarwati and Rukminingsih (2018)	strategies for eLearning in the digital era	businesses and organizations be proactive in carrying out e-learning approaches through training	Their study was performed in USA; the proposed study will be conducted among TVET institutions in Nairobi County.
Rugg et al. (2017)	user acceptance model for polytechniques in New Zealand	one of the key factors that influence LMS acceptance is limit and dependability of the ICT framework	Their study did not propose a framework for user adoption of LMS; which the proposed study will.
Ahmed and Hasan (2018)	teachers' attitude on adoption of information communication technology in Syria	accomplishment of any technology in an instructive	The study fell short of proposing a framework for user adoption

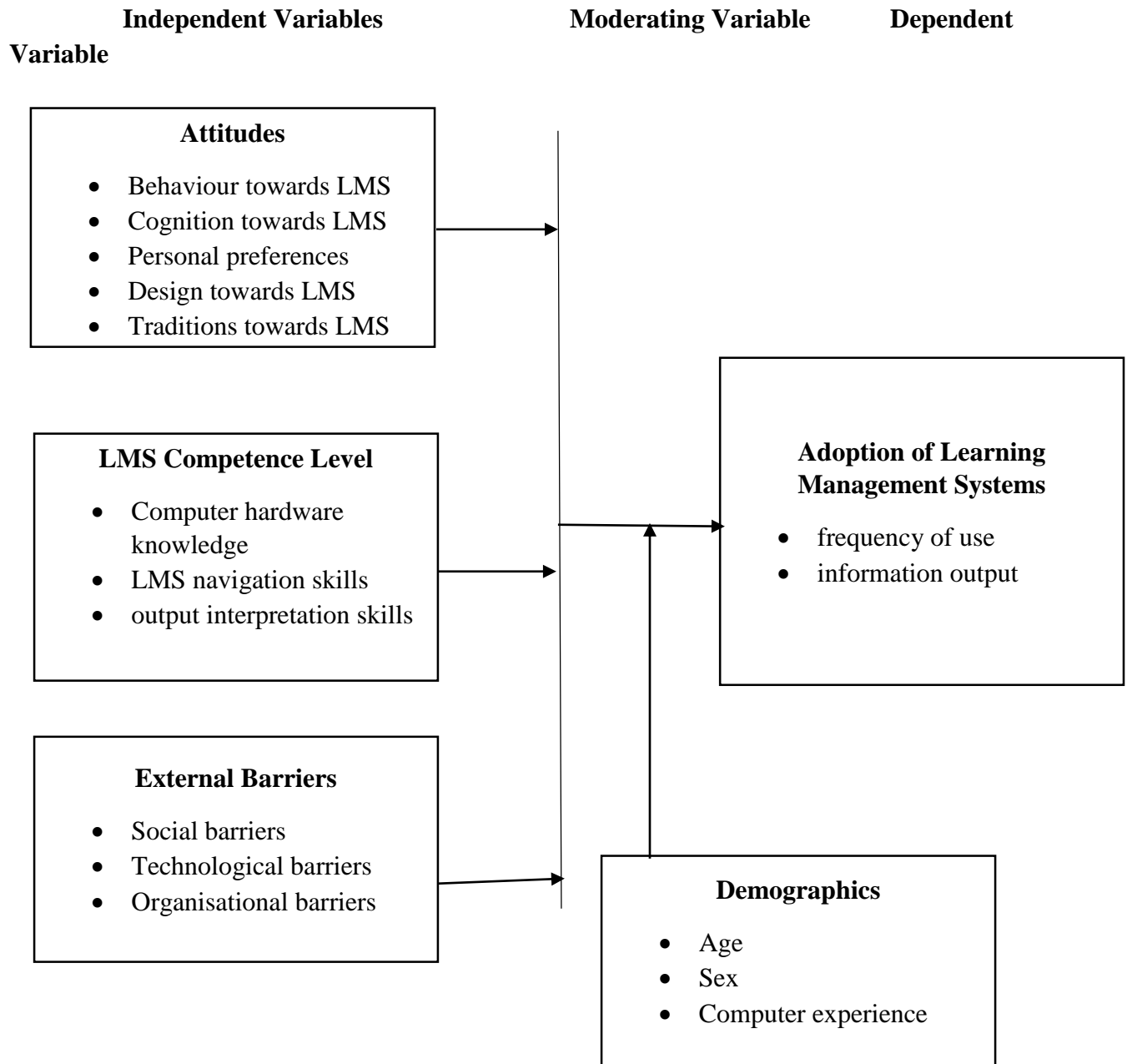


		program relies on the perspectives of faculty	of LMS; a gap which this study seeks to fill
Winter et al. (2021)	teacher beliefs and use of technology in Indiana State, the United States of America	The study identified Pedagogical Beliefs among the factors that affect technology adoption	The research fell short of propose a framework for user adoption of LMS; a gap which this study seeks to fill
Lee et al. (2019)	teachers' efficacy to the use of technology in Taiwan.	Research findings have indicated that male users tend to exhibit a higher level of trust and confidence in utilizing technology compared to their female counterparts. This suggests that men may feel more comfortable and self-assured when engaging with various technological tools and platforms. This does not imply any inherent differences in capability or aptitude between genders, but rather highlights a gender-based disparity in the	This study attempts to address the gap left by their lack of a framework for user acceptance of LMS.

		<p>perception of technology use.</p> <p>The reasons behind this divergence in trust levels may be influenced by external factors. Recognizing and addressing such gender-related differences can contribute to creating a more inclusive and equitable technological environment for all users.</p>	
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The focus of looking at the empirical studies, is to find out the factors they had looked at. It was also important while looking at the literature, to find if any user adoption models of frameworks were proposed.

### 2.5 Conceptual Framework



**Figure 3: Conceptual Framework**

Source: Author (2022)

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1 Introduction**

This chapter shows a comprehensive explanation and the chosen research design. The population is identified, and the process for selecting a representative sample is described. Additionally, the tools utilized for data collection are outlined data analysis is discussed. Ethical considerations are also highlighted.

#### **3.2 Research Design**

A descriptive survey research design was utilised for this investigation. It is most suited to obtaining social facts, beliefs and attitudes (Kothari ,2014). The design involves asking respondents questions on a phenomenon to explore their opinions, attitudes and knowledge (Fraenkel et al.,2012). In this study, the respondents were asked of their beliefs and attitudes towards adoption of e learning systems. The respondents' demographics of age, sex were also taken.

#### **3.3 Target Population**

Nairobi County had a total of three hundred and twenty TVET institutions. The study population were students in the TVET institutions in Nairobi County. There were a total of 62,720 students in TVET institutions in Nairobi County (TVETA,2022). They gave information on factors that influence user adoption of LMS in TVET institutions in Nairobi County. They also provided information that aided evaluate the existing frameworks on user adoption determinants of LMS in TVET institutions in Nairobi County.

#### **3.4 Sample Size and Sampling Procedure**

##### **3.4.1 Sample Size**

The sample size was done using the formulae used by Creswell (2009):

$$n = \frac{Z^2 P (1-P)}{d^2}$$

Where n = sample size;

Z = Level of confidence (in this case will be 95%),

P = Standard Deviation of 0.5

d = Confidence Interval (Margin error) of +-5%, d = 0.05).

Therefore,

$$n = ((1.96)^2 \times .5(.5)) / (.05)^2$$

$$(3.8416 \times .25) / .0025$$

$$.9604 / .0025$$

$$384.16$$

Thus, the sample size for the study was 384 students.

