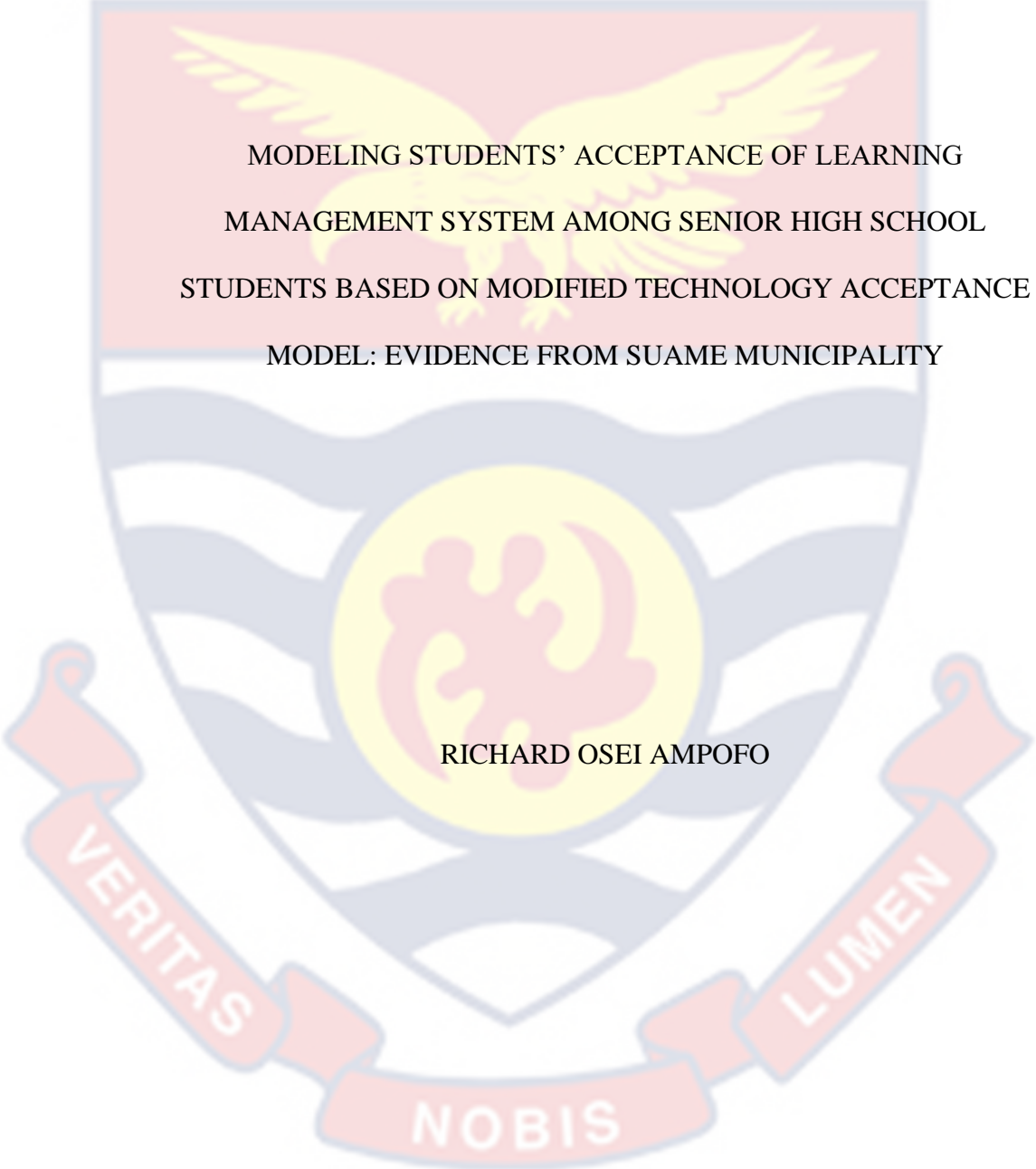UNIVERSITY OF CAPE COAST

MODELING STUDENTS' ACCEPTANCE OF LEARNING

MANAGEMENT SYSTEM AMONG SENIOR HIGH SCHOOL

STUDENTS BASED ON MODIFIED TECHNOLOGY ACCEPTANCE

MODEL: EVIDENCE FROM SUAME MUNICIPALITY

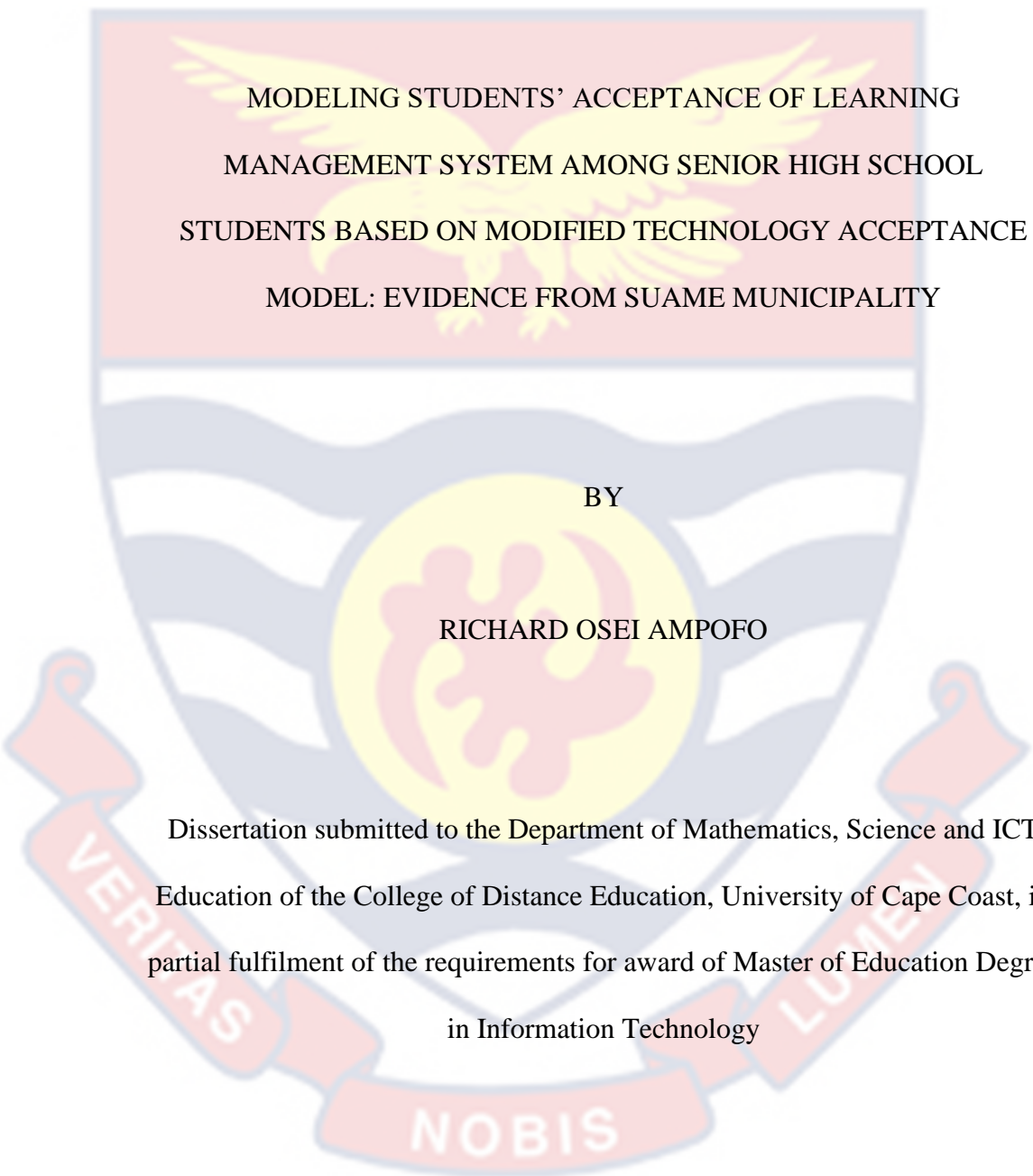RICHARD OSEI AMPOFO

2022

UNIVERSITY OF CAPE COAST

MODELING STUDENTS' ACCEPTANCE OF LEARNING

MANAGEMENT SYSTEM AMONG SENIOR HIGH SCHOOL

STUDENTS BASED ON MODIFIED TECHNOLOGY ACCEPTANCE

MODEL: EVIDENCE FROM SUAME MUNICIPALITY

BY

RICHARD OSEI AMPOFO

Dissertation submitted to the Department of Mathematics, Science and ICT

Education of the College of Distance Education, University of Cape Coast, in

partial fulfilment of the requirements for award of Master of Education Degree

in Information Technology

OCTOBER 2022

DECLARATION

Candidate's Declaration

I hereby declare that this dissertation is the result of my own original research

and that no part of it has been presented for another degree in this university or

elsewhere.

Candidate's Signature: .... Date: ……………………

Name: Richard Osei Ampofo

Supervisor's Declaration

I hereby declare that the preparation and presentation of the dissertation were

supervised in accordance with the guidelines on supervision of dissertation laid

down by the University of Cape Coast.

Supervisor's Signature: ....Date: ....
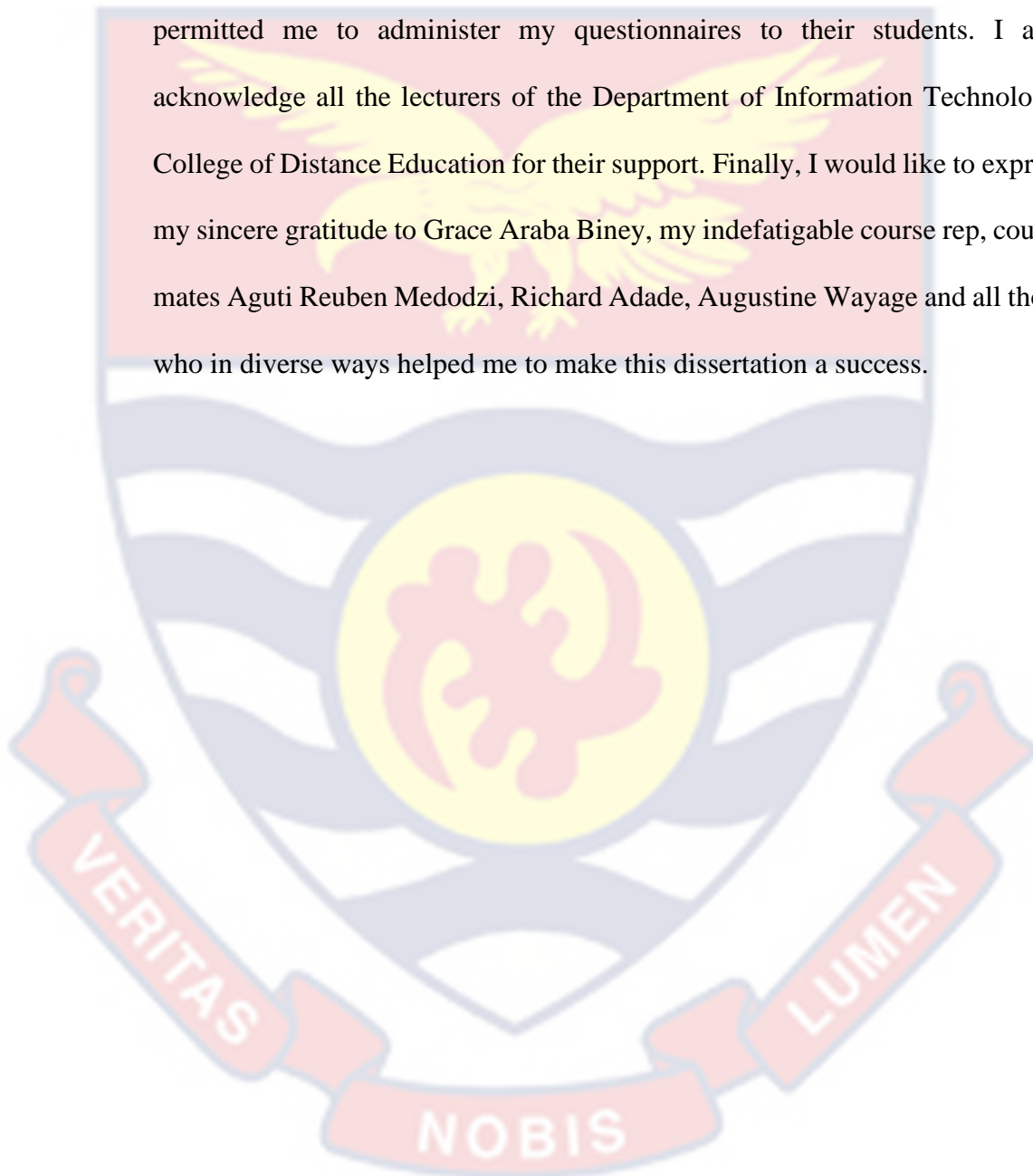
Name: Dr. Emmanuel Arthur-Nyarko

ABSTRACT

The main purpose of the study was to model students' acceptance of the learning management system among senior high school students based on the modified Technology Acceptance Model (TAM). The descriptive survey research design was used for this study. The study utilised simple random sampling to select 313 respondents for the study. The instrument used to collect data was questionnaire, and the data collected were analysed using mean, standard deviation, mean of means, Pearson Product Moment Correlation and linear regression. The results of the study revealed that students face technological challenges which inhibit them from utilising LMS in teaching and learning in senior high schools. Again, the result also revealed that socio-cultural factors/dimensions are predictors of students' acceptance of LMS. Additionally, the study revealed that perceived usefulness, perceived ease of use and technological challenges are predictors of students' LMS acceptance in Senior High Schools in the Kumasi Metropolis. The study, therefore, recommended that the Ghana Education Service should train students and teachers on the use of Learning Management System to help them utilise blended learning. It was recommended that students' perceived ease of use, perceived usefulness and technological challenges should be considered when adopting an LMS for use in Senior High Schools in Ghana and across the world.

