CONTINUOUS UTILIZATION OF SAKAI LEARNING MANAGEMENT SYSTEM (LMS) BY GRADUATE STUDENTS AT THE UNIVERSITY OF GHANA

BY

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THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF DOCTOR OF PHILOSOPHY DEGREE IN ADULT EDUCATION AND HUMAN RESOURCE STUDIES

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DECLARATION

I declare that apart from references cited in the study which have been duly acknowledged, this thesis titled *CONTINUOUS UTILIZATION OF SAKAI LEARNING MANAGEMENT SYSTEM (LMS) BY GRADUATE STUDENTS AT THE UNIVERSITY OF GHANA* was done by me under the supervision of Dr. Samuel Kofi Badu-Nyarko, Professor Yaw Oheneba-Sakyi and Dr. Clara Ohenewa Benneh, for the award of the Doctor of Philosophy in Adult Education and Human Resource Studies and submitted to the Department of Adult Education and Human Resource Studies, University of Ghana. This work has not been presented anywhere for any degree.

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DEDICATION

I dedicate this work to the Almighty God and my parents, Mr. Martin Odame and Mrs. Rose Odame for having great confidence in me throughout my academic journey from Kindergarten to this level, and always kept asking me each time I visited them at home ‘‘Kweku Mensah, *wo Ph.D thesis no, ɛhefa na waduru? Onyankopon ka wo ho, enti mensuro*’’. These comments from you encouraged me to work harder. Daddy and Mummy, I say a big thank you.

I also dedicate this work to my dear wife, Mrs. Doreen Anyamesem Odame, whose sacrificial support and prayers right from the beginning of this work has brought me this far, constantly urging me on to finish that which I have started.

To my son, Michael Kwasi Anyamesem Odame, this thesis should serve as an inspiration towards further greater academic heights.

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ABSTRACT

The continuous utilization of the SAKAI Learning Management System (LMS) by graduate students may provide rich opportunities for them to effectively interact with their lecturers and to receive immediate feedback from them on their online assignments, quizzes among others. On the other hand, non-continuous utilization of the platform may deprive graduate students from enjoying the benefits the system may offer for their academic work. This study sought to investigate the continuous and effective utilization of the SAKAI Learning Management System (LMS) by graduate students at the University of Ghana.

The study used a cross-sectional survey design. By using the Multi-Stage sampling technique, a sample of 190 graduate students affiliated to the Colleges of Health Sciences, Humanities and Education were selected for the study from the target population. The questionnaire was the main research instrument used for the study with a Cronbach's Alpha value of r = 0.83. Six (6) research questions and six (6) research objectives were used and all the hypotheses stated were tested using Chi-Square, Independent T-test, One-Way Analysis of Variance, the Structural Equation Model (SEM) at the 0.05 two-tailed significance level.

The findings of the study indicated that graduate students had low knowledge on the features of the SAKAI LMS (M=1.49, SD=0.56) and as a result barely used them for their academic work (M=3.32, SD=1.26). The study found that graduate students had positive attitudes towards the SAKAI LMS (M=3.67, SD=1.77) and thus were greatly motivated to continuously use the system for their research and academic courses (M=2.73, SD=1.67).

The study also found that graduate students had several challenges when using the SAKAI LMS due to poor internet connectivity, lack of adequate computer skills among others (M=4.22, SD=2.77). Again, the study found that Performance Expectancy ($\beta = 0.086$, $p < .05$) and Facilitating Conditions ($\beta = 0.906$, $p < 0.05$) had a significant influence on individual decision to use the SAKAI LMS. Furthermore, the study found that individual decision had a significant influence on the continuous utilization of the SAKAI LMS.

The study concluded that graduate students at the University of Ghana barely used the SAKAI LMS as a result of the numerous challenges and limited knowledge of its significant features but were momentously motivated to continuously use it as they had positive attitudes. Besides, continuous usage of the platform was at the mercy of Performance Expectancy and Facilitating Conditions such as the provision of laptops, computers, smartphones, tablets and other electronic resources to access online information at all times. The study recommends the continuous utilization of the Learning Management System (LMS) in higher education to facilitate lifelong learning and human resource development. In addition, technology-mediated learning should be part of the university curriculum for effective teaching, learning and research.

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LIST OF ABBREVIATIONS

BI:	Behavioral Intention
CFA:	Confirmatory Factor Analysis
CU:	Continuous Utilization
Coef:	Coefficient
EE:	Effort Expectancy
FC:	Facilitating Condition
CFI:	Comparative Fit Index
ID:	Individual Decision
LMS:	Learning Management System
PE:	Performance Expectancy
PEN:	Perceived Enjoyment
PEU:	Perceived Ease of Use
PU:	Perceived Usefulness
RMSEA:	Root Mean Square Error of Approximation
SEM:	Structural Equation Model
SI:	Social Influence
TPACK:	Technological Pedagogical Content Knowledge
UG:	University of Ghana
US:	User Satisfaction
UTAUT:	Unified Theory of Acceptance and Use of Technology

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Universities all over the world are gradually responding to the integration of digital technologies in their teaching and learning methodologies. Technology-based teaching is creating a new educational system that eliminates boundaries of geography, jurisdiction and time while integrating academic and real-world concerns and giving students more extensive and affordable challenges. The key challenge for universities is to evolve from a teacher-centered model of education to an approach that emphasizes learning productivity and to carry students with them. As a result of globalization expansions, higher education is progressively crossing borders at the national, regional, sectoral and institutional levels. Thus, educational institutions are being compelled to respond to other profound changes, such as the knowledge explosion, the changing interaction between the public and private spheres and the increasingly rapid development of information and communication technologies (ICTs).

Information and communication technologies (ICTs) have become an integral element in the evolution of diverse forms of open, online and distance education, which over the last 40 years, have brought new opportunities for lifelong learning in many developed countries. The twenty-first century has been branded by embryonic technological advancements. In fact, contrary to the Industrial Revolution era, which was built on machines, technical skills and labor, the twenty-first century continues to flourish itself on digital technologies and the internet (Pinheiro, Ouma & Pillay, 2012).

At this point, information and communications technology have become nearly as vital as oxygen when we consider how younger generations (digital natives) learn and the types of

jobs they will have in the future. With the growth of the internet and digital technologies, web-based course delivery has become an attractive choice in expanding educational opportunities to students worldwide (Rivera, McAlister & Rice, 2002). Today, the internet has become the target for universities to deliver Web-Based Information Systems (WBIS) services for their faculty members, researchers and students.

In addition, the internet has accelerated the incorporation of online educational resources into the curricula of higher learning institutions and as a result, the application of E-learning continues to gain importance in both developed and developing countries. However, the increasing flow of information, rapid technological, social and cultural changes have determined new trends in adult education particularly in technology-based teaching. Predominantly, adult learners may need fresh forms of acquiring knowledge and training so that they could be competitive workforce at workplaces. This is because a new set of potential university students who demand access to flexible learning opportunities have emerged through trends in globalization and the international economy (Ertmer, Anne & Tondeur, 2015).

In higher education, the adaption of a distance learning programme is fast becoming a choice as it offers the prospective clientele flexibility of learning. Distance Education pivots on communication and technology as its bedrock. As rightly detailed in one definition:

> Distance education implies that the majority of educational communication between (among) teacher and student(s) occurs noncontiguous (at different times and at separate places – separating the instructor-tutor from the learner). It must involve two-way communication between (among) teacher and student(s) for the purpose of facilitating and supporting the educational process. It uses technology to mediate the necessary two-way communication (Garrison & Shale, 1987, p. 11).

From the above discussion, the new teaching and learning environment may require academic staff (lecturers) to adapt to educational technology and possess a wide range of technological skills in teaching. This is because the majority of students entering into the university education are ‘digital natives', and hence using technology in teaching has turned into a necessity rather than an option. Similarly, it could be said that Information and Communication tools may have become part and parcel of university students’ academic life. Studies conducted by Yusuf (2005) and Azumah (2016) have advocated that traditional forms of teaching and learning might be insufficient in meeting the needs of growing student populations. As such, universities are turning to learning platforms to revolutionize the face of their teaching and learning endeavors. In effect, within institutions of higher learning, the impact of e-learning systems has become enormous. Yet, the success of introducing e-learning/online learning may be critically dependent on students and faculty members’ readiness to adapt to this innovation.

The passion of integrating e-learning platforms such as Learning Management Systems (LMS) or Course Management Systems in higher educational institutions may be driven by many reasons, such as their efficiency and enrichment for teaching and learning, their responses to student expectations, to address the needs of the huge numbers of students around the globe, and their ability to manage and control the teaching process (Coates, James & Baldwin, 2005). It could be said that the arrival of LMSs may have profoundly affected the academic life of both campus-based and distance education teaching universities.

As a result, LMS has been at the forefront of the online technologies making serious impact on teaching and learning patterns in higher education. Thus, online learning platforms have circulated education to a global level. In the meantime, most of the course contents are transferred to the LMSs, allowing more time for activities and collaboration between

student-student and student-lecturer interaction not only in a classroom atmosphere but also on online discussion boards. Other platforms comprising, e-journals, plagiarism-detection tools, emails, digital library systems among others are now being gradually adopted by universities globally (Henderson, Selwyn & Aston, 2017).

Online learning has the potential to improve educational efficiency by accelerating the rate of learning, taking advantage of learning time outside of lecture hours, reducing the cost of instructional materials, and better utilizing the lecturer's time. These strategies could be particularly useful in rural areas where blended or online learning could help lecturers and students in remote areas overcome distance limitations. The purpose of these platforms just like the LMS is to supplement conventional forms of teaching and learning. As postulated by Dalsgaard (2006, p.2):

> E-learning is organized and managed within an integrated system. Different tools are integrated into a single system, which offers all the necessary tools to run and manage an e-learning course. All learning activities and materials in a course are organized and managed by and within the system. LMS typically offer discussion forums, file sharing, and management of assignments, lesson plans, syllabus, chat, and others.

An 'LMS' (LMS) enables the management and delivery of learning content and resources to students. It provides an opportunity to maintain effective interaction between the instructor and students and to assess the students by providing immediate feedback on the online quizzes and assignments (Pankaja & Mukund Raj, 2013). Blended learning opportunities incorporate both face-to-face and online learning opportunities. The degree to which online learning takes place, and the way it is integrated into the curriculum, can vary across schools. At present, there are over 100 LMSs available and commonly these LMSs are categorized under two groups: Open-source LMSs like Moodle, SAKAI and

Proprietary/Commercial LMSs like WebCT, Blackboard, Learn.com and Desire2Learn (Technopedia, 2014).

Commonly, LMS usability, flexibility, and accessibility for use at all times are the most significant features that have attracted several users globally (Dobozy & Reynolds, 2010). LMSs supports lecturers in "creating and managing online courses and provide them with a great variety of features which can be included in the course such as learning material, quizzes, discussion forums, assignments, and so on" (Graf, Liu, Chen, & Yang, 2009, p. 15). Indisputably, the adaptation to the LMS may have the great potential of influencing the quality of teaching and learning as the platform could enhance students' skills through their constant engagement. The continuous utilization of the LMS may provide numerous benefits to an institution of higher learning.

A significant number of Ghanaian Universities are blending the web-based LMSs with the traditional methods of lecturing in delivering both online and face-to-face learning, allowing working students to continue their education along with pursuing their personal goals and professional careers. According to Marfo & Okine (2010). The Kwame Nkrumah University of Science and Technology, the University of Education, Winneba, and the Ghana Technology University College (GTUC) were a few of the public universities in Ghana that had implemented and adopted e-learning platforms as a strategic management tool in response to the growing number of students accessing tertiary education in the country.

1.2 Adoption of Electronic Learning at the University of Ghana

An e-learning platform known as the Knowledge Environment for Web-based learning was implemented by the University of Ghana in 2004. The Knowledge Environment for Web-based learning was a free Open Source LMS with features such as an assignment

upload, dictionary, Wiki, Rubrics, mailing lists, Groupware suites, calendar among others. A key benefit of the Knowledge Environment for Web-based learning was its flexibility in usage by an institution, requiring minimal hardware and internet bandwidth. Three years after its adoption by the University of Ghana, it was found that only twenty-eight (28) lecturers from the Faculty of Science and Arts had used the system (Dadzie, 2009).

In 2014, the University of Ghana adopted and implemented a new Learning Management System (LMS) called SAKAI. The University of Ghana has gone a long way in the implementation of e-learning to enhance academic excellence through an improved teaching and learning methodology in fulfilling the university's strategic vision, 2014-2024. The Information and Communication Technology (ICT) policy on E-learning developed by the University of Ghana states that, "It is the university's policy to promote E-learning or integrate ICT into teaching and learning to enhance faculty unit effectiveness". The policy is aimed at helping administrators, instructors and students enhance teaching and learning (Draft Policy on ICT by University of Ghana, p. 1).

The Vice-Chancellor of the University of Ghana, Prof. Ernest Aryeete, during the 2014/2015 academic year matriculation address mentioned that several efforts had been put up to include e-learning in the distance learning programmes at the University of Ghana. He remarked that "distance learning … is an opportunity for applicants to earn a University of Ghana degree without leaving the comfort of their homes". He postulated further that the style of delivery for distance learning will be a mixture of e-learning with face-to-face interactions at the University of Ghana. In addition, degree programmes will be run in all the various regional centers (at off-campus locations) hence, students, workers could stay at their current post while pursuing their degree programmes (Aryeetey, 2014).

At present, the Distance Education Programme at the University of Ghana has subscribed to the above-mentioned service (e-learning). As a result, students, lecturers, tutors across the 10 regions of the country have been equipped with the requisite e-learning resources. The current study had been designed to study the effective and continuous usage of the SAKAI Learning Management System by graduate students at the University of Ghana.

1.3 Statement of the Problem

Globally, institutions of higher education are using e-learning as a supplement to their teaching and learning processes. In their statement, Deng & Tavares (2013) voiced out that the majority of universities are now investing a lot of resources into e-learning systems on their campuses. Indeed, the growth in the electronic world has made it possible for educational institutions to easily provide information on a large scale towards teaching and learning. According to Tagoe (2012), the increase in the Ghanaian population coupled have compelled higher educational institutions to integrate e-learning systems as a supplement for large students' enrolment.

The majority of higher education institutions in Ghana may seem to be overwhelmed with the huge demand of student enrolment. As a result, the University of Ghana realizing the shortfalls in the print mode, adopted e-learning as a supplement to its distance education programmes and to reach more students who otherwise may not have access to programmes offered on campus due to work or distance. The main purpose of implementing e-learning at the University of Ghana was the promotion of academic distinction through enriched teaching and learning in fulfilment of the University's Strategic Plan, 2014-2024.

A few graduate students I interacted with at the University of Ghana about the use of SAKAI LMS indicated that they only used the system when they were instructed by their

lecturers to do so, while others were not using it because they encountered certain difficulties when logging unto the system. The views of these graduate students seemed to suggest that the system did not satisfy their expectations and needs. Consequently, non-continuous utilization of the SAKAI LMS by graduate students may deprive them from enjoying the benefits of collaborative learning with their colleagues on the platform as well as quality time management as they may have to combine their academic work with other demanding responsibilities such as the completion of their research project (thesis) within the specified time, increase their burden of coming to campus regularly to submit assignments, being unable to receive feedback from their colleagues and lecturers when topics and issues are being discussed and posted on the Forum tool, having to constantly rely on their lecturers, colleagues and friends for information regarding their reading materials, course outlines among others. It is against this background that the study was conducted to establish: whether graduate students at the University of Ghana were continuously using the SAKAI LMS for their academic work.

1.4 Purpose of the Study

The purpose of the study was to examine the continuous utilization of the SAKAI LMS by graduate students at the University of Ghana and establish strategies towards its effective use.

1.5 The Objectives of the Study

The general objective of the study was to investigate the continuous utilization of the SAKAI LMS by graduate students at the University of Ghana. The following were the specific objectives of the study:

1. To determine the level of knowledge on the features of the SAKAI LMS.
2. To ascertain the extent of usage of the features on the SAKAI LMS.
3. To examine attitudes towards the continuous usage of the SAKAI LMS.
4. To find out the motivation towards the continuous usage of the SAKAI LMS.
5. To investigate factors that promoted the continuous usage of the SAKAI LMS.
6. To find out challenges encountered in the continuous usage of the SAKAI LMS.

1.6 Hypotheses of the Study

Emanating from the research problem stated, the objectives of the study, current related literature and theoretical framework for the study, the following hypotheses were formulated and tested:

1. Performance Expectancy will have no effect on individual decision to use SAKAI LMS.
2: Effort Expectancy will have no effect on individual decision to use SAKAI LMS.
3. Social Influence will have no effect on individual decision to use SAKAI LMS.
4. Facilitating Conditions will have no effect on individual decision to use SAKAI LMS.
5. User Satisfaction will have no effect on individual decision to use SAKAI LMS
6. Individual Decision will have no effect on Continuous use of the SAKAI LMS

1.7 Research Questions

The purpose of the study could be achieved by accomplishing the seven objectives which were best reflected in the following research questions concerning graduate students at the University of Ghana.

1. What is the knowledge base of students on the features of the SAKAI LMS?
2. To what extent are the features of the SAKAI LMS being used?
3. What are the attitudes of students towards the continuous utilization of the SAKAI LMS?
4. What is the motivation of students towards the continuous utilization of the SAKAI LMS?
5. What significant factors promote the continuous utilization of the SAKAI LMS?
6. What challenges do students encounter in the continuous utilization of the SAKAI LMS?

1.8 Significance of the Study

Higher educational institutions throughout the world are making enormous investments in the implementation of LMSs to improve their educational effectiveness and delivery. I hope that the findings from this study would significantly contribute to an in-depth understanding of the continuous utilization of the SAKAI LMS from the perspective of graduate students at the University of Ghana. The study contributes to scholarship on the international and domestic literature as it provides relevant information on continued usage of the SAKAI LMS in higher institutions.

The findings of this study have implications for e-learning research through the application of the Unified Theory of Acceptance and Use of Technology (UTAUT) model in a Ghanaian research setting. In the area of policy, the findings would enable policymakers make quality informed decision on the continuous use of the SAKAI LMS in higher education. Based on the findings, the study would provide recommendations for higher institutions of learning on how to prepare the right e-learning environment before the introduction of LMS to their students and faculty members. Lastly, the findings of the

study would provide important insights into how distance education in developing countries could be better managed with e-learning resources to enhance its rapid adaptation.

1.9 Scope of the study

Although information technology has become more widespread in university education, and coupled with a growing interest in how online learning is perceived, accepted and used by students, the University of Ghana was selected as the study area. All respondents were graduate students at the University of Ghana who had already completed a four-year degree programme in a recognized university and admitted to the University of Ghana School of Graduate Studies. The study was limited to the use of questionnaires as it was purely quantitative.

1.10 Operational Definition of Terms

Continuous: As defined by the Merriam-Webster English Dictionary (2020) continuous is "happening or existing without a break or interruption". In this study, the concept of continuous refers to regular usage of the SAKAI Learning Management System by graduate students until they complete their academic programme. This is related to habitual and addictive use of the Learning Management System.

Graduate Student: According to the Cambridge Business English Dictionary (2011) a graduate student is "a student who is studying for a degree that is higher than the one received after four years of study at a college or university". For the purpose of this study, it connotes a student admitted to the Graduate School of the University of Ghana to pursue a course after completion of the first degree.

Learning Management System: A computer software application or Web-based technology used in planning, implementing, managing and accessing specific teaching and learning processes. Usually, an LMS enables lecturers and instructors to create and delivery academic contents, monitor students' performance through the availability of certain interactive features such as threaded discussion, video conferencing and discussion forums (Pankaja & Mukund Raj, 2013). In this study, the LMS is an online platform used by students and lecturers at the University of Ghana as a support to teaching and learning.

SAKAI Learning Management System: A free to download open source LMS. The computer software comes with a license that gives all users the right to configure, implement and distribute the software free of charge and for any purpose (Conole & Oliver, 2007). With regards to the study, the SAKAI LMS is an e-learning system adopted by the University of Ghana.

Utilization: As explained by Chen, Wang & Xie (2011) utilization is the action of making practical and effective use of something. In line with the study, utilization is the actual usage of the SAKAI LMS by graduate students of the University of Ghana.

1.11 Structure of the Thesis

The thesis was organized into six (6) different chapters in line with the objectives and research questions of the study. Each chapter opened with a brief introduction followed by a detailed explanation of its content and ended with a summary. Chapter One gave an introduction and background study of the entire research process. It covered the research problem identified, the purpose of the study, research objectives, research questions, hypotheses, the scope of the research, operational definition of terms used, and significance of the study and the structure of the thesis. Chapter Two took into consideration the reviewed related and available literature relevant to the e-learning and

the SAKAI LMS in general. It further identified the gap in the literature, discussed the Unified Theory of Technology Acceptance and Use (the theoretical framework for the study) and explained the theoretical model that was developed for the study.

Chapter Three outlined the research methodology and research paradigm adopted for the study, the population (target and accessible), research design, sampling techniques, data collection procedures, ethical considerations, the instrument used data collection and how the data was analyzed. Chapter Four looked at the analysis and interpretation of results obtained from the data collected for the study. The results were analyzed using both descriptive and inferential statistics. Chapter Five was concerned with the discussion and interpretation of the analyzed results. The last chapter, Chapter Six, focused on the summary of the entire research, conclusion drawn, recommendations and implications of the study, the contribution of the study to knowledge and limitation of the study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

Higher education is gradually moving towards technologically based teaching and learning approach. Basically, this chapter took into account the literature review by identifying, evaluating and synthesizing the relevant literature within the field of e-learning. The chapter illuminated how significant knowledge has unfolded within the field, highlighting what investigators and scholars have already done, what is universally accepted, what is emerging and what contemporary researchers think about the topic (LMSs). The literature review in this chapter identified the research gap and articulated how the thesis addressed this gap and directions that further studies may take in addressing these gaps. In addition, the literature review discussed common approaches, trends, areas of controversies and conflicts in the continuous utilization of the LMS in higher education.

In doing this, the first part of the chapter looked at the theoretical and conceptual framework upon which the study is grounded. The study was based on the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh, Moris, Davis & Davis (2003). Again, the theoretical framework guided the entire study and explained its path in theoretical constructs. The second part was concerned with the empirical research and related available literature on the subject matter.

2.1 Theoretical Framework

2.1.1 Unified Theory of Acceptance and Use of Technology (UTAUT)

Technology adaptation has become an essential subject for nearly all areas and actors, from private businesses to public institutions, and from the health sector to university education. As a result, numerous studies have been conducted on this subject, and a number of models that mainly attempt to describe technology adaption on an individual basis have been developed. One of the most recognized fields of information systems (IS) studies has been works carried out on individual's adaptation and use of information and communication technologies. The constructs of the Unified Theory of Acceptance and Use of Technology (UTAUT) model comprise Performance Expectancy, Effort Expectancy, Facilitating Conditions, Social Influence and Behavioral Intention to Use and have been used to explain and understand individuals' use of information systems (Venkatesh et al., 2003).

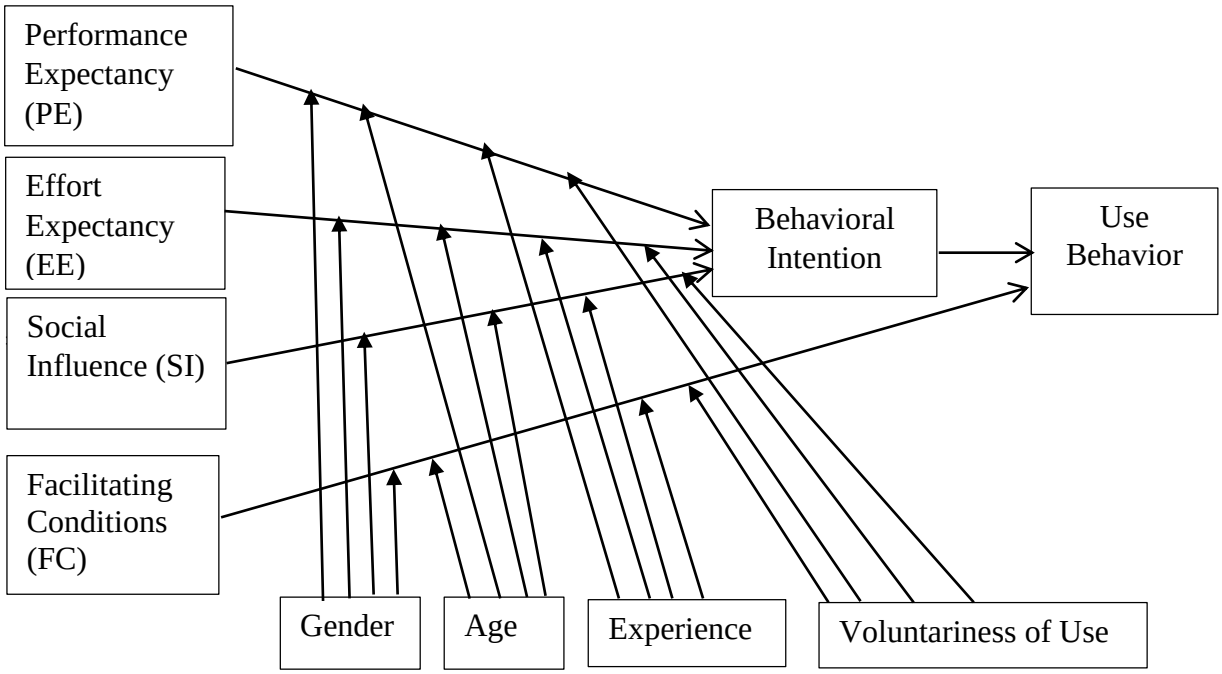
Although the Unified Theory of Acceptance and Use of Technology (UTAUT) model is relatively new compared to other models such as the Technology Acceptance Model (Davis, 1989), Theory of Planned Behavior (Ajzen, 1991) and the Innovation of Diffusion theory (Rogers, 2003) among others, the model since its emergence in 2003 has been used by scholars (Ismail, 2010; Al-Qeisi, 2009; Li & Kishore, 2006) researching into issues of information technology adaptation. The development of the Unified Theory of Acceptance and Use of Technology (UTAUT) model was based on eight dominant technology adaption theories namely:

- Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980) which asserts that a person's actual behaviors are affected by their behavioral intention which is then influenced by their behavior, attitudes and subjective norms.

- Technology Acceptance Model (Davis, 1989) predicts the use and acceptance of information systems and technology by individual users.
- Motivational Model (MM) (Davis, Bagozzi & Warshaw, 1992) suggest that extrinsic (usefulness) and intrinsic (enjoyment) factors affect a person's motivation to use an information technology system.
- Theory of Planned Behavior (TPB) (Ajzen, 1991) postulates that attitudes towards a behavior, its subjective norms and previewed control influences its intentions.
- A model combining the Theory of Planned Behavior and Technology Acceptance Model (C-TPB-TAM) (Taylor & Todd, 1995) argues that an individual's attitude comprises perceived usefulness, perceived ease of use and compatibility.
- Model of PC Utilization (MPCU) (Thompson, Higgins & Howell, 1991) predicts an individual's acceptance and use of an information system.
- The Innovation Diffusion Theory (IDT) (Rogers, 2003) explains how people adopt new innovations and technologies.
- The Social Cognitive Theory (SCT) (Bandura, 2001) is based on the notion that people learn by observing and watching what others do.

The integration of these technology theories led to the emergence of four constructs namely: Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions. These four constructs influence Behavioral Intentions and Use Behavior (Venkatesh et al., 2003). Gender, age, experience and voluntariness of use indirectly have an effect on Behavioral Intention and Use Behavior through the four main constructs. Figure 2.1 below shows the Unified Theory of Acceptance and Use of Technology (UTAUT) Model.

Figure 2.1: Unified Theory of Acceptance and Use of Technology Model.



Source: (Venkatesh, Morris, Davis & Davis, 2003)

Figure 2.1, indicates that a graduate student's Behavioral Intention is an imperative predictor of technology use (SAKAI LMS). The Unified Theory of Acceptance and Use of Technology (UTAUT) model was very much relevant for this study as it addressed the underlying factors affecting the continuous utilization of the SAKAI LMS by graduate students at the University of Ghana.

2.2 Factors Promoting the Continuous Utilization of SAKAI LMS

Studies into the determinants of e-learning adaptation have evolved within a number of theories. As earlier explained, one of the most widely used models within the field of information systems literature is the Unified Theory of Acceptance and Use of Technology (UTAUT) model. The factors influencing an individual's decision to adapt to an e-learning atmosphere may affect the extent of its continuous utilization. These factors can be

categorized into the following headings: (a) Performance Expectancy (b) Effort Expectancy (c) Social Influence (d) Facilitating Conditions and (e) Behavioral Intention

Performance Expectancy (PE)

Performance Expectancy has been defined as "the degree to which the user expects that using the system will help him or her to attain gains in job performance''. The definition implies that an individual will be more likely to adopt new technology when he or she believes that its usage will improve performance. The construct (Performance Expectancy) was developed through a combination of five different concepts from technology models (Venkatesh et al., 2003, p. 447). These concepts were *Perceived Usefulness, Relative Advantage, Outcome Expectations, Extrinsic Motivation and Job-Fit*. The concept of Perceived Usefulness was introduced by Davis (1989) in his Technology Acceptance Model which was later adapted by Taylor & Todd (1995) in their C-TAM-TPB (combined Theory of Planned Behavior and Technology Acceptance Model).

A significant similarity exists between the concept of perceived usefulness and Performance Expectancy. This is because Davis (1989) proposes that perceived usefulness is the situation in which an individual believes that the usage of a system would enhance productivity and performance and outlines further that a system's usefulness depends on the existence of a positive usage performance relationship. In short, if a system (SAKAI LMS) has a high level of usefulness (performance), it would be used by the potential user (graduate students).

The concept of Job-fit is the claim by an individual that adopting new technologies will improve job performance (Teo, 2009). After adaptation, users may perceive the new technology as being very useful than already existing ones, explaining the concept relative advantage (Rogers, 2003). Again, Bandura (2006) in his Social Cognitive Theory

presented the outcome expectations concept. The concept was divided into two namely: performance-related (or job-related) and personal-related outcome expectations (e.g. sense of accomplishment and self-esteem). Researchers have duly admitted similarities between these two concepts developed by Bandura (Davis, Bagozzi & Warshaw, 1992; Plouffe, Hulland & Vandenbosch, 2001).