### **3.4.2 Sampling Procedure**

A list of all TVET institutions in Nairobi County was drawn. Respondents for this study were drawn from five (5) TVET institutions, which were purposively selected. The 5 institutions had adopted LMS which had been in use for more than 5 years. To choose the students, the researcher utilised a straightforward random selection procedure. This method was employed because it was simple to apply and allowed for the impartial selection of every member of the population (Mugenda & Mugenda, 2003). Each person in the population was given a number by the researcher, who created a stratified random sample using a manual lottery approach.

### **3.5 Instrumentation**

The study used questionnaires to gather primary data. Six sections made up the questionnaire, and section A was responsible for gathering background and general information on the participants. Section B gathered data on attitudes of respondents towards adoption of LMS; section C collected data on competence level in use of LMS; section D collected data on beliefs of respondents towards adoption of LMS; section E collected data on external barriers towards adoption of LMS. Section F focus on data for the dependent variable, Adoption of LMS.

### **3.5.1 Instruments validity**

The capacity of a research tool to measure what it is meant to measure is called validity (Frankel & Wallen, 2011). This study made use of content validity, a sort of reliability that demonstrates how well study components related to research questions and goals are represented (Mugenda and Mugenda, 2003). The researcher asked the subject-matter experts to assess the usefulness of the information found in these instruments in obtaining the data required for the study. To make the instruments better, their feedback, recommendations, and explanations were taken into account. The instruments were subsequently piloted in a TVET institution that wasn't among the study's participants. The questionnaires were evaluated differently in light of the goals of the study.

### **3.5.2 Instruments reliability**

A research tool's capacity to consistently produce the same results is referred to as reliability (Segal and Coolidge ,2018). Uncertain instructions given to respondents, murky questionnaires, or inattentiveness during interviews can contribute to random errors. By cross-checking the surveys during piloting, the researcher minimised random errors. The reliability of the study equipment was determined by this investigation utilising the test-retest methodology. After a two-week gap, the researcher issued the surveys to the same group twice. The researcher used this to determine whether the responses were consistent. According to Segal and Coolidge (2018), the correlation between the two tests' results decreases with the passage of time. This concept was applied by the researcher to administer the two tests.

## **3.6 Data Collection**

Data was gathered from the participants through questionnaire. The questionnaires were issued to the participants online. Data was directly collected from students of the TVET institutions.

## **3.7 Data Analysis**

The researcher took great care in reviewing the questionnaires to ensure their completeness and consistency. Furthermore, the validity and reliability of the questionnaire were rigorously evaluated. In order to establish content validity, the input of experts in e-LMS at the TVET institutions was sought. The research tool's reliability was evaluated through the Cronbach Alpha Coefficient, with a threshold of 0.7 or higher considered satisfactory. Data collection was

conducted using Microsoft Excel, and appropriate coding procedures were applied before entering the data into the statistical package for social sciences. Descriptive statistics were then employed to analyze and summarize the main characteristics of the collected data. A multiple regression model was utilized to investigate the relationship between the dependent variable, adoption of LMS and the independent variables. The study adopted the below regression model:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon$$

Where:

Y is the Adoption of LMS

$\beta_0$  is a constant

$(\beta_i; i=1, 2, 3)$  are the Beta coefficients

$X_1$  is attitude towards adoption of LMS

$X_2$  is Competence Level towards adoption of LMS

$X_3$  is external barriers towards adoption of LMS

$\epsilon$  is the error term

### **3.8 Ethical Considerations**

Prior to commencing data collection, the study will obtain research permission from the University of Nairobi, ensuring that the research is conducted with the necessary institutional approval. Additionally, the study will seek ethical approval from NACOSTI. An introduction letter will be appended to the research instrument, seeking the informed consent of participants before they can take part in the research. Confidentiality and privacy of respondents will be safeguarded. Data will be utilized exclusively. No individual's identity will be disclosed in any published or shared findings.

## CHAPTER FOUR

### DATA ANALYSIS, PRESENTATION AND INTERPRETATION

#### 4.1 Introduction

This chapter discusses the study's results. It presents data on the background information and descriptive statistics. The chapter analyses the data factors that influence user adoption of LMS (LMS) in TVET institutions in Nairobi County.

#### 4.2 Response Rate

The respondents were given to 384 questionnaires in all. Three hundred and fifty two questionnaires that were satisfactorily completed and returned were examined for the study. This was a response rate of 92%, as summarized in Table 4.1

Table 4.1: Response Rate

Category	Sample Size	Responses	Response Rate
Students	384	352	92%

**Source: Research Data**

Mugenda & Mugenda (2002) recommended that a response rate of 70% and above is magnificent. Consequently, the overall response rate of 92% enhanced the credibility of the study's results.

#### 4.3 Pilot Test Results

##### 4.3.1 Reliability Tests

Table 4.2: Reliability Results

Variable	Item	Alpha Value	Recommendations
user attitude	5	0.871	Reliable
user competence	3	0.702	Reliable
external barriers	5	0.885	Reliable
adoption of LMS	2	0.869	Reliable

**Source: Research Data (2022)**



Cronbach Alpha was calculated for all the variables. The coefficient for adoption to LMS was 0.869, user attitude was 0.871, user competence was 0.702, external barriers was 0.885. All the variables had reliability values higher than 0.7, which was considered adequate in the study.

### 4.3.2 Validity Tests

The study conducted validity tests for the questionnaire. The study instrument's validity was ensured by the university supervisor's professional opinion. Upon adequate advice from the supervisor, the questionnaire was examined and accepted. The questionnaire would provide data that accurately answered the research questions.

## 4.4 Demographic Information

### 4.4.1 Distribution by Gender

Table 4.3 : Respondents' Gender

<b>Gender</b>	<b>Frequency</b>	<b>Percent</b>
Male	203	57.7
Female	149	42.3
<b>Total</b>	<b>352</b>	<b>100.0</b>

**Source: Research Data**

Out of the total 352 respondents, 203 (57.7%) were male, while 149 (42.3%) were female. This indicates that most of the respondents were male. The study included a significant representation from both genders, ensuring that there was no gender bias in the sample. Figure 4.1 visually presents the distribution of respondents by gender.

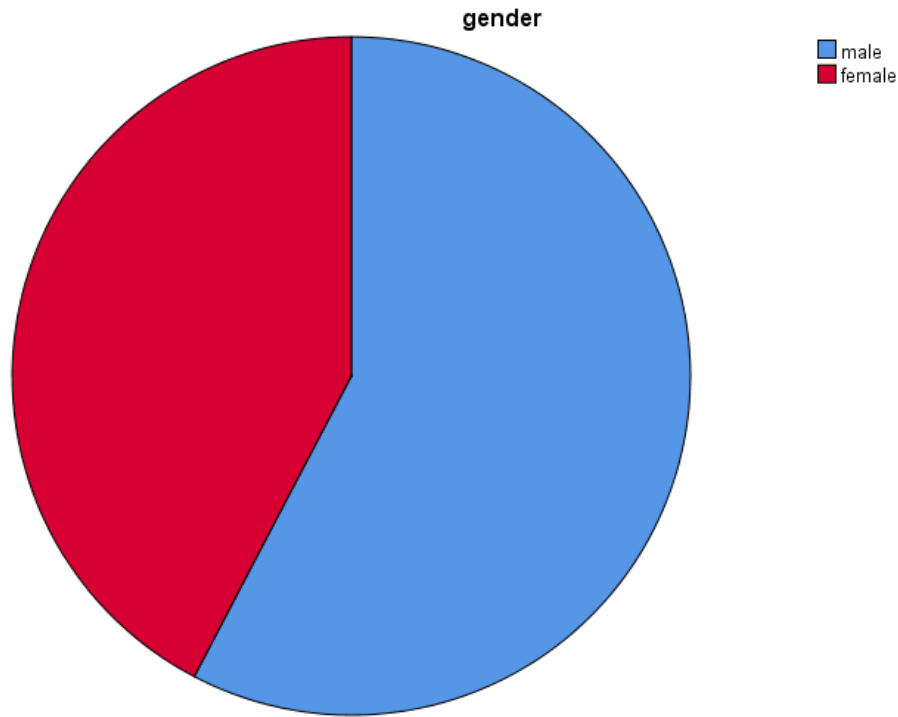


Figure 4.1 : Respondents Gender

#### 4.4.2 Distribution by Age

Table 4.4 : Respondents' Age

<b>Age</b>	<b>Frequency</b>	<b>Percent</b>
Under 30 years	282	80.1
31-40 years	62	17.6
41-50 years	8	2.3
<b>Total</b>	<b>352</b>	<b>100.0</b>