ACKNOWLEDGEMENTS

iv

DEDICATION

To my lovely wife, Precious Abena Boampomaah; my daughter, Kimberly,

Nana Serwaah Ampofo , my dearest mother Madam Cynthia Esi Nyamekye and

my deceased father Mr Osei Kwadwo Num Ampofo

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

INTRODUCTION

Background to the Study

The education industry is rapidly evolving due to the advent of information and communication technology. The upsurge nature of Information and Communication Technology in education has aided in the gradual shift from traditional instruction toward technology-enabled one (Bonsu et al, 2021). This implies that computer technology is not only utilised in industries and businesses alone but also in classrooms (Jhurree, 2005), a drastic improvement to its original purpose, that is computation (Ziavra, 2003). Nowadays, computers come in various forms and shapes i.e., personal computers, notebooks, netbooks, and smartphone, and they are now equipped with Wi-Fi-receivers, powerful processors and Random Access Memory (Moss, 2021).

Currently, several tasks can be performed on personal computers, and a significant number of educational materials such as books, scientific research, presentations, video tutorials, educational games, software, among others, have become portable and available on the world wide web--giving rise to e-learning (Kljunić & Vukovac, 2015). Electronic learning is defined as "the science of learning without using paper printed instructional material" (Goyal, 2012, p.240). Electronic learning thus utilises electronic resources such as videos, presentations and educational software to deliver education (Goyal, 2012; Bonsu, 2021). E-learning encompasses online learning or web-based learning, and they are often structured, student-centred and collaborative (Chitra & Raj, 2018). Currently, e-learning is used as either standalone online or distance education or blended learning by educational institutions (Bervell, 2018). E-

1

learning is convenient for the learner and cost-effective since the course content is reusable (Chitra & Raj, 2018).

Among such e-learning platforms used in education is Learning Management System (LMS), which was developed a decade ago (Ouadoud, Chkouri & Nejjari, 2018). LMS assists with course management, assessment, tracking of students' progress, and communication (Turnbull, Chugh & Luck, 2019). LMS has proved helpful for distance and blended learning, particularly during the pre, peri and post-Covid-19 pandemic era (Bonsu, 2021) due to its classroom tracking, management reports, online forums, chatrooms and email tutor (Kulshrestha & Kant, 2013).

Over the years, there have been calls for incorporating educational technologies such as e-learning into teaching in Senior High Schools (Shraima and Khlaif, 2010; Basar, Mansor, Jamaludin & Alias, 2021). Although developed countries like Canada and the USA continue to integrate e-learning into Senior High School education (Barbour, 2010), Shraima and Khlaif (2010) contended that despite high school students and teachers' positive attitude about e-learning, they are slow in adopting it. In Malaysia, Basar et al. (2021) found that high school students have low motivation for e-learning acceptance compared with conventional teaching.

In the developing world, especially Sub-Saharan Africa, the acceptance of LMS by tertiary institutions has continued to increase (Sarfo &Yidana, 2016). However, from the researcher's experience and observation, this growth has not been extended to the senior high schools. The only period LMS was mass adopted in Sub-Saharan Africa was during the COVID-19 lockdown when the government of Ghana, Nigeria and Kenya encouraged the use of LMS in

primary and senior high schools (Bonsu, Bervell, Armah, Aheto & Arkorful, 2021). Adarkwah (2021) attributed the slow adoption rate of e-learning and LMS to challenges such as inadequate ICT infrastructure in schools, power outages, high cost of internet, and slow internet speed, among others. And despite its challenges, e-learning is noted for effectively increasing students' academic performance, access to quality education, improving teaching and learning, collaboration and communication (Awidi, 2013; Arthur-Nyarko & Kariuki, 2019; Bonsu, 2021).

Consequently, salient factors also account for students' acceptance of LMS in general. These factors include the teacher, technological challenges, learner anxiety, student attitude, perceived usefulness, and perceived ease of ease (Bervell, 2018; Bonsu et al., 2021). Therefore, it is vital to understand and explore the predictors of Senior High School students' acceptance of LMS. Understanding how these variables predict students' acceptance of LMS will aid mass adoption of LMS in Senior High Schools across the country.

Statement of the Problem

In spite of the challenges confronting learning management system (LMS) adoption in teaching in Africa, it appears the prospects and effectiveness of LMS have influenced several researchers to investigate its acceptance and adoption. Although there are numerous models such as Unified Theory of Acceptance and Use of Technology (UTUAT), Technology Acceptance Model (TAM) and Theory of Reason Action (TRA) for predicting acceptance of technology, the most popular and widely used model in predicting students' acceptance is TAM (Al-Busaidi, 2013; Al-Emran et al., 2018). Initially, TAM consists of five constructs namely perceived usefulness (PU), perceived ease of

3

use (PU), attitude, behavioral intention, and use intention. According to TAM, perceived usefulness and perceived ease of use dertermines a person's behavioral intention to use and actual use of LMS (Mahdizadeh, Biemans & Mulder, 2008). The predictors PU and PEOU, according to Toland et al. (2014), are the most influential elements of the model.

Researchers have, over the years, either modified or extended the TAM variables to predict users' acceptance of LMS. The difficulty with the existing TAM research is that the models fail to explain user acceptance of LMS in developing countries like Ghana, where technological challenges and socio-cultural factors (beliefs, nroms, taboos, value system, levels of acculturation, etc.) also affect acceptance and use of LMS in senior high schools. In fact, most e-learning acceptance in the Ghanaian high school using TAM ignored the crucial role of technological challenges and socio-cultural factors in the model (Bonsu et al., 2021). Others also looked at senior high school preparedness to use LMS in Ghana without examining variables that predict acceptance (Bariham, Ondigi & Kiio, 2020).

Technological challenges are known for hindering LMS use for instruction in the least developed countries. Some scholars attributed these hindrances to inadequate ICT infrastructures (Bingimlas, 2009; Purnomo & Kusnandar, 2018). Some of the challenges could also be the result of access to ICT infrastructure, affordability and difficulty in attracting users (Shambere, 2014). In addition to the challenges lies socio-cultural problems that also affect students' acceptance of technology. Socio-cultural factors are a group of people's common views, values, and cultural norms (Apsalone & Šumilo, 2015).

4

Until recently the Deeper Life Bible Church of Ghana prohibited its members from watching television. Also, some people in Africa refuse to use technology due to their cultural orientation (Ramawela & Chukwuere, 2020). Thus, the relationship between technology and social environment of users in the technology acceptance of LMS in Ghana cannot be ignored (Kitson, 2011). From the foregoing, the researcher aims to investigate technological challenges and socio-cultural factors in LMS acceptance in senior high schools in Ghana. Against this background, the study seeks to model students' acceptance of the learning management system among senior high school students based on modified Technology Acceptance Model (TAM).

Purpose of the Study

The study's main prupose of th study was to model students' acceptance of the learning management system among senior high school students based on the modified Technology Acceptance Model (TAM). Specifically, the study sought to:

1. assess the technological challenges senior school students face when using LMS at Suame Municipality.

2. explore the role socio-cultural factors such as religion and cultural beliefs play in LMS acceptance by senior high school students at Suame Municipality.

3. Find out the predictor variables (Perceived ease of use, Perceived Usefulness, Technological challenges associated with LMS use, and Socio-cultural factors) of senior high school students' acceptance of LMS at Suame Municipality.

5

Research Questions

The following research questions were formulated to achieve the research objectives:

1. What technological challenges do senior high school students face when adopting LMS for teaching and learning?

2. To what extent do students' socio-cultural factors affect their acceptance of LMS for teaching and learning at the senior high school level?

3. What predictor variables (Perceived ease of use, Perceived Usefulness, Technological challenges associated with LMS use, and Socio-cultural factors) predict students' acceptance of LMS for teaching and learning at the senior high school?

Research Hypotheses

Based on the research question 3, the following hypotheses were formulated:

1. H_{01}. There is no statistically significant relationship between students' perceived ease of use and their acceptance of LMS.

2. H_{02}. There is no statistically significant relationship between students' perceived usefulness and their acceptance of LMS.

3. H_{03}. There is no statistically significant relationship between students' technological challenges associated with LMS acceptance and acceptance of LMS.

4. H_{04}. There is no statistically significant relationship between students' socio-cultural factors and acceptance of LMS.

Significance of Study

Firstly, outcome of the study would be helpful to curriculum developers, examiners, policymakers and even teachers on the predictors of high school

6

students' acceptance of LMS. Again, policymakers would be able to develop plausible policies like the use of LMS to blend classroom instruction in the senior high school level. Finally, the outcome of this study would add to the existing literature on students' acceptance of LMS based on technology acceptance model (TAM).

Delimitations

The study was delimited to the students' acceptance of learning management system among senior high school students based on a modified technology acceptance model using evidence from Suame Municipality in the Ashanti Region of Ghana. Additionally, the study was limited to senior high school students at the Suame Municipality in the Ashanti Region of Ghana.

Limitation of the Study

This study has inherent limitations. First, the close-ended questionnaire limited the responses of the respondents. Again, using a close-ended questionnaire can cause respondents to fake unwarranted responses. Furthermore, other extraneous factors that the researcher could not see could influence the result of the study.

Organization of the study

The study was structured into five chapters. Chapter one encompassed the introduction, which includes the background to the study, statement of the problem, the purpose of the study, research questions, significance of the study, delimitation, limitations and organization of the study. Chapter two outlined the relevant literature that the various scholars from different persuasions had expressed. Chapter three highlighted the research design that was used, population, sample and sampling procedure and other research instruments used

7

during the data collection and its analysis. Chapter four provided the results and discussions. Finally, Chapter five summarised the entire study and outlined some recommendations to address the problems.

8

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

This chapter focuses on a review of the study's related literature. In this chapter, the researcher searched and analysed existing studies that were relevant to this investigation. The study adopted social constructivism as the theoretical framework. Additionally, the concept and meaning of e-learning, types of e-learning, learning management systems, differences and similarities between m-learning and e-learning, advantages and disadvantages of e-learning, the concept of blended learning and challenges facing e-learning implementation in were also covered in the conceptual review. The conceptual framework also focused on Technology Acceptance Model (TAM). Finally, an empirical review was conducted to compare the findings of this study with similar studies in order to corroborate or disprove other researchers' conclusions.

Theoretical Framework

Social Constructivism

Social constructivism, which was the theoretical basis for the study, was pioneered by Lev Vygotsky in 1968. Vygosky postulated that individuals are active participants in knowledge generation (Bonsu, 2021). Social constructivists like Vygosky are of the belief that learning takes place primarily in socio-cultural situations rather than just within the learner (Bonsu, 2021). This implies that, societal influences impact the advancement of scientific knowledge. Johnson and Bradbury (2015) held that social constructivism is concerned with small groups of individuals who learn primarily through interactions with their peers, instructors, and parents. Additionally, educators in

9

the classroom excite, support, and encourage knowledge acquisition (Powell & Kalina, 2009). Vygotsky's social constructivism assumptions, according to Bonsu (2021) is based on assumptions of reality, knowledge, and learning.