In this study, Performance Expectancy refers to a graduate student's belief that the use of the SAKAI LMS will provide lots of benefits and aid in the completion of academic work and assignments. Again, Performance Expectancy may have implications for the continuous use of SAKAI LMS among graduate students. This is simply because the way graduate students perceive the SAKAI LMS to be useful in terms of their academic success and ease of communication with colleagues and lecturers will possibly influence the extent of usage of the system. Besides, they will be more likely in making a comparison in terms of cost and benefits (in relation to productivity and efforts) of using the system. As a result, Performance Expectancy may have a role to play in students decision making process on the continuous utilization of the SAKAI LMS. This is because studies carried out have indicated relationships between Performance Expectancy and Behavioral Intention to Use a particular technology (Prasad, Lalitha & Srikar, 2015; Rahman, Ghazali & Ismail, 2010).

Effort Expectancy (EE)

Often times, a system requiring less energy and effort in its operation will be preferred to by users irrespective of its counterpart. On this note, Effort Expectancy is seen as “the degree of ease associated with the use of the system” (Venkatesh et al., 2003, p.450). Just like the concept of Performance Expectancy explained earlier, three concepts were combined from other theories in coming up with Effort Expectancy. These three concepts

were perceived ease of use, complexity and ease of use. Originally, the term perceived ease of use was derived from the Technology Acceptance Model (Davis, 1989) relating to the awareness by individuals that the use of new technology will be easy. I propose that the continuous utilization of the SAKAI LMS by a graduate student will depend on the efforts (mental and physical) he or she puts into learning.

Secondly, the concept of complexity describes the degree to which users find innovation as less challenging and easy to use (Bennett & Bennett, 2003). The concept of complexity is similar to the ease-of-use concept, which is a construct of the Technology Acceptance Model.

As contended by Moghavvemi, Hakimian, Feissal & Faziharudean (2012), high complexity of technological innovation affect adaptation rate and usage of technology. Likewise, Dzogbenuku (2013) pointed out that inadequate technical infrastructure inhibits the use of technical innovation as it requires new skills, is time-consuming and perhaps becoming frustrating. Lee, Hsieh & Hsu (2011) argued that less complicated ideas are easy to learn as they get accepted faster than innovations requiring adopters to develop new skills and knowledge and that influence employees' intentions to use an electronic learning system. Lee et al. (2011) suggest that in promoting the intention to use technological innovation, designers of the software should pay attention to the innovative features and content of the system in making them easier to use by potential users. In relation to this, the complexity of features on the SAKAI LMS could be problematic if a graduate student has to put in extra effort learning how to use the system. Hence, if the use of an innovation requires learning, it may be adopted slowly.

Social Influence (SI)

Researchers have explored the concept of Social Influence in the Unified Theory of Acceptance and Technology use model. Social Influence is viewed as "the degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh et al., 2003, p.451). The concept of Social Influence comprises of *subjective norm, social factors* and *image.* Each of these three concepts mentioned looks at how our social environment influences the way we act as individuals.

The concept of the subjective norm was initially introduced in the Theory of Reasoned Action by Ajzen & Fishbein (1980). The concept was later used by Ajzen (1985) in his Theory of Planned Behavior and subsequently employed by Taylor & Todd (1995) in their C-TAM-TPB (combined Technology Acceptance Model and Theory of Planned Behavior). As an additional concept predicting individuals' decision towards a phenomenon, Venkatesh & Davis (2000) in their extension of the Technology Acceptance Model added subjective norm. This resulted in a new model named TAM2.

As an explanation, subjective norm refer to an individual's perception of how important others think they should act. In this study, the social pressure for a graduate student to use the SAKAI LMS is viewed as the subjective norm. In fact, subjective norm manifests during the preparatory stages of adaptation when people who intend to use new technology (SAKAI LMS) have limited direct experience with it. In this case, a graduate student with limited knowledge on the features the SAKAI LMS will search through the immediate social environment for information and assistance from people relevant to his or her studies. Nonetheless, studies in relation to subjective norms have produced mixed results. This is because studies conducted by Mathieson (1991) and Davis (1989) found no substantial effect of subjective norm on adaptation intention, although Taylor & Todd (1995) found a significant effect on adaptation intention.

The third concept, Image, was introduced by Rogers (2003) in his Diffusion of Innovations theory and could be understood as the perception that the use of a particular technology (SAKAI LMS) will upgrade an individual's (graduate student's) image or social status in his or her organization (University of Ghana). In line with this, an image (aesthetics) will give a graduate student confidence to use the SAKAI LMS due to its usefulness and value. As reported by Faaeq, Alqasa & Al-Matari (2015) in their study, employees were socially influenced by their peers' beliefs in using e-government services, while Fidani & Idrizi (2012) confirmed a strong significant relationship between Social Influence and students' decision to use the LMS. The current study highlights that Social Influence (course mates, friends and lecturers) possibly has a role to play in a graduate student's continuous utilization of the SAKAI LMS.

Facilitating Conditions (FC)

In present day university education, Facilitating Conditions are playing an increasingly significant role in the use of technology. Facilitating Conditions refer to the extent in which an individual believes that organizational and technical infrastructure exists to support the use of a particular technology. The explanation takes into account concepts such as Perceived Behavioral Control (Planned Behavior Theory and Decomposed Planned Behavior Theory), Facilitating Conditions (PC Utilization Model) and Adaptability (Innovation Diffusion Theory) (Davis 1989; Venkatesh et al., 2003). From this explanation, for a graduate student to effectively utilize the SAKAI LMS, all the needed e-learning resources must exist. Furthermore, certain factors such as institutional policy, training support and leadership may have a significant influence on an individual's decision to use a new system.

A report issued by Liu & Wang (2009) indicated that the rate of use, time spent on use and confidence in computer usage had an influence in the acceptance of e-learning by students

studying at a Swedish university. Additionally, Shahadat, Mahbub & Che (2012) in a study found that Facilitating Conditions such as lack of ICT equipment, inadequate technical support and lack of e-learning resources affected the integration of the LMS. The successful implementation of ICT requires the availability of resources such as computers, printers, multimedia projectors and scanners and many others, which most of the time are available in tertiary institutions. Additionally, system quality such as reliability, accessibility, functionality and response time (Pituch & Lee, 2006) coupled with information quality comprising of accuracy, relevance, timeliness, understandability and accessibility (Al-Busaidi & Al-Shini, 2010) could conceivably affect decisions. This is because as Lwoga (2014) found out, both system and information quality (Facilitating Conditions) were significant factors affecting individual's decision to use new technology. Based on these findings, one may expect that the same would be true among graduate students at the University of Ghana.

Behavioral Intention (BI)

In this study, Behavioral Intention (BI) refers to the likelihood that a graduate student would engage in an intended behavior. Using a quantitative method of research, Chen & Tseng (2012) explored the effects of Perceived Ease of Use, survey data collected through structural equation modelling (SEM). The outcomes revealed that Behavioral Intention had positive effects on the acceptance and use of e-learning. This confirmed the findings of Kallaya, Prasong & Kittima (2009) that Behavioral Intention positively correlated with online learning. Furthermore, Al-Harbi (2011) examining the factors serving as determinants in the acceptance of electronic learning in Saudi Arabian Universities found that Behavioral Intention to use was influenced by Facilitating Conditions.

2.2.1 Extension of the Unified Theory of Acceptance and Use of Technology

The Unified Theory of Acceptance and Use of Technology (UTAUT 2) Model developed by Venkatesh, Thong & Xu (2012) is an extension of the original Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh et al. (2003). Three additional constructs namely habit, hedonic motivation and price value were later added. Bakar, Razak & Abdullah (2013) explained habits as a form of repetitive action embarked on by people as a result of prior knowledge. Venkatesh & Davis (2000) further recognized habits as an alternative factor affecting an individual's decision and the usage of technology. In relation to this study, habits could be perceived as graduate students' frequent use of the SAKAI LMS which may be shaped by their knowledge, skills and experiences.

On the other hand, it could be argued that habitual behaviors could become an obstacle in graduate students' use of the LMS. Hence, a positive relationship may exist between a graduate student's habits, adaptation and continuous use of the SAKAI LMS. This may imply that the constant use and regular checking of various SAKAI LMS features (Forum tool, Chat room tool, Email tool and others) over an extended period of time may encourage graduate students to build a positive attitude towards the use of the platform that may later lead to their continuous use in the long run. Also, hedonic motivation relates to the fun or pleasure derived from using an innovation. In fact, this construct (hedonic motivation) has been observed to be a very significant determinant in technology adaptation (Nemet & Johnson, 2012).

In the context of this study, hedonic motivation may be regarded as the enjoyment derived by graduate students leading to the adaptation of the SAKAI LMS at the University of Ghana. Thus, hedonic motivation could be a predictor of graduate student's continuous use of the SAKAI LMS. As explained by Venkatesh et al. (2012) price value refers to a user's perceived benefits of using a particular technology and the monetary cost involved.

In relation to this, graduate students are not liable to pay any cost to use the SAKAI LMS at the University of Ghana. However, they are expected to devote quality time and effort in order to benefit from the platform and have to bear the cost in terms of owning a personal computer and purchase of internet credit to access the platform. Hence, a graduate student's attitudes and perception that the time and effort put into using the SAKAI LMS represents good value or positive value may have an impact on their continuous use.

The three additional constructs (hedonic motivation, habit and price value) have an effect on an individuals' decision to utilize a particular technology (Venkatesh et al., 2012). However, in this study, I was not interested in price value but on how constructs such as gender, age, hedonic motivation, habits, aesthetic and satisfaction lead to the continuous utilization of the SAKAI LMS by graduate students at the University of Ghana. This is because the novelty of the features on the SAKAI LMS may have been of key interest and satisfaction to different categories of graduate students (age and gender).

2.2.2 Empirical Studies Conducted on the Unified Theory of Acceptance and Use of Technology (UTAUT) Model.

Much of the debate within the utilization of the LMS literature has centered mainly on the question of whether the benefits of the LMS are universal in all higher educational institutions globally, or whether the effectiveness of the LMS is contingent upon other factors. In a study carried out by Ismail (2010) it was found out that Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions had a positive influence on university students' behavioral intention in using blogs as a learning tool and social networking sites respectively. In another study carried out in the United Kingdom and Jordan on internet banking on online usage behavior using the Unified Theory of Acceptance and Use of Technology (UTAUT) model, Al-Qeisi (2009) found that perception towards website quality had an influence on user behavioral intention. Social

influence, on the other hand, had no impact on behavioral intentions. Equally, Li & Kishore (2006) tested the key constructs in the Unified Theory of Acceptance and Use of Technology (UTAUT) model across several population subgroups and indicated that individuals with different experience and knowledge in computing and weblog had similar interpretations in relation to the Performance Expectancy and Effort Expectancy of the instruments (computers). Alternatively, Social Influence and Facilitating Conditions did not have any impact on users' behavioral intentions to use the instruments.

Again, Rahman et al. (2010) in their study on the usage of the Moodle LMS among post-graduate students at the University of Utara in Malaysia found out that Performance Expectancy had a positive influence on behavioral intention. Consequently, the outcome related to the moderator influence of gender revealed that all the four Unified Theory of Acceptance and Use of Technology (UTAUT) Model constructs (Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions) failed to reject the hypothesis stated that gender moderated the relationship between Performance Expectancy and Effort Expectancy. Again, the results showed that when gender was related to Performance Expectancy with Behavioral Intention to Use, a strong relationship was found among more males than female graduate students. This confirms the assertion that a person's exposure to and/or the use of technology may sometimes be affected by gender.

Correspondingly, Prasad et al. (2015) established in their study found Performance Expectancy had an influence on the acceptance and usage of ICT among secondary school teachers in India. About 78% of the teachers believed that the use of ICT increased their opportunity for a promotion at their workplace. The teachers also claimed that lack of internet connectivity and motivation affected their regular use of ICT. Furthermore, Chiu & Wang (2008) in a survey to understand the impact of web-based LMS on continuous Behavioral Intentions on 286 respondents, found that Performance Expectancy

significantly predicted behavioral intentions of continuously using a web-based LMS. However, anxiety was found to have a significant negative effect on the sample. Likewise, Lai, Yang, Chen, Ho & Chan (2007) on the influence of effort and Performance Expectancy on employees' use of e-government services at Oman found that Performance Expectancy had a significant influence on employees' intention to adopt e-government services. The findings by Lai et al. (2007) may possibly indicate that there will be the need to empower employees to respond to the e-services provided by their government. Alternatively, other studies carried out did have not supported the Unified Theory of Acceptance and Use of Technology (UTAUT) model. For instance, Marchewka & Kostiwa (2007) employing the Unified Theory of Acceptance and Use of Technology (UTAUT) model in describing university students' perceptions towards the use of the Blackboard LMS found that the results obtained from the data collected did not support the Unified Theory of Acceptance and Use of Technology (UTAUT) model. They realized that age and gender did not have any significant effect on Behavioral Intentions to use the Blackboard Learning Management System. From the studies reviewed so far, it is evident that the Unified Theory of Acceptance and Use of Technology (UTAUT) model provides a rich understanding of technology acceptance. A common assumption with this literature is that users of the LMS Behavioral Intention to use an information system are at least influenced by certain identifiable factors depending on the environment and nature of the subjects used.

Yet, few studies have actually been carried out to examine the behavioral intentions by university students towards the utilization of the LMS applying the Unified Theory of Acceptance and Use of Technology (UTAUT) model. Since the integration of LMSs in higher education is fairly new and particularly Ghanaian universities, it is very pivotal to research into the factors promoting the continuous utilization of the LMS in order to gain insights on graduate students' attitudes, knowledge on its features, motivation to use and

challenges encountered in informing policy makers, academicians and practitioners as they may be interested in understanding the main determinants of technology acceptance behavior. Consequently, in this study the focus was on four concepts of the Unified Theory of Acceptance and Use of Technology (UTAUT) model as earlier mentioned to investigate their role in influencing graduate students' decision leading to continuous use of the SAKAI LMS at the University of Ghana.

From the above discussions, a graduate student's adaptation and continuous use of the SAKAI LMS at the University of Ghana may be influenced by factors such as Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions among others. Based on the results of a review of the existing theories and then literature, a conceptual framework examining graduate student's continuous use and adaptation to the SAKAI LMS at the University of Ghana has been developed for this study. The next section explains the conceptual framework of this study.

2.3 Conceptual Framework for the Study

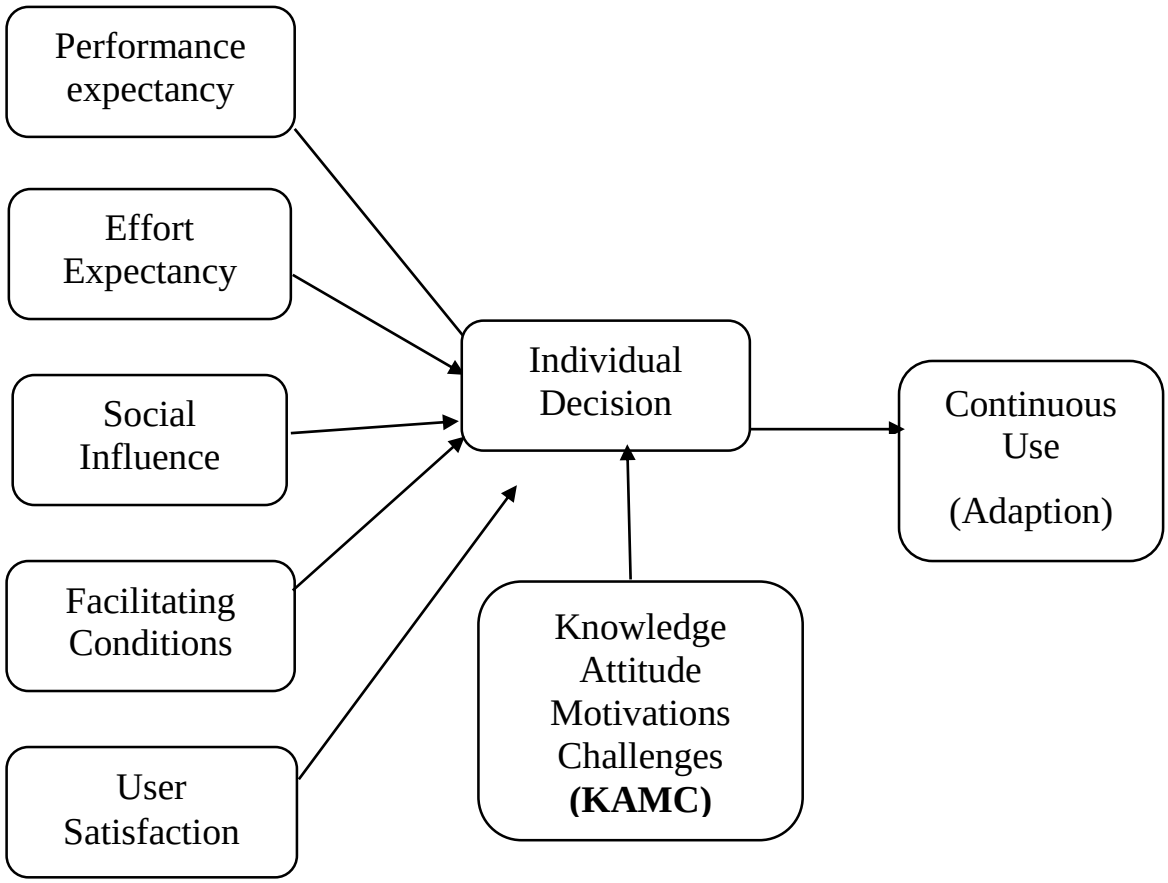
In the face of the colossal benefits of the LMS in higher education, it is evident from the available literature that technological expansions alone cannot guarantee its acceptance and continuous use among university students. As a result, it was imperative to appreciate the core reasons behind the continuous utilization of the SAKAI LMS particularly by graduate students at the University of Ghana. The proposed conceptual framework was based on the constructs of the Unified Theory of Acceptance and Use of Technology (UTAUT) such as Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions.

However, the framework has been modified to include factors and other variables that the original model did not have. I adapted the Unified Theory of Acceptance and Use of Technology (UTAUT) due to the fact that it contained all the elements needed in

addressing the objectives of the study. Again, it had been adapted for the purpose of making the entire study well-grounded and focused and to make it easy for the research questions of the study to be answered. In addition, the study examined the impact of these factors on a graduate student's continuous utilization of the SAKAI LMS at the University of Ghana. Figure 2.2, illustrates the proposed conceptual framework of the study.

Figure 2.2: Proposed Conceptual Framework

Factors Promoting the Continuous Utilization of the SAKAI LMS



Author's Construction: Framework for Continuous Utilization (Adaptation) of the SAKAI Learning Management System.

As illustrated in Figure 2.2, the proposed conceptual framework assumes that Performance Expectancy, Effort Expectancy, social influence, Facilitating Conditions and User Satisfaction will have an influence on individual decision to use the SAKAI LMS continuously. It could be seen that the variables in the conceptual framework (Performance

Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions) were from the Unified Theory of Acceptance and Use of Technology (UTAUT) model. Drawing from empirical literature on these constructs, the proposed conceptual framework dug into these factors and hypothesized that if the continuous utilization of a new innovation (SAKAI LMS) can help a graduate student to be productive (increase performance) in their academic work, satisfy their needs, submit and do most of their assignments with ease online, then, it is likely to be used continuously. Again, the conceptual framework assumes that the knowledge of the features on the SAKAI LMS, the attitudes and motivations of graduate students to use the SAKAI LMS for their academic work coupled with the challenges they encountered would jointly have an influence on their decision to use the SAKAI LMS which leads to continuous use. Research hypotheses developed within the conceptual framework of the study are as follows (earlier stated in Chapter One):

- HI: Performance Expectancy will have no effect on individual decision to Use SAKAI LMS.
- H2: Effort Expectancy will have no effect on individual decision to Use SAKAI LMS.
- H3: Social Influence will have no effect on individual decision to Use SAKAI LMS.
- H4: Facilitating Conditions will have no effect on individual decision to Use SAKAI LMS.
- H5: User Satisfaction will have no effect on individual decision to Use SAKAI LMS.
- H6: Individual decision will have no effect on continuous use of the SAKAI LMS.

2.4 The Concept of Electronic Learning (E-Learning)

Over the years, there have been extensive discussions about a common definition of the term Electronic Learning (e-learning). Prevailing definitions according to Dublin (2003) tend to reveal the specialization and interest of the scholars. For instance, Clark & Mayer

(2003, p.8) defined e-learning as an "instruction delivered on a digital device such as a computer or mobile device that is intended to support learning", while Hogan & Kedrayate (2010) saw e-learning as a form of blended learning combining online and face-to-face classroom teaching.

In the same way, Gotschall (2000) and Hall (2002) explained e-learning as a technologically- based form of distance education. From a bigger outlook, Abbad, Morris, & de Nahlik (2009) describes e-learning as a form of teaching and learning electronically facilitated. In a narrow perspective, Keller & Cernerud (2002) put across that e-learning is internet based and could either take the form of distributed learning, online distance learning or hybrid form of learning. Likewise, Twigg (2002) labelled e-learning approach as being centered on the learner, involving a system that is collaborating, repetitive, self-paced and customizable. Additionally, Pan & Jang (2008) explained e-learning as the use of computer software and laptops in providing information to people using the internet. Furthermore, Tagoe (2012, p.1) contended that "E-learning is a type of learning supported by information and communication technology (ICT) via the internet, intranets, extranets or many others to improve the quality of teaching and learning". This shows that e-learning uses a varied set of ICT technology-based equipment and processes.

Also, Ansong (2015, p.16) explained e-learning as a "complexity of elements which makes researchers and practitioners suggest different definitions with respect to the technologies involved, their extent of integration into learning processes and how learning occurs among participants in terms of time". Moreover, Kocur & Kosc (2009) defined e-learning as the use of the internet to access learning content and resources, interacting with instructors and other students, in order to gain knowledge. From the above definitions cited, I defined e-learning as the utilization of technology to enhance and/or support

learning and teaching in tertiary education to foster lifelong learning and to adequately prepare university students for their future professional careers.

It can therefore be established from the above that it is difficult to get a commonly accepted explanation/definition for e-learning as some scholars have defined the term as the provision of online courses only whiles others view it as a form of blended learning. In spite of the confusion within the literature regarding the definition of e-learning, it is possible to state some general conclusions regarding the field in higher education. In the current study, it is believed that e-learning may enable university students to overcome certain academic barriers connected with time, space or geographical location. Hence, e-learning gives a graduate student the opportunity to study from the University of Ghana without necessarily being personally present, as learning takes place electronically.

2.4.1 Categories of Electronic Learning

The technological revolution in education is one reality with which higher educational institutions must constantly cope in order to survive. The emergence of educational technological change is perhaps one of the most critical aspects of effective e-learning administration in university education. Based on the literature, e-learning can be classified into three main types namely: fully-online, hybrid/blended and web-assisted (Anastasiades & Retalis, 2001).

As explained by Wright & Li (2011) in a fully online learning atmosphere, there is no face to face interaction between learners and instructors/lecturers. Teaching and learning take place primarily through using the internet and technologies. In brief, teaching materials, submission of assignments and learning are all carried out online. This form of e-learning may facilitate self-directed learning among students. This is because students can acquire

knowledge and skills needed by themselves as they determine when, where and when to learn, hence satisfying their needs.

Blended learning combines face-to-face teaching and learning interaction with fully online learning. With this type of e-learning, certain parts of teaching and learning are done online, whiles some aspects are done face to face. For instance, submission of assignments and presentations may be done online whereas teaching and examinations are done on a face-to-face interaction meeting. Based on the predictions made by Allen & Seaman (2003) blended/hybrid learning has caused a paradigm shift in higher education as majority of education institutions have successfully combined online teaching with face to face classroom instructions. The web-assisted mode of e-learning operates in the same fashion just like fully-online learning. Online discussions and interactions between students and instructors/lecturers take place in this mode of e-learning.

Davis & Coulon (2007) contend that blended/hybrid learning is better compared to the others as it combines both fully-online learning/web-assisted learning and face-to-face interaction. It could be argued further that irrespective of the type of e-learning adapted by a higher educational institution, e-learning provides a supporting virtual environment to students as they could learn independently in any time and place. However, it is very imperative for a graduate student to have the capacity to adapt quickly in order to survive in the e-learning atmosphere.

2.4.2 Forms of Electronic Learning

To a certain extent, all educational institutions exist in a digitally changing environment and as a result, are faced with highly dynamic and ever more complex e-learning environments. Hence, any tertiary education institution that ignores the integration of e-learning may do so at its own risk. Therefore, an educational institution must adopt

strategies that realistically reflect their ability to utilize multiple e-learning resources. As explained earlier, e-learning provides innovation and utilization of technology as support to instruction for university students and lecturers. Literally, the two most popular types of electronic learning are **synchronous** and **asynchronous** online learning. As a matter of fact, these two forms are the modern-day e-learning categories. As explained by Kalpana (2010) synchronous is a form of e-learning that could be accessed at the same time by two or more people at different locations while asynchronous learning creates a virtual classroom atmosphere where communication takes place electronically at different times.

In the context of this study, graduate students associating themselves with synchronous e-learning can easily interact with their lecturers and colleagues during the course at the same time. Synchronous e-learning enables communication at a specific time at different locations using the Chat room or Forum features on the SAKAI LMS. As identified by Obasa (2010), a major drawback of this form of e-learning is that it requires that individuals must be online at the same time irrespective of their locations. On that account, to overcome this challenge, a graduate student must be able to familiarize him/herself with differences in time zones and locations for effective communication.

According to Horton (2006) asynchronous e-learning allows instructors and learners to be online at different times, or proceed in an entirely self-paced mode with no instructors present. In this case, a graduate student could complete a course at his or her own convenient time with the support of the internet. This kind of e-learning is also known as self-paced learning, or pause and resume learning as online interaction takes place at a later time with the use of tools such as the email. A disadvantage with this form of e-learning is that a graduate student will not be able to receive instant feedback from lecturers as well as colleagues. Fortunately, most online learning these days are mediated by LMSs which are standardized with both synchronous and asynchronous communication tools.

Based on this assertion, irrespective of the location and time, a graduate student can have online access to information and communicate effectively on the SAKAI LMS.

2.4.3 The Rise of Electronic Learning in Higher Education

In order to survive and grow in the 21st century, educational institutions are increasingly making their presence felt globally. The case of educational technology highlights this concept. Since the appearance of digital technologies and the internet, traditional methods of teaching referred as "chalk and talk", involving teachers (lecturers) standing at the front of class, writing on a blackboard and explaining concepts to students in the classroom (lecture room) has gradually changed into a new method termed as Electronic Learning (e-learning). E-learning has gradually transformed education at all levels from Kindergarten to tertiary.

The advent of e-learning in higher education has led to remarkable developments in the field of education in general as a result of its numerous benefits. Historically, the term e-learning was coined in the mid-1990s. During this time, the spread of the internet was great across the world. The emergence of e-learning was to provide a learning platform for students where they could access their educational resources and learning materials conveniently.

While technology in education offers brilliant opportunities, it appears there is little research currently being directed towards its integration in university education particularly in Sub-Saharan Africa. At this point, it would be interesting to state that various governments in African countries have progressively shown interests in the utilization of e-learning in an attempt to widen student involvement in higher education (Namisiko, Munialo & Nyongesa, 2014). This was evident from the study by Gakio (2006) who found out that 47% of 54 tertiary institutions from 27 African countries have

installed educational technologies in their campuses. In a similar study, Isaacs & Hollow (2012) also disclosed that 52% of 447 universities in Africa were using e-learning systems as at the year 2012. The interest in e-learning may be attributed to the availability of web 2.0 technologies and Free Open Source Software (FOSS) (Namisiko et al., 2014). The authors further assert that web 2.0 technologies have diversified the needs of contemporary learners and widen the participation of education to include: RSS, Wikis, Tagging, Blogs and Podcasts. Free and open-source software such as Moodle, Dokeos, and Caroline have facilitated e-learning in universities in African countries. The integration of e-learning into higher education educational curricula has exposed university students to several digital and multimedia technologies thereby enriching their teaching and learning experience.

Thus, instructors could use diverse technological tools such as the internet, intranet, extranet, satellite broadcast, audio/video tape, interactive TV, CD–ROM, computers, laptops and many others in the classroom (Sorebo, Halvari, Gulli & Kristiansen, 2009).

With these electronic gadgets, a university student may have the opportunity of choosing the time to learn. As predicted by Adeoye & Wentling (2007) e-learning will move into a variety of networks such as wireless, satellites and cellular phones. The arrival of e-learning (SAKAI LMS) in higher education is not just a paradigm shift in teaching and learning methods but can enhance a university student's (graduate student) experience on campus as it could be tailored to the classroom. In summary, the growth of e-learning has resulted in the integration of LMSs into the routine practices of universities and at the same time, given distance education a new appeal.

2.4.4 Benefits of E-learning in Higher Education

In recent times, the use of e-learning resources in higher education has become an imperative source of innovation and improvement of competence for many sectors across

the world. In the education sector, particularly, the application of e-learning has become a critical part of the learning process for university students both outside and inside the classroom. To begin with, e-learning facilitates the use of multimedia and digital technology tools as part of their learning exercises, enabling students to efficiently apply concepts to their everyday lives. Also, e-learning allows animation to be used in the demonstration of concepts and topics that are difficult to describe in a traditional classroom setup. This advantage helps to ease the flow of communication and understanding of challenging ideas and issues which might not have been easily understood by students (Smart & Cappel, 2006).

Again, it offers students convenience and flexibility in completing their course materials when and where they wish. Thus, the student can learn effectively from any part of the world, without having to be in the classroom environment. This confirms the assertion made by Arasteh, Pirahesh, Zakeri & Arasteh (2014) that e-learning allows students to take courses from home or anywhere they have access to internet connectivity. In Ghana, the traditional face-to-face (F2F) education which usually occurs in a classroom in which a teacher/tutor/instructor/lecturer imparts educational knowledge to students in an interactive manner has been the norm.

E-learning has been identified to help workers or working people who want to attain higher education but cannot opt for residential tertiary education for one reason or the other. Asabere & Enguah (2012) recommended that every tertiary institution in Ghana should make e-learning part of its structure, so as to facilitate and speed up the development of education in the country as a whole.

2.4.5 Challenges of E-learning in Higher Education

Over the past years, higher learning institutions and other education stakeholders have invested millions of dollars and resources in implementing e-learning in their educational programmes in an attempt to bridge the digital divide prevailing in teaching and learning worldwide (Odunaike, Olugbara & Ojo, 2013). However, in spite of all these e-learning projects, universities in Africa lack action plans and specific budgets for their effective e-learning implementation. On the other hand, universities that have fully integrated e-learning into their curriculum have had great transformation and improvement in teaching, learning, research and development. Through an array of learning resource channels, universities of today are better positioned in meeting a variety of their students' learning needs and styles.