#### Source: Research Data

From the 352 respondents 282 (80.1%) were below 30 years, 62 (17.6%) were aged 31-40 years and 8 (2.3%) were aged between 41-50 years. Most of the students were below 30 years. All age categories were considered for the study, hence no biasness. Figure 4.2 indicates the respondents age distribution:

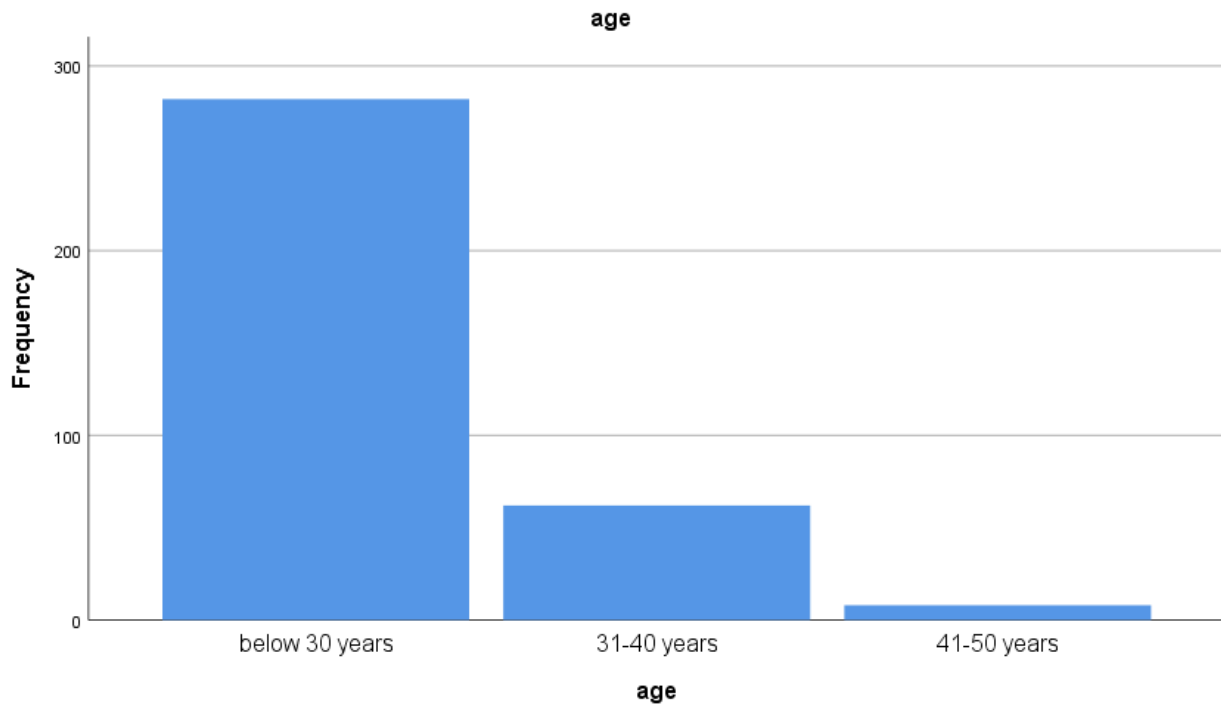


Figure 4.2 : Respondents' Age Bracket

#### 4.4.3 Distribution by Computer Skills

Table 4.5 : Respondents' Computer Skills

Computer Skills	Frequency	Percent
Beginner	53	15.1
Moderate	185	52.6
Competent	114	32.4
<b>Total</b>	<b>352</b>	<b>100.0</b>

**Source: Research Data**

From the 352 respondents, 53 (15.1%) were beginners, 185 (52.6%) were moderate and 114 (32.4%) were competent. Most of the students were moderate in computer skills. Their responses could be relied on to make credible conclusions and recommendations for the study. Figure 4.3 illustrates the respondents' computer skills :

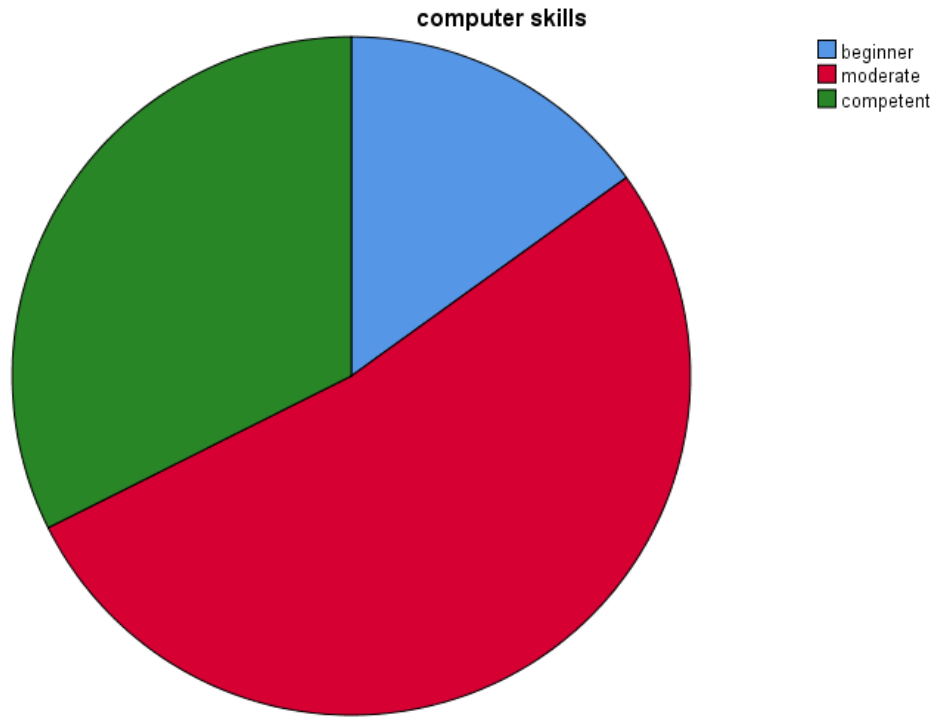


Figure 4.3 : Respondents Computer Skills

#### 4.4.4 Distribution by LMS used

Table 4.6 :Respondents' LMS Use

LMS Used	Frequency	Percent
Moodle	181	51.4
google classroom	104	29.5
Canvas	4	1.1
e-masomo	21	6.0
Blackboard	18	5.1
Scholar	18	5.1
D2L brightspace	6	1.7
<b>Total</b>	<b>352</b>	<b>100.0</b>

**Source: Research Data**

From the 352 respondents, 181 (51.4%) used moodle,104 (29.5%) used google classroom,4 (1.1%) used canvas,21 (6%) used emasomo,18 (5.1%) used blackboard,18 (5.1%) used scholar and 6(1.7%) used D2L brighterspace.Hence,most of the students used moodle in their college.This is shown in figure 4.4 :