1. **Reality**: Social constructivists believe that human action creates reality. According to them, society invents the properties of the world (Kukla, 2000; Jackson, 2006; Bonsu, 2021). Kim (2001) asserts that reality, as we know it, cannot be discovered since it did not exist prior to its social construction.

2. **Knowledge**: The social constructivists argue that knowledge is a human product that is shaped by culture (Jackson, 2006). Thus, to social constructivists, knowledge is co-constructed by people through their interactions with themselves and their environment (Kim, 2001; Bonsu, 2021).

3. **Learning**: Learning is a social process, according to social constructivists. According to them, learning is not confined to what occurs intellectually within an individual, nor is it a passive growth of an individual's behaviours affected by external influences (Jackson, 2006). Social constructivism also defines meaningful learning as the product of people's engagement in social activities and relationships (Kim, 2001).

LMS-enabled blended learning is in line with the social constructivist paradigm since LMS enables interaction among learners and their teachers, thereby helping learners interact with themselves and their socio-cultural environment.

Conceptual Review

The concept of e-learning (Electronic Learning)

Electronic learning, acronym, eLearning or e-learning is "defined as the science of learning without using paper printed instructional material" (Goyal,

2012, p240). Chitra and Raj (2018) also described e-learning as "the intentional use of networked information and communication technology in teaching and learning" (p.11). E-learning has also been espoused as the implementation of electronic learning resources to deliver distance education, online learning or blended learning (Kassymova, Issaliyeva & Kosherbayeva, 2019). Thus, e-learning relies on information communication technology utilisation to provide educational resources and information. However, terminologies like online learning, virtual learning, distributed learning, networked learning, and web-based learning are sometimes used interchangeably with e-learning. E-learning also encompasses much more than online or web-based learning because it is more structured, however, it can be synchronous or asynchronous (Goyal, 201; Bonsu, 2021).

e-learning is enabled by the internet and ICT devices such as personal computers, notebooks, netbooks, interactive whiteboards, network systems, mass media, programs and software. Educational software like learning management systems such as Google Classroom and Moodle; and synchronous software like Google Meet and Zoom are utilised in e-learning (Fernández-Rodriquez, Rainer & Miralles, 2014).

Characteristics of e-learning

The main features or characteristics of e-learning are synthesised from Bhatia (2011), Rasumalla (2018) and Bonsu (2021) and outlined below:

1. **Networking**: e-learning allows students, irrespective of their location, to access education resources remotely through computer use.

2. **Flexibility:** e-learning accommodate the needs of learners. In fact, handicap students who are unable to attend regular classes can benefit significantly from e-learning or online courses.

3. **Interactivity and collaboration**: learners can collaborate with each other and their tutors or instructors anytime, anywhere. This is done through chats, comments etc. features of LMS and video conferencing tools like Zoom.

4. **Blended:** Teachers can utilise e-learning in a blended learning instruction. E-learning, thus, can use for classwork, homework, and projects, among others.

5. **Engaging:** e-learning is based on current technology that students utilise daily; hence, it increases student engagement.

6. **Permanency:** The instructional materials or information remains permanent on the computer or server unless removed or cleared.

7. **Immediacy:** The instructional materials can be retrieved immediately.

8. **Accessibility**: The instructional materials are always available wherever and whenever students need to use them.

Benefits of E-Learning

First, e-learning offers reusable content. Unlike classroom teaching where instruction is not reusable, with e-learning, students can access the same educational content an unlimited number of times. According to Bonsu (2021) and Zervas and Sampson (2014), many online-based open-access digital repositories and libraries have been developed. These repositories and libraries offer students and instructors reusable digital learning resources for their instructional activities.

12

Furthermore, e-learning is more cost-efficient than conventional teaching. In general, the initial cost associated with developing and deploying e-learning is higher in terms of infrastructure and training material costs (Fielden, as cited in Weller, 2004). But afterward, the training materials and infrastructure become reusable saving a lot of money. Also, regarding e-learning, the cost associated with travel and accommodation are reduced (Guragain, 2016).

Again, e-learning offers a higher degree of interactivity among instructors and learners. Instructors can easily communicate and exchange ideas with each other, while learners on the other hand, can easily receive instant feedback on their learning via e-learning platforms (Radović-Marković, 2010). Thus, e-learning makes interactivity between students or students and instructors possible through the use of interactive systems such as LMS, Hypermedia, SMS, and Email (Garaj, 2010; Bonsu, 2021).

Moreso, e-learning makes it easy to contact the instructor outside the regular working hours. The learner could send inquiries to the instructor via email, instant messaging, or chat system (Kulik, as cited in Abed, 2019).

Moreover, e-learning is often scalable. As a result, the same infrastructure and materials can be used for a larger or smaller number of students without affecting the total cost (Guragain, 2016).

Furthermore, unlike classroom-based teaching and learning, e-learning resources can be updated more regularly. After the study materials have been uploaded to a database server or LMS, they can be changed without replacing the entire set of materials (Guragain, 2016).

13

Lastly, e-learning is more effective than the conventional teaching. Several research have established the effectiveness of blended-enabled e-learning in improving students' academic performance, critical thinking and communicative skills (Bonsu, 2021). Additionally, the multimedia format used in e-learning makes teaching and learning engaging. Learners tend to remember knowledge acquired from multimedia materials (Guragain, 2016).

Learning Management System

A learning management system (LMS) is a software or platform that creates, manages, and maintains learning content, recognizes and analyses individual and group learning, and gathers data to monitor the learning process (Bervell, 2018; Watson & Watson, 2007). LMS can also be defined as software that automatically administers training (World Bank, 2010). Thus, LMS is a software package that can handle training.

LMS have been used for purely online, offline and blended learning all over the world. It is also used to support e-learning activities; thus, it could be concluded that LMS is the backbone of e-learning and m-learning (Bervell, 2018). Kundi and Nawaz (2011), and Aljaloud (2012) also espoused LMS as web-based learning, which are synchronous, open-network structures created to facilitate collaborative, active, authentic, creative and constructive learning. LMS contains learner enrolment, activity reporting, messaging, discussion boards, conducting assessments and certification, among others. And it is essential in planning, developing and implementing learning activities and creating positive learning outcomes for learners (AlphaLearn, nd.).

LMS "provides access to student-centred teaching approaches, increased accessibility, assessment and evaluation features, and improved

management of course content and administrative tasks" (Gautreau, as cited in Bervell, 2018, p. 46). LMS also has learning environment personalisation, web-driven tool for communication, and enabling best practice for instruction, allowing instructors to deliver instruction (Tu et al, 2012). Currently, there are many LMS available in the market, ranging from Moodle, Blackboard, WebCT, Sakai, Docebo. They could be open-source like Moodle or proprietary (closed source) like Blackboard.

Today, LMS is widely used by organisations and educational institutions due to its advantages, such as organising learning in a single location, tracking students learning progress, reducing training cost, allowing micro-learning at scale, allowing gamified learning, easy to customised, consistent and scalable, and multimedia learning.

Challenges Facing E-Learning Implementation in Africa

Despite the advantages of online learning, its adoption rate is slow in Africa. The slow pace of online learning implementation is as a result of plethora of challenges confronting e-learning. Among these challenges include lack of infrastructure, slow internet, unfavourable government policies, high cost associated with laptops and smartphones and inadequate online or e-learning specialists.

First, the internet bandwidth available to transport data between Africa and the rest of the globe is around one-seventh of Europe's international bandwidth capacity (Les Cottrell, 2013). This makes it inadequate for a continent with over a billion population. The effect is that internet connectivity is often poor and slow (Baylon & Antwi-Boasiako, 2016).

Second, infrastructural challenges mare e-learning implementation in Africa (Kasse & Balunywa, 2013). E-learning implementation relies heavily on hardware and software infrastructure such as computers, servers, internet connectivity, cameras, LMS software, multimedia and video editing software, among others. Unfortunately, most educational institutions in developing countries lack these resources (Bhuiyan, 2010), making e-learning implementation difficult in Africa.

Third, unfavourable government policies in some developing nations also hinders e-learning implementation. In Ghana, for instance, the Education Service (GES) has outlawed mobile phone and personal computer usage in Senior High Schools (Bonsu, 2021). The reason for prohibiting computers that can be used for learning is because the authorities feel these gadgets can be a distraction (McLean, 2016).

Furthermore, adequate e-learning and instructional design specialists are needed to combine technology with sound pedagogies (Bonsu, 2021). In the words of Bhuiyan (2010) "higher education institutions have encountered a myriad of pedagogical challenges that they should overcome if their attempts at adopting e-learning is (sic) to bear any fruit." The truth is that instructors in Ghana's senior high schools lack the expertise to integrate e-learning into teaching (Bonsu, 2021).

Finally, negative attitude to e-learning is a critical challenge confronting e-learning adoption in Africa. Some students and tutors are wary of e-learning and are hesitant to use it. Mutisya and Makokha (2016) found that instructors in Kenya had negative attitudes toward the use of e-learning. They further referred

16

to these group of students and instructors as "technology averse, phobic, and conservative" (Mutisya & Makokha, 2016, p.154).

Socio-Cultural Dimensions (Factors) that Influence Technology Acceptance

Culture has been defined differently by various scholars, from Anthropology to Sociology background. Culture, according to anthropologists,

"consists of patterned ways of thinking, feeling and reacting, acquired and transmitted mainly by symbols, constituting the distinctive achievement of human groups, including their embodiments in artifacts; the essential core of culture consists of traditional (i.e., historically derived and selected) ideas and especially their attached values" (Kroeber & Kluckhohn, 1952, p. 86)."

Culture is also defined by Hofstede as "the collective programming of the mind which distinguishes the members of one human group from another" (1980, p. 260). Culture, therefore, is: "(1) something that is shared by all, or almost all members of some social group; (2) something that the older members of the group try to pass on to the younger members; and (3) something (as in the case of morals, laws and customs) that shapes behavior, or that structures one's perception of the world" (Merchant, 2007, p.432).

Various frameworks have been propounded to explain and classify cultures in order to understand their influence on society. Among them include Hofstede's cultural dimensions, which consist of uncertainty avoidance, power distance, individualism, and masculinity (1980). Individualism/collectivism, according to Hofstede's cultural dimensions, refers to "societies in which the

17

interests of the individual prevail over the interests of the group" against "societies in which the interests of the group prevail over the interest of the individual" (Hofstede, 1991, p.50). Power distance, on the other hand, refers "to the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally" (Hofstede, 2001, p.98). Also, the uncertainty of avoidance is "the extent to which the members of a culture feel threatened by uncertain or unknown situations" (Hofstede 1991, p.113), whiles concerning masculinity/f emininity, "Masculinity stands for a society in which social gender roles are clearly distinct… and Femininity stands for a society in which social gender roles overlap" (Hofstede, 2001, p. 297).

Hofstede's cultural dimensions have been regularly used in TAM throughout the last two decades to predict technology acceptance (Srite, 2006). Its usage is due to the relationship between culture and technology acceptance. Thus, socio-cultural factors of a group influence whether or not they are likely to accept a technology (Evers, 2001; Setyohadi, Aristian, Sinaga & Hamid, 2017).

Conceptual Framework

A conceptual framework utilises a diagram to explain the relationships among variables of the research problem. Latham (as cited in Adom, Hussein & Joe, 2018) opined that the entire methodology of the research understudy must agree with the variables and their relationships and context. This study rest on a modified (Adaptted) Technology Acceptance Model (TAM) espoused by Davis (1986 and 1989). Fishbien's Theory of Reasoned Action (TRA) influenced Davis' development of the TAM (Bonsu, 2021). TAM is one of the

technology acceptance theories that serve as basis to predict user acceptance of technology. The TAM, in particular, predicts users' behavioural intention and use intention using three predictors: perceived ease of use, perceived usefulness, and attitude (Alfadda & Mahd, 2021). Technology Acceptance Model concentrates on the relationship between emotional variables and use intention, excluding socio-cultural variables and technological challenges, which play an essential role in technology acceptance, especially in Africa. Therefore, the researcher modified the original TAM by Davis to include technological challenges associated with LMS use and socio-cultural factors, eliminating behavioural intention and attitude as a mediating variable.