Although institutions of higher learning and a significant number of universities worldwide have invested heavily to furnish their campuses with e-learning facilities due to its convenience, flexibility and low cost (Esterhuyse & Scholtz, 2015) it presents certain challenges as well. First of all, the asynchronous type of e-learning is not effective for online technical training programmes such as information technology subjects. This is due to the fact that because asynchronous learning does not enable face-to-face interaction with an instructor/lecturer, it also does not permit practical demonstrations on what has been learnt. Secondly, students/learners are often isolated as they may study alone (fully-online).

A report issued by Venter, van Rensburg & Davis (2012) on adaptation to the Learning Management System in twenty five (25) African universities indicated that the majority of undergraduate students in these universities had little knowledge and interest in the use of the LMS for the reason that they lacked adequate computer skills and ICT technical support, hence affecting continuous utilization. The report of Venter et al. (2012) confirms

the findings of a research carried out by Chitanana, Makaza & Madzima (2008) on the state of LMS utilization in certain universities in Zimbabwe. In the study, the researchers found that among the numerous reasons accounting for the low utilization of the LMS in Zimbabwean universities was poor computer skills among the university undergraduate students. A critical look at the outcome of this study coupled with the report issued suggests that university students perhaps struggle with lack of computer skills when using new technological innovations on their campuses. Notwithstanding, the potential benefits of continuous utilization of the LMS in the academic life of university students cannot be overlooked. In another study assessing the awareness and experiences of undergraduate distance education students' utilization of the SAKAI LMS at the University of Danubius, Nuta & Pusca (2017) found that 56% of the respondents lacked computer skills coupled with limited knowledge on its significant features. However, 22% of the respondents had enough computer skills and were able to effectively communicate with their lecturers using the SAKAI LMS.

In a recent study carried out by Darko-Adjei (2018) as already stated, it was revealed that that the students used the SAKAI LMS once in a while as they had to battle with inadequate computer skills. From the study, it was discovered that 133 (58%) of the respondents had no knowledge of using a computer with only 47 (20.4%) having had adequate computer skills. This is serious considering the fact that LMS requires adequate knowledge of computer skills, hence non-usage by the students.

Similar to that of Darko-Adjei (2018), Uziak, Oladiran, Lorencowicz & Becker's (2018) study on 503 undergraduate students' utilization of the Blackboard LMS in an engineering course at the University of Botswana found that majority of students lacked computer skills and as a result did not regularly use the platform as expected from them. From the data analysis, it was reported that 44.5 % of respondents had never used computers before.

In spite of the difficulties university students faced in the continuous utilization of the LMS, it has been pointed out by Lin, Chan & Jin (2004) as being is user-friendly and easy to use. This is because, the same study carried out by Uziak et al. (2018) found quite a number (25%) regarding the blackboard as helpful and perceived it as easy to use in their studies. Similar results were found by Dube & Scott (2014) in investigating the utilization of the SAKAI LMS by undergraduate students at the National University of Science and Technology in Zimbabwe where 77.3% lecturers lacked computer skills. This finding inevitably lead to low utilization of the platform affecting the students' continuous use the SAKAI LMS. Salawudeen (2010) in Nigeria reported that majority of undergraduate students lacked computer skills affecting the adaptation to e-learning. Tagoe (2012) found female undergraduate students lacking computer skills. From the above studies reviewed, a lot of university undergraduate students do not utilize the LMS to its fullest potential and benefits as a result of inadequate computer skills. As such, lack of adequate computer skills could possibly affect the adaptation and continuous utilization of the SAKAI LMS by graduate students.

In comparing the various communication tools (whiteboard/video services, discussion Forums, file exchange/internal mail, online journal mail, and real live chat) on the SAKAI LMS, Cavus & Zabadi (2014) in a study concluded that the features on the SAKAI LMS were perceived to be very complicated and difficult to use by both undergraduate students and lecturers due to poor knowledge of them and lack of computer skills. This meant that both university lecturers and their students require adequate training on the use of e-learning resources.

One of the major problems facing the continuous utilization of the LMS in many higher educational institutions particularly in Sub-Saharan Africa has been poor infrastructure coupled with irregular and unstable electrical power needed to operate ICT devices

(Whelan & Bhartu, 2007). Christie & Garotte Jurado (2007) have contended that a lot of universities may lack adequate ICT infrastructures as a result of the high cost involved in purchasing ICT devices. Thus, universities trying to integrate a Learning Management System into their teaching and learning methods may incur extra cost in setting up an ICT infrastructure. In finding out the level of acceptance of the MOODLE LMS among 870 undergraduate students at the University of Professional Studies, Accra Asampana, Akanferi & Ami-Narh (2017) found that poor ICT infrastructure affected the students' complete acceptance of the Moodle LMS in their academic work. This is exactly so in many African countries, where infrastructural development is the sole responsibility of its governments and the low students' fee regime controlled by governments.

In recent times, there have been institutional provision of computers through computer laboratories. But, then these computer laboratories do not operate for 24 hours in a day. So, there is the need for students to own their personal computers. In a study conducted by Salawudeen (2010) it was found that acquiring personal computers and laptops was a burden to undergraduate students in Nigeria due to the cost involved. The outcome of the study again indicated that students who could afford a laptop or personal computer were not using them for online activities as it was expensive.

The lack of a good broadband internet connectivity could affect the continuous utilization of the SAKAI LMS. In a report issued by the World Bank (2008) it was noted that one of the key challenges faced by higher educational institutions in Sub-Sarahan Africa in the integration of e-learning resources were issues to do with poor internet connectivity and accessibility. Darko-Adjei (2018) delving into the challenges faced by undergraduate Distance education students at the University of Ghana in using the SAKAI LMS, found that poor internet connectivity robbed the students of enjoying the full benefits the SAKAI LMS. The majority of the students had difficulties downloading reading materials,

communicating with their friends, colleagues and others on the platform due to bad internet accessibility.

Similarly, Mtebe & Raisamo (2014) investigating perceived barriers in the utilization of open educational resources in higher education in Tanzania, collected empirical data through semi-structured interviews from a random sample of 92 instructors. The outcome of the study revealed that lack of access to the internet coupled with low internet bandwidth affected the effective utilization of the SAKAI Learning Management System by the instructors. Again, Hedberg & Ping (2004) focusing on the problems of using open source LMS in China, found that majority of Chinese universities had insufficient bandwidth in their lecture halls making it impossible for students to easily access the internet. In this case, the majority of students did not utilize the LMS as due to poor internet connectivity. Thus, university students' reluctance towards e-learning is contributed by of poor internet access and connectivity.

On the contrary, in the United Kingdom, Sclater's (2008) study at the Open University found sufficient internet service routers in classrooms, lecture halls and students could easily access the internet making the use of e-learning platforms less stressful. Based on this assertion, good internet connectivity and accessibility is essential for the continuous utilization of the SAKAI LMS.

2.5 Learning Management System (LMS)

In the field of education, Information and Communication Technology (ICT) can be understood as the application of digital tools and computer software to all dimensions of teaching and learning. By this definition, ICT encompasses equipment and resources such as laptops, computers and their accessories, software, communication equipment, televisions, LCD projectors, digital cameras, scanners and other audio and video

equipment. By reason of the rapid expansion and innovation of Internet technologies, e-learning environments today have become dependent on Learning Management Systems LMSs (LMSs) or Course Management Systems (CMSs). This new pattern has become a critical factor in the mission and vision of several institutions of higher learning, which comprises divulging best education to their students, spreading the learning process outside the classroom environment, cultivating measurable student learning accomplishment, drawing brilliant students to the institute and improving its overall reputation (Coates, 2005).

It appears that LMSs are at the edge of becoming a new teaching and learning paradigm as a lot of higher educational institutions all over the world have embraced it. Theoretically, an LMS is a platform that supports numerous aspects of the educational methods, from administrative roles to course delivery, management and assessment. Schar & Krueger (2000) have argued that an LMS must be capable of handling several delivery styles and assist the process of student admissions, registration, records, academic transcripts generation, schedules and reports. The most commended function of the LMS for an academic environment has been course content management, evaluation and communication. From this, LMSs could be said to be at the forefront of online teaching and learning making, a significant impact in higher education. It is however not a surprise that LMS continues to be used in many higher education institutions worldwide. To enumerate, LMS is computer software used to deliver and manage educational content and materials focused on delivering courses.

Given these points, Morris (2004) argues that since educational institutions are facing growing enrolments and greater demands for online courses, the utilization of an LMS becomes indispensable. In effect, it provides an avenue for learning and teaching within an integrated virtual environment. It is, therefore, not a new revelation that in this day and

age, LMS has become a major attention of interest in the educational field; especially in universities and colleges. In his conclusion, Sallum (2008) posited that LMS has a high solution package that allows for the effective administration of e-resources to all students and lecturers.

With the LMS, educational institutions are able to offer either a fully online learning program, blended/hybrid or web-enhanced courses. From the literature, names such as Course Management Systems (CMS) and Virtual Learning Environment (VLE) have been associated with the LMS. As a computer programme, the LMS helps instructors/lectures to manage students' academic courses, upload reading/lecture materials, conduct online academic quizzes, communicate with students online and assess their performance. Again, the LMS enables the management and delivery of online content to students.

Dougiamas & Taylor (2003) strongly contend that with the LMS university lecturers can also plan, implement, and assess specific learning processes and outcomes of their students. Although different e-learning systems may have different functions, common features of the LMS include calendars, discussion boards and assessment instruments. In spite of these wonderful features, the LMS is not only limited to the online teaching and learning environment but also could be used in the hybrid/blended environment.

2.5.1 Benefits of LMS

Despite all the challenges in e-learning, it has a lot of potential benefits that higher educational institutions could tap from. As educational institutions increase the number of online courses, there will be a need for students to effectively learn the LMS. Consequently, understanding the prospective benefits of adapting to the LMS is important to education (Mullinix & McCurry, 2003). Researchers over the years have argued that

infusing e-learning resources, such as an LMS, may assist lecturers/instructor with the management of academic courses and organization of its contents.

For example, Frazee's (2003) and Edelstein & Edwards (2002) in their opinion were of the view that students are less confident in asking a question in a face-to-face classroom atmosphere compared to online discussions on the LMS where they felt confident participating and asking questions in a non-threatening environment. For victory to be won in the continuous utilization of the LMS, students' active online participation is needed. All things considered, the LMS support lecturers incorporating multimedia features such as audio recordings, music, video, text, interactivity, and sequencing into their teaching. Centered on the benefits outlined in the literature, it will be profitable for graduate students at the University of Ghana faculty to adopt the LMS in their various degree programmes.

2.6 The SAKAI LMS

SAKAI LMS is a free, public source, educational computer platform designed to enhance teaching, learning, research and collaboration in either fully or partially online environments. The SAKAI LMS was developed by a community of academic organizations, commercial institution and individuals. It has been distributed under the Educational Community License (a type of open source license) from the time of its development. SAKAI LMS is being used by a lot of academic institutions, largely in the United States of America, but also in Asia, Australia, Europe and Africa (Web.archive.org, 2019).The platform was designed to be accessible and reliable and has over 100,000 online users (Berg & Dolphin, 2011).

In December 2012, the SAKAI Foundation merged with Jasig to form the Apereo Foundation, which took over stewardship of SAKAI development (Apereo.org, 2019). In an effort to enhance SAKAI’s user experience and to make the platform more efficient,

developers of the system have implemented a program to create a code termed DRY (don't repeat yourself) (En.wikipedia.org, 2019). With this code, faculty and users could adopt and use the SAKAI LMS.

The SAKAI LMS for 2019 was released on Thursday, March 21 2019, to support teaching and learning. Most remarkable in this release is the built-in, flexible grading rubrics. In line with this, faculty members can easily create rubrics for use in Assignments, Tests & Quizzes, Forum and the Grade book. Further improvements to the rubrics have been planned to be for released in 2020. Within the next three years, the SAKAI LMS seeks to increase faculty flexibility and enable greater learning outcomes for users (Hodges, 2019).

2.7 Commentary on the Features of the SAKAI LMS

Although earlier research have shown that the use of the LMS is increasing in higher educational institutions, majority of university students only use a few features on the system as a result of lack of awareness/knowledge of about them (Dutton, Cheong & Park, 2004; Gaba & Sethy, 2010). From accessible literature, there is strong evidence to suggest that most university students, only use a few features on the SAKAI LMS out of its numerous features. Some features of the SAKAI LMS have been discussed below.

Forum tool: A Forum can be described as a grouping for topics. For example, interesting topics may be created within Forums, where a student could post a comment. Lecturers/instructors could assign points to students' contributions and interactions. Forums and topics could be released according to specified dates and instructors/lecturers could choose to moderate messages posted to topics. With the Forum, a graduate student can read his/her course mates' posts/comments from the SAKAI LMS. Additionally, the Forum tool allows for the creation of private and public groups and discussions of topics.

Using the Forum tool, lecturers/instructors could create a limitless number of discussion Forums for graduate students.

Gradebook tool: Gradebook tool helps lecturers/ instructors to calculate and store the grades of their students. With this tool, lecturers/instructors can grade assignments or examination taken by students. The Gradebook tool allows a graduate student to view the scores for all their marked assignments and class exercises. Using Gradebook, lecturers could define their course grades based on a 100% scale for their students on the SAKAI LMS.

Lessons tool: The Lessons tool helps a lecturer/instructor to organize e-learning resources and activities on a single page on the system. For instance, with the Lessons tool, a lecturer at the University of Ghana can organize his/her course by units, modules, weeks, topics, or any other groupings. Every lesson page could be personalized to suit the needs of a particular topic. As an example, a graduate student could be instructed to click on the Lessons Page Title (e.g. Unit 3) in the Tool Menu to display the page by an instructor on the SAKAI LMS.

Test and quizzes tool: Tests and quizzes online can be done with the tests and quizzes tool on the SAKAI LMS. This tool allows lecturers and instructors to conduct their interim assessments (IA), quizzes and end of semester examinations. It usually takes the form of "fill in" and multiple choice questions, thus preventing students from cheating as a result of the randomization of exam questions. Additionally, the tests & quizzes tool offers many background features that could allow lecturers to control the layout, delivery, grading and assessment of their students. For instance, student assessments which have passed the due date will continue to appear in the list with the due date/time shown. However, assessments which are not available do not show up in the Take an Assessment list.

Syllabus tool: The Syllabus tool is the place where a lecturer could post a Syllabus for students' accessibility. The lecturer or instructor could add a document (ie, .pdf, .docx) as an attachment to the Syllabus tool. With this tool, a graduate student may download, open, and print a needed file at his or her convenience. In editing an already posted Syllabus on this tool, the lecturer/instructor edits the original document on their laptop or computer, removes the attachment and replaces it with the newly edited document. Again, lecturers or instructors could create a webpage Syllabus using the rich text editor in the Syllabus tool. In this regard, a Lecturer/Instructor could copy and paste the text into the rich text editor in an attempt to create a webpage version of the file. For instance, a graduate student may read the document in the Syllabus tool, later press on the print button to print the Syllabus. Instructors/Lecturers can also create a multi-part Syllabus by adding one Syllabus item at a time. When this happens, the lecturer/instructor is able to re-order or remove individual items from the Syllabus tool. As a result, if a lecturer wants to organize the Syllabus by weeks, the Syllabus tool is a good option to use. Again, if a lecturer has a Syllabus posted on a webpage, the lecturer may direct the Syllabus tool to that Syllabus. On the whole, the Syllabus tool on the SAKAI LMS helps lecturers and instructors to post their Syllabus and course outlines for their students.

Chat room tool: The Chat room is the real-time text-only Chat room tool within the SAKAI LMS. The Chat room tool can be used for synchronous, facilitates conversations among students and lecturers who may have logged unto the site at the same time. Only students registered in the same site may chat using the Chat room. For example, a lecturer may create an "online office hours" Chat room for graduate student questions and answers. Additionally, Chat rooms for graduate student groups can also be set up as a space for collaboration with graduate students in order departments. The Chat room tool may alert a graduate student to another graduate student who has entered the same Chat room. When

this happens, the graduate student knows who is available to chat online. However, a limitation of the Chat room tool is that it does not allow a student to chat privately. Consequently, all chat messages are visible to every student inside the Chat room.

Resources tool: The Resources tool allows lecturers/instructors and students to share various files with their students. Lecturers/Instructors can upload files (for instance, word processing documents, slide presentations, audio and videos), as well as create and post HTML (web) pages. Likewise, Instructors/Lecturers could organize their files into folders making it easier for their students to locate and access them. A lecturer using this tool can automatically notify a graduate student by an email that an item such as a reading material has been added to resources. On the other hand, students may also have resources within their personal My Workspace area. In short, this tool helps lecturers to upload multiple files unto the SAKAI LMS.

Announcement tool: The Announcements tool allows for the distribution of messages to an entire group (graduate students) on the SAKAI LMS. A graduate student using the tool will see announcement messages displayed in the announcements area of their "My Workspace" tab. On the SAKAI LMS, messages can be made to show instantaneously, or at specific dates of interest.

Calendar tool: The Calendar tool allows instructors/lecturers to post events in a calendar format on the SAKAI LMS. The calendar has a day, week, month and year. The calendar can be used in posting important dates in the semester, such as start and end dates. With this tool, a graduate student could check dates for assignments submission including deadlines.

Dropbox tool: This tool facilitates the creation of separate folders for each student in a particular course of study. In this case, graduate students are able to access their own

folders. Students and Lecturers can both place files in the Dropbox folder on the SAKAI LMS.

Email tool: The Email tool allows a graduate student to send an email message to other course mates and lecturers. The tool operates by using a student's external email address, which often times is specified in the account details. Characteristically, the email address is the student's institutional email. For instance, jodame003@st.ug.edu.gh.

Assignment tool: The assignments tool enables instructors/lecturers to give, distribute, take and grade students' assignments online. Student's assignments are typically private as they are not visible to other students on the SAKAI LMS. Nevertheless, the instructor/lecturer has the option to permit peer assessment of assignments if desired. Depending on the preference of the lecturer/instructor, student assignments may be submitted through the file upload or the rich text. With this tool, a graduate student is able to upload and submit assignments to their lecturers and receive feedback from them.

Turnitin tool: This tool helps students to measure the plagiarism index of their research work or article. In 2014, the University of Ghana fused the Turnitin into the SAKAI LMS to check for the plagiarism index of assignments and project works submitted by students (Ansong, 2015).

2.8 Level of Knowledge on the Features of the SAKAI LMS

As the saying goes ''*the more knowledgeable a person is, the more powerful he/she may become''.* Based on this saying, it is very necessary for a university student to have enough knowledge about modern educational technologies such as the LMS. This is because the continuous utilization of these technologies could have a positive impact on their academic life and professional development. In agreement with Nugent (2013) individuals having

adequate knowledge and ability on the use of digital technologies tend to develop positive attitudes towards e-learning. This statement may imply that a graduate student with adequate knowledge about a phenomenon would have a sympathetic feeling (positive attitude) towards it. In this study, I explained ‘‘*knowledge of SAKAI*’’ as a graduate student's familiarity with features of the platform such as the Forum, Gradebook, Lessons tool and others. One of the ways by which a graduate student could benefit from the use of the SAKAI LMS is perhaps by possessing adequate knowledge of its features. Hence, the lack of knowledge of the features of the SAKAI LMS may affect its continuous use by graduate students.

In a study conducted at the Faculty of Communication and Information Science at the National University of Science and Technology by Choga (2015) on the utilization of the SAKAI LMS by fifty-one (51) undergraduate students, it was found that all the respondents had good knowledge of the features of the SAKAI LMS and had at least used the system once in their studies. The findings of the study confirm the assertion made earlier by Mtebe (2015) that knowledge of an information system could affect its continual usage. On the other hand, Dube & Scott (2014) carried out a study to understand the various factors influencing the utilization of the SAKAI LMS by seventy (70) faculty members at the National University of Science and Technology (NUST), Zimbabwe. The objective of the study was to establish the reasons for using the SAKAI platform and again if the use of the LMS was affected by the level of knowledge on its features. The results of the study indicated that the lack of knowledge of the SAKAI LMS influenced its usage, and only 50% of faculty members were knowledgeable about its features.

The findings from this research reveals that faculty members do not use the LMS for teaching mainly due to lack of knowledge of the system, thus confirming the assertion

made by De Smet, Bourgonjon, De Wever, Schellens & Valcke (2012, p. 690) that "users need to acquire a basic factual knowledge level about technology before they are able to move on." This possibly provides useful information to management of universities on the need to train faculty members and students on the LMS and its features in general. However, further studies needed to be carried out to understand the reasons why faculty members have a low level of knowledge on the features of the e-learning platform despite its benefits to their teaching.

In a similar study, Bhalalusesa, Lukwaro & Clemence (2013) wanted to find out the challenges faced by faculty members in using an e-LMSs at the Open University of Tanzania (OUT). Based on the general hypothesis stated on the use of Information Systems, various methodologies were used to find out the factors that lead to the ineffective use of the ELMS at OUT. The outcome of the study showed that 27% of the faculty members lacked knowledge of the features of the ELMS. The findings indicate that educational institutions have an essential role to play in making sure that faculty members and students utilize e-LMS. Faculty members could be motivated to use the ELMS through the provision of incentives for various e-learning activities comprising developing e-learning contents. In identifying strategies of enabling learners in developing countries to fully utilize the LMSs (LMSs), Ssekakubo, Marsden & Suleman (2011) conducted a study using an online survey of a total of 144 students from two African universities. The findings of the survey indicated that the majority of the students had a good knowledge of certain features such as the Assignment tool, Forum tool and Chat room tool.

This implies that perhaps the most frequently used LMS function was the uploading of course resources, course outlines and chatting with friends and lecturers. From the findings, it appears that lecturers usually prepare their learning material and upload it on

the LMS. Ssekakubo et al. (2011) believe that the lack of knowledge on the features of the LMS could be attributed to the fact that many LMS initiatives are normally announced from top to bottom. These kinds of initiatives face more resistance than initiatives started by departments or small units within the institution. As a result, an institution of higher education should not only organise training on the features of the LMS but also create awareness of its advantages in teaching and learning.

In the introduction of e-learning systems, a lot of universities perhaps do not involve students in the decision-making process. This may contribute to the low level of knowledge on the features and could affect continuous utilization by students. As a result, students' opinions and perceptions towards the integration of an LMS should be taken into consideration in tertiary institutions.

In another study carried out by Juhary (2014, p.32) the majority of the respondents reported about lack of knowledge and awareness concerning the features of the SAKAI LMS. Some of the respondents suggested that "more awareness and knowledge creation about the SAKAI LMS needed to be done before more users can utilize the system to its full potential". Furthermore, in exploring the experiences of Canadian and intenational students concerning the adoption of the SAKAI LMS, Arhinful (2016) found out that students were not utilizing the SAKAI LMS partly because they were not aware of the features. From the above studies reviewed, it could be said that if a graduate student at the University of Ghana lacks knowledge about the features on the SAKAI LMS, he /she will not fully benefit from the system in his/her academic studies.

On the contrary, in the study carried out by Choga (2015) the majority of the respondents used in the research had good knowledge of the SAKAI LMS features. This was partly because it was mandatory for all the students to take tests and submit assignments using

the test and quizzes tools. Students' could find their grades using the grade box tool on the SAKAI LMS. This may explain why they became aware and knowledgeable of the Grade Book tool and other features.

In order to explore how knowledge could be exchanged and shared successfully among distance education students using the SAKAI LMS, Soon & Fraser (2011) carried out a study on 37 graduate students studying at a distance. The data collection techniques such as the participatory observation, documentation and questionnaire were employed during the investigation. The outcome of the study indicated that the calendar tool was least popular among graduate students. The graduate students again had little knowledge about the Email tool. From the study, though online learning is prevalent, there is limited research on how knowledge activities happen in online group work when using LMS, especially in distance education.

In yet another study, Derakhshan (2012) was interested in finding out the perceptions of students and faculty members towards the features of a mobile LMS in higher education. Using 5,000 respondents comprising faculty and students. It was revealed that the Assignment tools had the highest level of users' knowledge and concluded that lecturers and course instructors engaged students in using the system for their daily activities as far as teaching and learning was concerned. In a recent study to investigate the perceptions of students and use of the SAKAI LMS at the University of Ghana, Darko-Adjei (2018) used a total number of 230 level 300 distance learning students of the University of Ghana's, Accra campus. The outcome of the survey indicated distance learning students became aware of the SAKAI LMS mostly through their tutors and the orientation programme. However, some of the SAKAI tools were not utilized due to lack of awareness or knowledge of them particularly the calendar tool. This implies that the distance education

units of universities could possibly provide adequate orientation and training to all distance education students on the features of the SAKAI LMS.

In finding out students' satisfaction with e-learning resources, Issifu (2018) collected quantitative data from 715 distance education nursing students at the University of Ghana. The results of the analysis indicated that the majority of distance education nursing students had poor knowledge of the SAKAI LMS and were not using them. However, they were very much satisfied with the availability of their e-learning resources for their academic work.

The lack of knowledge on the features one of the SAKAI LMS may affect its continuous utilization. The outcome of the study carried out by Leeder & Lonn (2014) revealed that both users and non-users of the SAKAI LMS had little knowledge of its features and hence experienced numerous difficulties such as sending an email, chatting, downloading documents. Similar results were found by Berg (2013) that poor communication existed among lecturers and students as a result of lack of knowledge of the use of the Forum and Chat room tools on the SAKAI LMS. As part of the objectives of the study stated in Chapter One of this thesis, I seek to address the level of knowledge and to find out if the lack of adequate knowledge of the features on the SAKAI LMS would be a barrier towards its continuous utilization.

2.9 Extent of Utilization of the Features of the SAKAI LMS

Over the past few years, there has been an interest in the adaptation of several LMSs in many higher institutions of learning in the delivery of online courses and programmes. The continuous utilization of these LMSs may be essential in preparing university students towards lifelong learning in the present digital era. As earlier predicted by Adkins (2013)

the use of the LMS have increased by 15% from 2011 and 2016 in various African universities.

The ultimate purpose behind the adoption of the LMS in many universities was possibly to prevent turning away many qualified candidates applying to gain admission into tertiary education particularly in public institutions as they could be enrolled into their distance education programmes facilitated by the LMS. Due to the usefulness of the LMS, Al-Alwani & Soomro (2009) have suggested that in assessing/measuring the effectiveness of a particular LMS in some educational establishments, factors such as the technological readiness, ICT infrastructure, good internet connectivity among others needed to be taken into consideration as it could have an effect on users' satisfaction and adaptation.

For instance, Nuta & Pusca (2017) in a study aimed at assessing the opportunities offered by the SAKAI LMS to distance education students at the Danubius University found that the utilization of the SAKAI LMS by students was as a result of the kind of flexibility the system offered them coupled with its positive impact on their academic performance. In the course of the study, it was noted that time management was a key variable that affected a university student's decision to opt for distance education. From the analysis, 93% of the respondents claimed that the SAKAI LMS helped them to access their lecture notes and reading materials at all times. Again, 86.6% of the respondents indicated that the SAKAI LMS made it easier for them to communicate with their lecturers and colleagues and used it regularly to submit all assignments.

In finding out the experiences of University of Ghana's undergraduate students' use of the SAKAI LMS, Oheneba-Sakyi & Amponsah, (2018, p. 33) found that the SAKAI LMS made teaching and learning very interactive between lecturers and their students. As such, students were frequently engaged by their lecturers through chats, forum questions,

assignments, projects among others, requiring them to apply their knowledge acquired from the lecture hall in analyzing real-life situations and coming up with suggestions on the platform. In addition, the use of the SAKAI LMS had improved students' academic performance. Again, the findings revealed that "very reserved and shy students were able to freely contribute effectively in online discussions, bringing out brilliant ideas and suggestions they could not have had the courage to do so in the traditional classroom setting."

Rafi, Samsudin & Hanafi (2015, p.11) in a study aimed at finding prevailing differences existing between perceived benefits, use and students' satisfaction of an Open source LMS (SAKAI) and a Proprietary LMS (Blackboard) at two Malaysian universities observed that "perceived benefits mean score was significantly higher for the group that used an open source system (SAKAI) than for the group that used the proprietary system". The outcome of the study suggested that the features on the open source LMS (SAKAI) supported students online learning activities and hence was used frequently. This finding indicated that most users perceived the SAKAI LMS as a useful learning platform for university students.

As highlighted by Kulshrestha & Kant (2013) regular use of the SAKAI LMS equips students with the requisite computer literacy skills. Based on this assertion, it could be argued that regular use of the SAKAI LMS by graduate students at the University of Ghana in one way or the other would help to enhance their computer literacy skills.

Again, Mayoka & Kyeyune (2012) using 200 undergraduate students at the Makerere University Business School on e-learning information system adoption, found only 60 students occasionally used the features on the e-learning platform although all the students had knowledge about them. The outcome of the study further indicated that some students

totally abandoned using the system while others used the e-learning platform out of curiosity. The findings of this study imply that students' utilization of e-learning resources could be influenced by the knowledge of its features with its perceived relative advantages to university students.

In another study aimed at identifying the underlying causes of failure in the adoption of a LMS in a blended learning atmosphere, Ssekakubo et al. (2011) discovered that factors such as high ICT illiteracy rate, low confidence in technology usage and limited knowledge on the features of the LMS affected the frequent utilization of the LMS. This implies that in spite of the potential benefits of the LMS in blended learning, it could be saddled with certain challenges which in the long run may influence its continuous use by students.

On the contrary, a study carried out by Arhinful (2016) on the adoption of the SAKAI LMS among 131 international undergraduate students in a Canadian University revealed a high level of utilization of the features on the SAKAI LMS. The findings of the study revealed that the majority of students regularly used the SAKAI LMS to submit their assignments, download course materials, chat with their colleagues and checked their grades through the Gradebook tool. The results indicate that although the undergraduate students perceived the SAKAI as a useful learning tool, they were perhaps concerned about the platform’s ease of use.

In the same vein, Lonn, Teasley & Krumm (2009) in exploring the perceived benefits of functional tools on the LMS by university students in residential and commuter campuses discovered that among the functional tools, the Announcement tool was highly utilized. On the whole, the outcome of the study indicated that the extent of usage of the features of the LMS was very high among the students. In a case study research by Soon & Fraser

(2011) a majority of graduate students regularly used the SAKAI LMS in downloading lecture materials, chatting with colleagues, sending emails among others.