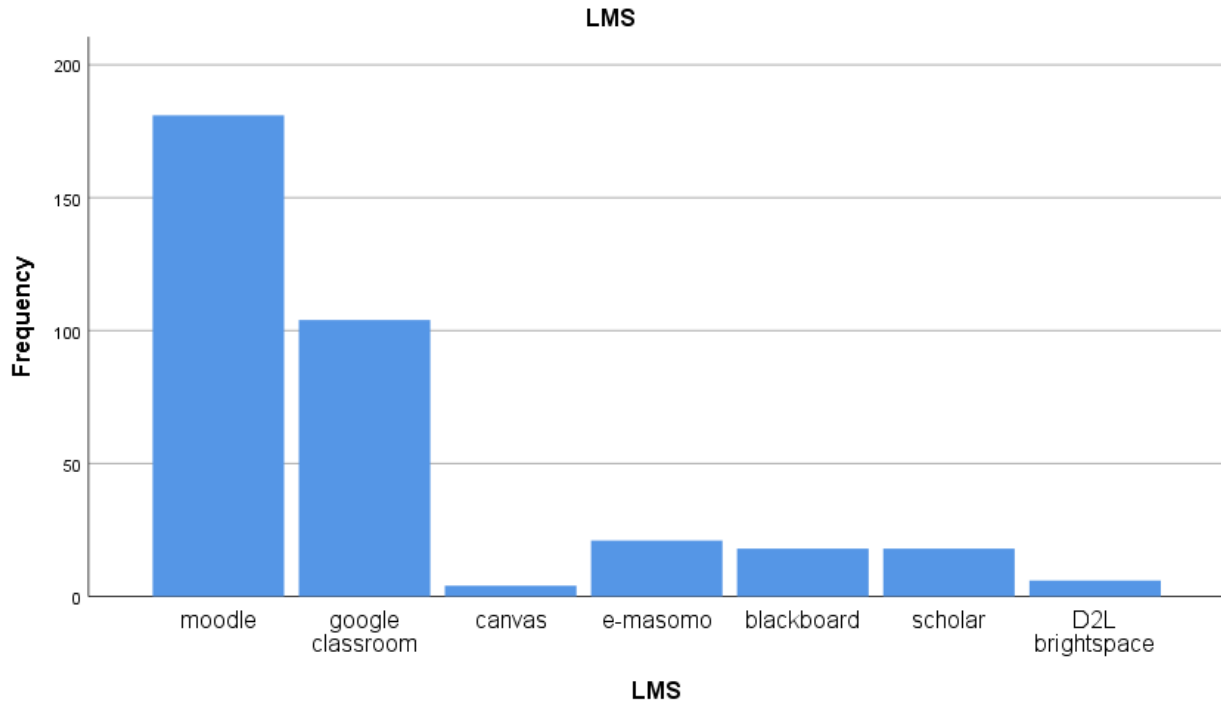


Figure 4.4 : LMS Used

## 4.5 Analysis of Study Variables

### 4.5.1 Attitude Towards Adoption of LMS

Table 4.7: Attitude Descriptions

Statement	N	Mean	Std. Deviation
I believe it is crucial to have skills for using LMS.	352	4.91	0.292
I believe that students should use LMS to perform their daily academic tasks. ie. access to learning materials and uploading class assignments.	352	4.90	0.296
I prefer for my institution to implement full use of LMS.	352	4.90	0.296
I like the design of LMS used in my institution.	352	4.90	0.296
I believe using learning management system makes me perform learning activities efficiently.	352	4.90	0.309
<b>Mean</b>		<b>4.90</b>	

Source: Research Data

The students agreed that it was important to have skills for using LMS (Mean=4.91; SD=0.292). Additionally, the respondents agreed that students should use LMS to perform their daily academic tasks, i.e. access to learning materials and uploading class assignments (Mean=4.90; SD=0.296). The respondents agreed that they preferred for their institutions to implement full use of LMS (Mean=4.90; SD=0.296). Moreover, the respondents agreed that they liked the design of LMS used in their institutions (Mean=4.90; SD=0.296); and believed using learning management system made them perform learning activities efficiently (Mean=4.90; SD=0.309). These results concur with those of Ahmed and Hasan (2018), who carried out study on teachers' attitudes on adoption of information communication technology in Syria. Their study pointed out that accomplishment of any technology in an instructive program relies on the perspectives of faculty.

#### 4.5.2 Competence Levels in Use of LMS

**Table 4.8: Competence Descriptions**

Statement	N	Mean	Std. Deviation
I am able to use the hardware that run LMS.	352	4.91	0.284
I can easily navigate through the learning management system used in our institution.	352	4.91	0.301
I am able to interpret the Information output generated from learning management system .	352	4.89	0.311
<b>Mean</b>		<b>4.90</b>	

#### **Source: Research Data**

The students agreed that they were able to use the hardware that run LMS (Mean=4.91; SD=0.284). Additionally, the respondents agreed that could easily navigate through the learning management system used in their institutions (Mean=4.90; SD=0.296). The respondents agreed that they were able to interpret the Information output generated from LMS (Mean=4.89; SD=0.311). These results concur with those of Alghaberi (2019) whose study concluded that most of educators who viewed themselves as able users in utilizing electronic technology oftentimes utilized it in their teaching, the greater part of the members were viewed as acquainted with teaching instruments in

online innovation, and the level of teachers' abilities or abilities fundamentally anticipated staff participation in online guidance.

#### 4.5.3 Barriers Towards Adoption of LMS

**Table 4.9 : Barriers Descriptions**

<b>Statement</b>	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>
My institution has provided adequate hardware for use of LMS i.e. computers, laptops .	352	4.89	0.316
My institution has provided WIFI internet to enable use of LMS.	352	4.91	0.292
My institution has trained students on the use of LMS.	352	4.90	0.322
My institution has created students support groups to help student accept use of LMS.	352	4.90	0.303
There is adequate technical user support in my institution on the learning management system.	352	4.90	0.300
<b>Mean</b>		<b>4.90</b>	

#### **Source: Research Data**

The students agreed their institutions had provided adequate hardware for use of LMS (Mean=4.89; SD=0.316). Additionally, the respondents agreed that their institution had provided WIFI internet to enable use of LMS (Mean=4.91; SD=0.292). The respondents agreed that their institutions had trained students on the use of LMS (Mean=4.90; SD=0.322). Moreover, the respondents agreed that their institution had created students support groups to help student accept use of LMS (Mean=4.90; SD=0.303); and there was adequate technical user support in their institutions on the learning management system (Mean=4.90; SD=0.300). Likewise, Singh, Sahni and Kovid (2020) underscored that technological, organizational and social limitations fundamentally affected the introduction of computer-aided communications.

#### 4.5.4 Adoption of LMS

**Table 4.10 : Adoption of LMS Descriptions**

Statement	N	Mean	Std. Deviation
A lot of students use LMS regularly in their academic activities.	352	4.90	0.303
The information output for students from the LMS is better.	352	4.89	0.327
<b>Mean</b>		<b>4.89</b>	

#### Source: Research Data

The respondents agreed that a lot of students used LMS regularly in their academic activities (Mean=4.90; SD=0.303). Additionally, the respondents agreed that the information output for students from the LMS was better (Mean=4.89; SD=0.327).