Perceive ease of use is defined as "one's perception that the utilisation of a new technology system will be free from effort" (Davis, 1989). Perceive usefulness (PU) also mean "the degree to which a person believes that using an information system would improve his or her job performance and output" (Davis, 1989). Technological challenges, on the other hand, are also variables that hinder the acceptance of e-learning in the least developed countries (Purnomo & Kusnandar, 2018). Furthermore, socio-cultural factors are shared values, norms, beliefs, religions, and attitudes among people who form a community (Apsalone & Umilo, 2015). These socio-cultural factors are known to affect technology acceptance. The figure 1 below depicts the relationship among the constructs.
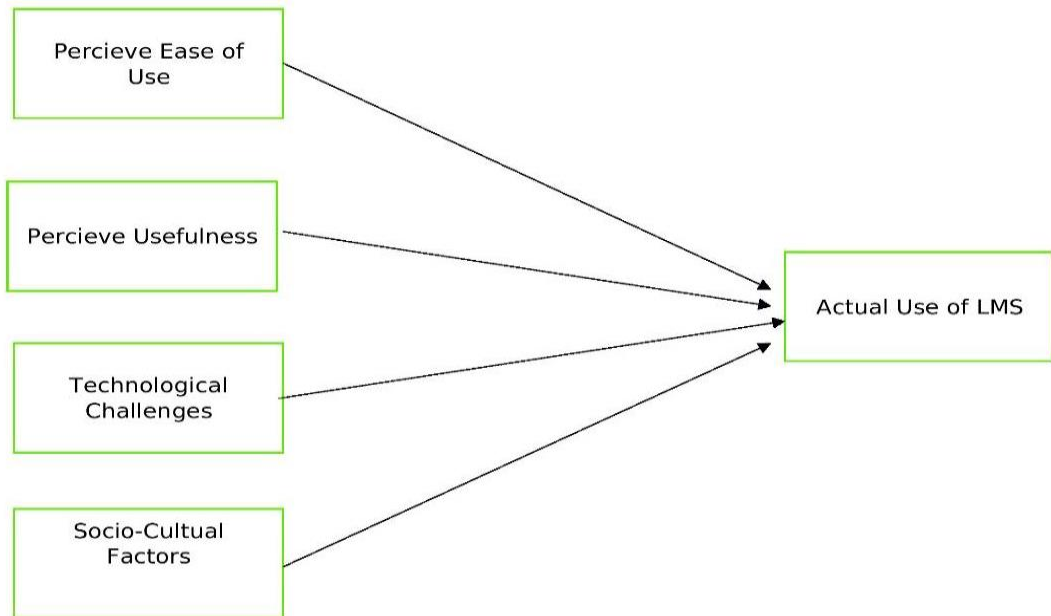
Figure 1: Modified TAM by the Author

Empirical Review

Technological Challenges Associated with LMS Acceptance

During the Covid-19 epidemic, learning management system (LMS) adoption became difficult for many higher education institutions. Although LMSs with lots of features were developed for universities, the success of those systems is highly related to a detailed understanding of challenges and factors influencing the use of the systems among their users.

Snousi (2019) examined he potential and difficulties of LMS in Education in the United Arab Emirates. Inconsistency between the Learning Management System and some academic programs offered in many higher education institutions in the emirates, limited use of Arabic, and technical illiteracy were challenges facing LMS use in the school, according to the study. Students' lack of self-discipline in the online environment was also revealed..

Similarly, Alhazmi and Rahman (2021) investigated the reasons why LMS failed to support student learning in institutions of higher learning. They revealed that causes of LMS failure are technological, theoretical, and pedagogical aspects.

20

The appropriateness of adopting effective e-learning through a learning management system (LMS) at the tertiary educational institutions in Bangladesh was also examined by Sarker, Mahmud, Islam & Islam (2019). The results of the study showed that poorly e-learning aterials do not promote much interaction between students and lecturers. Technical issues including a slow internet connection that prevented access to e-learning platforms were also present.

Mutisya and Makokha (2016) evaluated the barriers to e-learning adoption in various higher education institutions. According to the report, the biggest obstacle is a lack of Internet connectivity, which is followed by a shortage of computers and laptops, inadequate computer labs, a lack of ICT expertise, and a lack of time for online activity.

In addition, Bervell and Umar (2017) conducted a thorough evaluation of the research on LMS acceptance and use in higher education in Sub-Saharan Africa. ICT infrastructure, LMS usage expertise and training, LMS system quality, and LMS use policy and management support were the main LMS implementation hurdles.

In conclusion, although Covid-19 pandemic has had a significant impact on the adoption and use of LMS in the education sector. With the sudden shift to online learning due to the pandemic, many educational institutions had to quickly adopt and adapt to the use of LMS to ensure continuity of learning. This posed several challenges, including technical difficulties, limited access to reliable internet connectivity and ICT infrastructure, and inadequate training and support for educators and students in using the LMS. It should also be emphasized that none of the reviewed study focus on challenges associated with

21

LMS use in Senior High School. The reviewed studies focused on higher education level.

Relationship Between Technological Challenges Associated with E-Learning Use and Students' Acceptance

Purnomo and Kusnandar (2018), in their research to examine the hindance to adoption of ICT in agricultural extension in Indonesia, revealed that technological challenges predict acceptance of ICT for instructional purposes.

Similar to this, Ryder and Machajewski (2017) looked into the connection between students' attitudes toward using ICT and their level of digital literacy. They claimed that students' attitudes toward accepting ICT are improved by having access to the internet, computers, and smartphones.

Furthermore, Bere and Rambe (2016) researched on the adoption of mobile learning in a South African university of technology using an extended technology acceptance model. According to the study, students' attitudes toward using mobile instant messaging for e-learning are greatly influenced by low cost of ICTs.

Again, WhatsApp use in teaching and learning during the COVID-19 pandemic was evaluated by Bonsu et al. in 2021. According to the study, technical difficulties affect how students actually utilize WhatsApp for teaching and learning.

The gap in this section is the need for further research that specifically investigate the relationship between technological challenges associated with e-learning use and students' acceptance of e-learning. While the studies mentioned in the text touch on this relationship to some extent, they focus on specific contexts or technologies and do not provide a comprehensive understanding of

how technological challenges impact students' attitudes towards e-learning. Therefore, more research is needed to explore this predictive relationship.

Relationship between Social-Cultural Factors and E-Learning Use

Evers (2001) examined how students' perceptions of e-learning related to their cultural upbringings. Her study categorised the cultural backgrounds according to Hofstede's research such as uncertainty avoidance, individualism and power distance. According to the study, there is a significant relationship between learner interactions with e-learning materials and systems like LMS and the predicted cultural orientations.

Also, based on the Technology Acceptance Model, Setyohadi, Aristian, Sinaga, and Hamid (2017) investigated the crucial social aspects influencing intents and behaviors to adopt e-learning (TAM). The study found that social factors have a big impact on students use of e-learning.

Furthermore, Adeoye and Oni (2010) also looked at the relationship between national culture and an e-learning system's usability. The cultural facets of this study were guided by Hofstede's cultural dimensions. It was determined that each person's cultural background significantly affects how well they can use the majority of online learning systems. It is advised that educators and designers collaborate to develop or design the learning experience.

Using TAM, Rabayah (2017) also examined the influence of culture on the acceptability of E-learning in Palestine. The study aimed to link sociocultural variables and technology-related ones. The model included three cultural dimensions as exogenous constructs. The results of the study showed a significant relationship between learner culture and e-learning acceptance.

23

Among the most important cultural factors influencing the decision to use e-learning were power distance, individuality, and the need to avoid uncertainty.

Al-Jumeily, Hussain and Crate (2014) found that individualism & collectivism, uncertainty avoidance and power distance were among the most significant cultural dimensions influencing the decision to adopt e-learning. Their study, the impact of cultural factors on technology acceptance, confirmed these findings.

There is a consistent body of research that suggests social and cultural factors play an important role in students' acceptance and use of e-learning in higher education. Studies have used Hofstede's cultural dimensions and the Technology Acceptance Model to investigate the relationship between cultural factors and e-learning use. The results indicate that cultural dimensions such as power distance, individualism and collectivism, and uncertainty avoidance significantly influence learners' acceptance of e-learning. However, it is not clear from the literature whether the same predictive relationship exist in the Senior High School level.

Relationship Between Perceived Usefulness and E-Learning Acceptance

In 2020, Ali, Mahomed, Yusof, Afzal, and Shah investigated WhatsApp's official usage in Malaysian HEIs in relation to the technology adoption model. The study found that a key factor in determining WhatsApp use is perceived usefulness.

Again, based on Modified TAM, Bonsu et al. (2021) investigated the adoption and use of WhatsApp messenger for teaching and learning in Senior High Schools in Ghana. The study found a strong positive correlation between PU and Actual Use.

24

In five Tanzanian institutions, Kazoka and Mwantimwa (2018) investigated lecturers' and students' perspectives on the use of Web 2.0 technologies in teaching and learning activities. The results of their study showed that adoption of Web 2.0 technologies is significantly predicted by perceptions of these tools' usability.

Perceived ease of use substantially linked with both current and future usage, according to Davis' (1989) study, which also looked at perceived usefulness and user acceptance of information systems (r=.45 for Study 1 and r=.59 for Study 2).

Additionally, Lee et al. (as cited in Bonsu et al., 2021) discovered a favourable correlation between PEOU and real technology use.

It is worth noting that the relationship between perceived usefulness and e-learning acceptance is a key component of the Technology Acceptance Model (TAM), which has been widely used in research on technology adoption and use. The above studies focused on Whatsapp aceeptance and general technology acceptance. None of the studies focused on the predictive relationship between Perceived Usefulness and E-Learning Acceptance in Senior High School level, thus this study is necessary to fill in the gap.

Relationship Between Perceived Ease of Use and E-Learning Acceptance

Additionally, Lee et al. (as cited in Bonsu et al., 2021) discovered a favourable correlation between PEOU and real technology use.

Similarly, Ali et al. (2020), who looked at how the technological acceptance model affected the official use of WhatsApp at Malaysian HEIs, found that perceived ease of use has a significant impact on the adoption WhatsApp for instructional activities.

25

The adoption and use of WhatsApp Messenger for teaching and learning in Senior High Schools in Ghana were evaluated by Bonsu et al. in 2021. The study found a strong positive correlation between PEOU and Actual Use.

In five Tanzanian institutions, Kazoka and Mwantimwa (2018) investigated lecturers' and students' perspectives on the use of Web 2.0 technologies in teaching and learning activities. The results of their study showed that adoption of Web 2.0 technologies is significantly predicted by perceived ease of use.

Perceived usefulness (PU) was substantially related with both self-reported current usage (r=.63, Study 1) and self-predicted future usage (r=.85, Study 2) in Davie's (1989) study, which also looked at perceived ease of use, perceived usefulness, and user acceptability of information systems.

There seem to be a strong correlation between perceived ease of use and technology acceptance. Studies conducted by Lee et al. (as cited in Bonsu et al., 2021), Ali et al. (2020), Kazoka and Mwantimwa (2018) and Davies (1989) have all found that perceived ease of use is a significant factor in the adoption and use of technology for instructional activities. This study goes a step further to assess the relationship in relation to e-learning acceptance in Senior High School level.

Chapter Summary

The study adopted social constructivism as the theoretical framework. Social constructivism postulates that learning takes place primarily in socio-cultural situations rather than just within the learner. Additionally, the conceptual review focused on related literature on meaning of e-learning, types of e-learning, learning management systems, differences and similarities

26

between m-learning and e-learning, advantages and disadvantages of e-learning, the concept of blended learning and challenges facing e-learning implementation in were also covered in the conceptual review. The conceptual framework also focused on modified Technology Acceptance Model (TAM). This modified TAM has perceived ease of use, perceived usefulness, socio-cultural dimension and technological challneges as predictors of LMS acceptance. Finally, an empirical review revealed that individual studie have been conducted to assess the relationship among PE, PU, TC and SC and ICT acceptance without modelling the above predictor variables with LMS acceptance.

27

CHAPTER THREE

RESEARCH METHODS

Introduction

The research approach utilised to conduct this study was covered in this section. It included the study design, the population, the sample and sampling procedure, the research instrument, data collection procedure and data analysis.

Research Design

A framework for carrying out research is known as research design. It explains the steps to take to get the data you need to address a research problem (Malhotra & Birks, 2007). This implies that research design is an essential ingredient of research; hence, the study adopted the descriptive research design. The descriptive survey facilitates the gathering of data to test hypotheses or respond to inquiries about the current state of a research problem (Gay, 1987).