Learning Management System (LMS) training may play a vital role in the extent of usage. This is because university students who in one way or the other have attended LMS training were able to effectively use its features compared to those who had not (Al-Alwani & Soomro, 2009). Again, it could be said that the lack of LMS training may affect a university student's decision to adapt to technology as any new innovation may present certain challenges. Research by Coleman & Mtshazi (2017) concluded that the lack of LMS training affected the utilization of the SAKAI LMS among academic staff at the University of the Witwatersrand, South Africa. To this end, LMS training is perhaps a necessity for the continuous utilization and adaptation of the SAKAI LMS by graduate students.

In conclusion to their research, Suorsa & Eskilsson (2014) postulated that the extent to which the undergraduate students utilized the LMS was being affected by certain technological factors such as adequate ICT infrastructures, good computer skills and strong internet connectivity. From the above-reviewed literature, it is obvious to say that the utilization of the SAKAI LMS is gradually shifting the traditional classroom setting to a virtual environment. However, there seems to be varying results as far as the extent of use of the SAKAI LMS is concerned in institutions of higher learning. As a result, there may be certain factors that could affect the extent of utilization of the SAKAI LMS by graduate students such as their computer skills, availability of adequate ICT infrastructures and others.

In relation to the Unified Theory of Acceptance and Use of Technology (UTAUT) model, if graduate students develop a positive outlook towards the continuous use of the features

of the SAKAI LMS, it might influence their decision to continuously use the SAKAI LMS in all their academic endeavors. In a nutshell, the perceived usefulness/ease of use of the SAKAI LMS will determine a graduate students' attitudes towards the SAKAI LMS in terms of their motivation and extent of use.

2.10 The Concept of Attitudes

Scholars including social psychologists have argued that attitudes have a significant relationship with an individual's behavior. As a result, to determine a graduate student's decision to continuously use the SAKAI LMS at the University of Ghana, it is essential to know their attitudes.

Buunk & Van Vugt (2008) have defined attitudes as a psychological concept used in evaluating the desirability or undesirability of an object. This explanation supports the idea of Rogers (2003) who perceived the term (attitude) as a relatively persistent belief held by individuals about a phenomenon which could positively or negatively affect their actions towards it. Similarly, Azmi (2011) further explained the concept (attitude) as a kind of evaluated beliefs that influences a person to act in specific ways.

As pointed out by Tagoe (2012) attitudes may be affected by certain principles held by individuals which direct their behavior towards a desirable or undesirable outcome. Correspondingly, Darko-Adjei (2018) sees attitudes as a feeling of favorableness or unfavourableness towards an object. Again, as defined by Hogg & Vaughan (2005, p. 150) attitudes are "relatively enduring organization of beliefs, feelings and behavioral tendencies towards socially significant objects, groups, events or symbols".

From the above, it could be deduced that several definitions have been given explaining the concept of attitudes. These definitions have focused attention on the beliefs held by

individuals which influence their thoughts and actions towards an object or phenomenon. However, with respect to this study, ‘‘attitude’’ was defined as a graduate student’s positive or negative feeling affecting the continuous utilization and adaptation to the SAKAI LMS at the University of Ghana. As a result, if a graduate student at the University of Ghana perceives that using the SAKAI LMS regularly would bring tremendous improvement in their studies such as easy accessibility and ready availability of course materials, he /she may develop a positive attitude about the system and would highly adapt to it. On the other hand, if their subjective beliefs reveal SAKAI LMS does not bring any substantial improvement in their academic studies, they would feel reluctant to use the system.

2.10.1 Theories on Attitudes

One of the most primitive if not the first model that could be used to explain and understand a university student’s attitude towards the continuous use of the SAKAI LMS is the Theory of Reasoned Action (Fishbein & Ajzen 1975). The model since its development has been used extensively in researches focused on the attitude of students towards the adaptation to technology in higher educational institutions. According to this model, individuals' attitudes towards innovation could affect their decision towards usage. As result of this, the survival of e-learning resources may depend on the attitudes of its stakeholders such as their students, lecturers and administrators. As a result, if a graduate student believes that using the SAKAI LMS would boost their academic studies, they may develop an attitude (positive or negative) towards the system.

2.10.2 Component of Attitudes

Based on the literature, the attitudes of graduate students towards the continuous utilization of the SAKAI LMS possibly comprise cognitive, affective and behavioral components.

First of all, the affective component relates to the emotional response exhibited by a graduate student towards the SAKAI LMS. In reality, it could be said that perhaps it is at the affective stage that graduate students actually develop either a positive or negative attitude towards the SAKAI LMS. This is because students based on their feelings may decide to use the SAKAI LMS in their academic studies. Secondly, the cognitive component focuses on a graduate student's belief and knowledge held about the SAKAI LMS. As this knowledge gets repeatedly reinforced through the use of the features on the platform attitudes may be developed. On the other hand, the behavioral component centers on positive or negative behavior put up by a graduate student when using the SAKAI LMS.

2.10.3 Attitudes Towards the Continuous Utilization of the SAKAI LMS

According to Selim (2007) the attitudes of university students are major determinants for the failure or success of online learning. A lot of studies carried out have confirmed the influence of university students' attitudes towards the continuous utilization of the SAKAI LMS. For instance, in a study carried out by Qiu, Wright & Xu (2010) at the University of North Carolina, it was discovered that a majority of undergraduate students had positive attitudes towards the SAKAI LMS as they were using the platform for submitting their assignments, chatting with friends, checking their grades among others.

This finding was similar to the study carried out by Elbasuony, Gangadharan, Janula, Shylaja & Gaber (2018) at the University of Taiwan, School of Nursing. In their study, the researchers found that undergraduate nursing students had a positive attitude towards Backboard LMS. In fact, the majority of the nursing students confessed that the regular use of the Backboard LMS had a tremendous impact on their academic performance as it saved them a lot of time and money from printing lecture materials and hand-outs as they just had to download them from the platform. The outcome of these two studies (Qiu et

al., 2010 & Elbasuony et al., 2018) possibly suggests that the use of the LMS increases the academic performance and learning outcomes of university students.

In a recent study carried out by Arhinful (2016) on the adoption of the SAKAI LMS at the Brock University employing a mixed method research approach, a lot of undergraduate students had a positive attitude towards the SAKAI LMS. This was manifested in a comment made by one of the students, ‘‘*I think it speeds up communication between the professor and the students. Because initially, the professor had to see his students but then with SAKAI LMS he can even communicate with students even in their homes’’*. Once more "*Taking SAKAI, for instance even when you don't make it to lectures you can get updated information about what happened in class there are an announcement, probably class cancellation you can easily get access to without necessarily talking to someone*’’. The outcome of the study indicates that a student's attitude and decision could affect their adaptation towards the LMS in an academic institution.

In contrast with Tagoe (2012), undergraduate students' response to whether they strongly agreed or disagreed to the assertion that "*I think the university should continue to offer face-to-face and not bother about e-learning*", (37.7%) had a positive attitude towards the introduction of the e-learning platform in teaching and learning at the University of Ghana.

Wang, Doll, Deng, Park & Yang (2013) concluded that the attitudes of university students towards the SAKAI LMS may be influenced by the quality and perceived usefulness of the features on the system. In the same vein, Juhary's (2014) study on attitudes towards the use of the LMS among university students in Malaysia found that the students had a positive attitude towards the use of LMS. A study by Gaba & Sethy (2010) stressed that the utilization of e-learning systems by distance students were shaped by their positive attitude towards e-learning resources in general, pointing out that online learning made it

possible for students to communicate with their course mates who were far and near off campus.

Although the majority of the studies reviewed found positive attitudes toward the LMS, other studies found negative attitudes. The negative attitudes toward the LMS were mainly due to certain challenges such as poor internet connectivity, inadequate e-learning resources and lack of computer skills individuals encountered and as a result shunned away using the system for their academic work. For instance, in finding out how students perceived the effectiveness of the SAKAI LMS, Lowerison, Sclater, Schmid & Abrami (2006) studying 922 undergraduate students found that the students had both positive and negative attitudes towards the SAKAI LMS. However, their positive attitudes towards the system superseded their negative attitudes. The positive aspect of their attitudes indicated that blended learning method provided easy access to course materials, convenience, effective online interaction with lecturers and improved academic performance in general. Their negative attitudes were due to lack of computer skills and inadequate e-learning resources they had to battle with. However, Park (2009) revealed that students had a positive attitude towards the SAKAI LMS due to convenience and negative attitude as a result of poor internet connectivity. This affected their extent of continuous usage. Consequently, students who are able to access the LMS outside the campus for reading materials, lecture notes are more likely to develop positive attitudes towards the system.

In a study carried out by Becta (2008) 78% of the respondents preferred the traditional method of teaching to an online approach. The result of the study indicated that respondents had negative attitudes towards the LMS as a result of poor internet connectivity. Similarly, Srichanyachon (2014) studied Bangkok University undergraduate students' perception towards the use of the LMS, and established that the respondents hardly used the LMS despite its usefulness in their English course as result of poor internet

connectivity. Furthermore, as emphasized by Jones, Packham, Miller & Jones (2004) inadequate computer skills, lack of ICT infrastructures, difficulties logging unto the platform, poor online communication among others may lead students to develop negative attitudes toward the SAKAI LMS. Based on the assertion made by Piccoli, Spalding & Ives (2001) students with a positive attitude towards e-learning may develop an intention to continuously use the SAKAI LMS whiles those with negative attitudes may feel reluctant logging unto the platform.

A majority of students may develop negative attitudes and perceptions about the LMS as a result of constant system crash. A study carried out by Wei, Wu & Zheng (2014) on the application of the SAKAI Learning Management System at the University of Science and Engineering, found out undergraduate students experiencing regular system error while using the platform, hence making it difficult for them to successfully complete their assignments and submit them on time online. This is not different from Nasser, Cherif & Romanowski (2011) findings on the factors accounting for the utilization of the Learning Management System in Qatari schools, where they noted that technical challenges such as system crash and system freeze took away the joy of students in using the system. Such loading problems and system errors affecting university students may not allow them to fully benefit from available e-learning systems.

Lecturers' use of e-learning resources may also affect students' attitudes towards the SAKAI LMS as they act as role models for them. For instance, Murithi & Indoshi (2011) found university students who had developed a positive attitude towards the use of the LMS resulted from its regular use by their lecturers. Arguably, for the SAKAI LMS to be fruitful in any academic institution, students and lectures must change their behavior, perceptions, beliefs and attitudes about its usage. Zemsky (2007) realized that certain

elements like computer literacy skills, ICT knowledge and technological readiness had a significant effect on the extent of utilization of the SAKAI LMS.

Again, Ozkan & Koseler (2009, p. 25) revealed that "system qualities are the characteristics of a system and can be measured as response time, reliability, flexibility, ease of use, and ease of access, well-organized design and personalization". Based on this outcome, the more graduate students perceive the features of the SAKAI LMS as quality, the more they would develop positive attitudes towards it and vice versa. Likewise, Choga (2015) in a study suggested that the accessibility of technical supports promotes students' beliefs of the uses about the SAKAI LMS. According to Choga (2015) a new innovation is more likely to be adapted when students are given paramount support from their lecturers or technical support team. Furthermore, he concluded that "training serves as a precursor to positive attitudes about the technology, and it eliminates negative effects such as apprehension about something new and unpredictable, arming the learner with more perceived control" (p.16).

In a similar study, Selim (2007) revealed that students who had prior knowledge about the features of web technology had developed positive attitudes toward the utilization of the SAKAI LMS. From the above literature, it could be argued that the graduate students' attitudes towards the continuous use of the SAKAI LMS at the University of Ghana could be affected by variables such as computer literacy skills and training.

The attitudes of graduate students may affect their decision to use the SAKAI LMS. This is because in a study by Choga (2015) six (6) respondents representing (11.8%) agreed to the fact that, they willingly logged on into the SAKAI platform while the majority of the respondents specified otherwise. It can be concluded from this finding that a majority of the respondents visited the platform when they were forced by their lecturers to do so or

when exercises such as quizzes and interim assessments were being conducted on the SAKAI platform. However, this finding did not support that of Lonn (2009) whose study revealed that the majority of respondents voluntarily used the SAKAI LMSI in their academic studies.

In Tagoe's (2012) study on "students' perceptions on incorporating e-learning into teaching and learning at the University of Ghana", about half of the respondents strongly agree to the fact that they will prefer using an e-learning platform, supplemented with the face-to-face mode of instruction. In addition, Mohammed & Hassan (2015) examined the perceptions and attitudes towards blended learning of English courses in Saudi Arabia, and found "students' attitude toward e-learning and students' decision to use e-learning the most important factor in determining their intention to use e-learning". These findings were inconsistent with Markwei (2017) who undertook a study on the use of a course website to enhance face-to-face instruction and noted that majority of respondents had a preference for the face-to-face instruction enhanced by their course website and were willing to continuously use it.

From the above literature on the attitudes of university students towards the utilization of the SAKAI LMS, it is anticipated that if graduate students develop a positive attitude towards the SAKAI LMS, they would be able to successfully adapt to and continuously use it throughout their stay on campus and enjoy its fantastic benefits.

2.11 The Concept of Motivation

Generally speaking, the word motivation comes from a Latin verb *movere* which means to move. In the field of Educational Psychology, motivational theories have investigated several factors driving university students towards the use of e-learning resources

(Pintrich, 2003). Afzal, Ali, Aslam Khan & Hamid (2010) explained the concept of motivation as a feeling of passion, awareness or commitment that could cause an individual (graduate student) to behave in a certain way. From a psychological point of view, the term could be perceived as a driving force determining and directing people's behavior towards a goal. In the same way, motivation may energize behavior by influencing what an individual learns and does. In this study, motivation is perceived as a graduate student's willingness and determination to continuously use the SAKAI LMS for all academic work.

2.12 Types of Motivation

The self-determination theory by Ryan & Deci (2000) about human motivation indicates there are two basic types of motivation: intrinsic and extrinsic According to Simpson (2008) intrinsic motivation occurs when a person engages in an activity out of curiosity or the need to know more about something. As such, the desire is to perform an activity purely for the sake of engaging in it and completing the task. In the context of this study, intrinsically motivated graduate students may be more likely to use the SAKAI LMS as it brings them an inner pleasure. Further, intrinsic motivation could be enjoyed by graduate students when the SAKAI LMS has been properly designed and successfully integrated into their teaching and learning methods. On the other hand, extrinsic motivation occurs when an individual is rewarded or encouraged by another person to perform an activity. Similarly, as said by Davis et al. (1992) ‘‘extrinsic motivation refers to the performance of an activity because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself ’’ (p. 112). In contrast, "intrinsic motivation refers to the performance of an activity for no apparent reinforcement other than the process of performing the activity per se" (p. 112). Hence, extrinsically motivated graduate students

would have to be encouraged, enticed or prodded by friends, lecturers and others to use the SAKAI LMS for their academic work. In this case, intrinsic and extrinsic motivators could influence graduate students to use the SAKAI LMS. A student's beliefs concerning the use of the SAKAI LMS could be a determinant factor to the extent to which they adapt to the system.

2.13 Summary of Chapter

The chapter has carefully reviewed the prevailing related literature and relevant theories on the continuous utilization of the SAKAI LMS in higher education with respect to the objectives of the study and purpose. In the chapter, literature on e-learning and the SAKAI LMS were reviewed. Again, the chapter addressed and explained in detail the Unified Theory of Acceptance and Technology Use (UTAUT) model on which the study was established. A wide gap in literature was revealed as majority of the studies were conducted using undergraduate students. Again, only a handful of studies reviewed used the Unified Theory of Acceptance and Technology Use (UTAUT) model to investigate the use of the Learning Management System (LMS). In relation to this, the current study was intended to fill the gap in literature by focusing attention on graduate students' continuous utilization of the SAKAI Learning Management System (LMS) in the Ghanaian higher education environment using the Unified Theory of Acceptance and Technology Use (UTAUT) model. The next chapter described the research methodology used for conducting the study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

The process I used for this chapter was to provide a general idea of the actual collection of data and interpret the results analyzed. The research methodology gave a systematic and scientific way of providing valid and reliable answers to research questions identified in chapter one (1). This chapter provides a detailed description of the various steps and strategies that were followed in probing into the research problem identified. The chapter discusses the research design, sampling techniques, data collection procedures and pilot study discoveries among others.

The study employed the quantitative research approach grounded in the positivist paradigm. The positivist approach was used in the study as I perceived reality (continuous utilization of the SAKAI LMS) as being objective, accurate and precise. However, the approach did not allow me to focus on the individual responses of the respondents (graduate students) as their feelings were hidden behind the numerical data collected, summarized, analyzed and evaluated collectively. The quantitative data collected were analyzed and valid inferences drawn from them. To overcome biases, I took effective measures in ensuring the validity and reliability of the entire study.

3.1 Research Paradigm

Every research is based on an underlying philosophical assumption about what constitutes 'valid' research and which research method and procedures are appropriate for the expansion of knowledge in a given study. Therefore, research produces knowledge and knowledge is power. Often, research is focused on individuals who in one way or the other have an interest in acquiring new knowledge. Like, Turyasingura (2011) who emphasized

that the research paradigm conveys the researcher's perceptions about reality and thoughts on the acquisition of valid knowledge, this approach helped to eliminate research errors and challenges. The research paradigm adopted in the present study empowered me to research rigorously as the data collected was free from all forms of biases, followed a carefully thought-out methodology and paid attention to ethical issues regarding the use of human subjects (graduate students) in research. Basically, the adopted research paradigm informed the choice of methodology and provided an arena within which the structure of the research was situated.

The positivist research paradigm which was adopted perceives reality as objective. It is grounded in highly structured research methodologies ensuring the generalization of observations and statistical evaluation of results (Onwuegbuzie & Johnson, 2006). In the measurement of effects, specifically on a group and individual changes, I used non-experimental design and collected data mainly in the form of numbers and presented results in the quantitative form. In the area of study methodology, the accuracy of data was achieved through verification and replication of outcomes as well as the non-manipulations of the research variables and the use of statistical analysis. The study was based on the *positivist paradigm* which assumed that knowledge was based on careful observation and measurement of the objective reality (Lincoln, Lynham & Guba, 2011). With this paradigm (positivism), I was able to collect quantitative data from graduate students at the University of Ghana to address the research questions using highly standardized tools such as questionnaires. Fraenkel, Wallen & Hyun (2012) further postulates that quantitative research test theories by examining the relationship between variables which could be analyzed statistically. As reported by these researchers, using quantitative research helped to answer questions about relationships between variables with the purpose of explaining, predicting and controlling them. As such, I attempted to work under the notion of objectivity. This was

premised on the belief that there is an objective reality to be observed with significant others on its existence and features. Additionally, the choice for this method (quantitative) was to enable me obtain valid and reliable results that could be generalized to the larger population (graduate students not only at the University of Ghana but beyond using LMS)

3.2 Research Setting

The research setting for the study was the University of Ghana (UG). The reason for choosing the University of Ghana was based on the fact that it is the only university in Ghana using the SAKAI LMS. The university comprises three main campuses namely: Legon, Korle-Bu and Accra City. Each campus offers academic research and learning programmes dispersed within the College of Health Sciences, College of Basic and Applied Sciences, College of Humanities and College of Education (University of Ghana, 2017b).

The population of students is about thirty-seven thousand nine hundred and forty (37,940). This includes both undergraduate and graduate students enrolled in either regular, sandwich or distance education. It also comprises international students pursuing various courses leading to the award of a certificate, bachelor and graduate degree as well as visiting international students who may either study for a year or semester programmes (University of Ghana, 2017a).

As a result of the large student's enrollment and admission, the University of Ghana introduced e-learning into its curriculum with the objective of using technology to enhance its academic excellence in fulfilling its strategic vision, 2014-2024 and to develop into a world-class human resource institution (Strategic Plan 2001-2011) having the capability of meeting global challenges and developmental needs. As stated in the University of

Ghana's Information Communication Technology (ICT) policy "it is the university's policy to promote E-learning or integrate ICT in teaching and learning to enhance faculty unit effectiveness" (Draft policy on ICT by University of Ghana, p. 1). In addition to the above, the University of Ghana was chosen for the study because of the proximity and easy accessibility of its graduate students of which the majority are resident.

3.3 Research Design

The factors accounting for this design included the nature and purpose of the study, the type of population and the structure of the research. The research design adopted for the study was the cross-sectional survey design. Israel & Hay (2006) defined this design (cross-sectional) as a type in which data is collected by a researcher from a sample carefully drawn from an entire population of interest. Singleton & Straits (2010) go on further to explain that this design does not establish cause and effect relationships. Instead, it gathers information from a group of individuals (sample) to describe certain important features about the population of which those individuals belong. The design was considered appropriate for this study because of its advantages and suitability. With this design, the cost of data collection was relatively low as I collected the data at one point at a time with questionnaires from a large number of graduate students. This contributed an accurate assessment of the validity and reliability of the study.

Again, I was able to make a comparative analysis of the demographic variables *(Gender, Age and College of Affiliation)* of graduate students at the University of Ghana from the data collected and arrived at a valid conclusion. Also, the use of this design enabled me to foresee and prevent errors, bias and distortions from the data collected. Besides, it also aided me in using descriptive and inferential statistics in addressing the stated research questions for the study.

3.4 Population of the Study

The population for this study which was of much interest comprised graduate students at the University of Ghana. Although the entire population (graduate students) did not participate in the study, the results from the study are generalized to the entire population. At the time the study was conducted, the University of Ghana Facts & Figures (2017) revealed that the total population of graduate students admitted to its graduate school were **5,546.** These individuals had completed Bachelor's degree of four (4) years or three (3) years of study based on their entry requirements, West African Senior Secondary School Certificate Examination (WASSCE), Diploma and others. Table 3.1 presents the population of graduate students at the University of Ghana and the Program of study.

Table 3.1: Population of graduate students at the University of Ghana and Program of Study

Programme	**Number of students**
PhD	652
M.PHIL	1,475
MA/MBA/MFA/MPH/MSC	3,419
Total	**5,546**

(Source: University of Ghana, 2017a)

From table 3.1, it could be seen that out of the total number of graduate students (5,546), 652 are pursuing PhD programmes, 1,475 are offering MPhil, 3419 reading either MA/MBA/MFA/MPH/MSC programmes. This indicates that the majority of graduate students at the University of Ghana perhaps are admitted to several Master's Degree Programmes compared to Doctoral Degree programmes. The population comprised both Male and Female graduate students roughly between the ages of twenty-one (21) to fifty (50) years.

This population was chosen because from the available literature reviewed, quite a number of studies had been carried out using the undergraduate students with a limited number of studies focusing on the graduate population. None of them was from Ghana. Again, currently at the University of Ghana, graduate students utilize the SAKAI LMS in their studies, thus, my interest.

3.4.1 Target Population

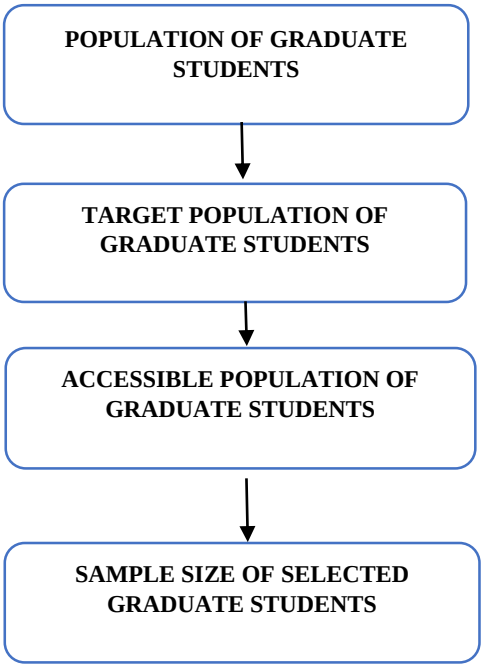
For the sampling technique employed to be feasible, the target population needed to be defined by an objective criteria that indicate its limit of inclusion. Individuals (in this study, the University of Ghana graduate students) in the target population normally share one feature. Out of the four (4) main Colleges at the University of Ghana, three (3) Colleges namely: Health Sciences, Education and Humanities were used. From these three Colleges, six (6) schools were selected to constitute the target population. This population were aware of the SAKAI LMS and were using it for academic work. The target population included all graduate students (from first to final year) admitted to the School of Graduate Studies at the University of Ghana at the time of the study. As a result, a graduate student not admitted to the School of Graduate studies such as a graduate student at the Faculty of Law was excluded from the population as they were still pursuing another undergraduate study towards professional law.

3.4.2 Accessible Population

A lot of researchers select their samples from the accessible population. Bearing this in mind, I was not only cautious about generalizing the results of the study to the accessible population of graduate students at the University of Ghana but again was very cautious about generalizing the results obtained from the data analyzed to the target population. For

the accessible population, graduate students who were deemed accessible to me within the various Departments at the time the study was carried out were used. Accordingly, it was this population that was used for the study. I used the homogenous sampling technique since all the population used had certain similar or identical characteristics (Creswell & Plano Clark, 2011).

Figure 3. 1: The Relationship between the Population, Target Population, the Accessible Population and the Sample.



Source: Author's Construction

Figure 3.1 portrays the relationship between the entire population, target population, accessible population and the sample used in the study. From the target population (graduate students), I was able to arrive at the accessible population upon which the sample size was selected for the study.

3.5 Sample and Sample Size

A sample of human respondents was studied to learn about an entire population for the purposes of generalization. As suggested by Singleton & Straits (2010) the selected sample in this study was made up of individuals from different sexes, regions, social classes, age groups among others. As recommended by Fraenkel et al. (2012) the minimum number of respondents to be used as the sample size for a research survey should not be less than a hundred (100) based on a specific population. On the other hand, they argued further that there seems to be no definite number of respondents that is acceptable or sufficient to be considered an adequate sample size. As a suggestion, any chosen sample size for a study should be large enough to represent the entire population.

As it has been indicated by Tashakkori & Teddlie (2010) the sample size of research could be affected by the research paradigm (positivism) guiding the entire study as well as the nature of the target population. In selecting the appropriate sample size of the study, I took into consideration these two factors. The sample size used for the study was based on the total population of six (6) different schools selected within the three colleges (Health Sciences, Education and Humanities) of the University of Ghana who were using the SAKAI LMS actively.

The majority of quantitative researchers employ statistical methods when deciding on the right sample size to be used for their studies in an attempt to reduce sampling error to a minimum level (Sarantakos, 2013). To minimize sampling bias and errors, I used a formula developed by Schaeffer, Mendenhall & Ott (1986) in determining the exact sample size to be selected for the study from the target population **(552).**

Below is the formula used in the calculation.

$$n = \frac{Np(1-p)}{(N-1)\frac{\beta^2}{4}+P(1-p)}$$

Where:
N=Population size
p= proportion of people to be identified, p is always measured at 0.24
B=0.05 representing confidence level

$$n = \frac{552 \text{ x } 0.24(1-0.24)}{(552-1)0.05^2 / 4 + 0.24(1- 0.24)}$$

$$n = \frac{552 \text{ x } 0.24(0.76)}{551(0.0025) /4 + 0.24(0.76)}$$

$$n = \frac{552 \text{ x } 0.1824}{0.34625 +0.1824}$$

$$n = \frac{100.685}{0.529}$$

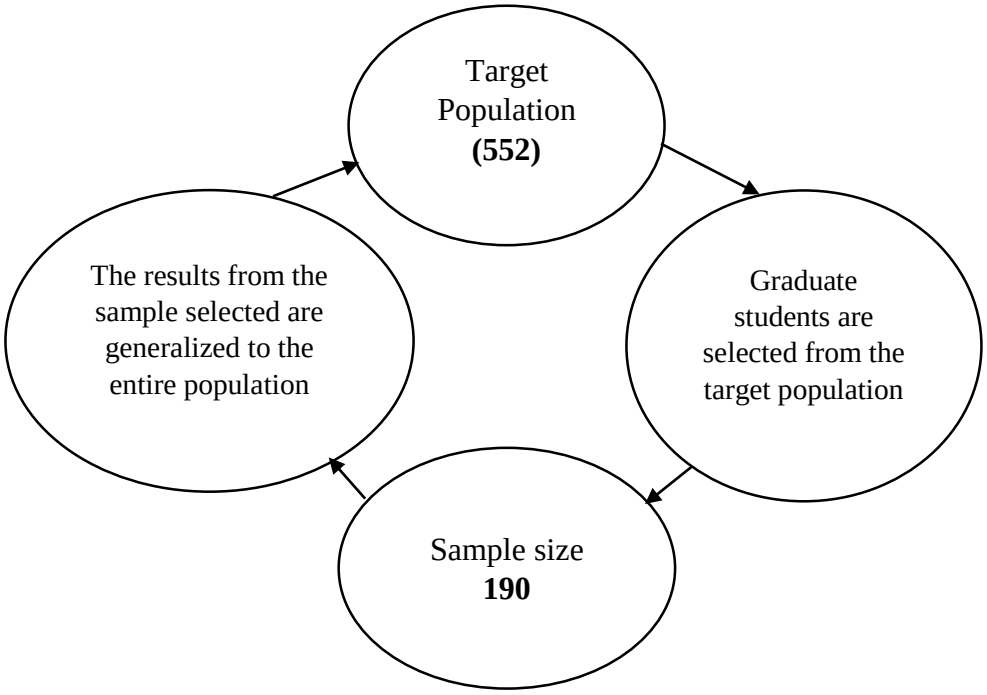
n = 190

The sample size for the study at the University of Ghana was **190** representing 34 % of the target population based on the formula below. To eliminate sampling error and adhere to a high response rate, 10% was added to get **209** subjects.

$$P = \frac{\text{Sample Size}}{\text{Target Population}} \text{ X } 100 \qquad P = \frac{209}{552} \text{ X } 100 = 37.86 \quad \mathbf{P = 38\%}$$

Where p represents the percentage of the Target Population.

Figure 3.2: The Relationship between the Target Population and Sample



Source: Author's Construction

From Figure 3.2, the relationship existing between the target population and sample has been illustrated. As said by Babbie (2007, p. 198) target population is "that aggregation of elements from which the sample is actually selected". Therefore, graduate students were selected from the target population of graduate students at the University of Ghana. The outcomes of results obtained from the selected sample were then generalized to the larger population of graduate students.

3.5.1 Sampling Frame

As defined by Badu-Nyarko (2011) a sampling frame is a graphical picture of information specifying and showing how a particular sample size of interest is selected from the entire population. He goes further to explain that the sampling frame entails the procedures through which the sample will be selected from the population. In this study, the sampling frame constituted all graduate students who were selected from the target population.