#### 4.6 Inferential Analysis

##### 4.6.1 Correlation Analysis

**Table 4.11: Correlation Analysis**

		adoption	attitude	Competence	barriers
Adoption	r	1	0.115*	0.074	.187**
	p		0.031	0.166	0.000
	N	352	352	352	352
Attitude	r	0.115*	1	0.080	-0.039
	p	0.031		0.134	0.469
	N	352	352	352	352
Competence	r	0.074	0.080	1	0.103
	p	0.166	0.134		0.052
	N	352	352	352	352
Barriers	r	.187**	-0.039	0.103	1
	p	0.000	0.469	0.052	
	N	352	352	352	352



**Source: Research Data**

The results noted a significant correlation between attitude and adoption of LMS ( $r=0.115$ ,  $p=0.031$ ). The relationship between competence and adoption of LMS was insignificant ( $r=0.074$ ,  $p=0.166$ ). Barriers had a positive significant correlation with adoption of LMS ( $r=0.187$ ,  $p=0.000$ ).

**4.6.2 Linear Regression**

The study carried out regression analysis to investigate how the predictor variables influence the response variable.

**Table 4.12: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.225 <sup>a</sup>	0.051	0.043	0.21468

a. Predictors: (Constant), barriers, attitude, competence

**Source: Research Data**

The results reveal that r square is 0.051 that is, 5.1%. This means that adoption of LMS would vary by 5.1% due to changes in attitude, competence and barriers, at 95% confidence level. Other factors that affect employee performance account for 94.9%. The correlation coefficient, R, measures the relationship between the variables. The results revealed a low, positive correlation between the variables, as shown by 0.225 correlation coefficient.

**Table 4.13: ANOVA**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	0.859	3	0.286	6.211	.000 <sup>b</sup>
	Residual	16.039	348	0.046		
	Total	16.898	351			

a. Dependent Variable: adoption

b. Predictors: (Constant), barriers, attitude, competence

**Source: Research Data**

The analysis of variance (ANOVA) revealed a significant relationship between the independent variables and dependent variables, with a significance level of 0.000. This indicates that the

population parameters associated with these variables are statistically significant, highlighting the importance of the relationship between them. The findings suggest that the independent variables play an important role in influencing the dependent variable. The estimated value of F was more than the critical value of F (6.211 > 2.605). This shows that attitude, competence and barriers significantly affect user adoption of LMS (LMS) in TVET institutions in Nairobi County.

**Table 4.14: Coefficients**

	Unstandardized Coefficients		Standardized Coefficients		t	Sig.	VIF
	B	Std. Error	Beta				
(Constant)	4.096	0.637			6.426	0.000	
attitude	0.187	0.087	0.113		2.157	0.032	1.009
competence	0.081	0.066	0.065		1.230	0.219	1.018
barriers	0.269	0.080	0.176		3.354	0.001	1.013

a. Dependent Variable: adoption of LMS

**Source: Research Data**

From Table 4.14, the multiple regression model yields:-

$$Y = 4.096 + 0.113 X_1 + 0.065 X_2 + 0.176 X_3 + 0.21$$

Attitude is statistically significant in explaining user adoption of LMS in TVET institutions in Nairobi County ( $\beta = 0.113$ ,  $p < 0.05$ ), according to the findings. The results reveal that user competence is statistically insignificant in explaining user adoption of LMS in TVET institutions in Nairobi County ( $\beta = 0.065$ ,  $p > 0.05$ ). The findings indicate that barriers has a statistically significant effect on user adoption of LMS in TVET institutions in Nairobi County ( $\beta = 0.176$ ,  $p < 0.05$ ). Overall, attitude, competence and barriers have a statistically significant effect on user adoption of LMS in TVET institutions in Nairobi County ( $p < 0.05$ ). This study, therefore proposes that TVET institutions in Nairobi County consider user attitudes, competencies and remove barriers to enhance user adoption of LMS.

## **CHAPTER FIVE**

### **SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter presents concise summary of the research findings related to the factors affecting the adoption of LMS (LMS) in TVET institutions in Kenya. It provides an extensive overview of the key discoveries derived from the research and data analysis. It emphasizes the primary determinants that influence the usage of LMS in TVET institutions. Drawing upon these findings, conclusions are derived to give a detailed comprehension of the research topic. Furthermore, it concludes by presenting pertinent recommendations based on the research outcomes, aimed at improving the effective implementation and utilization of LMS in TVET institutions in Kenya. The suggested recommendations aim to enhance the overall quality and efficacy of e-learning practices, contributing to the advancement of education in the TVET sector in the country. These recommendations serve as practical guidelines for policymakers, educational institutions, and other stakeholders to enhance the adoption and integration of LMS into the TVET system, ultimately enhancing the quality of technical education in the country.

#### **5.2 Discussion of the Findings of the Research Study**

This part provides the summary of research findings. The summary of findings is presented based on the research objectives.

##### **5.2.1 Factors that Influence User Adoption of LMS**

The primary aim of the research was to explore the factors that influence the adoption of LMS (LMS) in TVET institutions within Nairobi County. The research specifically investigated the impact of three key factors: attitude towards LMS adoption, competence levels in using LMS, and external barriers hindering LMS adoption. The study's findings revealed a notable and positive effect of attitude towards LMS adoption. This implies that individuals' positive perceptions and inclinations towards utilizing LMS play a crucial role in their willingness to adopt and integrate these systems in TVET institutions. The students agreed that it was important to have skills for using LMS . Additionally, the participants agreed that students should use LMS to perform their

daily academic tasks, that is, access to learning materials and uploading class assignments. The participants agreed that they preferred for their institutions to implement full use of LMS.

Moreover, the participants agreed that they liked the design of LMS used in their institutions. The students believed using learning management system made them perform learning activities efficiently. Similarly, Ahmed and Hasan (2018) performed study on teachers attitudes on adoption of information communication technology in Syria. Their study pointed out that accomplishment of any technology in an instructive program relies on the perspectives of faculty. Additionally, Rugg et al. (2017) noted that attitude of the employees significantly influence attitude towards computer adoption and use. Likewise, Costello, O'Brien and Hickey (2021) explored teacher beliefs and use of technology in Indiana State, the United States of America and concluded that instructor's beliefs impact on educator's innovation adoption and integration.

The findings revealed a positive and insignificant effect of competence levels towards adoption of LMS. The students agreed that they were able to use the hardware that run LMS. Additionally, the participants agreed that could easily navigate through the learning management system used in their institutions. The participants agreed that they were able to interpret the Information output generated from LMS. These findings concur with those of Holm, Lorenz and Nielsen (2020), who stress that the absence of technological skill is one of the principle explanations behind employees declining to incorporate new technology in their teaching. Additionally, Alghaberi (2019) observed that most of educators who viewed themselves as able users in utilizing electronic technology often times utilized it in their teaching. Likewise, Chien (2021) expressed that the aim of a teacher to utilize innovation is fundamentally affected by computer self-adequacy.

The findings revealed a positive and significant effect of external barriers towards adoption of LMS. The students agreed their institutions had provided adequate hardware for use of LMS. Additionally, the participants agreed that their institution had provided WIFI internet to enable use of LMS. The participants agreed that their institutions had trained students on the use of LMS. Moreover, the participants agreed that their institution had created students support groups to help student accept use of LMS. There was adequate technical user support in their institutions on the learning management system.

Overall, the respondents agreed that a lot of students used LMS regularly in their academic activities. Additionally, the participants agreed that the information output for students from the LMS was better. These findings concur with those of Sorce and Issa (2021), who explained that administrative and technical barriers hinder the utilization of computer technology. Hence, organizational, technological and social obstructions should be distinguished to guarantee their optimal utilization of LMS. Likewise, Singh, Sahni and Kovid (2020) underscored that technological, organizational and social limitations hinder the adoption and use of computer-aided communications.