The use of a descriptive survey is because it helps the researcher gather the needed data for further statistical analysis such as inferential statistics (Bonsu et al., 2021). A survey was also adopted since it can be done within a shorter period (Creswell & Clark, 2007). Despite the benefits of descriptive survey research, this approach has drawbacks. Kelley, Clark, Brown and Sitzia (2003) pointed out the danger that the significance of the data can become neglected. They assert that this occurs when a researcher concentrates excessively on the scope of coverage without providing a sufficient analysis of the significance of those data for pertinent issues, problems, or theories.

28

Population

Population in research refers to a larger group of individuals with visible qualities to which one expects to apply the research findings (Fraenkel & Wallen, 2003). 7582 students from 4 Senior High Schools in the Suame Municipality of Ghana's Ashanti Region made up the study's population. However, 1698 Pentecost Senior High School pupils made up the accessible population.

Sample and Sampling procedures

Generally, it is agreed that the primary goal of sampling is to choose samples that fairly represent the entire population from which they were chosen. First, purposive sampling was used to select 1698 students of Pentecost Senior High School since the school was the only one out the 4 schools in the Municipality that granted the access to researcher to use the school facilities for the purpose of the research. Furthermore, simple random sampling was adopted to select 313 from 1698 students. The sample size for the study is in line with Krejcie and Morgan (1970) sampling table for determining sample size. Simple random sampling allows the probability of each member of the population to be selected; hence, the findings derived from this sampling technique are generalisable within the population (Lynn, 2019).

Data Collection Instrument

The study adopted a questionnaire from Davis (1989), Bonsu et al. (2021) and Srite (2006). The questionnaire was administered to the students. There were six sections in the questionnaire. The first part thus, section A gathered biographic data of the respondents. The second section (Section B) examined the perceived ease of use of LMS. The third section (Section C) also

looked the perceived usefulness of LMS. The fourth section (Section D) focused on the technological challenges associated with LMS use. The fifth section (Section E) examined the socio-cultural dimensions that influence LMS acceptance. The last section (Section F) examined the actual use and acceptance of LMS.

Additionally, the questionnaire was designed on a 5-point Likert-type scale ranging from "Strongly Disagree to Strongly Agree" by the researcher. The questionnaire's items were all closed-ended questions. The construction, coding, and analysis of the closed-ended questions are simple and uncomplicated; hence, its adoption for the study (Cohen, Manion & Morrison, 2003).

Validity and Reliability of Instruments

The questionnaire used was adopted from Davis (1989), Bonsu et al. (2021) and Srite (2006). PE, PU and actual use constructs were adopted from Davis (1989), the technological challenges construct was also adopted from Bonsu et al. (2021), while the socio-cultural construct section was adopted form Srite (2006). These scales are known to have high reliability coefficient and they have been reused by various researchers when researching on Technology Acceptance Model. Nevertheless, the questionnaire was given to experts to determine whether it meets the face, construct, and content validity before it was finally administered to the respondents.

Data Collection Procedures

The researcher sought authorisation from the school prior to data collection phase. The researcher obtained a letter of introduction from the College of Distance Education, University of Cape Coast, and sent it to the

school for permission to carry out the study there. The researcher then designed a course using Google Classroom for form two social studies students of the school. The purpose of the LMS was to blend face-to-face instruction in social studies. The social studies instructor of the school taught the face-to-face while during vacation, the researcher served as an online facilitator for the e-learning course via Google Classroom. After the online course completion, students were sent the questionnaire via google forms to be completed.

Data Analysis

The questionnaires were serially numbered for ease of identification before coding. "Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree " were each given a numerical value of 1, 2,3 4 and 5 for the purposes of coding. Statistical Product for Service Solution (SPSS 21.0). was used to analyse each response to each question in the questionnaire. Research questions one and two were analysed using mean and standard deviation, which are descriptive statistics. On the other hand, hypotheses 1 to 4 were analysed with pearson-product moment correlation coefficient and multiple regression model. The choice of Multiple regression was the fact the variables under study have separate linear relationships with no mediating variable(s). Structural Equation Model (SEM) is only preferable when simultaneously analysing all the variables (including mediating variables) in the model instead of separately (Fornell, 1984; Chin, 1998). In fact, the first modified version of TAM by Davis Bogozzi and Warshaw (1989) utilised correlation and regression model. The interpretations and conclusions on the research questions were made based on decision rules for the mean values and standard deviation values below:

Decision Rule for Mean Values for the Five Points Likert scale

- 1-1.4 = Strongly Disagree

- 1.5-2.4= Disagree

- 2.5-3.4= Neutral

- 3.5-4.4= Agree

- 4.5-5.0= Strongly Agree

Decision Rule for Standard Deviation Values

- Standard Deviation of 1.0 and below= Responses from the respondents are homogeneous.

- Standard Deviation greater than 1.0 = Responses from the respondents are heterogeneous.

Research Ethics

To guarantee adherence of recognised ethical norms and practices in research, some steps were taken. These steps include: First, securing a letter of introduction from the University of Cape Coast's College of Distance Education and submitted to Pentecost SHS. Second, the introductory paragraph of the questionnaire also had a clause promising the respondents of their rights, privacy and confidentiality. Additionally, characteristics pertaining to the identification of the respondents were disregarded. Furthermore, a consent form detailing the study's goals, participants' rights, and confidentiality was produced for them to sign.

Chapter Summary

The descriptive research design was used in this quantitative study. 313 students from high schools in the Suame Municipality made up the study's sample size. The 313 participants in the study were chosen using the simple

random sampling. A self-administered questionnaire served as the primary data collection tool. Frequency and percentage were used to analyse the respondent's background. While hypotheses 1 to 4 were examined using pearson product moment correlation and multiple regression, research questions 1 to 2 were examined using mean and standard deviation.

33

CHAPTER FOUR

RESULTS AND DISCUSSION

The purpose of this study was to model students' acceptance of the learning management system among Senior High School students based on the modified Technology Acceptance Model (TAM). Questionnaires were used to gather data from respondents for this study. The data collected were analysed through the computation of descriptive (percentages, mean and standard deviation) and inferential statistics (correlation and regression). This chapter presented the interpretations, discussion and inferences that were made from the analysis.

Analysis of Data from Respondents

Table 1 shows the respondents' results regarding their gender and age group. The totoal number of the respondents were 313 as represented by "n=313"

Table 1: Demographic Information of Respondents (n=313)

Category	Sub-Category	Percentage (%)
Gender	Male	55
	Female	45
Age	16 years and below	2.8
	17-18 years	74.6
	19-20 years	21.2
	Above 20 years	1.4
Total		**100**

Source: Field Data, Osei Ampofo (2022)

34

It is evident from Table 1 that, out of the 313 students who participated in this study, 55% were males, whiles 45% were females. Thus, majority of the respondents were males. Again, concerning the age groups of the respondents, 2.8% were 16 years and below, 74.6% were between 17 to 18 years, 21.2% were between 19 to 20 years, and 1.4% were above 21 years. Thus, the majority of the respondents were between the ages of 17 to 18 years.

Analysis of Research Questions

Research Question One (1): What technological challenges do Senior High School students face when adopting LMS for teaching and learning? The results are presented in Table 2.

Table 2: Technological challenges faced when adopting LMS for teaching and learning.

Statements on Technological Challenges	M	SD
Lack of smartphones to access learning management system	2.0	1.6
Lack of internet access	4.5	1.34
Difficulty in buying data for learning via learning management system	3.3	1.4
Lack of personal computer to access learning management system	4.0	1.4
Mean of means	**3.5**	

Source: Field Survey: Osei Ampofo (2022)

The result from Table 2 indicated that students lack smartphones to access learning management systems (M=2.0, SD=1.6). Also, the respondents agreed with the statement that sought to find whether they lack internet access (M=4.5, SD=1.34). Again, students were unsure whether they faced difficulty

35

buying data for learning via a learning management system. This is evident by the mean value of 3.3 and standard deviation value of 1.4. Moreover, students agreed that they lack personal computers that can be used to access learning management systems (M=4.0, SD=1.4). In conclusion, the overall mean of means of 3.5 showed the respondents face technological challenges which inhibit them from utilising LMS in teaching and learning in Senior High Schools.

Research Question Two (2): To what extent do students' socio-cultural factors affect their acceptance of LMS for teaching and learning at the Senior High School level? The results are presented in Table 3.

Table 3: Socio-Cultural Factors that Affect Students' Acceptance of LMS for Teaching and Learning at the Senior High School Level.

Statements on Socio-Cultural Factors	M	SD
There are some jobs in which a man can always do better than a woman	3.3	1.4
Being accepted as a member of a group is more important than being independent	3.8	1.3
Students should question their managements and teacher's decisions	3.9	.93
Rules and regulations are important because they inform students what the school expects of them	4.2	.88
My cultural beliefs permit me to use technology for learning	4.0	1.0
Mean of means	**3.8**	

Source: Field Survey: Osei Ampofo (2022)

36

Some socio-cultural beliefs prohibit females from venturing male-dominated professions. This belief could affect female students' use of technology such as LMS. As such, the respondents were asked whether there are some jobs where a man can always do better than a woman. The evidence from Table 3 shows that the respondents were unsure whether there are some jobs in which men can always do better than women (M=3.3, SD=1.4). Furthermore, the respondents agreed with the statement that being accepted as a member of a group is more important than being independent (M=3.8, SD=1.3).

Again, the respondents agreed that students should question their management and teachers' decisions (M=3.9, SD=.93). Moreover, the respondents felt that rules and regulations are important because they inform students what the school expects of them (M=4.2, SD=.88). Lastly, the respondents reiterated that their cultural beliefs permit them to use technology for learning (M=4.0, SD=1.0). The mean of means value (3.8) revealed that socio-cultural factors/dimensions are predictors of students' acceptance of LMS in Senior High Schools in Ghana.

Analysis of Research Hypotheses

Four research hypotheses were formulated to answer research question one that sought to examine the predictor variables (Perceived ease of use, Perceived Usefulness, Technological challenges associated with LMS use, and Socio-cultural factors) of Senior High School students' acceptance of LMS at Suame Municipality. These research hypotheses are as follows:

1. H_0. There is no statistically significant relationship between students' perceived ease of use and their acceptance of LMS.

37

2. H_0. There is no statistically significant relationship between students' perceived usefulness and their acceptance of LMS.

3. H_0. There is no statistically significant relationship between students' technological challenges associated with LMS acceptance and acceptance of LMS.

4. H_0. There is no statistically significant relationship between students' socio-cultural factors and acceptance of LMS.

To answer these research hypotheses, a person-product moment correlation was carried out to ascertain the strength and direction of the association, while a multiple regression analysis was carried out to examine the cause-effect (predictive) relationship among the variables.

Correlation Analysis

Pearson correlation (r) was used for the analysis of research hypotheses 1 to 4. Correlation analysis is used to describe the strength and direction of the linear relationship between two or more variables. Pearson correlation coefficient (r) can only take on values from –1 to +1. The positive sign in front indicates that there is a positive correlation (as one variable increases, so too do the other) or a negative correlation (as one variable increases, the other decreases). The significant value of 0.01 and 0.05 were both used as a measure of the significance of the correlation. Findings from the study are presented in Table 4.

38

Table 4: The Relationship Among the Independent Variables and the Dependent Variable.

Variables	PE	PU	TC	SC	A
Perceived Ease of Use (PE)	1	.643**	.189**	.246**	**.388**
Perceived Usefulness (PU)	.643**	1	.155**	.407**	**.356**
Technological Challenges (TC)	.189**	.155**	1	.204*	**-.266**
Socio-Cultural Factors (SC)	.246**	.407**	.204*	1	**-.139**
Acceptance (A)	.388**	.356**	-.266**	-.139**	1

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

* Correlation is significant at the 0.05 level (2-tailed).

H0. There is no statistically significant relationship between students' perceived ease of use and their acceptance of LMS.

The result from Table 4 shows that there is a moderate, positive correlation between the two variables, r=.388 p<0.01, with moderate levels of perceived ease of use associated with students' LMS acceptance. This means that when students find easy to use LMS for teaching and learning, their acceptance rate also increases, and also when they find it challenging to use LMS, it reduces their acceptance rate of LMS.

H0. There is no statistically significant relationship between students' perceived usefulness and their acceptance of LMS.

The result from Table 4 shows that there is a moderate, positive correlation between the two perceived usefulness and their acceptance of LMS,

r=.356, p<0.01. This means that when students find LMS useful for teaching and learning, their acceptance rate increases, and vice versa.