Since I couldn't have direct access to the entire population of graduate students, I used the sampling frame as a representative of all the graduate students at the University of Ghana. As it has been made clear by Fowler (2002) sampling frames that are not accurate could be a major source of bias in research. Consistent with him, this bias could occur when the Sampling Frame either excludes individuals who are members of the target population or those that are not members of the target population. In this study, I took careful steps in ensuring that graduate students who were selected and included in the Sampling Frame were members of the target population. On the whole, the Sampling Frame provided a basis for sampling from the identified population. Concerning the sampling ratios, a proportionate sample size based on the number of graduate students in each of the six (6) departments selected from the target population was calculated using the following formula:

$$P.S = \frac{\text{Number of graduate students in each department}}{\text{The Target Population}} \times \text{Sample size}$$

Where:

P.S = proportionate sample size.

The following statistics show the number of graduate students selected from each Department.

Community Health Nursing $P.S = \frac{88}{552} \times 209 = 33.3 = \mathbf{33}$

Population, Family and Reproduction Health $P.S = \frac{159}{552} \times 209 = 60.2 = \mathbf{60}$

Adult Education and Human Resource Studies $P.S = \frac{24}{552} \times 209 = 9.08 = \mathbf{9}$

Communication Studies $P.S = \frac{44}{552} \times 209 = 17.65 = \mathbf{18}$

Organization and Human Resource Management P.S = $\frac{186}{552}$ X 209 = 70.42 = **70**

Social Work P.S = $\frac{51}{552}$ X 209 = 19.3 = **19**

Table 3:2 present the list of the Sampling Frame used for the study.

Table 3.2: The Sampling Frame and Sample

College	**School selected**	**Department Selected**	**No. of graduate students**	**No. of graduate students selected based on the Sample size**
Health Sciences	Nursing and Midwifery	Community Health Nursing	88	33
	Public Health	Population, Family and Reproduction Health	159	60
Education	Continuing and Distance Education	Adult Education and Human Resource Studies	24	9
	Communication & Information studies	Communication Studies	44	18
Humanities	Business	Organization and Human Resource Management	186	70
	Social Sciences	Social Work	51	19
	Total		**552**	**209**

From table 3.2, the majority of graduate students were selected based on the sample size from the Department of Organization and Human Resource Management (70), followed by the Department of Population, Family and Reproduction Health. Notwithstanding, only nine (9) graduate students were selected from the Department of Adult Education and Human Resource Studies.

3.5.2 Demographic Characteristics of Sample

Demographic data refers to the various characteristics of the student in the population. These characteristics comprise Gender, Age and College of Affiliation. For this study, the demographic data gathered from the respondents were limited to these three categories as other demographic characteristics such as marital status, religious affiliation among others were of no interest to me. The demographic characteristics of respondents have been presented in Table 3.3.

Table 3.3: Demographic Characteristics of Respondents based on Gender and Age.

Variables	No. of graduate students	Percentage
Gender:		
Male	102	59
Female	88	41
Age:		
20 – 29	55	29
30 – 39	106	56
40 – 49	23	12
50 – 59	6	3

It is evident from table 3.3 that 59 % of graduate students were males and 41 % were females. This ensured that views were taken from both male and female graduate students. Again, it could be inferred from the analysis that the ratio of male to female was not biased and may not significantly affect the responses in any way. The age of the respondents was put into groups (categories). The analysis revealed that most of the respondents (29 %) were within the ages of *20 to 29* followed by those within the range of *30 to 39* (56 %) and *40 to 49* (12 %), were those in the *50 to 59* years' group (3%). However, no respondent was 60 years and above or below 20 years. The number of questionnaires received from graduate students within the three Colleges and the number of respondents used from each of the three colleges have also been presented in table 3.4.

Table 3.4: Demographic Characteristics of Respondents based on Colleges

Colleges	Departments	No. of Distributed questionnaires received.	Respondents used.
Health Science	Community Health Nursing.	32	30
	Population, Family & Reproduction Health.	60	55
Education	Adult Education & Human Resource studies.	9	8
	Communication Studies.	17	15
Humanities	Organization & Human Resource Management.	68	64
	Social work	19	18
Total		**205**	**190**

Results from table 3.4 indicate that out of the 205 questionnaires received from graduate students within the three Colleges, 190 of them was used for the study. 92 questionnaires were received from graduate students belonging to the College of Health Science (Community Health Nursing and Population, Family & Reproduction Health) out of which 85 was used for the study. 26 questionnaires were also received from the College of Education (Adult Education & Human Resource Studies and Communication studies) out of which 23 were used for the study. Lastly, out of the 87 questionnaires received from the College of Humanities (Organization & Human Resource Management and Social Work) 82 was used for the study. Hence, College of Health (85) + College of Education (23) + College of Humanities (82) gave a sample size of 190.

3.6 Inclusion Criteria

By explanation, inclusion criteria in research are a set of predefined features used to classify subjects or participants who will be included in a research. Essentially, inclusion criteria, along with exclusion criteria together make up the selection or eligibility criteria

used in ruling in or out the target population for a research (Johnson, 2004). Proper selection of the inclusion criteria enhances the external and internal validity of the study and minimize ethical concerns. For this study, the inclusion criteria were all graduate students (PhD and Masters) at the University of Ghana who were using the SAKAI LMS in their academic studies and duly registered at the School of Graduate Studies. The inclusion criteria were based on the assertion that since the SAKAI LMS is being used by the entire University community as its e-learning platform, graduate students have enough experience and knowledge about it.

3.7 Exclusion Criteria

The exclusion criteria comprised graduate students who were not dully registered at the School of Graduate studies at the University of Ghana. In line with this, graduate students at the Faculty of Law were not selected as respondents for the study. Again, the study excluded graduate students who had never used the SAKAI LMS for learning. All graduate students at the Department of Statistics and Actuarial Science (College of Basic and Applied Sciences) who were used as respondents during the pilot study period were also excluded from the study during the data collection stage.

3.8 Sampling Techniques or Procedures

One of the most substantial issues I considered when conducting this research was the kind and number of people who will be part of the study. The process of selecting individuals for the study brought about the issue of subject sampling which was expected to be representative of the entire population. For me to achieve this representativeness, sampling procedures were required to be followed on certain standards and methodological principles. Along with Badu-Nyarko (2013) sampling is less expensive to conduct and

saves a lot of time as the researcher cannot study the entire population. He believes that the information given by each individual in the selected sample could be verified easily within the shortest possible time. From the above, it could be said that if sampling is done properly, the results would be very reliable and valid conclusions could be drawn. In line with this, I embarked on the sampling of respondents for the study with the aim of cost reduction and quick access to vital information needed.

In this study, the probability sampling techniques were employed particularly the multi-stage sampling. This was to offer each graduate student of the target population an equal chance of selection. Again, in satisfying the conditions of randomness, I could not simply pick graduate students haphazardly as unconscious biases will enter into the selection process. The *multi-stage sampling* was used for the study as graduate students are scattered all over the University of Ghana campus belonging to different colleges, faculties and departments. As explained by Sarantakos (2013) in the multi-stage sampling, the selection of sample units begins with the identification of a larger sample, then proceeds with new samples taken in succession from those previously selected, thus facilitating the construction of a more suitable and more effective choice. In this scenario, a large sample (colleges) was chosen using a random sampling procedure, and then another sample was taken from within this sample, excluding excess and unrelated units.

Golafshani (2003) contends that the characteristic of this type of sampling (multi-stage) is that data is collected only from the final sample arrived. In using multi-stage sampling, the University of Ghana was seen as a whole unit. Out of the four main colleges, three colleges (Health Sciences, Humanities and Education) were selected using the simple random sampling technique. This method (simple random) ensured that each college had an equal chance of being selected, were independent of each other and their selection did not depend on the selection of other colleges.

Also, the selection of these three colleges represented 75% of 5,546 of the entire population of graduate students at the University of Ghana. This confirms the assertion made by Sarantakos (2013) that in achieving representativeness, sampling procedures need to follow certain standards and methodological principles particularly with regards to quantitative research. Within each of the three Colleges, two schools each was selected using the simple random sampling technique. The lottery method (a method of simple random sampling) was later used in selecting a department each from the six schools selected. This method (lottery) ensured that every department within each school was identified with a number, well mixed and then the required number of samples were chosen. With this method, I was able to select six (6) departments constituting 552 graduate students.

At this point, I had to use the systematic sampling technique or sampling method (Badu-Nyarko, 2013) in selecting 209 graduate students from the six (6) departments. Based on the population, an interval was determined by dividing the population by the sample size (552÷209) to get 2.64 (or 3) representing the interval. From this, a list of graduate students in each department (six selected schools) from the Colleges was retrieved based on their index numbers chronologically from the Academic offices within the Departments. To ensure maximum equal representation and avoid bias, three numbers (1, 2, and 3) were folded, reshuffled and one selected randomly. In this exercise, number 2 was selected so every second student on the list of the graduate students in each department was deemed selected and an interval of 3 was used. Thus, the next student was the 5^{th} person (2+3) and subsequently applied to get the students required. In each department, those identified or selected were contacted to be respondents and questionnaires distributed to them. As a result, a graduate student in each department was selected not based on similar

characteristics (homogenous), convenience and ease of accessibility to me at the time of data collection but readily available and willing to participate in the study as selected.

3.9 Instrumentation

The main instrument used in collecting data for the study was a questionnaire. As survey research, questionnaires were used extensively to collect information from the large graduate student population. The use of questionnaires in this research was less expensive and convenient. Moreover, it provided greater anonymity. In this case, the likelihood of obtaining true responses to sensitive questions increased as respondents were asked not to write their names or disclose their identity. The reason for the use of questionnaires for data collection in this study was to get access to what is ‘inside a graduate student head' about the SAKAI LMS. That is how he or she feels and think about the e-learning platform at the University of Ghana and the possible challenges encountered when logged unto the system.

In spite of the above benefits derived from the questionnaires, there were certain weaknesses. This was because it did not allow probing, prompting and clarification for questions and as a result, hardly provided opportunities for motivating the respondent to participate in the study or provide answers to questions asked. In addition, the questionnaires did not provide an opportunity to collect additional information if I had used interviews.

3.9.1 Construction of Research Instrument

Constructing the questionnaire was a demanding task requiring rich experience in general and questioning techniques in particular. I had to exhibit the essential skills needed to cope with the major issues emerging from the literature review and conceptual framework. As

pointed out by Hair, Black, Babin & Anderson (2010) the size of the questionnaire depended on factors such as my research objectives, the type of respondents, the methods of analysis and the availability of resources at my disposal as a researcher.

I carefully constructed the questionnaires bearing in mind that the content of the questions plays a vital role in the entire questionnaires. Whereas the format and order of questions may influence access to information, the content of the questions teased out the essence of the answers sought in the study in relation to the objectives and research questions of the study in Chapter One.

Each question on the questionnaire was expected to address an objective. I made sure that each question was related to the research topic. The content of the questions was clear, precise and in simple in language. For instance, *using the SAKAI LMS saves time, the SAKAI LMS motivates me to Learn and others.*

All the questions conveyed a positive attitude towards the respondent on the questionnaire. For instance, *SAKAI LMS improves my academic performance.* The questions on each section of the questionnaire (Sections A to H) was made very easy to be understood by the respondents and meaningful to them. Again, clear instructions were given to respondents about how to answer the questions. For instance, please show how you agree or disagree with the following sets of statements using the following guide *(1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly Agree).*

The first draft of the constructed questionnaire was sent to research supervisors for their comments and recommendation before the pilot study was carried out. The critical reviews and suggestions offered by the research supervisors were considered and eventually, changes were implemented on the questionnaires. On the whole, the content of all

questions on the questionnaire was carefully and thoroughly checked for possible bias and ethical adequacy as it was my goal.

3.9.2 Instrument for graduate students

In this study, I carefully reviewed available literature and found that earlier researchers who studied these constructs (perceptions, attitudes and knowledge) had utilized surveys in their research (e.g. Brown, 2008). Questionnaires were found to be the most widely used type of data collection instrument by these authors. The questionnaire used for the study was developed based on available literature on e-learning and the LMS. The questionnaires were adapted and modified based on the objectives of the study and suggestions made by research supervisors.

I used familiar language that was clear to the respondents in making them feel relaxed in completing the questionnaire. For example, '*I enjoy using the SAKAI LMS for my studies*'. Therefore, all technical, ambiguous, confusing, unclear and embarrassing words were avoided. Sufficient instructions on how to answer questions on the questionnaire were provided to respondents on all sections (A-H). For instance, in section A, information on respondents' demographic variables (Gender, Age and College of Affiliation) was sought and instructed to '*Please tick [√] where appropriate'*. Further, leading and suggestive questions soliciting indirect responses from respondent were avoided. I made sure that each question asked was relevant to the objectives of the study and asked respondents what was supposed to ask. In line with this, certain items were deleted and other items developed based on content validity. For instance, *conventional teachings are far better than online methods,* was deleted from the questionnaire. The questionnaire had a professional appearance giving a good impression of the document thereby deserving the respect of the respondents, invoking their responsibility in filling it out. As a result, I presented the

questionnaire in a way that encouraged respondents to complete and return it. Together with my research assistants, I collected 205 questionnaires distributed to graduate students who provided accurate and genuine information on the items asked them on the questionnaire.

3.9.3 Description of Research Instrument

Again, all the variables used in the study were chosen based on earlier research design and psychometric properties. The questionnaire had eight (8) sections (A-H). All questions on the questionnaire were closed-ended requiring respondents to choose from a set of predetermined response alternatives provided based on the pilot study. The closed-ended questions provided me with more standardized data as all the respondents were given the same response categories. On the other hand, respondents could not come up with answers in their natural language since they were asked to tick or select one or more responses appropriate to them in a box provided. The font size for all the items were 12 for easy reading by the respondents with each page being numbered on the questionnaire for easy flow of entire questions. Each question asked on the questionnaire had a number and followed serially. For example, 1, 2, 3, 4, 5 and not 1a, 1b, 1c. As pointed out by Badu-Nyarko (2011) this form of numbering (1a, 1b, and 1c) is slightly stressful.

I used a Likert scale questionnaire (Christensen, Johnson & Turner, 2015) in evaluating the magnitude of respondents' responses. In this case, a respondent could strongly disagree or strongly agree to an item on the questionnaire and not both at the same time. The Likert scale (1-5) helped me to measure the intensity of each respondent's feelings and attitudes towards the continuous utilization of the SAKAI LMS. On the other hand, it also gave the respondents several alternative answers to a question asked.

Section A: Demographic Characteristics

The items in this section included Gender, Age and College of Affiliation (see Appendix A).

Section B: Level of Knowledge on the Features of the SAKAI LMS

The level of knowledge on the features subscale (KSS) was self-developed. The scale consisted of thirteen (13) items on respondents' level of knowledge on the features of the SAKAI LMS. The features on the scale included the Forum tool, Chat room tool, Announcement tool, Gradebook tool, Lessons tool, Email tool among others. The Knowledge Subscale (KSS) was measured on a three-point Likert Scale ranging from *1=Low, 2= Moderate and 3=High*. I obtained a reliability correlation coefficient of 0.76 after analyzing the data collected on the Knowledge Subscale (KSS). This indicated that the self-designed instrument was highly reliable and can be used for future research.

Section C: Extent of Utilization of the Features of the SAKAI LMS

The Extent of Utilization of the Features Subscale was also self-developed with thirteen (13) items. Some of the features in this scale included the Gradebook tool, the Lessons tool among others. The scale was rated on a 5-point Likert Scale ranging from *1= None, 2= Once a Semester, 3=Once a month, 4=Once a week and 5=Every day*. A reliability correlation coefficient of 0.83 was obtained after analyzing the data collected on the Extent of Utilization of Features Subscale (UFSS).

Section D: The Attitudes Towards the Continuous Utilization of the SAKAI LMS

The attitudes towards the continuous utilization of the SAKAI LMS was developed and modified from a 22 items questionnaire used in a study conducted by Mishra & Panda (2007) to examine the attitudes of faculty members towards e-learning. The scale consists

twelve (12) positive statements aimed at determining respondents' attitudes towards the continuous utilization of the SAKAI LMS on a 5-point Likert scale ranging from 1=Strongly Disagree, 2= Disagree, 3=Neutral 4=Agree and 5=Strongly Agree. Items under this section included, *I feel confident in using the SAKAI LMS, I enjoy using the SAKAI LMS for my studies and others.* Conforming to Wong, Rindfleisch & Burroughs (2003) the purpose for the use of positively and negatively worded statements was to minimize the potential impact of agreement or disagreement in response bias. A reliability correlation coefficient of 0.80 was obtained after analyzing the data collected on the attitudes towards the continuous utilization of the SAKAI LMS.

Section E: Motivation Towards the Continuous Utilization of the SAKAI LMS.

The motivation towards the continuous utilization of the SAKAI LMS was measured using the Motivation Orientation Scale – Student Version (MOS-SV) developed by Johnson, Stewart & Bachman (2013). The scale was adapted and modified to suit the context of the research to its objectives. External validation of the MO-SV has demonstrated an excellent fit: $\chi 2$ (97) = 100.14, p = .39, CFI = .98 and Root Mean Square Error of Approximation (RMSEA) = .03 (Johnson et al., 2013). Cronbach's Alpha for the four components were: online intrinsic motivation a = .92, online extrinsic motivation a = .75, face-to-face intrinsic motivation a = .92 and face-to-face extrinsic motivation a = .81 (Johnson et al., 2013). The motivation subscale (MSS) comprised nineteen (19) items measured on a 3-Point Likert Scale with 3 being highly motivated, 2 moderately motivated and 1 being the least motivated. In this section items asked respondents included, *the use of the SAKAI LMS can affect my future career, using the SAKAI LMS saves time* and others. A reliability correlation coefficient of 0.78 was established when the data collected was analyzed.

Section F: Factors Promoting the Continuous Utilization of the SAKAI LMS

This section, on the other hand, focused on the factors promoting the continuous utilization of the SAKAI LMS by graduate students and was measured on a 5 point Likert Scale ranging from 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5 = Strongly Agree. The items were designed based on the constructs of the Unified Theory of Acceptance and Use of Technology model. A standardized questionnaire developed by Al-Awadhi & Morris (2008) was used to evaluate constructs of Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions and Individual Decision. On the other hand, items under User Satisfaction were adapted from Sun, Tsai, Finger, Chen & Yen (2008). A reliability correlation coefficient of 0.85 was obtained after analyzing the data collected in this section. Table 3.5 sheds light on the items and the number of questions under each factor.

Table 3.5: Factors Promoting the continuous utilization of the SAKAI LMS

Factors	Number of items
Performance Expectancy	6
Effort Expectancy	4
Social Influence	4
Facilitating Conditions	5
User Satisfaction	3
Individual Decision	3

Source: Author's Construction

Table 3.5 indicates the factors promoting the continuous use of the SAKAI LMS and the number of items asked under each factor. In all, a total number of 25 items were asked on the factors.

Section G: Challenges Towards the Continuous Utilization of the SAKAI LMS

This section was centered on the challenges faced by respondents in continuously using the SAKAI LMS. The challenges encountered subscale was self-developed and comprised seven (7) items, measured on a 5 –point Likert scale ranging from *1=Strongly Disagree, 2= Disagree, 3=Neutral 4=Agree and 5=Strongly Agree.* Some of the items here includ*ed using the SAKAI LMS is stressful, it is frustrating using the SAKAI LMS* and others. I obtained a reliability correlation coefficient of 0.86 after analyzing the data collected on this subscale.

Section H: Continuous Utilization of the SAKAI LMS

This section focused on the continuous utilization of the SAKAI LMS and comprised of three (3) items adapted from Pituch & Lee (2008). The items were measured on a 5-point Likert scale ranging from *1 = Strongly Disagree, 2 = Disagree, 3 = Neutral 4 = Agree and 5 = Strongly Agree*. Some of the items here comprised *I will frequently use the SAKAI LMS in the future to supplement my studies among others.* I obtained a reliability correlation coefficient of 0.80 after the data collected was analyzed.

3.10 Pretesting of Instrument for Data Collection

Pilot studies and pretesting of the instrument were two activities I embarked on before the commencement of the actual data collection. They were provisional activities employed to ensure that the planning of the main study and its processes were correct, reliable, suitable and valid. I conducted a pilot study to find out whether the items on the questionnaires were properly worded, misleading or unclear to the respondents and the amount of time they would use in filling out all items on the questionnaire. Again, I wanted to find out whether there would be a need to re-arrange the response categories to a

particular question based on respondent's responses. In this case, if the proportion of respondents selecting "other", please specify is very small, the question will remain the same. However, if the number of responses to a particular item is relatively large, the response set needed to be modified.

A total number of twenty (20) graduate students (comprising ten (10) males and ten (10) females) at the Department of Statistics and Actuarial Science (College of Basic and Applied Sciences) were selected using the simple random sampling technique for the pilot study. Questionnaires were administered to the respondents (20 graduate students) at the Lecture Hall.

I, together with two (2) research assistants who had completed their undergraduate degree program had to spend four (4) to six (6) minutes in explaining the purpose and aims behind the study to each participant after seeking their consent to participate in the study. Initially, some of the participants were reluctant to fill the questionnaires as the pilot study was conducted at the time of the University of Ghana was preparing itself towards the end of second-semester examinations and consequently, graduate students needed to learn.

Respondents were instructed to complete the entire questionnaire and in the process identify any ambiguity or unclear questions, item or any problem they encountered while filling the questionnaires. I used *think-aloud-technique* during the pilot study. In this technique, respondents were required to speak out their thoughts and perceptions while they filled out the questionnaire in terms of difficulty.

The research team noticed that each participant spent between thirty (30) to thirty-five (35) minutes in filling out all the items on the questionnaire. The pilot study was carried out on 17th and 18th May 2018 from 4 pm to 6 pm. On the first day, each researcher was able to collect three (3) questionnaires from the respondents, making a total of nine (9)

questionnaires collected. However, not all questions were dully answered by the respondents. Some questions were left unanswered in certain sections of the questionnaire. For instance, '*I find the SAKAI LMS has compatible with how I learn*, was left unanswered in all the nine (9) questionnaires collected. The remaining questionnaires were collected the following day by the research team. This was because nine (9) respondents had pleaded with the research team to fill and submit the next day as they had ended their evening lectures and needed to go home hurriedly.

After questionnaires had been filled, I and the research team collected them and showed appreciation to the respondents for the time spent in filling out the questionnaires because they had just closed from an evening lecture and had to stay to fill the questionnaires.

The research team was very grateful to the respondents. The research team interviewed a few respondents after submission of their completed questionnaires. The purpose of the interview was to find out additional challenges they encountered while filling out the questionnaires, what their thoughts were concerning the study if any question or item was confusing or irritating to them. For instance, during the interview, a respondent pointed out that a question asked *I find the SAKAI LMS has compatible with how I learn* under the motivation to use the SAKAI LMS was confusing. As a result, the question had to be modified to, *the SAKAI LMS enhances my learning.*

After the pilot study, I had to modify and drop some items on the questionnaire as the respondents had difficulties understanding them. Furthermore, some response sets such as "None", were eliminated. This was because majority of the respondents did not respond to them. Again, other related and similar questions were also eliminated on the questionnaire. This included such questions as *I find the SAKAI LMS useful in my studies*.

On the whole, the pilot study helped me to test the suitability of the research methods and to discover the weaknesses, inadequacies and problems in all aspects of the research, so they could be corrected before actual data collection takes place. Finally, the pilot study offered an opportunity to the research team to practice using the research instrument before the main study began aside the familiarization with the research environment.

To avoid subject maturation, the research questionnaires were administered to the respondents within the shortest possible period of two months following the pilot study. I ensured that graduate students at the Department of Statistics and Actuarial Science (College of Basic and Applied Sciences) that were used for the pilot study were not administered with questionnaires during the actual data collection.

3.10.1 Reliability and Validity of the Research Instrument

The reliability and validity of the research instrument were tested to determine the degree of consistency or accuracy with which the instrument measured the attribute it was designed to measure if replicated. Upon analysis using the Cronbach's Alpha method, the Level of Knowledge on Features of the SAKAI LMS was 0.75, the Extent of Use of Features of the SAKAI LMS was 0.84, Attitudes towards the continuous use of the SAKAI LMS was 0.82, Motivation towards the continuous use of the SAKAI LMS was 0.83, Challenges encountered in the continuous use of the SAKAI LMS was 0.93, Performance Expectancy was 0.83, Effort Expectancy was 0.85, Social Influence was 0.88, Facilitating Conditions was 0.87, User Satisfaction was 0.85, Individual Decision was 0.87 and Continuous use was 0.92. Table 3.6 provides a summary of the reliability coefficient of the pilot study.

Table 3.6: Summary of Pilot Study Results

Variables	Cronbach's Alphas
Knowledge	0.75
Extent of Use	0.84
Attitudes	0.82
Motivations	0.83
Challenges	0.93
Performance Expectancy	0.83
Effort Expectancy	0.85
Social Influence	0.88
Facilitating Conditions	0.87
User Satisfaction	0.85
Individual Decision	0.87
Continuous Use	0.92

From table 3.6, it could be seen that the Cronbach Alpha measured the internal consistency of the questionnaire comprising of multiple Likert Scales and items (Gotz, Liehr-Gobbers & Krafft 2010). The alpha for the subscales ranged from 0.75 to 0.93. All the values in the questionnaire revealed significant levels of reliability.

3.11 Data Collection Procedures

Unfortunately, prior to the collection of data for the study, I had to spend three days training a new team of research assistants. Those (research assistants) who helped during the pilot study had completed their undergraduate degree program at the University of Ghana and had other commitments to fulfil, so could not make time for the actual data collection. Given this, I had to recruit four (4) new research assistants made up of three (3) males and one (1) female between the ages of 23 to 28 years old. The research assistants had graduated from the Kings University College and completed their National Service. All the four research assistants were unemployed and along these lines made time for the data collection.

The research assistants were given a copy of the research proposal to read for a week to understand the entire study. I organized a two-day research orientation for the four research assistants at my residence in Accra. During the orientation period, the research assistants were asked to practice the administration of the questionnaires on me to have a fair idea of what to expect when they went to the field. Again, the research team drew up a time table on days each department will be visited for data collection. For instance, it was agreed by the research team that the first Department to collect data from graduate students was to be the Department of Adult Education and Human Resource Studies. As part of the orientation process, I had to take the research assistants to the University of Ghana, Legon campus as well as the selected departments for familiarization.

I decided to provide each research assistant with their breakfast and lunch when the data collection starts as well as transportation allowances to and from the University of Ghana to their homes. I sought for ethical clearance from the Research and Ethical Committee of the University of Ghana (see Appendix C). After being granted permission, I and the research team had to go to all the selected departments to formally introduce themselves to the secretaries, administrators and Heads of Departments. A copy of the ethical clearance and research proposal was shown to the secretaries in the various departments. The research team did not visit the Halls of residence of graduate students throughout the entire data collection period (Valco Phase 1& 2, and Legon Hall Annex C) as the administration and collection of completed questionnaires by respondents was carried out solely at the departmental level and lecture halls.

Within each department, I was given the lecture periods for graduate students as well as the venue for their lectures. This information helped the research team to know the days and particular periods to meet the graduate students for an effective data collection. The data collection started on 14th August 2018 to 27th September 2018.

It was done from Mondays through to Thursdays because those were the days that the majority of graduate students within the various departments had lectures. Nonetheless, the research team rested on Fridays. In ensuring a high response rate, the research team printed out two hundred and twenty (220) questionnaires to be administered although the required number of respondents was 209 in case of defacing and lost. On each day of data collection, respondents consent was sought after which they were administered with the questionnaires to fill. Filling questionnaires were mostly done immediately at the end of the respondent's lectures except where they could not, they were permitted to take them home and return them at the next lecture. The research team had to be at the lecture halls at about fifteen (15) minutes before the end of a lecture to get a greater number of respondents. The approach of "give and collect later" helped to provide a high response rate (98%) as 205 questionnaires were retrieved. Conversely, the majority of the respondents filled and handed over the questionnaires on the same day of administration.

On each day of data collection, about 80% of questionnaires administered were filled and retrieved back from the various departments. Each respondent spent between twenty (20) to twenty-five (25) minutes completing all sections of the questionnaire. This gave an assurance to the research team that the participants understood the items on the questionnaires because, during the pilot study, the respondents had used between thirty (30) to thirty-five (35) minutes as a result of perhaps difficulties in understanding and answering the items.

Daily, appreciation was shown to respondents for spending time in filling the questionnaires. The respondents were advised to always use the SAKAI LMS to enhance their studies. The research team had to embark on several follow-up visits retrieving already administered questionnaires to the respondents at their lecture halls. After a

month, 205 administered questionnaires were retrieved out of 209 administered. Several efforts and attempts made proved futile in getting back the remaining 4 questionnaires by the research team. I carefully sorted out 190 questionnaires that were successfully filled by the respondents in getting the required sample size as the remaining 15 questionnaires were not filled properly by the respondents, had certain contradictory responses and inconsistencies. Others were also half-filled and double ticked by the respondents. The final distribution of respondents has been reported in Table 3.4. The research team carefully planned the study, took appropriate measures and was very vigilant in improving the response rate throughout the data collection period and promised to brief the respondents on the aftermath of the research.

3.11.1 Challenges of Data Collection

As stated earlier, I had to train new research assistants as those used during the pilot study had other commitments to fulfil and could not make time. Again, majority of the respondents did not have enough time to spare as questionnaires were administered sometimes during their evening lectures. Majority of respondents were in a rush to leave the lecture hall immediately after the close of lectures. This may have affected the results as some useful respondents were lost.

3.12 Ethical Considerations During Data Collection

Creswell (2014, p. 95) strongly believes in carrying out a research, that there is the need for the researcher to protect their subjects “in order to build confidence with them, promote the integrity of the research, guard against misconducts and impropriety that might reflect on their organization or institution, and cope with challenges”. As a result of this, I ensured that the integrity of all the respondents (graduate students) was duly taken care of.

Fisher & King (2010) urges researchers to abide by professional research ethics in conducting their research and safeguard research participants from any possible harm that may arise in research. With regard to this, professional research ethics were observed throughout the entire study. I sought permission from the Research and Ethical Committee of the University of Ghana after submitting all necessary documents and having received a letter of approval for the commencement of data collection (see Appendix C). The approval of the study was accompanied by an introductory letter taken from the Department of Adult Education and Human Resource Studies which was sent to the various Departments selected within the Colleges used for the study.