### **5.2.2 Proposed Framework for User adoption of LMS**

The study's second objective was to come up with a framework for user adoption of LMS (LMS) in TVET institutions in Nairobi County. Descriptive statistics and correlation analysis were applied to the collected data for statistical analysis. The study revealed that each variable had a positive impact on the user adoption of LMS. Notably, the correlation analysis demonstrated a significant and positive link between attitude and adoption of LMS. Furthermore, the study observed a positive correlation between competence and the adoption of LMS, although this correlation was not found to be statistically significant. On the other hand, correlation analysis noted a significant and positive relationship between external barriers and the adoption of LMS. In conclusion, the research utilized descriptive statistics and correlation analysis to explore the relationships between the variables, highlighting their positive influences on the adoption of LMS. The findings offer valuable insights into the factors that lead to proper execution and utilization of LMS in the context of TVET institutions. This study, therefore, proposes that TVET institutions in Nairobi County consider user attitudes, competencies and remove external barriers to enhance user adoption of LMS.

### **5.2.3 Evaluation of the Proposed Framework for Adoption of LMS**

The third objective of the study was to investigate the proposed framework for the adoption of LMS (LMS) in TVET institutions in Nairobi County. To accomplish this, the study conducted a linear regression analysis for the variables under consideration. The results indicated that attitude, competence, and external barriers significantly influence the user adoption of LMS in TVET

institutions. Specifically, attitude was found to be statistically significant in explaining user adoption of LMS. This implies that individuals' positive or negative attitudes towards LMS adoption play a crucial role in determining whether they will embrace and utilize these systems in TVET institutions. Additionally, the study indicated that user competence had no substantially significant effect on user adoption of LMS in TVET institutions. This proposes that the level of users' skills and proficiency in using LMS may not be the primary determinant of their adoption of these systems in this case. However, the findings demonstrated that external barriers have a statistically significant impact on user adoption of LMS in TVET institutions. External barriers refer to various obstacles or challenges that users may encounter when trying to adopt and implement LMS in their educational practices. The study's findings indicate that attitude, competence, and external barriers are all statistically significant factors affecting the adoption of LMS in TVET institutions within Nairobi County. Understanding the influence of these factors is crucial for devising effective strategies to promote successful LMS adoption and utilization in the TVET education setting.

### **5.3 Conclusion**

The study found a positive but insignificant effect of attitude towards the adoption of LMS. In addition, there was a positive and significant effect of external barriers on the adoption of LMS. Each of the variables was shown to influence the user adoption of LMS. Notably, a significant correlation was identified between attitude and the adoption of LMS. Conversely, the relationship between competence and LMS adoption was positive but insignificant. Moreover, external barriers were found to have a positive and significant correlation with LMS adoption. According to these results, it is suggested that TVET institutions in Nairobi County ought to take into account user attitudes and competencies while also addressing and removing external barriers to enhance the adoption of LMS among their users. By understanding and addressing these factors, the institutions can foster a more conducive environment for successful LMS implementation and usage, ultimately improving the overall learning experience and outcomes for their students and educators.

Attitude, competence and external barriers significantly affect user adoption of LMS in TVET institutions in Nairobi County. Attitude is statistically significant in explaining user adoption of

LMS in TVET institutions in Nairobi County. User competence is statistically insignificant in explaining user adoption of LMS in TVET institutions in Nairobi County. Barriers have a statistically significant effect on user adoption of LMS in TVET institutions in Nairobi County. Overall, attitude, competence and external barriers significantly affect user adoption of LMS in TVET institutions.

## **5.4 Recommendations of the Study**

### **5.4.1 Factors that Influence User Adoption of LMS**

This study recommends that TVETs should enhance user capabilities to perform learning activities efficiently. This would enhance user adoption and usage of LMS in TVETs. It is a recommendation of this study that TVETs management enhance platforms that are easy to interpret information output generated from learning management system. This would enhance user adoption to LMS in TVETs. This study recommends that TVETs provide adequate hardware for use of LMS. This would enhance the adoption and usage of LMS. More students and other users will be able to use the LMS at all times.

### **5.4.2 Proposed Framework for User adoption of LMS**

User attitude, user competence and external barriers influence user adoption of LMS. The relationship between competence and adoption of LMS is thus positive and insignificant. Overall, attitude, competence and external barriers have a statistically significant effect on user adoption of LMS in TVET institutions in Nairobi County. It is a recommendation of this study that TVET institutions consider user attitudes, competencies and remove external barriers to enhance user adoption of LMS.

## **5.5. Recommendations for Further Studies**

The research was restricted to TVETs within Nairobi county. Other studies could be conducted in all TVETs within the nation. The findings reveal that  $r^2$  is 0.051 that is, 5.1%. This means that adoption of LMS would vary by 5.1% due to changes in attitude, competence and barriers, at 95% confidence level. Other factors that affect employee performance account for 94.9%. Additional research opportunities could explore other factors that may impact user adoption of LMS, such as the quality of LMS hardware and software, as well as the level of user support

provided. A descriptive study design was used to address the research questions. The study's findings suggest that future research could benefit from employing a mixed-methods research strategies, incorporating both qualitative and quantitative techniques to obtain a more comprehensive understanding of the factors influencing LMS adoption. This would include qualitative techniques, indicating a more detailed understanding of the phenomenon.

### **5.6 Contributions of the Study**

The study improved the existing models, adding an understanding of how technology is adopted and used. By integrating the post-acceptance use of the technology, the study expanded these models. LMS was already being used by TVET students in various institutions. The study discussed the factors that contributed into their choice to adopt LMS. The study added the external barriers variable, that has seldom been focused by earlier user adoption models.



## REFERENCES

- Ahadzadeh, A. S., Wu, S. L., Ong, F. S., & Deng, R. (2021). The Mediating Influence of the Unified Theory of Acceptance and Use of Technology on the Relationship Between Internal Health Locus of Control and Mobile Health Adoption: Cross-sectional Study. *Journal of Medical Internet Research*, 23(12). <https://doi.org/10.2196/28086>
- Ahmed, J. U., & Hasan, H. (2018). Barriers to E-Commerce Adoption in Syria: An Empirical Detection. *World Journal of Business and Management*, 2(1), 41. <https://doi.org/10.5296/wjbm.v2i1.7404>
- Ajzen, I. & Fishbein, M., (1972). Attitudes and normative beliefs as factors influencing behavioral intentions. *Journal of Personality and Social Psychology*,.
- Alghaberi, J. A. (2019). Methods For Teaching Speaking Skill At Thamar Schools And Their Impacts On Learners Oral Competency. English Review: *Journal of English Education*, 7(2), 39. <https://doi.org/10.25134/erjee.v7i2.1732>
- Ali, S. (2021). How Successful is the Management of Technical and Vocational Institutions, Kuwait, in Reducing Dependence on Expatriates? *Technium Social Sciences Journal*, 23, 256–284. <https://doi.org/10.47577/tssj.v23i1.4575>
- Alkhattabi, M. (2017). Augmented reality as e-learning tool in primary schools' education: Barriers to teachers' adoption. *International Journal of Emerging Technologies in Learning*, 12(2), 91–100. <https://doi.org/10.3991/ijet.v12i02.6158>
- Araka, E., Maina, E., Gitonga, R., Oboko, R., & Kihoro, J. (2021). University Students' Perception on the Usefulness of Learning Management System Features in Promoting Self-Regulated Learning in Online Learning. *International Journal of Education and Development Using Information and Communication Technology (IJEDICT)*, 17(1), 45–64.
- Bada, J. K. and Khazali. (2006). "An Empirical Study on Education Strategy to E-learning in a Developing Country". Proceedings of the Fourth International Workshop on Technology for Education in Developing Countries, 10-12 July 2006, Iringa, Tanzania.