H$_0$. There is no statistically significant relationship between students' technological challenges associated with LMS acceptance and acceptance of LMS.

The result from Table 4 shows that there is a weak, negative correlation between students' technological challenges and their LMS acceptance, r=-.266, p<0.01. This means that the more technological challenges students face when using LMS, the lesser their acceptance, and vice versa.

H$_0$. There is no statistically significant relationship between students' socio-cultural factors and acceptance of LMS.

The result indicates that there is a weak, negative correlation between the two variables, r=-.139 p<0.01, with high levels of students' socio-cultural factors associated with their LMS acceptance. This implies that socio-cultural barriers hinder students' LMS acceptance. The more social cultural barriers facing students regarding LMS, the less likely they would accept LMS as a teaching and learning platform.

Multiple Regression Analysis

Multiple regression is a statistical technique that can analyse cause and effect/predictive relationships between a single dependent variable and several independent variables. This study utilised the technique to model students' acceptance of LMS using four predictor variables, i.e., Perceived ease of use, perceived usefulness, socio-cultural factors and technological challenges associated with LMS use. The outcome of the analysis is presented in Tables 5 and 6.

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Str Error of Estimate
1	.432[a]	.187	.177	3.3

Predictors: (constant), Pu, PE, TC and SC.

Table 5 shows that the predictors in the model determined a total variance of 18.7% explanation in the dependent variable, thus LMS acceptance. This means that about 81.3% of variance was unexplained by the regression's predictive model for students' LMS acceptance. The implication is that additional variables are needed to fully explain the total variance in students' LMS acceptance prediction.

Table 6: The Predictor Variables of Senior High School Students' Acceptance of LMS at Suame Municipality.

						95% Confidence Interval	
	Coefficients Table						
Variable	B	β	t	p	VIF	Lower Bound	Upper Bound
(Constant)	6.68		5.694	.000		4.374	8.989
PE	.160	.155	2.439	.015	1.730	.031	.290
PU	.264	.231	3.464	.001	1.921	.114	.414
TC	.166	.202	4.115	.000	1.041	.087	.246
SC	-.016	.057	-.278	.781	1.201	-.127	.096

Source:Field Data, Osei Ampofo (2022)   Significant at .01 and .05 Alpha Levels

H₀. There is no statistically significant relationship between students' perceived ease of use and their acceptance of LMS.

From the coefficient's Table 6, perceived ease of use predicted students' LMS acceptance with $\beta=0.155$ and $t=2.439$ at $p=.015$, $p\leq0.05$ significant alpha threshold. The prediction is further validated by unidimensionality of the confidence interval level at lower and upper boundaries of .031 and .290, respectively. The confidence interval values imply that the prediction was valid in significance. Hence, the null hypothesis formulated for this predictive relationship is rejected

H₀. There is no statistically significant relationship between students' perceived usefulness and their acceptance of LMS.

Table 6 indicates that students' perceived usefulness predicted students' LMS acceptance with $\beta=0.231$ and $t=3.464$ at $p=.001$, $p\leq0.01$ alpha threshold. The prediction is further validated by non-multidimensionality of the confidence interval level at 95%. The lower and upper boundary values were 0.114 and 0.414, respectively. The confidence interval values show that the prediction was non-spurious in significance. Hence, the null hypothesis formulated for this predictive relationship is rejected.

H₀. There is no statistically significant relationship between students' technological challenges associated with LMS acceptance and acceptance of LMS.

Table 6 reveals that students' technological challenges predicted their LMS acceptance with $\beta=0.202$ and $t=4.12$ at $p=.000$ ($p\leq0.01$ alpha level). The prediction is further validated by the 95% confidence interval level lower value of 0.87 and upper boundaries value of 0.246. This indicates that result of the

prediction was valid. Hence, the null hypothesis formulated for this predictive relationship is rejected.

H_0. There is no statistically significant relationship between students' socio-cultural factors and acceptance of LMS.

The result from the coefficient table in Table 6 found that socio-cultural factors/dimensions of students did not predict their LMS acceptance rate (β=0.57 and t=-2.78 at p=.781). The prediction is further confirmed by the multi-dimensionality of the confidence interval values at lower and upper boundaries of -.127 and .096, respectively. This proves that the insignificant prediction is accurate. Hence, the study failed to reject the null hypothesis formulated for this predictive relationship.

Discussion of Results

Concerning research question one, the study found that respondents face technological challenges which inhibit them from utilising LMS in teaching and learning in Senior High Schools. Lack of internet access, difficulty in acquiring data and lack of computer and mobile phone access prevent students from utilising mobile learning and electronic learning. The finding is in line with a similar conclusion by Alhazmi and Rahman (2021) who reported the main causes of LMS failure into technological, theoretical, and pedagogical aspects. In agreement, Mutisya and Makokha (2016) also remarked that lack of computers/laptops, inadequate computer laboratories, limited ICT skills and poor internet connection restrict access to e-learning platforms.

Research question two, which examined whether some socio-cultural beliefs hinder LMS use, found that students viewed being accepted as a member of a group as more important than being independent. This implies that they

43

would be more likely to use LMS for group learning than individual learning. Additionally, students were of the belief that management and teachers' decisions could be questioned; thus, students will not blindly use an LMS platform implemented by their management unless otherwise students are consulted. However, the respondents reiterated that their cultural beliefs do not prevent them from using technology like LMS for learning. The findings of research question two corroborate with Adeoye and Oni (2010) who found that Hofstede cultural dimensions contribute substantially to the usability of most online learning systems.

Also, concerning hypothesis one, the study revealed that there is a statistically significant relationship between students' perceived ease of use and their acceptance of LMS. This implies that students will use LMS if the platform is easy to navigate. The finding agrees with Lee et al. (as cited in Bonsu et al., 2021) and Ali et al. (2020) who found a positive relationship between PEOU and the actual usage of technology.

Again, the study found that perceived usefulness also predicts students LMS acceptance. Thus, students would accept and use LMS when the platform is useful to them. The platform should be able to improve their learning, save them study time, makes learning easier etc. The finding is incongruent with that of Ali, Mahomed, Yusof, Afzal and Shah (2020) who revealed that perceived usefulness is vital in explaining WhatsApp Use. Again, Bonsu et al. (2021) also found that that PU positively correlates with Actual Use. Kazoka and Mwantimwa (2018) examined the use of Web 2.0 technologies in teaching and learning activities in five Tanzanian universities also indicated that perceived

44

ease of use of Web 2.0 technologies is significant predictor of adopting these tools.

Moreover, the study showed that students' LMS technological challenges predict their LMS acceptance. Challenges such as lack of computers and mobile phones, lack of internet access, and sluggish internet speed prevent LMS utilisation by students. The result of this research hypothesis corroborates with similar findings by other researchers such as Purnomo and Kusnandar (2018), Ryder and Machajewski (2017), Bere and Rambe (2016) and Bonsu et al., (2021) who reported technological challenges as a predictor of students' technology acceptance.

Lastly, the study found a weak, negative correlation between students' socio-cultural factors and acceptance of LMS. Implying that socio-cultural beliefs influence students' LMS acceptance. However, the result from regression analysis found that socio-cultural factors/dimensions of students do not predict LMS acceptance rate.

Chapter Summary

In conclusion, the result from research question one showed that students face technological challenges which inhibit them from utilising LMS in teaching and learning in Senior High Schools. Again, the result of research question two revealed that socio-cultural factors/dimensions are predictors of students' acceptance of LMS

Regarding the hypotheses one to four, the findings from the correlation indicate that the predictors, thus PE, PU, TC, SC influences students LMS acceptance. However, the outcome of the regression analysis revealed that only PE, PU and TC, predict students LMS acceptance. This means that although SC

negatively correlated with LMS acceptance, the correlation does not imply

cause and effect, but a mere association.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter provided the summary of this study that model students' acceptance of the learning management system among Senior High School students based on the modified Technology Acceptance Model (TAM). This chapter also concludes and makes recommendations for practice and further research.

Summary

The prime purpose of the study was to model students' acceptance of the learning management system among Senior High School students based on the modified Technology Acceptance Model (TAM). The specific objectives of the study were to: examine the technological challenges senior school students face when using LMS at Suame Municipality; examine the role socio-cultural factors such as religion and cultural beliefs play in LMS acceptance by Senior High School students at Suame Municipality.; and explore the predictor variables (Perceived ease of use, Perceived Usefulness, Technological challenges associated with LMS use, and Socio-cultural factors) of Senior High School students' acceptance of LMS at Suame Municipality.

Consequently, to achieve the study's objectives, the following research questions were formulated:

1. What challenges do Senior High School students face when adopting LMS for teaching and learning?

2. To what extent do students' socio-cultural factors affect their acceptance of LMS for teaching and learning at the Senior High School level?

47

3. What predictor variables (Perceived ease of use, Perceived Usefulness, Technological challenges associated with LMS use, and Socio-cultural factors) predict students' acceptance of LMS for teaching and learning at the Senior High School?

Additionally, the following research hypotheses were also formulated:

1. $H_{01.}$ There is no statistically significant relationship between students' perceived ease of use and their acceptance of LMS.

2. $H_{02.}$ There is no statistically significant relationship between students' perceived usefulness and their acceptance of LMS.

3. $H_{03.}$ There is no statistically significant relationship between students' technological challenges associated with LMS acceptance and acceptance of LMS.

4. $H_{04.}$ There is no statistically significant relationship between students' socio-cultural factors and acceptance of LMS.

The study adopted a descriptive survey design with a 260 sample size out of 800. A questionnaire was the main instrument for data collection and the data gathered were analysed with descriptive and inferential statistics.

Key Findings

The main findings of the study were as follows:

Research question one, which sought to examine the technological challenges senior school students face when using LMS at Suame Municipality, found that students face technological challenges which inhibit them from utilising LMS in teaching and learning in Senior High Schools.

Regarding research question two, which examined the role socio-cultural factors such as religion and cultural beliefs play in LMS acceptance by

48

Senior High School students at Suame Municipality, found that students face socio-cultural factors/dimensions.

With regards to research question three, which sought to examine the predictor variables (Perceived ease of use, Perceived Usefulness, Technological challenges associated with LMS use, and Socio-cultural factors) of Senior High School students' acceptance of LMS at Suame Municipality, revealed that PU, PE, TC are predictors of students' LMS acceptance in Senior High Schools in the Kumasi Metropolis.

Conclusions

The following conclusions could be deduced from the findings of this study:

Firstly, concerning research question one, the study concluded that although students are willing to utilise LMS, the various technological challenges confronting LMS usage make its adoption difficult for Senior High School students in Kumasi. Therefore, until these challenges are addressed, LMS adoption rate by Senior High School students will remain slower.

Secondly, regarding research question two, the study concluded that cultural beliefs of students in Kumasi metropolis are a determinant of their LMS usage. Out of the four Hofstede's socio-cultural dimensions tested, individualism/collectivism and power distance were the main socio-cultural dimensions that affected students' acceptance of LMS. Thus, students are more likely to adopt LMS for a group than individual purposes. However, the uncertainty of avoidance and masculinity/femininity had no bearing on students' acceptance of LMS in Kumasi Metro. This could be due to the fact that Ghanaian society has evolved to allow females to use technology. As such, there is little to no technological divide inhibiting technology acceptance.

Lastly, concerning predictors of LMS acceptance by Senior High School Students in the Kumasi Metro, the researcher concluded that PE, PU and TC were the main predictors of LMS acceptance. This implies that irrespective of students' attitude and socio-cultural beliefs, they will adopt LMS for teaching and learning when they perceive it as useful, easy to use, and with no technological challenges.

Recommendations

The study makes recommendations based on the conclusions drawn from the respective findings:

1. The study recommends that the Ghana Education Service should train students and teachers on the use of Learning Management System to help them utilise blended learning.

2. The study recommends that the Ghana Education Service should lift the ban on mobile phone and personal computer usage in Senior High Schools.

3. It is recommends that students' perceived ease of use, perceived usefulness and technological challenges should be considered when adopting an LMS for use in Senior High School in Ghana and across the world.

Suggestions for Future Studies

This study only focused on modeling students' acceptance of the learning management system among Senior High School students in Kumasi based on the modified Technology Acceptance Model (TAM). A replication of the current research nationwide with a much larger sample size would be commendable so that the findings could be generalised across Ghana.