In protecting the confidentiality of all the respondents used in the study, their names were not asked both during the pilot study and the actual data collection period. The consent of each respondent was sought before data was collected after signing a consent form (see Appendix B). The trustworthiness of the questionnaires in terms of secrecy and my adherence to ethical standards led to a high response rate. All respondents used for the study were made aware and informed about their voluntary participation in the study. Each respondent was assured with a declarative statement on top of the questionnaire that the data collected for the study would be used exclusively for academic purposes.

Although the respondents belonged to different Colleges, Schools and Departments at the University of Ghana, no reference was made to any particular College, Department or graduate student when findings were being reported. Instead, I treated all Colleges, Schools, Departments and graduate students equally.

All the journals, articles, books and research materials used in carrying out the study were duly acknowledged and referenced with regard to the American Psychological

Association (APA) requirements and guidelines of the School of Graduate Studies at the University of Ghana. The process of reporting research results also involves ethics (Gravetter & Forzano, 2006). In this study, I assume that the conclusions are accurate and honest representations of the procedures used in the study. On the whole, I considered ethical issues at each step in the research process.

3.13 Organization and Management of Data

The collected data from the respondents were handled solely by the research team. This was done to ensure the reliability of the results and also to increase the efficiency of the entire research, to facilitate the security of the data and minimize data loss. I had to develop the variables and variable set (or descriptions) for all the questions from the questionnaires. This was done to simplify the data using numbers (codes) to represent the responses. For instance, Gender (Male= 1, Female=2), Age (20-29=1, 30-39=2, 40-49=3, 50-59=4). This process was repeated for every question on the questionnaire. For instance, respondent 8 was given code ‘‘1’’ to represent male and code ‘’2’’ to represent age. I picked up each questionnaire answered correctly and entered each code under the variable for each respondent into the Statistical Package for the Social Sciences (SPSS) software up to the last questionnaire. This exercise was carried out to facilitate further data analysis.

3.14 Data Analysis

Data analysis involves the preparation of research data collected for analysis, understanding the data, logically presenting the data as well as making valid and reliable interpretations of the data to a larger population (Greene, 2007). In the same way, Burns & Grove (2009, p. 544) see data analysis as "the process of extracting from a given data,

the relevant information from which a summarized and comprehensible numerical description can be formulated". In relation to these definitions of data analysis, I used descriptive statistics to summarize the main features of the data set. The data collected were analyzed descriptively in terms of measures of variability and central tendency. The measure of central tendency included the means, while the measure of variability comprised standard deviation. The use of descriptive analysis was essential in determining the normality of the distribution.

Again, I employed inferential statistics to make inferences and good judgment about the target population (graduate students) based on the sample results obtained from the data collected. In addition, the inferential statistics enabled me to test the hypotheses stated. Some of the inferential statistics that were used in analyzing the data obtained included the Chi-Square test of Independence, Independent t-test, Correlation and One-Way Analysis of Variance among others.

The Chi-Square test of independence was used to test for associations between categorical variables such as Gender (Male & Female) and Level of Knowledge (High, Moderate or Low) on the Features of SAKAI LMS. With the chi-square, I was able to determine whether or not a significant difference existed between males and females on their knowledge level of the Features on the SAKAI LMS.

The Independent t-test was used in comparing the mean scores of two different groups. In relation to this, I was able to compare if a statistically significant difference existed between the mean scores obtained by male and female graduate students on their attitudes towards the continuous utilization of the SAKAI LMS.

With the One-Way Analysis of Variance, I was able to compare the mean scores of more than two groups. As a result, the One-Way Analysis of Variance was used in comparing

whether the mean scores obtained by graduate students within the three Colleges of Affiliation (Health, Education & Humanities) on their Extent of Utilization of the Features on SAKAI LMS. The main difference between a t-test and One-Way Analysis of Variance used in this study was that t-test could compare the means of only two groups (males and females) while the ANOVA compared the means of more than two groups (College of Affiliation).

The confirmatory factor analysis was used to verify the factor structure of a set of observed variables (Gold & Bentler, 2000). The confirmatory factor analysis used helped to test the hypothesis that a significant relationship existed between the observed variables and their latent constructs. The factors promoting the continuous utilization of the SAKAI LMS was tested based on the Confirmatory Factor Analysis. The analysis of these factors was done with respect to the theoretical framework (Unified Theory of Acceptance and Use of Technology) and prevailing research literature.

Again, Structural Equation Modelling was used to analyze structural relationships existing between variables (George & Mallery, 2010). This model helped to analyze the relationship between the measured variables and latent constructs. I used this model to test the hypothesis stated. The Statistical Package for Social Sciences (SPSS version 21) was used in performing all the statistical analysis in the study.

3.15 Summary of Chapter

The chapter has explained the quantitative research methodology used in collecting data for the study. The positivist paradigm upon which the study was based has been explained with respect to its philosophy, research design, sampling procedures, data analysis and ethical consideration. The next chapter presented the analyzed data collected from the respondents in relation to the objectives of the study.

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF RESULTS

4.0 Introduction

This chapter presents the analysis of results obtained from the data collected using a standardized questionnaire. The chapter provides an overview of the various quantitative and statistical methods employed in the analysis. The analysis has been described using descriptive and inferential statistics. I used inferential statistics to enable me infer information about the population used for the study by the formation of reliable conclusions about the relationships between the variables of the study.

On the whole, the quantitative statistics served a fundamental purpose of description and analysis and helped in the testing of the hypotheses stated for the study. The data collected were analyzed descriptively in terms of measures of variability and central tendency. As stated by Christensen et al. (2015), measures of variability include standard deviation, skewness and kurtosis. All calculations in the Chi-Square analysis were done horizontally.

4.1 Level of Knowledge on the Features of the SAKAI LMS

To be successful in the use of the LMS, it is essential that a graduate student possesses adequate knowledge of its features. The regular use of the features on the LMS will save time for both lecturers and students as well as making their learning content easier to be accessed at any time and place. Responses to the *Knowledge Subscale (KSS)* was measured on a 3-point Likert scale with **1=Low, 2=Moderate** and **3=High,** and presented in Table 4.1

Table 4.1: Level of Knowledge on the Features of the SAKAI LMS

Features	Mean	Standard Deviation
Knowledge Subscale (13 items)	***1.49***	***0.56***
Forum tool	1.79	0.79
Gradebook tool	1.34	0.47
Lessons tool	1.50	0.50
Quizzes and Test tool	1.34	0.47
Syllabus tool	1.34	0.47
Chat room tool	1.34	0.47
Resources tool	1.55	0.50
Announcement tool	1.44	0.61
Calendar	1.28	0.45
Dropbox tool	1.50	0.50
Email tool	1.43	0.48
Assignment tool	1.66	0.75
Turnitin tool	1.96	0.89

Source: Field Data, 2018. ***N=190 in all cases across***

Results from table 4.1, on the level of knowledge regarding the features of SAKAI LMS by graduate students is very low (M=1.49, SD=0.56). However, although the general level of knowledge on the features of SAKAI LMS was low, graduate students had enough knowledge of the Turnitin tool (M=1.96, SD= 0.89), Forum tool (M= 1.79, SD= 0.55), Assignment tool (M=1.66, SD=0.75) and Resources tool (M=1.55, SD=0.50). Their knowledge on the calendar (M=1.28, SD= 0.45) was the least.

4.1.1 Level of Knowledge on the Features of the SAKAI LMS and Gender

Cavus & Kanbul (2010) believe that gender differences exist in the knowledge and acceptance of the LMS. In this study, I used the chi-square test of independence to test the Level of Knowledge on the Features of the SAKAI LMS and Gender. Table 4.2 shows the level of knowledge on the features of SAKAI LMS and Gender.

Table 4.2: Level of Knowledge on the Features of the SAKAI LMS and Gender

		Gender				
Features		**Male (%)**	**Female (%)**	**Chi-square**	**DF**	**P-value**
Forum tool				61.185	2	**.000**
	Low	37.8	62.2			
	Moderate	98.4	1.6			
	High	76.2	23.8			
Grade Book				42.72	1	**.000**
	Low	50.4	49.2			
	Moderate	49.6	0.6			
Lesson Tool				87.83	1	**.000**
	Low	34.4	54.6			
	Moderate	98.9	1.1			
Quizzes & Test tool				42.72	1	**.000**
	Low	50.8	49.2			
	Moderate	98.4	0.6			

Source: Field Data, 2018 ***** significant at p = 0.05***

Table 4.2: Level of Knowledge on the Features of the SAKAI LMS and Gender continued.

Features		Gender		Chi-square	DF	P-value
		Male (%)	Female (%)			
Syllabus tool				42.72	1	**.000**
	Low	50.8	49.2			
	Moderate	98.4	0.6			
Chat room tool				42.72	1	**.000**
	Low	50.8	49.2			
	Moderate	98.4	0.6			
Resources tool				19.526	1	**.000**
	Low	50	50			
	Moderate	80.6	19.4			
Announcement Tool				25.364	2	**.000**
	Low	63.2	37.8			
	Moderate	83.9	6.1			
	High	90.9	9.1			
Calendar tool				35.727	1	**.000**
	Low	54.1	45.9			
	Moderate	100	-			
Dropbox tool				41.895	1	**.000**
	Low	44.7	55.3			
	Moderate	89.2	10.8			
Email tool				19.526	1	**.000**
	Low	50	50			
	Moderate	80.6	19.4			
Assignment tool				75.570	2	**.000**
	Low	77.7	22.3			
	Moderate	83.9	16.1			
	High	100	0			
Turnitin tool				44.221	2	**.000**
	Low	50	50			
	Moderate	89.2	10.8			
	High	34.4	65.6			

Source: Field Data, 2018 ***** significant at p = 0.05***

Evidence from table 4.2 demonstrated statistically significant differences existed between the Level of Knowledge on the Features of SAKAI LMS and Gender. This means that male and female graduate students have different levels of knowledge with respect to the features on the SAKAI LMS such as the Forum tool, Chat room tool, Lessons tool among others, confirming the assertion made by Cavus & Kanbul (2010).

For instance, 76% of males had enough knowledge of the Forum tool compared to 62 % of females who had knowledge about the Forum tool. Again, 90% of males had good knowledge of the Announcement tool compared to 63 % of females who also had knowledge about it. With respect to the Assignment tool, all male graduate students (100%) had sufficient knowledge about it. However, 77% of females had very low knowledge of the Announcement tool. Moreover, 65% of males also had good knowledge of the Turnitin tool compared to 34% of females. From the analysis, there is an indication that male graduate students had a greater knowledge of the features of SAKAI LMS than female graduate students

4.1.2 Level of Knowledge on the Features of the SAKAI LMS and Age

Mayanja (2002) has argued that an individual's age has an influence on their level of knowledge of the LMS. According to him, younger people make more use of e-learning resources than older people. I employed the chi-square test of independence test to find out whether a graduate student's level of knowledge on the features of the SAKAI LMS was statistically significantly different with respect to the students' age and this is presented in table 4.3.

Table 4.3: Level of Knowledge on the Features of the SAKAI LMS and Age

	Age						
Features	**20-29 (%)**	**30-39 (%)**	**40-49 (%)**	**50-59 (%)**	**Chi-square**	**DF**	**P-value**
Forum tool					1.613	6	.952
Low	25.6	58.5	13.4	2.4			
Middle	28.6	57.1	9.5	4.8			
High	28.6	52.4	14.3	4.8			
Grade book					.921	3	.820
Low	26.6	56.5	13.7	3.2			
Moderate	28.6	57.1	9.5	4.8			
Lessons tool							
Low	26.6	56.5	13.7	3.2	.395	3	.941
Moderate	28.6	57.1	9.5	4.8			
Quizzes and test tool					.921	3	.820
Low	26.6	56.5	13.7	3.2			
Moderate	28.6	57.1	9.5	4.8			
Syllabus Tool					.921	3	.820
Low	26.6	56.5	13.7	3.2			
Moderate	28.6	57.1	9.5	4.8			
Chat room tool					.921	3	.820
Low	26.6	56.5	13.7	3.2			
Moderate	28.6	57.1	9.5	4.8			
Resources Tool					.636	3	.888
Low	28.6	54.8	11.9	4.8			
Moderate	26.2	58.3	12.6	2.9			
Announcement Tool					1.764	6	.940
Low	26.3	56.1	14	3.5			
Moderate	29	58.1	9.7	3.2			
High	27.3	54.5	9.1	9.1			
Calendar					.502	3	.918
Low	26.7	56.3	13.3	3.7			
Moderate	28.8	57.7	9.6	3.8			

Source: Field Data, 2018 ***** significant at p=0.05***

Table 4.3: Level of Knowledge on the Features of the SAKAI LMS and Age continued.

Features		Age 20-29 (%)	30-39 (%)	40-49 (%)	Chi-Square	DF	P-value
Dropbox tool					.636	3	.888
Low	28.6	54.8	11.9	4.8			
Moderate	26.2	58.3	12.6	2.9			
Email tool					.636	3	.888
Low	28.6	54.8	11.9	4.8			
Moderate	26.2	58.3	12.6	2.9			
Assignment tool					1.439	6	.963
Low	25.5	55.3	14.9	4.3			
Moderate	29	58.1	9.7	3.2			
High	29	58.1	9.7	3.2			
Turnitin tool					1.138	6	.980
Low	29	54.8	12.9	3.2			
Moderate	25.8	58.1	12.9	3.2			
High	28.1	56.3	9.4	6.4			

Source: Field Data, 2018 ***** significant at p = 0.05***

Table 4.3, shows that there were no statistically significant differences between the Level of Knowledge of the Features of SAKAI LMS and Age. This implies that irrespective of the age of a graduate student, they had equal knowledge about the features of SAKAI LMS such as the Forum tool, Chat room tool, Email tool, Lessons tool and others at the University of Ghana.

4.1.3 Level of Knowledge on the Features of the SAKAI LMS and College of Affiliation.

An area of interest was whether the College of Affiliation could influence the Level of Knowledge on the Features of SAKAI LMS by graduate students at the University of Ghana. As a result, the chi-square test of independence to test was used in determining whether a statistical significant existed. The results of the analysis is presented in table 4.4.

Table 4.4: Level of Knowledge on the Features of the SAKAI LMS and College of Affiliation.

	Colleges					
Features	**Health (%)**	**Humanities (%)**	**Education (%)**	**Chi-square**	**DF**	**P-value**
Forum tool				.019	4	1.000
Low	45.1	42.7	12.2			
Middle	44.4	42.9	12.7			
High	45.2	42.9	11.9			
Grade book				.017	2	.991
Low	45.2	42.7	12.1			
Moderate	44	42.9	12.7			
Lessons tool				.395	3	.941
Low	45.2	43	11.8			
Moderate	44.7	42.6	12.8			
Quizzes and test tool				.921	3	.820
Low	26.6	56.5	13.7			
Moderate	28.6	57.1	9.5			
Syllabus tool				.921	3	.820
Low	26.6	56.5	13.7			
Moderate	28.6	57.1	9.5			
Chat room tool				.921	3	.820
Low	26.6	56.5	13.7			
Moderate	28.6	57.1	9.5			
Resources tool				.636	3	.888
Low	28.6	54.8	11.9			
Moderate	26.2	58.3	12.6			
Announcement tool				1.764	6	.940
Moderate	29	58.1	9.7			
High	27.3	54.5	9.1			

Source: Field Data, 2018 ***** significant at p=0.05***

Table 4.4: Level of Knowledge on the Features of the SAKAI LMS and College of Affiliation continued.

	Colleges					
Features	**Health (%)**	**Humanities (%)**	**Education (%)**	**Chi-Square**	**DF**	**P-Value**
Calendar tool				.502	3	.918
Low	26.7	56.3	13.3			
Moderate	28.8	57.7	9.6			
Dropbox tool				.636	3	.888
Low	28.6	54.8	11.9			
Moderate	26.2	58.3	12.6			
Email tool				.636	3	.888
Low	28.6	54.8	11.9			
Moderate	26.2	58.3	12.6			
Assignment tool				1.439	6	.963
Low	25.5	55.3	14.9			
Moderate	29	58.1	9.7			
High	29	58.1	9.7			
Turnitin tool				1.138	6	.980
Low	29	54.8	12.9			
Moderate	25.8	58.1	12.9			
High	28.1	56.3	9.4			

Source: Field Data, 2018 ***** significant at p = 0.05***

Table 4.4 indicates that there were no statistically significant differences between Level of Knowledge on the Features of SAKAI LMS and College of Affiliation. This means that irrespective of the College of Affiliation that a graduate student belonged to, they possess the same level of knowledge on the features of SAKAI LMS at the University of Ghana. However, a cursory look of the percentages shows that graduate students in the Humanities had significantly higher knowledge of the features. In order to confirm the chi-square results, an independent t-test was conducted on gender as in Table 4.5.

Table 4.5: Independent t-test on Level of Knowledge on the Features of SAKAI LMS by Gender

	Gender	N	Mean	SD	DF	T	P
Knowledge	Males	102	1.60	0.35	188	8.74	0.00
	Females	88	1.26	0.14			

Table 4.5 illustrates results of the independent t-test on the level of knowledge on features of SAKAI LMS by gender. I used the Independent t-test to compare the means of males and female graduate students on their Level of Knowledge on the Features of SAKAI LMS. The results obtained showed that males had relatively enough knowledge (M=1.60, SD=0.35) on the features of SAKAI LMS than their female counterparts (M=1.26, SD=0.14). However, the t-test (t (188) =8.74, p=0.00) shows that there is a statistically significant difference between their levels of knowledge although both are low.

4.2 Extent of Utilization of the Features of the SAKAI LMS

Generally, the SAKAI LMS provides lectures and students with quite a number of tools for a collaborative and flexible learning environment. Continuous use of the LMS is supposed to make students' academic life less stressful. This is because the LMS has several useful applications and as a result almost all universities around the world compel their lecturers and students to use it as part of institutional teaching and learning practices (Coates et al., 2005). The continuous usage of its features (LMS) helps students to complete their academic task on time, upload their assignments and download course materials in addition to communicating effectively with their lecturers. The *Utilization Subscale* (USS) was measured on a 5-Point Likert Scale with 1= *None, 2=Once a Semester, 3=Once a month, 4=Once a week and 5=Every day*. Table 4.6 shows the extent

of utilization of the several features found of the SAKAI LMS by graduate students at the University of Ghana.

Table 4.6: Extent of Utilization of the Features of the SAKAI LMS

Features	**Mean**	**Standard Deviation**
Utilization Subscale (13 Items)	**3.32**	**1.26**
Forum tool	2.24	0.79
Gradebook tool	3.26	1.47
Lessons tool	2.50	1.50
Quizzes and Test tool	3.40	1.47
Syllabus tool	3.40	1.47
Chat room tool	3.50	1.47
Resources tool	3.57	0.50
Announcement tool	3.44	0.61
Calendar	3.28	0.45
Dropbox tool	3.50	1.50
Email tool	3.55	1.50
Assignment tool	3.66	1.75
Turnitin tool	3.84	1.87
Source: Field Data, 2018.	***N=190 in all cases across***	

Table 4.6, demonstrates that the extent of usage of Features on the SAKAI LMS by graduates was occasional (once a month) with (M=3.32, SD=1.26) respectively. Despite the fact that graduate students generally utilized the features of SAKAI LMS once in a while, they often used more of the Turnitin tool (M=3.84, SD= 1.87) and Assignment tool (M= 3.66, SD=1.75) in their academic studies. On the other hand, graduate students barely used the Lessons tool (M=2.50, SD = 1.50) and Forum tool (M=2.24, SD = 0.79). In line with this, the study tried to find out how gender, age and College of Affiliation are associated with usage of the features.

4.2.1 Extent of Utilization of the Features of the SAKAI LMS and Gender

The overall picture of the situation relating to Gender and Information and Communication Technology (ICT) has so far been that men have been dominant and have left the women behind. As it has been proven by earlier studies carried out, Gender has a significant influence on the use of new technology (Davis, 2000). The chi-square test of independence was used in ascertaining whether a statistically significant difference existed between the extent of utilization of the Features of the SAKAI LMS and Gender. The analysis of results tested is evident in table 4.7

Table 4.7: Extent of Utilization of the Feature of the SAKAI LMS and Gender

	Gender				
Features	**Male (%)**	**Female (%)**	**Chi-Square**	**DF**	**P-value**
Forum tool			23.541	1	.000
Once a semester	83.9	16.1			
Once a month	43.1	56.9			
Grade book tool			68.589	4	.000
None	50	50			
Once a semester	90.9	9.1			
Once a month	89.2	10.8			
Once a week	-	100			
Everyday	9.1	90.9			
Lessons tool			19.805	2	.000
Once a semester	69.1	30.9			
Once a month	9.1	90.9			
Once a week	90.9	9.1			

Source: Field Data, 2018. ***N=190 in all cases across***

Table 4.7: Extent of Utilization of the Feature of the SAKAI LMS and Gender continued.

Features	Male (%)	Female (%)	Chi-Square	DF	P-Value
Quizzes and Test tool			42.565	2	
None	60.8	39.2			
Once a month	60.8	39.2			
Once a week	77.4	22.6			
Syllabus Tool			60.234	1	.000
Once a semester	61.5	38.5			
Once a month	61	39			
Chat room tool			59.435	1	.000
Once a semester	75.6	24.4			
Once a month	60.8	39.2			
Resources tool			40.223	2	.000
None	60.3	39.7			
Once a semester	61.5	34.3			
Once a month	60.4	32.5			
Announcement tool			2.867	1	.000
Once a semester	68.8	31.1			
Once a month	50.1	50			
Calendar tool			12.345	1	.000
Once a semester	57.5	42.5			
Once a month	50.3	40.45			.000
Dropbox tool			13.980	2	
None	82	18			
Once a semester	50	50			
Once a month	62.3	37.7			
Email tool			9.828	2	.000
None	66.7	33.3			
Once a semester	50	50			
Once a month	75	25			
Assignment tool			12.345	2	.000
None	45.7	54.3			
Once a semester	34.6	65.4			
Once a month	7.3	95.7			
Turnitin tool			15.454	2	.000
		76.6			
None	23.4				
Once a semester	23.4	93.5			
Once a month	47.7	52.3			

Source: Field Data, 2018 ***** significant at p = 0.05***

As shown in table 4.7, there were statistically significant differences in terms of the extent of utilization of the Features on SAKAI LMS and Gender. This reveals that male and female graduate students utilized each feature on SAKAI LMS differently and for a specific purpose. In effect, 83% of males used the Forum tool once a semester while 56% of females used the Forum tool once in a month. In terms of the grade book tool, it was found that 90% of males used it once in the whole semester while all the females used it once a week (100%). For the Lessons tool, 90% of both males and females used it once a week. Quizzes and test tool was used once a week by 77% males against 39% females who used it once a month. The Syllabus tool was used once a semester by 61% males as 39% females used it once a month. The Chat room tool is used by 61% males once a month with 38% of females using it once a semester.

In relation to the drop box tool, 82% of males never used it with 18% of females using it. This was not different from the Email tool, the Assignment tool, the Announcement tool and Resources tool. For the Turnitin tool, more females had never used it. From the above, it could be said that male and female graduates utilized the feature on SAKAI LMS at different times within an academic year.

4.2.2 Extent of Utilization of the Features of the SAKAI LMS and Age

Adams, Cain, Giraud & Stedman (2012) have argued that the use of the LMS is more pronounced and visible among the younger generation than the older generation. In agreement with Adams et al. (2012) since LMS is a recent innovation, the younger population would have the benefit of being exposed to it in their schools before going in for tertiary education. Table 4.8 presents the extent of utilization of SAKAI LMS features and Age.

Table 4.8: Extent of Utilization of the Features of the SAKAI LMS and Age

Features	Age 20-30 (%)	30-39 (%)	40-49 (%)	50-59 (%)	Chi-Square	DF	P-value
Forum tool					0.719	3	.687
Once a semester	29	58.1	9.7	3.2			
Once a month	25	58.3	13.9	2.8			
Grade book tool					2.716	12	.968
None	29	54.8	12.9	3.2			
Once a semester	27.3	54.5	9.1	9.1			
Once a month	25.8	58.1	12.9	3.2			
Once a week	30	60	10	-			
Everyday	27.3	54.5	9.1	9.1			
Lessons tool					2.134	6	.896
Once a semester	27.3	57	12.7	3			
Once a month	27.3	54.5	9.1	9.1			
Once a week	27.3	54.5	9.1	9.1			
Quizzes and Test tool					1.345	6	.765
None	23.5	58.8	15.7	2			
Once a month	23.5	58.8	15.7	2			
Once a week	27.3	54.5	9.1				
Syllabus tool					1.123	3	.674
Once a semester	25.8	55.9	15.1	3.2			
Once a month	23.1	57.7	15.4	3.8			
Chat room tool					1.345	3	.564
Once a semester	22	58.5	17.1	2.4			
Once a month	23.5	58.8	15.7	2			
Resources tool					1.926	6	.876
None	30	60	10	-			
Once a semester	25.8	58.1	12.9	3.2			
Once a month	27.4	54.8	13.1	4.8			
Announcement tool						3	.765
Once a semester	26.9	56.3	12.6	4.2			
Once a month	30	60	10	-			
Calendar tool					1.134	3	.796
Once a semester	27.3	57	12.7	3			
Once a month	27.3	54.5	9.1	9.1			
Dropbox tool					2.345	6	.875
None	29	54.8	12.9	3.2			
Once a semester	27.3	54.5	9.1	9.1			
Once a month	25.8	58.1	12.9	3.2			
Email tool					2.828	6	.765
None	27.3	57	12.7	3			
Once a semester	27.3	54.5	9.1	9.1			
Once a month	27.3	54.5	9.1	9.1			

Source: Field Data, 2018 ***** significant at p = 0.05***

Table 4.8: Extent of Utilization of the Features on the SAKAI LMS and Age continued.

Features	Age 20-30 (%)	30-39 (%)	40-49 (%)	50-59 (%)	Chi-Square	DF	P-value
Assignment tool					2.510	6	.758
None	30	60	10	-			
Once a semester	27.3	54.5	9.1	9.1			
Once a month	23.5	58.8	15.7	2			
Turnitin tool					15.454	2	.985
None	6.5	93.5					
Once a semester	23.4	76.6					
Once a month	47.7	52.3					

Source: Field Data, 2018 ***** significant at p = 0.05***

From Table 4.8, the chi-square test of independence reveals that there is no statistically significant difference existing between the ages of graduate students and their extent of usage of the features on SAKAI LMS. Hence, this implies that the use of the features of the SAKAI LMS does not depend on how old or young a graduate student is.

4.2.3 Extent of Utilization of the Features of the SAKAI LMS and College of Affiliation

I was interested in finding out if graduate students' College of Affiliation will play a role in the extent of usage of the features on SAKAI LMS. This was to establish which College utilizes the features of the SAKAI LMS more. Table 4.9 presents the extent of usage of the features of the SAKAI LMS and College of Affiliation.

Table 4.9: Extent of Utilization of the Features of the SAKAI LMS and College of Affiliation

	College of Affiliation					
Features	**Health (%)**	**Humanities (%)**	**Education (%)**	**Chi-Square**	**DF**	**P-value**
Forum tool				.072	2	.965
Once a semester	45.2	43.5	11.3			
Once a month	45.8	41.7	12.5			
Grade book tool				.935	8	.999
None	45.2	41.9	12.9			
Once a semester	36.4	45.5	18.2			
Once a month	46.2	41.9	11.8			
Once a week	40	50	10			
Everyday	45.5	45.5	9.1			
Lessons tool				.136	4	.998
Once a semester	43.4	43.4	13.2			
Once a month	45.9	42.6	11.5			
Once a week	45.2	41.9	12.9			
Quizzes and Test tool				.229	4	.994
None	46.7	43.3	10			
Once a month	45.2	41.9	12.9			
Once a week	44.0	42.9	13.1			
Syllabus tool				.265	2	.876
Once a semester	44.3	43.1	12.6			
Once a month	50	40	10			
Chat room tool				.234	2	.785
Once a semester	46.2	41.9	11.8			
Once a month	45.5	45.5	9.1			
Resources tool				.123	4	.785
None	23.5	58.8	15.7			
Once a semester	23.5	58.8	15.7			
Once a month	25.8	55.9	15.1			
Announcement tool				.453	2	.765
Once a semester	45.5	45.5	9.1			
Once a month	36.4	45.5	18.2			
Calendar tool				.756	2	.796
Once a semester	45.2	43.5	11.3			
Once a month	45.8	41.7	12.5			
Dropbox tool				.265	4	.764
None	45.1	43.1	11.8			
Once a semester	44.1	43	12.9			
Once a month	46.2	42.3	11.5			

Source: Field Data, 2018 *****significant at p=0.05***

Table 4.9: Extent of Utilization of the Features of the SAKAI LMS and College of Affiliation continued.

Features	Health (%)	Humanities (%)	Education (%)	Chi-Square	DF	P-value
Email tool				.156	4	.997
None	27.3	57	12.7			
Once a semester	27.3	54.5	9.1			
Once a month	27.3	54.5	9.1			
Assignment tool				.210	4	.758
None	46.3	41.5	12.2			
Once a semester	45.1	43.1	11.8			
Once a month	44.9	42.9	12.2			
Turnitin tool				.167	4	.975
None	27.3	54.5	18.2			
Once a semester	27.3	54.5	18.2			
Once a month	27.3	57	15.7			

Source: Field Data, 2018 ***** significant at p = 0.05***

The analysis of data in Table 4.9 indicates that there is no statistically significant difference between the extent of usage of the Features on SAKAI LMS and College of Affiliation. The outcome of the analysis suggests that a graduate student's continuous use of the SAKAI LMS does not depend on his or her College of Affiliation. To further establish differences to confirm the chi-square analysis, an ANOVA test was conducted as in presented in Table 4.10.

Table 4.10: Summary of One-Way Analysis of Variance on the Extent of Utilization of the Features of the SAKAI LMS by College of Affiliation.

Source of Variations	Sum of Squares	DF	Mean Square	F	P
Between Groups	.117	2	.58	.349	.706
Within Groups	22.726	136	.167		
Total	22.843	138			

Source: Field Data, 2018 ***** significant at p = 0.05***

As shown in Table 4.10, the F ratio for the one-way ANOVA was not significant (F=0.349, p = 0.706) at the 0.05 alpha level. This means that so far as the extent of usage of the Features on SAKAI LMS is concerned, there was no difference among the mean scores of the College of Affiliation. Hence, it could be said that the extent to which graduate students utilized the Features of SAKAI LMS is almost the same in all three Colleges of the student.