- Bezai, N. E., Medjdoub, B., Al-Habaibeh, A., Chalal, M. L., & Fadli, F. (2021). Future cities and autonomous vehicles: analysis of the barriers to full adoption. *Energy and Built Environment*, 2(1), 65–81. <https://doi.org/10.1016/j.enbenv.2020.05.002>
- Bhullar, A., & Chaudhary, R. (2020). Key Factors Influencing Users' Adoption Towards OTT Media Platform. *International Journal of Advanced Science and Technology*, 29(11), 942–956. Retrieved from [sersc.org/journals/index.php/IJAST/article/view/20745](http://sersc.org/journals/index.php/IJAST/article/view/20745)
- Chien, C. W. (2021). A case study of the use of the Six Thinking Hats to enhance the reflective practice of student teachers in Taiwan. *Education 3-13*, 49(5), 606–617. <https://doi.org/10.1080/03004279.2020.1754875>
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Sage Publications, Inc.
- Damit, M. A., Omar, M. K., & Mohd Puad, M. H. (2021). Issues and Challenges of Outcome-based Education (OBE) Implementation among Malaysian Vocational College Teachers. *International Journal of Academic Research in Business and Social Sciences*, 11(3). <https://doi.org/10.6007/ijarbss/v11-i3/8624>
- Davis, F. D., (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. Management Information Systems Research Center, University of Minnesota.
- Dawuda, I., & Ibrahim, A. K. (2021). The Adoption of ICT by Libraries of Teacher Colleges of Education in Northern Ghana: challenges and prospects. *Library Philosophy and Practice*, 2021.
- Esfijani, A., & Zamani, B. E. (2020). Factors influencing teachers' utilisation of ict: The role of in-service training courses and access. *Research in Learning Technology*, 28, 1–16. <https://doi.org/10.25304/rlt.v28.2313>
- Fouad Altameemi, A., & Abdula Fatah Al-Slehat, Z. (2021). Exploring the Students' Behavior Intentions to Adopt E-Learning Technology: A Survey Study Based on COVID-19 Crisis.

- International Journal of Business and Management, 16(6), 31.  
<https://doi.org/10.5539/ijbm.v16n6p31>
- Fraenkel, J., Wallen, N., & Hyun, H. H. (2012). How to design and evaluate research in education (8th ed.). Boston: McGraw Hill
- Ghavifekr, S., Razak, A. Z., Ghani, M. F. A., Ran, N. Y., Meixi, Y., & Tengyue, Z. (2019). ICT integration in education: Incorporation for teaching and learning improvement. *The Malaysian Online Journal of Educational Technology*, 2(2), 24-45. Retrieved from [www.mojet.net](http://www.mojet.net)
- Hadullo, K., Oboko, R., & Omwenga, E. (2018). Status of e-learning quality in Kenya: Case of Jomo Kenyatta University of agriculture and technology postgraduate students. *International Review of Research in Open and Distance Learning*, 19(1), 138–159. <https://doi.org/10.19173/irrodl.v19i1.3322>
- Haidari, S. M., Yelken, T. Y., & Akay, C. (2019). Technology-enhanced self-directed language learning behaviors of EFL student teachers. *Contemporary Educational Technology*, 10(3), 229–245. <https://doi.org/10.30935/cet.590003>
- Hassall, C., & Lewis, D. I. (2017). Institutional and technological barriers to the use of open educational resources (OERs) in physiology and medical education. *Advances in Physiology Education*, 41(1), 77–81. <https://doi.org/10.1152/advan.00171.2016>
- Heryana. (2019). Metodologi Penelitian Kesehatan Masyarakat. Deepublish, 176–177.
- Holm, J. R., Lorenz, E., & Nielsen, P. (2020). Work organization and job polarization. *Research Policy*, 49(8). <https://doi.org/10.1016/j.respol.2020.104015>
- Hughes, C. (2021). The Changing Learning Technological Landscape for Trainers in the Wake of COVID-19. *Advances in Developing Human Resources*, 23(1), 66–74. <https://doi.org/10.1177/1523422320972108>
- Ibrahim, N. K., & Ramadan, I. K. (2021). Medical students' acceptance and perceptions of e-learning during the Covid-19 closure time in King Abdulaziz University, Jeddah. *Journal of Infection and Public Health*, 14(1), 17–23. <https://doi.org/10.1016/j.jiph.2020.11.007>

- Kinyanjui, D. N. (2019). Assessing the Need for and Constraints to Information and Communication Technology (ICT) Integration in the Teaching and Learning of Tourism at Higher Education Institutions in Kenya. *Journal of Education, Society and Behavioural Science*, 1–11. <https://doi.org/10.9734/jesbs/2019/v31i230143>
- Korshunov, I. A., Meshkova, T. A., Miroshnikov, M. S., & Sverchkov, M. N. (2018). Russian universities' further education: Integration with international markets. *Integration of Education*, 22(4), 612–631. <https://doi.org/10.15507/1991-9468.093.022.201804.612-631>
- Kothari, C. R. (2014). *Research methodology: Methods and techniques* (3rd ed.). New Delhi: Wiley Publications.
- Kweka, K. H., & Ndibalema, P. (2018). Constraints Hindering Adoption of ICT in Government Secondary Schools in Tanzania: The Case of Hanang District. *International Journal of Educational Technology and Learning*, 4(2), 46–57. <https://doi.org/10.20448/2003.42.46.57>
- Lajoie, S. P., Pekrun, R., Azevedo, R., & Leighton, J. P. (2020). Understanding and measuring emotions in technology-rich learning environments. *Learning and Instruction*, 70. <https://doi.org/10.1016/j.learninstruc.2019.101272>
- Lee, M. H., Hsu, C. Y., & Chang, C. Y. (2019). Identifying Taiwanese Teachers' Perceived Self-efficacy for Science, Technology, Engineering, and Mathematics (STEM) Knowledge. *Asia-Pacific Education Researcher*, 28(1), 15–23. <https://doi.org/10.1007/s40299-018-0401-6>
- Lubis, M., Yusri, D., & Gusman, M. (2020). Pembelajaran Pendidikan Agama Islam Berbasis E-Learning (Studi Inovasi Pendidik MTS. PAI Medan di Tengah Wabah Covid-19). *Fitrah: Journal of Islamic Education*, 1(1), 1–18. <https://doi.org/10.53802/fitrah.v1i1.1>
- Lund, A., & Eiliv Hauge, T. (2021). Designs for Teaching and Learning in Technology-Rich Learning Environments. *Nordic Journal of Digital Literacy*, 6(4), 258–271. <https://doi.org/10.18261/issn1891-943x-2011-04-05>

- Maina & Nzuki, (2015). Adoption determinants of e-learning management system in institutions of higher learning in Kenya: A Case of selected universities in Nairobi Metropolitan. *International Journal of Business and Social Science*.
- Martin, F. & Icek, A., (1975). *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*. s.l.:Reading, MA: Addison-Wesley.
- Mohammed, T. A. & Abuldughani, A. A. (2017). Impact of students' use of technology on their learning achievements in physiological courses at the University of Damman. *Journal of Taibah, University Medical Sciences*, 12 (1) 82-85. Retrieved from <http://www.sciencedirect.com>
- Morgado, J. C., Lencastre, J. A., Freires, T., & Bento, M. (2021). Smart Education as Empowerment: Outlining Veteran Teachers' Training to Promote Digital Migration. *Technology, Knowledge and Learning*, 26(4), 897–916. <https://doi.org/10.1007/s10758-021-09494-6>
- Mugenda, O. & Mugenda, A. (2003). *Research Methods. Qualitative and Quantitative Approaches*. Nairobi.
- Mugonya, J., Kalule, S. W., & Ndyomugenyi, E. K. (2021). Effect of market information quality, sharing and utilisation on the innovation behaviour of smallholder pig producers. *Cogent Food and Agriculture*, 7(1). <https://doi.org/10.1080/23311932.2021.1948726>
- Obwoye, E. & Stela, K. O., (2016). E-Learning in TVET: An Opportunity for Developing Countries. *IRA International Journal of Education and Multidisciplinary Studies* , 3(3).
- Oke, A., & Fernandes, F. A. P. (2020). Innovations in teaching and learning: Exploring the perceptions of the education sector on the 4th industrial revolution (4IR). *Journal of Open Innovation: Technology, Market, and Complexity*, 6(2). <https://doi.org/10.3390/JOITMC6020031>
- Okello, D. O., Feleke, S., Gathungu, E., Owuor, G., & Ayuya, O. I. (2020). Effect of ICT tools attributes in accessing technical, market and financial information among youth dairy