Additionally, the current study could also be replicated to include teachers' acceptance of the learning management system based on the modified Technology Acceptance Model (TAM).

REFERENCES

Abed, E. (2019). Electronic Learning and its Benefits in Education. *Eurasia Journal of Mathematics, Science and Technology Education*, *15*. 10.29333/ejmste/102668.

Adarkwah M. A. (2021). I'm not against online teaching, but what about us? ICT in Ghana post Covid-19. *Education and information technologies*, *26*(2), 1665–1685. https://doi.org/10.1007/s10639-020-10331-z

Adeoye, B. F., & Oni, A. (2010). *Socio-Cultural Dimensions of E-Learning Systems* [Chapter]. Transformative Learning and Online Education: Aesthetics, Dimensions and Concepts; IGI Global. https://doi.org/10.4018/978-1-61520-985-9.ch011

Adom, D., Hussein, E. K., & Joe, A. (2018). Theoretical and conceptual framework: mandatory ingredients of a quality research*, International Journal of Scientific Research*, *7*(1), 438-44.

Al-Busaidi, K. A. (2013). An empirical investigation linking learners' adoption of blended learning to their intention of full e-learning. *Behaviour and Information Technology*, *32*(11), 1168-1176.

Al-Emran, M., Mezhuyev, V., & Kamaludin, A. (2018). Technology acceptance model in m-learning context: A systematic review. *Computers & Education*, *125*, 389-412.

Alfadda, H. A & Mahdi, H. S. (2021). Measuring Students' Use of Zoom Application in Language Course Based on the Technology Acceptance Model (TAM). *Journal of Psycholinguistic Research*, DOI: https://doi.org/10.1007/s10936-020-09752-1

52

Alhazmi, A. K., & Rahman, A. A. (2012). Why LMS failed to support student learning in higher education institutions. *2012 IEEE Symposium on E-Learning, E-Management and E-Services*, pp. 1-5, doi: 10.1109/IS3e. 2012.6414943.

Ali, R. M., Mahomed, A. S. B. B. M., Yusof, R. N. R., Afzal, M. I., & Shah, A. B. B. A. H. (2020). The role of technology acceptance model on whatsapp's official usage in Malaysian HEIs. *International Journal of Recent Technology and Engineering (IJRTE) 8*(5), 270-273.

Aljaloud, M. (2012). *Barriers to implementing Learning Management Systems in Saudi Arabian higher education*. Master's thesis, Flinders University

Al-Jumeily, D., Hussain, A.J., & Crate, S. (2014). *The impact of cultural factors on technology acceptance, students' point of view*. FECS'14: The 2014 International Conference on Frontiers in Education: Computer Science and Computer Engineering. Retrieved from http://worldcomp-proceedings.com/proc/p2014/FEC2413.pdF

AlphaLearn (n.d). *Features of LMS: What to look for*? Retrieved from https://www.alphalearn.com/features-of-lms/

Apsalone, M., & Šumilo, E. (2015). Socio-cultural factors and international competitiveness. *Business, Management and Education, 13*(2),276–291.

Arthur-Nyarko, E., & Kariuki, M. G. (2019). Learner access to resources for eLearning and preference for eLearning delivery mode in distance education programmes in Ghana. *International Journal of Educational Technology*, *6*(2), 1–8.

Awidi, I. T. (2013). *E-learning implementation strategies for an ICT-challenged environment: case of the University of Ghana, Legon.* Unpublished Thesis, Edith Cowan University.

Barbour, M. K (2010). *State of the Nation: K-12 Online Learning in Canada.* International Association for K-12 Online Learning.

Bariham, I.,Ondigi, S. R., & Kiio, M.(2020). Preparedness of ghanaian senior high school instructors for application of online learning in social studies instruction amid the COVID-19 pandemic. *Social Education Research,* *2*(1),52-64

Basar, Z. M., Mansor, A. N., Jamaludin, K. A., & Alias, B.S. (2021). The Effectiveness and Challenges of Online Learning for Secondary School Students – A Case Study. *Asian Journal of University Education* (AJUE), *17*(3),119-129

Baylon, C., & Antwi-Boasiako, A (2016). Increasing internet connectivity while combatting cybercrime: Ghana as a case study. *Centre for International Governance Innovation and Chatham House, 44*, 1-14.

Bean, M. V., Aldredge, T., Chow, K., Fowler, L., Guaracha, A., McGinnis, T., et al. (2019). *Effective practices for online tutoring.* Sacramento: Academic Senate for California Community Colleges

Bere, A., & Ramber, P. (2016). Extending technology acceptance model in mobile learning adoption: South African university of technology students' perspectives. *Journal of Computing in Higher Education, 28,* 172–198 DOI: https://doi.org/10.1007/s12528-016-9112-2

Bervell, B. (2018). *Distance Education Tutors' Acceptance of Learning Management System for Blended Learning in Ghana*. University Sains Malaysia: PhD Dissertation.

Bervell, B., & Umar, I. N. (2017). A Decade of LMS Acceptance and Adoption Research in Sub-Sahara African Higher Education: A Systematic Review of Models, Methodologies, Milestones and Main Challenges. *Eurasia Journal of Mathematics, Science and Technology Education, 13*(11), 7269-7286. https://doi.org/10.12973/ejmste/79444

Bhatia, R. P (2011).Features and effectiveness of E-learning tools, *Global Journal of Business Management and Information Technology*, *1*(1), 1-7

Bhuiyan, T.(2010). *Exploring the Challenges of E-Learning Adoption in Developing Countries*. Conference: International Conference on Education and New Learning Technologies. 5-7 July, 2010, Barcelona, Spain

Bingimlas K. A. (2009). Barriers to the successful integration of ICT in teaching and learning environments: A review of the literature. *Eurasia Journal of Mathematics, Science and Technology Education*, *5*(3): 235–245.

Bonsu, N. O. (2021). *Effect of mobile blended learning on teaching and learning of history at Aburaman Senior High School in the Abura-Asebu Kwamankese District*. University of Cape Coast: Unpublished Dissertation.

Bonsu, N. O., Bervell, B., Armah, J. A., Aheto, S-P., & Arkorful, V.(2021) Whatsapp use in teaching and learning during covid-19 pandemic

period: investigating the initial attitudes and acceptance of students. *Library Philosophy and Practice* (e-journal). *6362,*1-20.

Chin, W. (1998). The partial least squares approach for structural equation modeling. In G. A. Marcoulides (Ed.), *Modern methods for business research.* Mahwah, NJ: Lawrence Erlbaum Associates, 295-336.

Chitra, A. P & Raj, M. A.(2018). E-Learning. *Journal of Applied and Advanced Research*, *3*(1),11-13

Cohen, L., Manion, L., & Morrison, K. (2000). *Research methods in education* (5th Edition). London: Routledge Falmer.

Creswell, J. W., & Clark, V. L. P. (2007). *Designing and conducting mixed methods research.* Sage Publications, Inc.

Davis, F. D. (1989) Perceived usefulness, perceived ease of Use, and user acceptance of information technology. *MIS Quarterly, 13* (3): 319-40.

Davis, F. D., Bogozzi, R., P., & Warshaw, P., R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science, 35*, 982-1003

Evers, V. (2001). *Cultural aspects of user interface understanding: An empirical evaluation of an e-learning website by international user groups*. Wetherby, West Yorkshire: British Library, British Thesis Service.

Fernández-Rodriquez, J.C., Rainer, J.J., & Miralles, F.(2014). Essential features in elearning: efficiency and quality. *La Pensée, 76.* 305-314.

Fielden, J. (2002) *Costing e-Learning: is it worth trying or should we ignore the figures? The Observatory on Borderless Higher Education*, Report, August.

56

Fornell, C. (1985). *A Second generation of multivariate analysis: Classification of methods and implications for marketing research* [Working Paper]. Retrieved from http://deepblue.lib.umich.edu/handle/2027.42/35621

Fraenkel, J. R & Wallen, N. E. (2000). *How to design and evaluate research in education* (4th ed.). Boston: McGraw-Hill.

Gay, L. R. (1987*). Educational research: Competencies for analysis and application* (3rd ed.). Columbus, Ohio: Merril Publications.

Goyal S, (2012). E-Learning: Future of Education. *Journal of Education and Learning*, *6* (2), 239-242.

Guragain, N. (2016). E-Learning Benefits and Applications. Dissertation: Helsinki Metropolia University of Applied Sciences, Finland.

Hofstede, G. (1980*). Culture's consequences: international differences in work-related values.* Beverly Hills, California: Sage Publications.

Hofstede, G. (1991). *Cultures and organizations: software of the mind.* McGraw-Hill, London, United Kingdom.

Hofstede, G. (2001) *Culture's consequences: comparing values, behaviors, institutions, and organizations across nation*. Sage Publications, Thousand Oaks, California.

Jhurree, V. (2005). Technology integration in education in developing countries: Guidelines to policy makers. *International Education Journal*, *6*(4), 467-43.

Kasse, J. P., & Balunywa, W (2013). An assessment of e-learning utilization by a section of Ugandan universities: Challenges, success factors and way forward. In: *Paper presented at the International conference on ICT for Africa 2013*, Harare, Zimbabwe.

Kassymova, G.K., Issaliyeva, S.T,, & Kosherbayeva, A.N. (2019). E-Learning and its Benefits for Students. *Modern Methods and Technologies Of Teaching*. Retrieved from https://www.researchgate.net/ publication/339336165

Kazoka, J. E., & Mwantimwa, K. (2019). Perceived usefulness and ease of use of Web 2.0 tools in university teaching and learning in Tanzania. *University of Dar Es Salaam Library Journal*, *14*(2), 19–37. https://doi.org/10.4314/udslj.v14i2

Kelley, K., Clarke, B., Brown, V. and Sitzia, J. (2003) Good Practice in the Conduct and Reporting of Survey Research. *International Journal for Quality in Health Care, 15*, 261-266 http://dx.doi.org/10.1093/intqhc/ mzg031

Kitson N. A(2011).*Convergence of Cultures and Strategies to Improve Electronic Health Record Implementation within a Tanzanian Clinical Environment*. University of Alberta.

Kljunić, J., & Vukovac, D. P. (2015). *A survey on usage of mobile devices for learning among tertiary students in Croatia*. Proceedings of the 26th Central European Conference on Information and Intelligent Systems (CECIIS 2015), Faculty of Organization and Informatics, University of Zagreb, 2015.pp. 97-104.

Krejcie, R. V. & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, *30*, 607-610.

Kroeber, A. & Kluckhohn, F.(1952) Culture: a critical review of concepts and definitions. *Peabody Papers, 27*(1).

Kulshrestha, T., & Kant, A. R(2013) Benefits of learning management system (LMS) in Indian Education. *International Journal of Computer Science & Engineering Technology, 4*(8),1153-1164

Kundi, G. M, & Nawaz, A. (2011). Users of e-learning in higher education institutions (HEIs): perceptions, styles and attitudes. *Int. J. Teaching and Case Studies, 3*(2),161-174

Les Cottrell, R. (2013, Jan 29). *How bad is Africa's internet? A decade long quest aims to pinpoint the internet bottlenecks holding Africa back.* Retrieved from https://spectrum.ieee.org/telecom/internet/how-bad-is-africas-internet

Lynn, P. (2019). The Advantage and Disadvantage of Implicitly Stratified Sampling. *Methods, data, analyses: a journal for quantitative methods and survey methodology, 13*(2), 253-266. https://doi.org/10.127 58/mda.2018.02

Mahdizadeh, H., Biemans, H & Mulder, M. (2008). Determining factors of the use of E-learning environments by university teachers. *Computers & Education, 51*, 142-154

Malhotra, N. K. & Birks, D. F., (2007). *Marketing Research*: *Applied Approach*. (3rd ed). London: Prentice Hall.

McLean, K. J. (2016). The implementation of bring your own device (BYOD) in primary [elementary] schools. *Frontiers of Psychology, 7*(1739), 1–3. Retrieved from https://doi.org/10.3389/fpsyg.2016.01739.

Merchant, S. (2007). Exploring the influence of cultural values on the acceptance of information technology: An application of the

Technology Acceptance Model. *Issues in Informing Science and Information Technology*, *4*, 431-443.