4.3 Attitudes Towards the Continuous Utilization of the SAKAI LMS

The attitude of graduate students towards e-learning is an important factor that could possibly influence their acceptance of an LMS. It could be said that the decision of a graduate student to continuously use the e-learning platform could perhaps affect his/her attitude towards the system. A 5 - point Likert Scale with *1= Strongly Disagree, 2 = Disagree, 3 = Agree and 5 = Strongly Agree* was used in measuring the attitudes of the respondents on the Attitudes Subscale (ASS). Table 4.11 shows the attitudes towards the continuous utilization of the SAKAI LMS by graduate students.

Table 4.11: Attitudes Towards the Continuous Utilization of the SAKAI LMS

Attitudes	Mean	Standard Deviation
Attitudes Subscale (12 Items)	***3.67***	***1.77***
I feel confident in using the SAKAI LMS	3.74	1.83
I enjoy using the SAKAI LMS for my studies	3. 60	1.77
The SAKAI LMS increase my productivity in my coursework	3.72	1.81
The SAKAI LMS can enhance my learning experience	3.79	1.87
The SAKAI LMS provides me with new knowledge	3.70	1.80
The SAKAI LMS increases the quality of my Learning	3.74	1.83
I am interested in studying courses that use SAKAI LMS	3.73	1.82
I am satisfied with the presentation methods of the SAKAI LMS	3.50	1.60
The SAKAI LMS helps me to better understand my course	3.69	1.79
The SAKAI LMS helps me to complete my course work	3.73	1.82
The SAKAI LMS allows an easy return to previous display	3.48	1.57
The course(s) is/are suitable to be run on the SAKAI LMS	3.60	1.77

Source: Field Data, 2018. ***N=190 in all cases across***

Table 4.11 illustrates the responses from the analysis of data depicted that graduate students had a positive attitude towards the continuous utilization of the SAKAI LMS with a mean and standard deviation (M=3.67, SD=1.77) correspondingly. The majority of graduate students were confident (M=3.74, SD=1.83) in using the SAKAI LMS as they acquired new knowledge (M= 3.70, SD=1.80), completed their coursework successfully (M=3.73, SD=1.82), increased the quality of their learning (M=3.74, SD=1.83), understanding of their coursework (M=3.73, SD=1.82), enhanced their learning (M=3.79, SD=1.87) as well as being very productive in their course work (M=3.72, SD=1.81). This implies that graduate students are optimistic and enthusiastic about the continuous utilization of the SAKAI LMS for their research and academic work. On the other hand, graduate students also enjoyed using the SAKAI LMS for their academic and research work (M=3.60, SD=1.71) and as a result, were much satisfied with the kind of presentation methods offered them by the SAKAI LMS (M=3.50, SD=1.60).

Other graduate students attested to the fact that they were able to easily return to earlier pages displayed on the SAKAI LMS (M=3.48, SD=1.57) making the use of the SAKAI LMS very suitable for their academic courses and programme (M=3.60, SD=1.77) at the University of Ghana. This shows that graduate students believed strongly that the use of the SAKAI LMS would be rewarding in their studies. Towards this end, the study sought to find out if significant differences existed regarding gender, age and College of Affiliation.

4.3.1 Attitudes Towards the Continuous Utilization of the SAKAI LMS and Gender

Graduate students' enjoyment of benefits of the SAKAI LMS perhaps depend on their overall attitudes towards it. Earlier studies carried out recognized the influence that gender had on individuals' adaptation to the SAKAI LMS. Selim (2007) has said that a university student (male/female) who is familiar with modern technology develop attitudes towards

it. Table 4.12 presents the analysis of Attitudes towards the usage of the SAKAI LMS and Gender.

Table 4.12: Attitudes Towards the Continuous Utilization of the SAKAI LMS and Gender

Attitudes	Gender				
	Male (%)	Female (%)	Chi-Square	DF	P
I feel confident in using the SAKAI LMS			137.314	3	.000
Strongly Disagree	20	80			
Disagree	20	80			
Neutral	91.9	8.1			
Strongly Agree	90.9	9.1			
I enjoy using the SAKAI LMS for my studies			58.875	3	.000
Strongly Disagree	40	60			
Disagree	43.1	56.9			
Neutral	89.2	10.8			
Agree	80	20			
The SAKAI LMS increases my productivity in my coursework			143.764	3	.000
Strongly Disagree	9.1	90.9			
Disagree	70	30			
Neutral	60	40			
Agree	78.8	21.2			
The SAKAI LMS can enhance my learning experience			143.764	3	.000
Disagree	20	80			
Neutral	90	10			
Agree	78.8	21.2			
Strongly Agree	90.9	9.1			
The SAKAI LMS provides me with new knowledge			29.897	1	.000
Disagree	43.1	56.9			
Neutral	81.7	18.3			
SAKAI LMS increases the quality of learning.			29.897	1	.000
Disagree	43.1	56.9			
Neutral	81.7	18.3			
I am interested in studying courses that use SAKAI LMS			105.874	1	.000
Disagree	10	90			
Neutral	85.6	14.4			

Source: Field Data, 2018 *****significant at p=0.05***

Table 4.12: Attitudes Towards the Continuous Utilization of the SAKAI LMS and Gender continued.

Attitudes	Gender				
	Male (%)	Female (%)	Chi-Square	DF	P
I am satisfied with the presentation methods of the SAKAI LMS			74.922	2	.000
Disagree	30	70			
Neutral	80	20			
Agree	80.4	19.6			
The SAKAI LMS helps me better understand my course			62.915	2	.000
Disagree	56	44			
Neutral	89.5	10.5			
Agree	95	5			
The SAKAI LMS helps me to complete my coursework			44.179	2	.000
Disagree	43.1	56.9			
Neutral	66.7	33.3			
Agree	98	2			
The SAKAI LMS allows an easy return to previous display pages			74.920	1	.000
Disagree	10	90			
Neutral	80.1	19.9			
The course is/are suitable to be run on the SAKAI LMS			30.358	2	.000
Disagree	43.1	56.9			
Neutral	80.8	19.2			
Agree	90.9	9.1			

Source: Field Data, 2018 ***** significant at p = 0.05***

Table 4.12 illustrates that there was a statistically significant difference between attitudes towards the continuous utilization of the SAKAI LMS and Gender. The results obtained showed that although graduate students at the University of Ghana had positive attitudes towards the continuous use of the SAKAI LMS at the University of Ghana, they differed in relation to gender. From the table, it is gathered 90% of males strongly agreed to the fact that they were confident using the SAKAI LMS against 80% who were less confident.

In trying to find out whether graduate students enjoyed using the SAKAI LMS at the University of Ghana, more males agreed to enjoying it than females. Similar results were found in terms of how the use of the SAKAI LMS increased the productivity of the students' coursework, enhancing their learning experience while providing them with new knowledge. In line with whether the use of the SAKAI LMS increases the quality of learning, both disagreed with more males being neutral in this regard. In finding out whether graduate students were interested in studying courses that use the SAKAI LMS, females (90%) were not interested. More female graduate students were dissatisfied with the presentation style of the SAKAI LMS, (70%) than their male counterparts (30%). Also, 95% of males found using the SAKAI LMS helped them to understand their course better than their female colleagues. In the same vein more males agreed to the notion that the use of the SAKAI LMS enabled them to complete their course work on time. About 90% of females disagreed that the use of the SAKAI LMS helped them to easily return to previously displayed pages. In addition, 90% of males believed their courses were suitable to be run on the SAKAI LMS whilst 56% of females disagreed. The results analyzed indicates that male and female graduate students at the University of Ghana have different attitudes when it comes to the use of the SAKAI LMS and this as a result, may have significant implications for educational technology in general.

4.3.2 Attitudes Towards the Continuous Utilization of the SAKAI LMS and Age

There is a common belief that older adults (40-60) have more negative attitudes toward online learning than younger adults (20-39). Based on this belief, I examined the attitudes of graduate students towards the continuous utilization of the SAKAI LMS and their age and presents the analyzed data in Table 4.13

Table 4.13: Attitudes Towards the Continuous Utilization of SAKAI LMS and Age

Attitudes	Age 20-30 (%)	30-39 (%)	40-49 (%)	50-59 (%)	Chi-Square	DF	P-Value
I feel confident in using the SAKAI LMS					3.456	12	.989
Strongly Disagree	27.3	54.5	9.1	9.1			
Disagree	29	58.1	9.7	3.2			
Neutral	26.6	56.5	13.7	3.2			
Agree	27.3	54.5	9.1	9.1			
Strongly Agree	30	60	10	-			
I enjoy using the SAKAI LMS for my studies					2.579	9	.979
Strongly Disagree	27.3	54.5	9.1	9.1			
Disagree	25	58.3	13.9	2.8			
Neutral	29	55.9	11.8	3.2			
Agree	27.3	54.5	9.1	9.1			
The SAKAI LMS increase my productivity in my coursework					2.29	9	.986
Strongly Disagree	27.3	54.5	9.1	9.1			
Disagree	29.3	58.5	9.8	2.4			
Neutral	28.9	55.4	12	3.6			
Agree	23.1	57.7	15.4	3.8			
The SAKAI LMS can enhance my learning experience					2.29	9	.986
Disagree	29.3	58.5	9.8	2.4			
Neutral	28.9	55.4	12	3.6			
Agree	23.1	57.7	15.4	3.8			
Strongly Agree	27.3	54.5	9.1	9.1			

Source: Field Data, 2018 ***** significant at p = 0.05***

Table 4.13 Attitudes Towards the Continuous Utilization of SAKAI LMS and Age continued.

Attitudes	20-29 (%)	30-39 (%)	40-49 (%)	50-59 (%)	Chi-Square	DF	P-Value
The SAKAI LMS provides me with new knowledge					.810	3	.847
Disagree	25	58.3	13.9	2.8			
Neutral	28.7	55.7	11.3	4.3			
The SAKAI LMS increases the quality of my learning					.810	3	.847
Disagree	25	58.3	13.9	2.8			
Neutral	28.7	55.7	11.3	4.3			
I am interested in studying courses that use SAKAI LMS					.623	3	.891
Disagree	29.3	82.6	17.4	2.4			
Neutral	26.7	14.4	82.6	4.1			
I am satisfied with the presentation methods of the SAKAI LMS					1.819	6	.936
Disagree	29	58.1	9.7	3.2			
Neutral	25.7	55.2	14.3	4.8			
Agree	29.4	58.8	9.8	2			
The SAKAI LMS helps me to better understand my course					1.422	6	.965
Disagree	25	58.3	13.9	2.8			
Neutral	28.6	55.2	11.4	4.8			
Agree	30	60	10	-			
The SAKAI LMS helps me to Complete my course work					1.164	6	.979
Disagree	25	58.3	13.9	2.8			
Neutral	28.6	54	12.7	4.8			
Agree	28.8	57.7	9.6	3.8			
The SAKAI LMS allows an easy return to previous display pages					.289	3	.962
Disagree	29.	58.1	9.7	3.2			
Neutral	26.9	56.4	12.8	3.8			
The course is/are suitable to be run on the SAKAI LMS					1.601	6	.953
Disagree	25.	58.3	13.9	2.8			
Neutral	28.8	55.8	11.5	3.8			
Agree	27.3	54.5	9.1	9.1			

Source: Field Data, 2018 ***** Significant at p= 0.005***

According to Table 4.13, the analysis reveals no statistically significant difference existing between Attitudes towards the usage of the SAKAI LMS and Age. This clearly shows that the chronological age of a graduate student (whether young or old) does not influence their attitudes towards the continuous use of the SAKAI LMS at the University of Ghana. From the results, both young and old graduate students felt confident using the SAKAI LMS, enjoyed logging unto the platform and were interested in using it for their academic work.

4.3.3 Attitudes Towards the Continuous Utilization of the SAKAI LMS and College of Affiliation

O'neill, Singh & O'donoghue (2004) recommend that moving away from the conventional university method of teaching to the online method of teaching and learning requires adequate education for lecturers and decision-makers in an understanding of students as it could affect their academic performance. A chi-square test of independence was used to test whether the College of Affiliation and attitudes towards the usage of the SAKAI LMS were statistically different. Table 4.14 shows the analysis.

Table 4.14: Attitudes Towards the Continuous Utilization of SAKAI LMS and College of Affiliation

Attitudes	College of Affiliation			Chi-Square	DF	P-value
	Health (%)	Humanities (%)	Education (%)			
I feel confident in using the SAKAI LMS				.907	8	.999
Strongly Disagree	45.5	45.5	9.1			
Disagree	45.2	41.9	12.9			
Neutral	46	41.9	12.1			
Agree	36.4	45.5	18.2			
Strongly Agree	40	50	10			
I enjoy using the SAKAI LMS for my studies				.674	6	.995
Strongly Disagree	45.5	45.5	9.1			
Disagree	45.8	41.7	12.5			
Neutral	45.2	43	11.8			
Agree	36.4	45.5	18.2			
The SAKAI LMS increase my productivity in my coursework				.224	6	1.000
Strongly Disagree	45.5	45.5	9.1			
Disagree	43.9	43.9	12.2			
Neutral	45.8	42.2	12			
Agree	44.2	42.3	13.5			
The SAKAI LMS can enhance my learning experience				.224	6	1.000
Disagree	43.9	43.9	12.2			
Neutral	45.8	42.2	12			
Agree	44.2	42.3	13.5			
Strongly Agree	45.5	45.5	9.1			
The SAKAI LMS provides me with new knowledge				.060	2	.971
Disagree	45.8	41.7	12.5			
Neutral	44.3	43.5	12.2			

Source: Field Data, 2018 ***** significant at p = 0.05***

Table 4.14: Attitudes Towards the Continuous Utilization of SAKAI LMS and College of Affiliation continued.

Attitudes	Health (&)	Humanities (%)	Education (%)	Chi-Square	DF	P-Value
The SAKAI LMS increases the quality of learnings				.060	2	.971
Disagree	45.8	41.7	12.5			
Neutral	44.3	43.5	12.2			
I am interested in studying courses that use SAKAI LMS				.028	2	.986
Disagree	43.9	43.9	12.2			
Neutral	45.2	42.5	12.3			
I am satisfied with the presentation methods of the SAKAI LMS				.447	4	.978
Disagree	45.2	41.9	12.9			
Neutral	43.8	42.9	13.3			
Agree	47.1	43.1	9.8			
The SAKAI LMS helps me to better understand my course				.257	4	.992
Disagree	45.8	41.7	12.5			
Neutral	44.8	42.9	12.4			
Agree	40	50	10			
The SAKAI LMS helps me to complete my course work				.190	4	.996
Disagree	45.8	41.7	12.5			
Neutral	42.9	44.4	12.7			
Agree	46.2	42.3	11.5			
The SAKAI LMS allows easy return to previous display pages				.018	2	.991
Disagree	45.2	41.9	12.9			
Neutral	44.9	42.9	12.2			
The course is/are suitable to be run on the SAKAI LMS				.600	4	.963
Disagree	45.8	41.7	12.5			
Neutral	45.2	43.3	11.5			
Agree	36.4	45.5	18.2			

Source: Field Data, 2018 ***** significant at p = 0.05***

As shown by Table 4.14, there were no statistically significant differences or associations between attitudes towards the usage of the SAKAI LMS and College of Affiliation. This outcome indicates that a graduate student's attitudes towards the continuous use of the SAKAI LMS has nothing to do with his/her College of Affiliation as they believed the SAKAI LMS may enhance their learning activities in general, help them to better understand and complete their course work successfully. Although minor differences may exist regarding the descriptive percentages. Graduate students of the respective colleges felt satisfied using the SAKAI LMS at the University of Ghana as it offered them an opportunity to acquire new knowledge. Thus they enjoyed using it in their studies. Further test to establish significant differences led to the Independent t-test as in Table 4.15.

Table 4.15: Independent t-test on Attitudes Towards the Continuous Utilization of SAKAI LMS by Gender

	Gender	N	Mean	SD	DF	T	P
Attitudes	Males	102	3.01	0.22	188	9.94	0.00
	Females	88	2.41	0.44			

Source: Field Data, 2018 ***** significant at p = 0.05***

Table 4.15 illustrates results of the t-test on the attitudes towards the usage of the features of the SAKAI LMS by Gender. The results obtained showed that Males had more positive attitudes (M=3.01, SD=0.22) towards the SAKAI LMS than Females (M=2.41, SD=0.44).This was confirmed by the t-test (t (188) =9.94, p=0.00) showing that there is a statistically significant difference between their attitudes towards the usage of the SAKAI LMS.

4.4 Motivations Towards the Continuous Utilization of the SAKAI LMS

Motivation is an indispensable feature in learning, and it has an impact in all areas of education. The effective application of e-learning resources in instruction may stimulate graduate students' interest in the use of the SAKAI LMS for effective learning. Responses to items on the Motivational Subscale (MSS) were assessed on a 3 – point Likert scale ranging from *three (3) being highly motivated, two (2) moderately motivated and one (I) being least motivated.* The outcome of the data analyzed on graduate students' motivations towards the continuous utilization of the SAKAI LMS has been presented in Table 4.16.

Table 4.16: Motivations Towards the Continuous Utilization of the SAKAI LMS

Motivations	Mean	Standard Deviation
Motivations Subscale (19 items)	**2.73**	**1.67**
The use of SAKAI LMS can affect my future career	2.96	1.86
Using the SAKAI LMS saves time.	2.97	1.89
The SAKAI makes it easy to communicate with my Lecturers and friends.	2.94	1.81
I receive emails from my friends on the SAKAI LMS.	2.76	1.71
I respond to the discussion group on the SAKAI LMS.	2.76	1.71
The SAKAI LMS is appropriate with how I learn	2.75	1.70
The SAKAI LMS requires me to change my study habits.	2.62	1.53
I am not worried about making mistakes by clicking on the wrong item when I use the SAKAI LMS.	2.61	1.50
I can use the SAKAI LMS at a comfortable pace.	2.78	1.71
I find the SAKAI LMS useful in my studies.	2.68	1.65
The use of the SAKAI LMS I increase my chances of getting a better grade.	2.61	1.50
The SAKAI LMS motivates me to learn.	2.65	1.63
SAKAI LMS is the latest learning technologies.	2.63	1.62

Source: Field Data, 2018. ***N=190 in all cases across***

Table 4.16: Motivations Towards the Continuous Utilization of the SAKAI LMS continued.

Motivations	Mean	Standard Deviation
The SAKAI LMS is similar to other applications I use (such as MS Power-point, MS Word, and others).	2.67	1.69
Working with the SAKAI LMS is fun.	2.95	1.83
Computer literacy training program organized for students	2.67	1.69
Previous personal experience with Internet resources	2.60	1.48
Lecturers aligning SAKAI LMS usage with learning	2.61	1.50
The frustration of attending face-to-face lecture Session	2.67	1.69

Source: Field Data, 2018. ***N=190 in all cases across***

Table 4.16 portrays that graduate students at the University of Ghana as being *highly motivated* (M= 2.73, SD = 1.67) towards the continuous utilization of the SAKAI LMS. This is because graduate students believe that using the SAKAI LMS saves them time (M = 2.97, SD = 1.89), had a significant impact on their professional career (M=2.96, SD =1.86) and was fun working with (M =2.95, SD=1.83). Graduate students were able to communicate easily with their lecturers and colleagues through the platform (M = 2.94, SD = 1.81). On the other hand, graduate students were of the view that the SAKAI LMS was appropriate with how they learn (M = 2.75, SD = 1.70). They found it useful using the SAKAI LMS in their studies (M = 2.68, SD =1.65) and were interested using the platform as it is the latest technology (M = 2.63, SD=1.62) introduced at the University of Ghana. This shows that both intrinsic factors such as *the SAKAI LMS is appropriate with how I learn, the SAKAI LMS requires me to change my study habits* etc. and extrinsic factors such as *the use of SAKAI LMS can affect my future career, using the SAKAI LMS saves time* etc. could affect a graduate student's decision to adapt to the SAKAI LMS at the University of Ghana. With such a high level of motivation, a graduate student may continuously use it profitably.

4.4.1 Motivation Towards the Continuous Utilization of the SAKAI LMS and Gender

The motivation to use innovation/technology has been found to be influenced by gender. With respect to this, I was interested in determining whether gender as a demographic variable may have an effect on graduate students' motivation towards the usage of the SAKAI LMS at the University of Ghana. Table 4.17 shows the analysis of data on the motivation to utilize SAKAI LMS and Gender.

Table 4.17: Motivation Towards the Continuous Utilization of the SAKAI LMS and Gender

Motivation	Gender				
	Male (%)	Female (%)	Chi-Square	DF	P
The use of SAKAI LMS can affect my future career					
Highly Motivated	70.0	30.0	7.22	2	0.077
Moderately Motivated	80.0	20.0			
Least Motivated	66.9	33.1			
Using the SAKAI LMS saves time					
Highly Motivated	90.0	10.0	4.903	2	0.086
Moderately Motivated	78.6	21.4			
Least Motivated	66.7	33.3			
The SAKAI makes it easy to communicate with lecturers and friends					
Highly Motivated	25.0	75.0	7.22	2	0.077
Moderately Motivated	80.0	20.0			
Least Motivated	66.0	40.0			
I receive emails from my friends on the SAKAI LMS					
Highly Motivated	75.0	25.0	7.21	2	0.065
Moderately Motivated	65.0	35.0			
Least Motivated	45.0	55.0			
I respond to the discussion group on the SAKAI LMS					
Highly Motivated	15.0	85.0	7.22	2	0.077
Moderately Motivated	80.0	20.0			
Least Motivated	66.9	33.1			

Source: Field Data, 2018. ***N=190 in all cases across***

Table 4.17: Motivation Towards the Continuous Utilization of the SAKAI LMS and Gender continued.

Motivation	Gender		Chi-Square	DF	P
	Male (%)	Female (%)			
The SAKAI LMS is appropriate with how I learn					
Highly Motivated	35.0	65.0	5.214	2	0.074
Moderately Motivated	80.0	20.0			
Least Motivated	66.5	33.5			
The SAKAI LMS requires me to change my study habits					
Highly Motivated	90.0	10.0	4.939	2	0.085
Moderately Motivated	50.0	50.0			
Least Motivated	68.2	31.8			
I am not worried about making mistakes by clicking on the wrong item when using the SAKAI LMS					
Highly Motivated	62.9	37.1	3.997	1	0.079
Moderately Motivated	78.7	21.3			
I can use the SAKAI LMS at a comfortable pace					
Highly Motivated	66.7	33.3	0.003	1	0.959
Moderately Motivated	67.0	33.0			
I find the SAKAI LMS useful in my studies					
Highly motivated	33.3	66.7	1.545	1	0.214
Moderately Motivated	67.4	32.6			
The use of the SAKAI LMS I increase my chance of getting a better grade					
Highly Motivated	45.0	55.0	4.076	1	0.069
Moderately Motivated	67.6	32.4			
The SAKAI LMS motivates me to learn					
Highly Motivated	55.0	45.0	0.259	1	0.611
Moderately Motivated	67.0	33.0			
The SAKAI LMS is the latest learning technologies					
Highly Motivated	80.0	20.0	0.499	1	0.481
Moderately Motivated	66.7	33.3			

Source: Field Data, 2018. ***N=190 in all cases across***

Table 4.17: Motivation Towards the Continuous Utilization of the SAKAI LMS and Gender continued.

Motivation	Gender				
	Male (%)	Female (%)	Chi-Square	DF	P
The SAKAI is compatible with other application I use [such MS Power-point, MS Word, and others]					
Highly Motivated	80.0	20.0	6.147	1	0.013
Moderately Motivated	67.9	32.1			
Working with the SAKAI LMS is fun					
Highly Motivated	80.0	20.0	1.003	1	0.317
Moderately Motivated	66.5	33.5			
Computer literacy training program organized for student					
Highly Motivated	75.0	25.0	0.123	1	0.726
Moderately Motivated	66.7	33.3			
Previous personal experience with internet resource					
Highly motivated	66.8	33.2	0.456	1	0.453
Lecturers aligning SAKAI LMS usage with learning objectives					
Highly Motivated	33.3	66.7	1.545	1	0.214
Moderately Motivated	67.4	32.6			
The frustration of attending the face-to-face lecture session					
Highly Motivated	90.0	10.0	4.939	2	0.085
Moderately Motivated	50.0	50.0			
Least Motivated	68.2	31.8			

Source: Field Data, 2018. ***N=190 in all cases across***

From Table 4.17, it can be seen that there were no statistically significant differences between motivation towards the usage of the SAKAI LMS and gender based on the chi-square analysis. This indicates that both male and female graduate students at the University of Ghana were very much motivated to use the SAKAI LMS as it made communication easy for them and their lecturers.

4.4.2 Motivation Towards the Continuous Utilization of the SAKAI LMS and Age

Researchers have found that younger students are motivated to use technology more than older students (Aramide, Ladipo & Adebayo, 2015). Based on these findings, I was interested in finding out whether the age of graduate students would have an impact on their motivation to use the SAKAI LMS at the University of Ghana. The results of the analysis have been presented in Table 4.18 below.

Table 4.18: Motivation Towards the Continuous Utilization of the SAKAI LMS and Age

Motivation	Age				Chi-Square	DF	P-value
	20- 30 (%)	30-39 (%)	40-49 (%)	50-59 (%)			
The use of SAKAI LMS can affect my future career							
Highly Motivated	27.8	56.2	12.4	3.6	1.293	6	0.972
Moderately Motivated	20.0	60.0	13.3	6.7			
Least Motivated	33.3	66.7	-	-			
Using SAKAI LMS saves time							
Highly Motivated	27.5	56.7	12.3	3.5	1.396	6	0.966
Moderately Motivated	21.4	57.1	14.3	7.1			
Least Motivated	50.0	50.0	-	-			
The SAKAI makes it easy to communicate with my lecturers and friends							
Highly Motivated	27.8	56.2	12.4	3.6	1.293	6	0.972
Moderately Motivated	20.0	60.0	13.3	6.7			
Least Motivated	33.3	66.7	-	-			
I receive emails from my friends on SAKAI LMS							
Highly Motivated	27.8	89.6	91.3	3.6	1.293	6	0.972
Moderately motivated	20.0	8.5	8.7	6.7			
Least Motivated	33.3	1.9	-	-			

Source: Field Data, 2018. ***N=190 in all cases across***

Table 4.18: Motivation Towards the Continuous Utilization of the SAKAI LMS and Age continued.

Motivation	Age				Chi-Square	DF	P-value
	20- 30 (%)	30-39 (%)	40-49 (%)	50-59 (%)			
I respond to the group discussion on the SAKAI LMS							
Highly Motivated	27.6	56.5	12.4	3.5	1.422	6	0.964
Moderately motivated	20.0	60.0	13.3	6.7			
Least Motivated	50.0	50.0	-	-			
The SAKAI LMS is compatible with how I learn							
Highly Motivated	28.5	55.3	12.3	3.9	4.405	6	0.622
Moderately Motivated	-	83.3	16.7	-			
Least Motivated	-	100	-	-			
The SAKAI LMS requires to change study habits							
Highly Motivated	27.7	57.4	10.6	4.3	0.195	3	0.978
Moderately Motivated	27.1	56.4	12.9	3.6			
I am not worried about making mistakes by clicking on the wrong item when I use SAKAI LMS							
Highly Motivated	27.7	55.3	12.8	4.3	0.238	3	0.971
Moderately motivated	26.9	58.1	11.8	3.2			
I can use SAKAI LMS at a comfortable pace.							
Highly Motivated	26.6	57.0	13.3	3.1	0.816	3	0.846
Moderately motivated	28.8	55.9	10.2	5.1			
I find the SAKAI useful in my studies							
Highly Motivated	27.3	56.8	12.9	3.0	0.733	3	0.865
Moderately Motivated	27.3	56.4	10.9	5.5			

Source: Field Data, 2018. ***N=190 in all cases across***

Table 4.18: Motivation Towards the Continuous Utilization of the SAKAI LMS and Age continued.

Motivation	Age				Chi-Square	DF	P-value
	20- 30 (%)	30-39 (%)	40-49 (%)	50-59 (%)			
The use of the SAKAI LMS increase my chances of getting a better grade							
Highly Motivated	27.2	57.1	12.0	3.8	1.545	3	0.672
Moderately Motivated	33.3	33.3	33.3	-			
The SAKAI LMS motivates me to learn							
Highly Motivated	27.6	56.8	11.9	3.8	2.979	3	0.395
Moderately motivated	-	50.0	50.0	-			
The SAKAI LMS is the latest learning technologies							
Highly Motivated	25.9	57.0	-	3.8	2.681	3	0.443
Moderately Motivated	100	-	12.4	-			
SAKAI LMS is compatible with other applications I use (such as MS Power-point, MS Word)							
Highly Motivated	27.2	57.1	12.2	-	1.545	3	0.672
Moderately motivated	33.3	33.3	33.3	3.8			
Working with the SAKAI LMS is fun							
Highly Motivated	27.6	56.2	12.4	3.8	1.545	3	0.672
Moderately motivated	-	100	-	-			
Computer literacy training program organized for students							
Highly Motivated	26.8	56.8	12.6	3.8	1.462	3	0.691
Moderately Motivated	50.0	50.0	-	-			

Source: Field Data, 2018. **N=190 in all cases across**

Table 4.18: Motivation Towards the Continuous Utilization of the SAKAI LMS and Age continued.

Motivation	Age				Chi-Square	DF	P-value
	20- 30 (%)	30-39 (%)	40-49 (%)	50-59 (%)			
Previous personal experience with internet resources							
Highly Motivated	27.4	56.7	12.1	3.8	5.865	6	0.439
Moderately Motivated	21.4	60.7	14.3	3.6			
Least Motivated	90.0	10.0	-	-			
Lecturers aligning SAKAI LMS usage with learning objectives							
Highly Motivated	82.4	17.6	-	-	2.936	6	0.817
Moderately motivated	15.7	18.9	12.1	3.0			
Least Motivated	2.0	80.0	18.0	-			
The frustration of attending face to a face lecture session							
Highly Motivated	27.4	56.7	12.1	3.8	5.865	6	0.439
Moderately motivated	21.4	60.7	14.3	3.6			
Least Motivated	70.0	30.0	-	-			

Source: Field Data, 2018. ***N=190 in all cases across***

From Table 4.18, the results of the chi-square analysis indicate no statistically significant difference existing between motivation toward the usage of the SAKAI LMS and Age. This means that the individual ages of graduate students at the University of Ghana had no impact on their motivation to use the SAKAI LMS. This is because, from the analysis, both young and old graduate students (20 years to 59 years) were greatly motivated to use the SAKAI LMS as it increased their chances of getting better grades, made communication easy and they had great fun using the system for their academic work at the University of Ghana.