- agripreneurs in Tanzania. *Cogent Food and Agriculture*, 6(1).  
<https://doi.org/10.1080/23311932.2020.1817287>
- Opoku-Boateng, G. A. (2018). Computerized and non-computerized approaches to brain games for maintaining and enhancing mental acuity in healthy older adults: An investigation of performance enhancement. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 78(10-B(E)), No-Specified. Retrieved from <http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=psyc15&NEWS=N&AN=2017-33540-031>
- Parkman, S., Litz, D., & Gromik, N. (2018). Examining pre-service teachers' acceptance of technology-rich learning environments: A UAE case study. *Education and Information Technologies*, 23(3), 1253–1275. <https://doi.org/10.1007/s10639-017-9665-3>
- Popova, I. (2017). Digital inclusion of secondary schools' subject teachers in Bolivia. *International Journal of Education and Development Using Information and Communication Technology*, 13(3), 41–56.
- Rugg, G., Petre, M., Lippmann, R. P., Riordan, J. F., Xing, L., Levitin, G., ... Wang, Y. (2017). Screen shot 2011-03-05 at 10. *IEEE Transactions on Dependable and Secure Computing*, 2017(1), 57. Retrieved from <http://ieeexplore.ieee.org/document/7515951/>  
<http://studentarbeten.chalmers.se/publication/219658-predicting-exploit-likelihood-for-cyber-vulnerabilities-with-machine-learning%0Ahttp://publications.lib.chalmers.se/records/fulltext/219658/219658.pdf> <http://publications.lib.chalmers.se/records/fulltext/219658/219658.pdf>
- Salim, K. R., Abdullah, M., Ali, N. L., & Ali, R. (2018). Usage of online learning resources among academic staff at Malaysian University. *International Journal of Engineering and Technology(UAE)*, 7(3), 16–20. <https://doi.org/10.14419/ijet.v7i3.25.17462>
- Samuel, K. J., & Ayeni, B. (2019). A GIS-based analysis of geographical accessibility to shared information and communications technology (ICT) infrastructure in a remote region of Nigeria. *African Journal of Science, Technology, Innovation and Development*, 11(1), 121–129. <https://doi.org/10.1080/20421338.2018.1550935>

- Sanseau, E., & Auerbach, M. (2021). Tips for Conducting Telesimulation-Based Medical Education. *Cureus*. <https://doi.org/10.7759/cureus.12479>
- Satpathy, S., Dash, K. K., & Mohapatra, M. (2020). A study on the new design thinking for industrial revolution 4.0, requirements and graduate readiness. *Rupkatha Journal on Interdisciplinary Studies in Humanities*, 12(4). <https://doi.org/10.21659/rupkatha.v12n4.09>
- Singh, S., Sahni, M. M., & Kovid, R. K. (2020). What drives FinTech adoption? A multi-method evaluation using an adapted technology acceptance model. *Management Decision*, 58(8), 1675–1697. <https://doi.org/10.1108/MD-09-2019-1318>
- Sintema, E. J. (2020). E-Learning and Smart Revision Portal for Zambian Primary and Secondary School Learners: A Digitalized Virtual Classroom in the COVID-19 Era and Beyond. *Aquademia*, 4(2), ep20017. <https://doi.org/10.29333/aquademia/8253>
- Songkram, N., & Chootongchai, S. (2020). Effects of pedagogy and information technology utilization on innovation creation by SECI model. *Education and Information Technologies*. <https://doi.org/10.1007/s10639-020-10150-2>
- Sorce, J., & Issa, R. R. A. (2021). Extended technology acceptance model (TAM) for adoption of information and communications technology (ICT) in the US construction industry. *Journal of Information Technology in Construction*, 26, 227–248. <https://doi.org/10.36680/j.itcon.2021.013>
- Sudarwati, N., & Rukminingsih. (2018). Evaluating e-learning as a learning media a case of entrepreneurship e-learning using schoology as media. *International Journal of Emerging Technologies in Learning*, 13(9), 269–279. <https://doi.org/10.3991/ijet.v13i09.7783>
- Technical and Vocational Education Training Authority (2022) <https://www.education.go.ke/state-departments>
- Winter, E., Costello, A., O'Brien, M., & Hickey, G. (2021). Teachers' use of technology and the impact of Covid-19. *Irish Educational Studies*, 40(2), 235–246. <https://doi.org/10.1080/03323315.2021.1916559>

## APPENDICES

### Appendix I: Transmittal Form

My name is **Walter Juma Agallo**. I am a masters student taking Information Technology Management course at the University of Nairobi. I am carrying out a research on; *Determinants of adoption of E-LMS among students in TVET Institutions in Kenya: A Case of Nairobi County*.

I'm asking you to take part in this study. Participation is voluntary and lasts about 15-20 minutes. The information gathered will only be utilised in this study. In case of any queries. Kindly contact me on :**0717497740** or **agallowalter@students.uonbi.ac.ke**



## Appendix II: Questionnaire

Please fill out all of the following sections. Every question is connected to the others and is crucial to the study.

### Section A: Background Information

Tick (✓) as appropriate.

1. Gender: Male  Female
2. Age bracket: Below 30 years  31 – 40  41 – 50  Above 50
3. How would you rate your computer skills level? Beginner  Moderate  Competent
4. Which learning Management system do you use in your institution?
  - a. Moodle
  - b. Google Classroom
  - c. Canvas LMS
  - d. E-Masomo
  - e. Blackboard Learn
  - f. Scholar LMS
  - g. D2L Brightspace

### Section B: Attitude Towards Adoption of LMS

In this section and subsequent sections, use the following scale to indicate your level of agreement with the statements. Scale 5=strongly agree ,4= agree, 3=not sure, 2=disagree and 1=strongly disagree

Description	5	4	3	2	1
I believe it is important to have skills for using LMS.					
I believe that students should use LMS to perform their daily academic tasks.ie. access to learning materials and uploading class assignments.					
I prefer for my institution to implement full use of LMS.					
I like the design of LMS used in my institution.					
I believe using learning management system makes me perform learning activities efficiently.					

### Section C: Competence Levels in Use of LMS

Description	5	4	3	2	1
I am able to use the hardware (Computers, Tablets, Smart phones) that run LMS.					
I can easily navigate through the learning management system used in our institution.					
I am able to interpret the Information output generated from learning management system .					

### Section D: External Barriers Towards Adoption of LMS.

Description	5	4	3	2	1
My institution has provided adequate hardware for use of LMS i.e. computers, laptops .					
My institution has provided WIFI internet to enable use of LMS.					
My institution has trained students on the use of LMS.					
My institution has created students support groups to help student accept use of LMS.					
There is adequate technical user support in my institution on the learning management system.					

What are other hinderances towards Adoption of LMS in your institution?

### Section E: Adoption of LMS

Description	5	4	3	2	1
A lot of students use LMS regularly in their academic activities.					
The information output for students from the LMS is better.					

In what ways could student's acceptance of LMS be enhanced?