Moss, S. (2021). From "brick" to smartphone: The evolution of the mobile phone. *MRS Bulletin*, *46*(3), 287–288. https://doi.org/10.1557/s43577-021-00067-

Mutisya, D. N., & Makokha, G. L. (2016). Challenges affecting adoption of e-learning in public universities in Kenya. *E-Learning and Digital Media, 13*(3–4), 140–157. https://doi.org/10.1177/2042753016672902

Ouadoud, M., Chkouri, M.Y & Nejjari, A. (2018). Learning management system and the underlying learning theories: towards a new modeling of an lms. *International Journal of Information Science & Technology*, *2*(1), 25-33

Purnomo S. H., & Kusnandar (2018) Barriers to acceptance of information and communication technology in agricultural extension in Indonesia. *Information Development*, *35*(4),1–12.

Queiros, D. R., & de Villiers, M. R. (2016). Online learning in a south African higher education institution: Determining the right connections for the student. *The International Review of Research in Open and Distance Learning*, *17*(5).

Rabayah, K (2019). The impact of culture on acceptance of e-learning: A Palestinian case study using structural equation model. *IEEE Global Engineering Education Conference (EDUCON)*, pp. 467-472, doi: 10.1109/EDUCON.2019.8725110.

60

Radović-Marković, M. (2010). Advantages and disadvantages of e-learning in comparison to traditional forms of learning. *Annals of the University of Petrosani, Economics*, *10*(2), 289–298.

Ramawela, S., & Chukwuere, J. E. (2020). Cultural influence on the adoption of social media platforms by employees. *Knowledge Management & E-Learning*, *12*(3), 344–358. https://doi.org/10.34105/j.kmel.2020.12. 018

Rasumalla, P. (2018, January 21). What is e-learning: its characteristics and advantages [Infographic]. *Rapid ELearning Blogs – CommLab India*. https://blog.commlabindia.com/elearning-design/basics-of-elearning-infographic

Ryder, R., & Machajewski, S. (2017). Investigating the relationship between students' digital literacy and their attitude towards using ICT. *International Journal of Educational Technology, 5*(2): 26-34.

Sarfo, F.K. & Yidana, I (2016). University lecturers's experience in the design and use of Moodle and blended learning environments. *The Online Journal of New Horizons in Eduction, 6*(2), 143-154.

Sarker, M.F.H., Mahmud, R.A., Islam, M.S. and Islam, M.K. (2019). Use of e-learning at higher educational institutions in Bangladesh: Opportunities and challenges. *Journal of Applied Research in Higher Education*, *11*(2), 210-223. https://doi.org/10.1108/JARHE-06-2018-0099

Setyohadi, D.B., Aristian, M., Sinaga, B.L, & Hamid,N.A.A (2017). Social critical factors affecting intentions and behaviours to use e-learning: an empirical investigation using technology acceptance model. *Asian Journal of Scientific Research, 10,* 271-280.
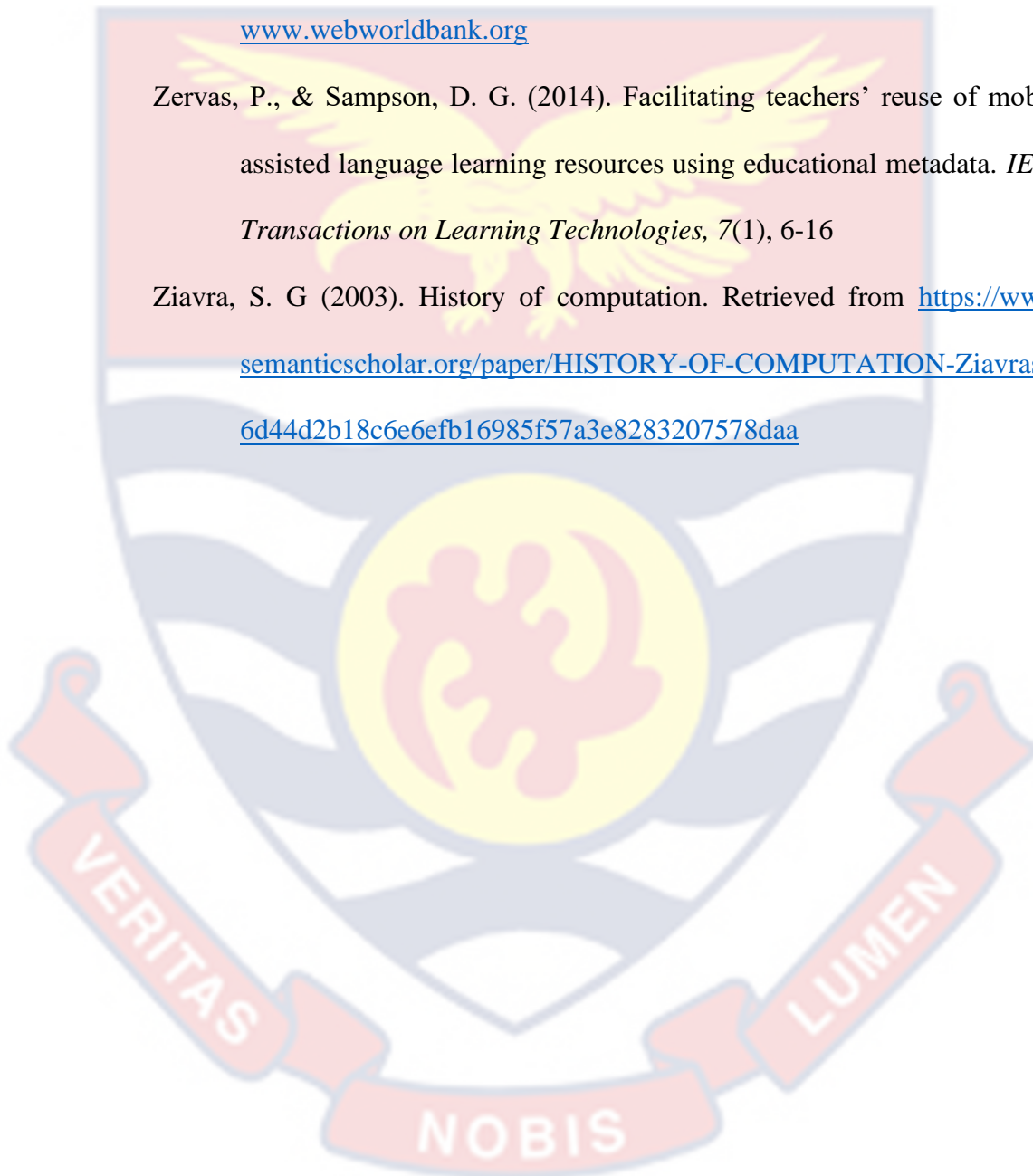
Shambere, R. (2014). The adoption of whatsapp: breaking the vicious cycle of technological poverty in South Africa. *Journal of Economics and Behavioral Studies, 6*(7),   542-550   https://doi.org/10.22610/jebs. v6i7.515

Shraima, K., & Khlaif, Z. (2010). An e-learning approach to secondary education in Palestine: opportunities and challenges. *Information Technology for Development, 16* (3) 159 –173

Snoussi, T. (2019). Learning management system in education : opportunities and challenges. *International Journal of Innovative Technology and Exploring Engineering, 8*(1).

Srite, M. (2006). Culture as an explanation of technology acceptance differences: an empirical investigation of Chinese and US Users. *Australasian Journal of Information Systems*, *14*(1). https://doi.org/10 .3127/ajis.v14i1.4

Toland, S., White, J., Mills, D., & Bolliger, D. U. (2014). EFL instructors' perceptions of usefulness and ease of use of the LMS Manaba. *The JALT CALL Journal, 10*(3), 221-236.

Turnbull, D.,Chugh, R., & Luck, J. (2019) Learning management systems: an overview. *Encyclopedia of Education and Information Technologies*,1-7. Retrieved from https://doi.org/10.1007/978-3-319-60013-0_248-1

Waston, W. R., & Watson, S. L (2007). An argument for clarity: What are learning management systems, what they are not, and what should they become? *Tech Trends, 51*(2), 28-34

Weller, M. (2004) Learning objects and the e-learning cost dilemma. *Open Learning: The Journal of Open, Distance and e-Learning, 19*(3), 293-302, DOI: 10.1080/0268051042000280147

World Bank (2010). *Learning management systems.* Retrieved from www.webworldbank.org

Zervas, P., & Sampson, D. G. (2014). Facilitating teachers' reuse of mobile assisted language learning resources using educational metadata. *IEEE Transactions on Learning Technologies, 7*(1), 6-16

Ziavra, S. G (2003). History of computation. Retrieved from https://www. semanticscholar.org/paper/HISTORY-OF-COMPUTATION-Ziavras/ 6d44d2b18c6e6efb16985f57a3e8283207578daa

APPENDICES

APPENDIX A: Self-Administered Questionnaire for Participants

UNIVERSITY OF CAPE COAST

COLLEGE OF DISTANCE EDUCATION

Department of Mathematics, Science and ICT Education

Questionnaire for Students

Dear Participant,

You are invited to participate in the study, "Modeling the Acceptance of Learning Management System Among Senior High School Students Based on Modified Technology Acceptance Model: Evidence from Suame Municipality."

I will therefore solicit your cooperation and consent to participate in this study. The confidentiality of your response is assured. You are kindly entreated to provide accurate responses by ticking items on this questionnaire. Thank You

SECTION A

DEMOGRAPHIC INFORMATION

Instruction: please, tick [√] the appropriate box [　]

1. Gender

   A. Male [ ]   B. Female [ ]

2. Age Group

   A. 16 years and below [ ]   B. 17-18 years [ ]   C. 19-20years [ ]

   D. Above 20 years [ ]

64

SECTION B: Students' Perceived Ease of Use Regarding Learning

Management Use in Teaching and Learning

Please, tick [√] the appropriate column to indicate the extent to which you agree

or disagree with the following statements

Key:

1= Strongly Disagree (SD)

2=Disagree (D)

3=Neutral (N)

4=Agree (A)

5=Strongly Agree (SA)

S/N	Perceived Ease of Use	SD	D	N	A	SA
3	I would find it easy to use learning management system for learning					
4	My interaction with learning management system would be clear and understandable					
5	I would find learning management system to be flexible to interact with					
6	I would be able to easily navigate learning management system software					

SECTION C: Students' Perceived Usefulness Regarding Learning Management Use in Teaching and Learning

Please, tick [√] the appropriate column to indicate the extent to which you agree or disagree with the following statements

Key:

1= Strongly Disagree (SD)

2=Disagree (D)

3=Neutral (N)

4=Agree (A)

5=Strongly Agree (SA)

S/N	Perceived Usefulness	SD	D	N	A	SA
7	Using learning management system for learning would improve my learning					
8	Using learning management system for learning would save me much study time					
9	Learning management system would be useful for my success in learning					
10	Using learning management system would make learning easier					

SECTION D: Students' Technological Challenges Associated with Learning

Management Use in Teaching and Learning

Please, tick [√] the appropriate column to indicate the extent to which you

agree or disagree with the following statements

Key:

1= Strongly Disagree (SD)

2=Disagree (D)

3=Neutral (N)

4=Agree (A)

5=Strongly Agree (SA)

S/N	Technological Challenges	SD	D	N	A	SA
11	Lack of smartphone to access learning management system					
12	Lack of internet access					
13	Difficulty in buying data for learning via learning management system					
14	Lack of personal computer to access learning management system					

SECTION E: Students' Socio-Cultural Beliefs that Hinders their Learning

Management Use in Teaching and Learning

Please, tick [√] the appropriate column to indicate the extent to which you

agree or disagree with the following statements

Key:

1= Strongly Disagree (SD)

2=Disagree (D)

3=Neutral (N)

4=Agree (A)

5=Strongly Agree (SA)

S/N	Socio-cultural Factors	SD	D	N	A	SA
15	There are some jobs in which a man can always do better than a woman					
16	Being accepted as a member of a group is more important than being independent					
17	Students should question their management's and teacher's decisions					
18	Rules and regulations are important because they inform students what the school expects of them					
19	My cultural beliefs permit me to use technology for learning					

68

SECTION F: Students' Acceptance of Learning Management Use in Teaching and Learning

Please, tick [√] the appropriate column to indicate the extent to which you agree or disagree with the following statements

Key:

1= Strongly Disagree (SD)

2=Disagree (D)

3=Neutral (N)

4=Agree (A)

5=Strongly Agree (SA)

S/N	Acceptance of Learning Management System	SD	D	N	A	SA
20	I use learning management system for learning					
21	I use learning management system for sharing learning materials among my friends					
22	I use learning management system to receive feedback on my learning from my teacher					
23	In future I will keep using learning management system to learn					

Thank You