4.4.3 Motivation Towards the Continuous Utilization of the SAKAI LMS and College of Affiliation

In the context of this study, motivation was seen as a graduate student's desire and willingness to use the SAKAI LMS in his /her academic work. I postulate that the basic influence of beliefs is on motivation that consequently affects usage. Against this background, I found it essential to find out the motivation towards the continuous use of the SAKAI LMS in relation to the College of Affiliation of graduate students at the University of Ghana. Table 4.19 shows graduate students' motivation towards the continuous use of the SAKAI LMS.

Table 4.19: Motivation Towards the Continuous Utilization of the SAKAI LMS and College of Affiliation.

Motivation	College of Affiliation			Chi-Square	DF	P-value
	Health (%)	Humanities (%)	Education (%)			
The use of SAKAI LMS can affect my future career						
Highly Motivated	44.4	43.2	12.4	1.441	4	0.837
Moderately Motivated	53.3	33.3	13.3			
Least Motivated	33.3	66.7	-			
Using SAKAI LMS saves time						
Highly Motivated	43.9	43.9	12.3	1.542	4	0.819
Moderately Motivated	57.1	28.6	14.3			
Least Motivated	50.0	50.0	-			
The SAKAI makes it easy to communicate with my lecturers and friends						
Highly Motivated	44.4	43.2	12.4	1.441	4	0.837
Moderately Motivated	53.3	33.3	13.3			
Least Motivated	33.3	66.7	-			
I receive emails from my friends on SAKAI LMS						
Highly Motivated	44.4	43.2	12.4	1.441	4	0.837
Moderately motivated	53.3	33.3	13.3			
Least Motivated	33.3	66.7	-			

Source: Field Data, 2018. ***N=190 in all cases across***

Table 4.19: Motivation Towards the Continuous Utilization of SAKAI LMS and College of Affiliation continued.

Motivation	College of Affiliation			Chi-Square	DF	P-value
	Health (%)	Humanities (%)	Education (%)			
I respond to the group discussion on the SAKAI LMS						
Highly Motivated	44.1	43.5	12.4	0.891	4	0.926
Moderately motivated	53.3	33.3	13.3			
Least Motivated	50.0	50.0	-			
The SAKAI LMS is appropriate with how I learn						
Highly Motivated	50.0	50.0	12.3	2.014	4	0.733
Moderately Motivated	66.7	16.7	16.7			
Least Motivated	44.1	43.6	-			
The SAKAI LMS requires to change study habits						
Highly Motivated	44.7	42.6	12.8	0.013	2	0.994
Moderately Motivated	45.0	42.9	12.1			
I am not worried about making mistakes by clicking on the wrong item when I use SAKAI LMS						
Highly Motivated	44.7	42.6	12.8	0.038	2	0.981
Moderately motivated	45.2	43.0	11.8			
I can use SAKAI LMS at a comfortable pace.						
Highly Motivated	46.1	42.2	11.7	0.269	2	0.874
Moderately motivated	42.4	44.1	13.6			
I find the use of the SAKAI LMS useful in my studies						
Highly Motivated	45.5	43.2	11.4	0.365	2	0.833
Moderately Motivated	43.6	41.8	14.5			

Source: Field Data, 2018. ***N=190 in all cases across***

Table 4.19: Motivation Towards the Continuous Utilization of SAKAI LMS & College of Affiliation continued.

Motivation	College of Affiliation					
	Health (%)	Humanities (%)	Education (%)	Chi-Square	DF	P-value
The use of the SAKAI LMS increase my chances of getting a better grade						
Highly Motivated	44.6	42.9	12.5	0.76	2	0.684
Moderately Motivated	66.7	33.3	-			
The SAKAI LMS motivates me to learn						
Highly Motivated	44.2	43.2	12.4	2.479	2	0.29
Moderately motivated	100	-	-			
The SAKAI LMS is the latest learning technologies						
Highly Motivated	45.20	42.5	12.4	1.345	2	0.511
Moderately Motivated	-	100	-			
SAKAI LMS is compatible with other applications I use (such as MS Power-point, MS Word)						
Highly Motivated	45.1	42.9	12.0	1.251	2	0.535
Moderately motivated	33.3	33.3	33.3			
Working with the SAKAI LMS is fun						
Highly Motivated	44.3	43.2	12.4	2.479	2	0.219
Moderately motivated	100	-	-			

Source: Field Data, 2018. ***N=190 in all cases across***

Table 4.19: Motivation Towards the Continuous Utilization of SAKAI LMS and College of Affiliation continued.

Motivation	College of Affiliation			Chi-Square	DF	P-value
	Health (%)	Humanities (%)	Education (%)			
Computer literacy training program organized for students						
Highly Motivated	44.8	42.6	12.6	0.576	2	0.755
Moderately Motivated	50.0	50.0	-			
Previous personal experience with internet resources						
Highly Motivated	44.9	42.8	12.3	1.243	4	0.435
Moderately Motivated	21.4	60.7	14.3			
Least Motivated	80.0	10.0	10.0			
Highly Motivated	45.8	41.8	12.4	1.497	4	0.827
Moderately motivated	42.4	45.5	12.1			
Least Motivated	-	100	-			
The frustration of attending face to face lecture Session						
Highly Motivated	45.9	42.0	12.1	2.847	4	0.584
Moderately motivated	42.9	42.9	14.3			
Least Motivated	-	100	-			

Source: Field Data, 2018. ***N=190 in all cases across***

As shown from Table 4.19 there were no statistically significant differences or associations between Motivation towards the usage of the SAKAI LMS and College of Affiliation. This outcome shows that a graduate student's motivation to use the SAKAI LMS has nothing to do with his/her College of Affiliation(Health, Education and Humanities) as they all believed the SAKAI LMS could affect their future career, be useful in their studies and

increase their chances of getting good grades in their assignments and classwork. From the analysis, it could be said that graduate students were very motivated by their Colleges to use the SAKAI LMS at the University of Ghana as they perceived it as the latest technology for their academic success.

4.5 Challenges Encountered in the Continuous Utilization of the SAKAI LMS

Graduate students in their desire to continuously use the SAKAI LMS may encounter certain challenges. I was interested in knowing the various challenges that they encountered. A 5 Point Likert Scale ranging from 1= *Strongly Disagree, 2 = Disagree, 3 = Neutral, 4=Agree and 5 = Strongly Agree* was used to measure the challenges encountered by graduate students on the Challenges Subscale (CSS). Table 4.20 shows the challenges encountered in the continuous utilization of the SAKAI LMS by graduate students.

Table 4.20: Challenges Encountered in the Continuous Utilization of the SAKAI LMS

Challenges	Mean	Standard Deviation
Challenges Subscale (7 items)	**4.51**	**2.22**
Using the SAKAI LMS is stressful	4.47	2.13
It is frustrating using the SAKAI LMS	4.44	2.42
I am not always comfortable with the use of the SAKAI	4.73	2.19
I lack adequate computer skills on how to use the SAKAI LMS	4.26	2.20
Poor internet connectivity affects my usage of the SAKAI LMS.	4.32	2.93
I find it difficult downloading learning materials from the SAKAI LMS	4.75	1.62
I encounter problems logging unto the SAKAI LMS	4.59	2.07

Source: Field Data, 2018. ***N=190 in all cases across***

As seen in Table 4.20, the outcome of the data analyzed revealed that graduate students experienced high levels of challenges when using the SAKAI LMS (M = 4.51, SD = 2.22). From the analysis, the majority of graduate students encountered difficulties when downloading their lecture notes and reading materials from the SAKAI LMS (M = 4.75, SD=1.62). Other graduate students felt uncomfortable using the SAKAI LMS in learning (M = 4.73, SD = 2.19). According to majority, they encountered certain problems when trying to log unto the system (M = 4.59, SD = 2.07) whiles others perceived the use of SAKAI LMS as stressful (M=4.47, SD=2.13). In addition, graduate students were also battling with poor internet connectivity on campus (M = 4.32, 2.93), while others struggled using the SAKAI LMS as a result of lack of computer skills (M = 4.26, SD = 2.20). This means that graduate students experience several challenges in the process of using SAKAI LMS.

4.5.1 Challenges Encountered in the Continuous Utilization of the SAKAI LMS and Gender

One of the most fundamental challenges facing higher education when introducing e-learning is perhaps managing the change within the institution as there has been a debate about the role of gender with regard to the challenges of e-learning. In this study, I saw it necessary to investigate whether males and females graduate students encounter the same challenges at the University of Ghana, and their pedagogical implications. I used the chi-square test of independence to test if gender had an influence on the challenges encountered by graduate students in their continuous utilization of the SAKAI LMS. Table 4.21 shows the analysis of data on challenges encountered in utilizing the SAKAI LMS and Gender.

Table 4.21: Challenges Encountered in the Continuous Utilization of the SAKAI LMS and Gender.

Challenges	Gender		Chi-Square	DF	P-value
	Male (%)	Female (%)			
Using the SAKAI LMS is stressful			2.252	4	.690
Strongly Disagree	64.3	35.7			
Disagree	67.8	32.2			
Undecided	64.7	35.3			
Agree	65.4	34.6			
Strongly Agree	88.9	11.1			
It is frustrating using the SAKAI LMS			3.826	4	.430
Strongly Disagree	72.7	27.3			
Disagree	78.8	21.2			
Undecided	59.0	41.0			
Agree	63.0	37.0			
Strongly Agree	65.2	34.8			
I'm not always comfortable with the use of SAKAI LMS			.734	4	.947
Strongly Disagree	73.3	26.7			
Disagree	72.2	27.8			
Undecided	65.0	35.0			
Agree	66.7	33.3			
Strongly Agree	64.0	36.0			
I lack adequate skills on how to use the SAKAI LMS			1.642	4	.801
Strongly Disagree	69.2	30.8			
Disagree	73.3	26.7			
Neutral	60.0	40.0			
Agree	69.8	30.2			
Strongly Agree	65.4	34.6			
Poor internet connectivity affects my usage			2.087	4	.720
Strongly Disagree	85.7	14.3			
Disagree	62.5	37.5			
Neutral	69.9	30.1			
Agree	64.7	35.3			
Strongly Agree	60.0	40.0			

Source: Field Data, 2018. ***N=190 in all cases across***

Table 4.21: Challenges Encountered in the Continuous Utilization of the SAKAI LMS and Gender continued.

Challenges	Gender		Chi-Square	DF	P-value
	Male (%)	Female (%)			
Difficulty to download Leaning Material for the SAKAI LMS			.747	4	.945
Strongly Disagree	100	-			
Disagree	75	25			
Neutral	66.7	33.3			
Agree	66.4	33.6			
Strongly Agree	66.7	33.3			
The problem of logging into the SAKAI LMS			1.950	4	.745
Strongly Disagree	100	-			
Disagree	70	30			
Neutral	63.6	36.4			
Agree	64.8	35.2			
Strongly Agree	67.6	32.4			

Source: Field Data, 2018 ***** significant at p = 0.05***

From Table 4.21, it can be seen that there were no statistically significant differences between the challenges encountered in the continuous utilization of the SAKAI LMS and gender. This indicates that generally, both male and female graduate students experienced the same challenges when using the SAKAI LMS in their academic studies. For instance, both male and female graduate students' reported having difficulties downloading reading materials from the SAKAI LMS as they had to battle with poor internet connectivity on campus among other problem.

4.5.2 Challenges Encountered in the Continuous Utilization of the SAKAI LMS and Age

Perceptions of online learning may be affected by a number of challenges. In relation to this, I was interested in finding out whether age as a variable had an impact on the challenges encountered in the continuous utilization of the SAKAI LMS by graduate students. Table 4.22 shows analysis of data on challenges encountered in utilizing the SAKAI LMS and Age.

Table 4.22: Challenges Encountered in the Continuous Utilization of the SAKAI LMS and Age

	Age						
Challenges	**20- 30 (%)**	**30-39 (%)**	**40-49 (%)**	**50-59 (%)**	**Chi-Square**	**DF**	**P-value**
Using the SAKAI LMS is stressful					15.851	12	.198
Strongly Disagree	26.2	52.4	14.3	7.1			
Disagree	20.3	61	13.6	5.1			
Undecided	21.6	62.7	13.7	2			
Agree	42.3	50	7.7	-			
Strongly Agree	66.7	33.3	-	-			
It is frustrating using the SAKAI LMS					50.930	12	.123
Strongly Disagree	27.3	54.5	13.6	4.5			
Disagree	36.4	42.4	12.1	9.1			
Undecided	59	28.2	5.1	7.7			
Agree	25.9	63	11.1	-			
Strongly Agree	4.5	78.8	16.7	-			
I'm not always comfortable with the use of SAKAI LMS					40.649	12	.245
Strongly Disagree	13.3	53.3	20	13.3			
Disagree	11.1	55.6	16.7	16.7			
Undecided	60	20	10	10			
Agree	32.1	58.3	9.5	-			
Strongly Agree	16	70	14	-			
I lack adequate skills on how to use the SAKAI LMS					30.550	12	.134
Strongly Disagree	61.5	23.1	-	15.4			
Disagree	46.7	36.7	10	6.7			
Neutral	40	45	12.5	2.5			
Agree	20.9	62.8	11.6	4.7			
Strongly Agree	3.8	80.8	15.4	-			

Source: Field Data, 2018 ***** significant at p = 0.05***

Table 4.22: Challenges Encountered in the Continuous Utilization of the SAKAI LMS and Age continued.

Challenges	Age 20-29 (%)	30-39 (%)	40-49 (%)	50-50 (%)	Chi-Square	DF	P-Value
Poor internet connectivity affects my usage					45.945	12	.546
Strongly Disagree	85.7	14.3	-	-			
Disagree	70.8	20.8	8.3	-			
Neutral	23.3	58.9	13.7	4.1			
Agree	11.8	69.1	13.2	5.9			
Strongly Agree	20	66.7	13.3	-			
Difficult to download learning material from SAKAI LMS					31.426	12	.324
Strongly Disagree	-	100	-	-			
Disagree	25	50	25	-			
Neutral	40	33.3	10	16.7			
Agree	24.2	62.5	12.5	0.8			
Strongly Agree	66.7	16.7	-	16.7			
The problem of logging into the SAKAI LMS					39.550	12	.234
Strongly Disagree	66.7	33	-	-			
Disagree	50	35	7.5	7.5			
Neutral	54.5	36.4	4.5	4.5			
Agree	18.2	64.8	14.8	2.3			
Strongly Agree	2.9	76.5	17.6	2.9			

Source: Field Data, 2018 ***** significant at p = 0.05***

As illustrated in Table 4.22, there were no statistically significant differences between the challenges encountered in the continuous utilization of the SAKAI LMS. This shows that regardless of the age of a graduate student, he or she faces certain difficulties when using the SAKAI platform such as difficulties downloading lecture materials and submission of assignments.

4.5.3 Challenges Encountered in the Continuous Utilization of the SAKAI LMS and College of Affiliations

The acceptance and adaptation of the LMS within various Colleges of the University of Ghana may have a great potential of improving the level and quality of teaching in spite of its challenges. I employed the chi-square test of independence to test whether College of Affiliation and challenges encountered in the Continuous utilization of the SAKAI LMS were statistically associated. Table 4.23 shows the challenges encountered in the continuous utilization of the SAKAI LMS and College of Affiliation.

Table 4.23: Challenges Encountered in the Continuous Utilization of the SAKAI LMS and College of Affiliation

	College of Affiliation					
Challenges	**Health (%)**	**Humanities (%)**	**Education (%)**	**Chi-Square**	**DF**	**P-value**
Using the SAKAI LMS is stressful				19.068	8	.414
Strongly Disagree	45.2	40.5	14.3			
Disagree	52.5	33.9	13.6			
Undecided	51	35.3	13.7			
Agree	30.8	61.5	7.7			
Strongly Agree	-	100	-			
It is frustrating using the SAKAI LMS				33.558	8	.345
Strongly Disagree	45.5	45.5	9.1			
Disagree	42.4	42.4	15.2			
Undecided	12.8	76.9	10.3			
Agree	48.1	44.4	7.4			
Strongly Agree	63.6	21.2	15.2			
I'm not always comfortable with the use of SAKAI LMS				16.863	8	.454
Strongly Disagree	66.7	13.3	20			
Disagree	55.6	22.2	22.2			
Undecided	25	60	15			
Agree	39.3	52.4	8.3			
Strongly Agree	52	36	12			

Source: Field Data, 2018 ***** significant at p = 0.05***

Table 4.23: Challenges Encountered in the Continuous Utilization of the SAKAI LMS and College of Affiliation (……..continued).

Challenges	College of Affiliation			Chi-Square	DF	P-value
	Health (%)	Humanities (%)	Education (%)			
I lack adequate skills on how to use the SAKAI LMS				21.978	8	.567
Strongly Disagree	-	84.6	15.4			
Disagree	33.3	56.7	10			
Neutral	37.5	55	7.5			
Agree	46.5	37.2	16.3			
Strongly Agree	65.4	19.2	15.4			
Poor internet connectivity affects my usage				24.820	8	.593
Strongly Disagree	-	100	-			
Disagree	20.8	75	4.2			
Neutral	50.7	38.4	11			
Agree	50	32.4	17.6			
Strongly Agree	53.3	33.3	13.3			
Difficult to download learning material from SAKAI LMS				10.668	8	.221
Strongly Disagree	-	100	-			
Disagree	62.5	25	12.5			
Neutral	33.3	46.7	20			
Agree	47.7	42.2	10.2			
Strongly Agree	-	83.3	16.7			
The problem of logging into the SAKAI LMS				33.821	8	.456
Strongly Disagree	-	100	-			
Disagree	22.5	65	12.5			
Neutral	22.7	72.7	4.5			
Agree	53.4	33	13.6			
Strongly Agree	67.6	17.6	14.7			

Source: Field Data, 2018 ***** significant at p = 0.05***

As shown in Table 4.23, there is no statistically significant difference between challenges encountered in the continuous utilization of the SAKAI LMS and College of Affiliation. This revelation implies that irrespective of the College graduate students belong to, they all virtually experience similar challenges when using the SAKAI LMS and perceive it as being stressful and frustrating at times. In with this objective, a correlational analysis was tested.

4.6 Correlational Analysis

Table 4.24: Summary of the Intercorrelation Matrix between the Study Variable

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Gender	1														
2. Age		1													
3. College			1												
4. Knowledge	.35*	.56	.38	1											
5. Attitudes	.71*	.01	.05	.67*	1										
6. Motivations	.09*	.05	.12	.01	.14	1									
7. Challenges	.36*	.01	-.13	.14	.02	.11	1								
8. Use	.06*	.15	-.01	.02	.04	.15	.09	1							
9.User Satisfaction	.75*	.03	.30	-.04	-.10	-.04	-.03	-.02	1						
10.Individual Decision	.64*	.12	.12	-.11	-.09	.01	-.02	.24*	-.00	1					
11. Continuous Use	.72*	.24	.12	-.13	-.06	-.07	-.04	.31*	-.06	.62*	1				
12.Performance Expectancy	.43*	-.12	.24	.14*	.14*	.17*	-.03	.36*	.02	.23*	-.12	1			
13.Effort Expectancy	.26*	-.12	.27	.15*	-.08	-.07	.00	.36*	.08	-.01	.03	.01	1		
14. Social influence	.51*	.13	.15	-.09	-.02	-.07	.04	.30*	.00	.61*	.88	-.11	.07	1	
15.Facilitating Conditions	0.34*	.13	-.15	-.11	-.07	-.00	.02	.26*	-.00	.72*	.74*	.40*	.00	.75*	1

Source: Field Data, 2018 ***Correlation is significant at the 0.05**

Table 4.24 reveals that there was a significant positive correlation between gender and knowledge ($r = 0.35$), attitudes ($r = 0.71$), challenges ($r = 0.36$), User Satisfaction($r = 0.005$), Individual Decision ($r = -0.64$), Continuous Use (r = 0.72), Performance Expectancy ($r = -0.43$), Effort Expectancy($r = 0.26$), Social Influence (r = 0.51) and Facilitating Conditions ($r = 0.34$). the Table further shows that Knowledge and Attitudes had a significant correlation($r = 0.67$). There was a significant correlation between Extent of Utilization and Individual Decision ($r = 0.23$), Continuous Use (r = 0.31), Performance Expectancy (r = 0.36), Effort Expectancy(r = 0.36), Social Influence (r= 0.30) and Facilitations Conditions ($r = 0.26$) respectively.

In addition, there was a significant correlation between Individual Decision and Continuous Use($r = 0.62$), Performance Expectancy ($r = 0.23$), Social Influence ($r = 0.61$) and Facilitating Conditions ($r = 0.72$) respectively. Furthermore, there was a significant correlation between Continuous Use and Social Influence and Facilitating Conditions ($r = 0.88$). Also, a significant correlation exited between Performance Expectancy and Facilitating Conditions ($r = 0.40$). Moreover, a significant correlation existed between Social Influence and Facilitating Conditions ($r = 0.75$). Likewise, there was a significant correlation between Knowledge and Performance Expectancy($r = -0.14$) and Effort Expectancy($r = 0.15$). Besides, there was a significant negative correlation between Attitudes and Performance Expectancy($r = -0.14$).

4.7 Confirmatory Analysis

I carried out a Confirmatory Factor Analysis (CFA) on seven-latent variables. The latent variables were variables that could not be observed directly. They were inferred from other variables in the study that could be observed (Thompson, 2004). The Latent variables were Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating

Conditions (FC), User Satisfaction (US), Individual Decision (ID) and Continuous Use (CU). All the latent variables were ascertained in terms of the Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI). According to Thompson (2004) the value of CFI and TLI in the range of 0.90 to 0.95 is very acceptable while values above 0.95 is very good. A small Root Mean Square Error of Approximation (RMSEA) value is preferable because according to Asparouhov & Muthen (2009) RMSEA values less than 0.05 are good and acceptable.

4.7.1 Confirmatory Factor Analysis of Performance Expectancy (PE)

The confirmatory analysis of Performance Expectancy (PE) was carried out in relation to six variables. These variables were namely, using the SAKAI LMS will improve my performance in the course (PE1), I'll find the system useful in my learning activities (PE2), using the SAKAI LMS enables me to accomplish my learning activities more quickly (PE3), using the SAKAI LMS improves the quality of my learning activities (PE4), using the SAKAI LMS makes my learning activities easier (PE5) and using the SAKAI LMS enhances my effectiveness in my learning activities (PE6). The results have been presented in Table 4.25.

Table 4.25: Confirmatory Factor Analysis of Performance Expectancy

	Coef.	Std. Err.	z-value	p-value	RMSEA	CFI	TLI
PE1	1	(constrained)					
Constant	4.471	0.052	85.960	0.000	**0.000**	**0.983**	**0.971**
PE2	0.854	0.032	26.840	0.000			
Constant	4.492	0.050	90.190	0.000			
PE3	0.989	0.011	93.500	0.000			
Constant	4.460	0.052	85.820	0.000			
PE4	0.995	0.008	132.040	0.000			
Constant	4.465	0.052	85.880	0.000			
PE5	0.943	0.016	58.140	0.000			
Constant	4.487	0.050	89.080	0.000			
PE6	0.578	0.046	12.430	0.000			
Constant	4.572	0.045	102.360	0.000			

From Table 4.25, it can be seen that all the coefficients of the variables measuring Performance Expectancy (PE) were significant and shows a significant path relationship to the latent variable "*Performance Expectancy*". Moreover, the value of RMSEA was below 0.05(RMSEA $= 0.000$). The values of CFI and TLI were all above 0.95 indicating that all the six variables (PE1, PE2, PE3, PE4, PE5 and PE6) under Performance Expectancy are jointly significant ($CFI = 0.983$; $TLI = 0.971$).

4.7.2 Confirmatory Analysis of Effort Expectancy (EE)

The Confirmatory Analysis of Effort Expectancy (EE) was done with regards to four variables such as learning to operate the SAKAI LMS will be easy for me (EE1), my interaction with the SAKAI LMS will be clear and understandable (EE2), It'll be easy for me to become skillful at using the SAKAI LMS (EE3) and I'll find the SAKAI LMS easy to use (EE4). The results are presented in Table 4.26.

Table 4.26: Confirmatory Analysis of Effort Expectancy

	Coef.	Std. Err.	z-value	p-value	RMSEA	CFI	TLI
EE1	1	(constrained)					
Constant	3.251	0.032	102.500	0.000	**0.000**	**0.983**	**0.950**
EE2	-1.010	0.142	-7.120	0.000			
Constant	3.754	0.061	61.880	0.000			
EE3	-1.135	0.049	-23.380	0.000			
Constant	3.684	0.034	108.420	0.000			
EE4	-1.167	0.044	-26.660	0.000			
Constant	3.706	0.033	111.220	0.000			

As shown in Table 4.26, all the coefficients of the variables measuring Effort Expectancy (EE), were significant and demonstrates a significant path relationship to the latent variable ‘‘*Effort Expectancy*”. Besides, the value of RMSEA was below 0.05(RMSEA = 0.004). The values of CFI and TLI were all above 0.95 showing that all the four variables (EE1, EE2, EE3 and EE4) under Effort Expectancy are equally significant ($CFI = 0.983$; $TLI = 0.950$).

4.7.3 Confirmatory Analysis of Social Influence (SI)

The Confirmatory Analysis of Social Influence (SI) was done with regards to four variables namely, people who influence my behavior think I should use the SAKAI LMS (SI1), people who are important to me think I should use the SAKAI LMS (SI2), lecturers have been helpful in the use of the SAKAI LMS (S13) and using the SAKAI LMS is academically status-enhancing for students (SI4). The results have been presented in Table 4.27.

Table 4.27: Confirmatory Analysis of Social Influence

	Coef.	Std. Err.	z-value	p-value	RMSEA	CFI	TLI
EE1	1	(constrained)					
Constant	4.631	0.037	125.600	0.000	**0.006**	**0.994**	**0.983**
EE2	0.932	0.050	18.490	0.000			
Constant	4.636	0.036	128.850	0.000			
EE3	0.989	0.046	21.660	0.000			
Constant	4.626	0.036	127.820	0.000			
EE4	0.949	0.052	18.180	0.000			
Constant	4.631	0	125.600	0.000			

Table 4.27 reveals that all the coefficients of the variables measuring Social Influence were significant and displayed a significant path relationship to the latent variable "*social influence*". Furthermore, the value of RMSEA was below 0.05(RMSEA = 0.000). The values of CFI and TLI were all above 0.95 showing that all the four variables (SI1, SI2, SI3 and SI4) under the Social Influence are together significant ($CFI = 0.994$; $TLI = 0.983$).

4.7.4 Confirmatory Factor Analysis of Facilitating Conditions (FC)

The Confirmatory Analysis of Facilitating Conditions (FC) was done using five items such as I have the resources necessary to use the SAKAI LMS (FC1), I have the knowledge necessary to use the SAKAI LMS (FC2), the SAKAI LMS is not compatible with other systems I use (FC3), a specific person is available for assistance with the SAKAI LMS difficulties (FC4) and using the SAKAI LMS fits my learning style (FC5). The results are presented in Table 4.28.

Table 4.28: Confirmatory Factor Analysis of Facilitating Conditions

	Coef.	Std. Err.	z-value	p-value	RMSEA	CFI	TLI
FC1	1	(constrained)					
Constant	4.717	0.034	139.490	0.000	**0.000**	**1.000**	**1.000**
FC2	0.937	0.053	17.810	0.000			
Constant	4.679	0.037	127.970	0.000			
FC3	0.947	0.048	19.720	0.000			
Constant	4.684	0.036	131.490	0.000			
FC4	0.928	0.056	16.490	0.000			
Constant	4.674	0.037	124.730	0.000			
FC5	0.988	0.029	34.350	0.000			
Constant	4.733	0.032	146.220	0.000			

Table 4.28, illustrates that all the coefficients of the variables measuring Facilitating Conditions (FC) were significant and portrayed a significant path relationship to the latent variable "*Facilitating Conditions*". Additionally, the value of RMSEA was below 0.05(RMSEA $= 0.000$). The values of CFI and TLI were all above 0.95 showing that all the variables under Facilitating Conditions (FC1, FC2, FC3, FC4 and FC5) are mutually significant $(CFI = 1.000; TLI = 1.000)$.

4.7.5 Confirmatory Factor Analysis of User Satisfaction (US)

The Confirmatory Analysis of User Satisfaction (US) was done using three items namely, I am satisfied with the performance of the SAKAI LMS (US1), I am pleased with the experience of using the SAKAI LMS (US2) and I am satisfied with the features on the SAKAI LMS (US3). Table 4.29 presents the results.

Table 4.29: Confirmatory Factor Analysis of User Satisfaction

	Coef.	Std. Err.	z-value	p-value	RMSEA	CFI	TLI
US1	1	(constrained)					
Constant	3.941	0.042	94.870	0.000	**0.000**	**1.000**	**1.000**
US2	0.891	0.069	12.990	0.000			
Constant	3.973	0.042	93.710	0.000			
US3	0.724	0.067	10.790	0.000			
Constant	4.053	0.041	99.990	0.000			

From Table 4.29, all the coefficient of the variables measuring User Satisfaction (US) were significant and displayed a significant path relationship to the latent variable "*User Satisfaction*". Likewise, the value of RMSEA was below 0.05(RMSEA = 0.000). The values of CFI and TLI were all above 0.95 showing that all the variables under User Satisfaction (US1, US2 and US3) are cooperatively significant ($CFI = 1.000; TLI = 1.000$).

4.7.6 Confirmatory Factor Analysis of Individual Decision (ID)

The Confirmatory Analysis of Individual Decision (ID) was done using three items such as I have decided to use the SAKAI LMS to enrich my studies (ID1), I believe I will use the SAKAI LMS for my academic work (ID2) and I am interested in using the SAKAI LMS (ID3). The results obtained have been presented in Table 4.30.

Table 4.30: Confirmatory Factor Analysis of Individual Decision (ID)

	Coef.	Std. Err.	z-value	p-value	RMSEA	CFI	TLI
ID1	1	(constrained)					
Constant	4.610	0.037	123.770	0.000	**0.000**	**1.000**	**1.000**
ID2	1.000	0.048	20.820	0.000			
Constant	4.610	0.036	126.410	0.000			
ID3	1.034	0.044	23.280	0.000			
Constant	4.642	0.036	129.400	0.000			

As shown in Table 4.30, all the coefficient of the variables measuring Individual Decision (ID) were significant, exhibiting a significant path relationship to the latent variable "*individual decision*". Also, the value of RMSEA was below 0.05 $(\text{RMSEA} = 0.000)$. The values of CFI and TLI were all above 0.95 showing that all the variables under individual decision are jointly significant $(CFI = 1.000; TLI = 1.000)$.

4.7.7 Confirmatory Factor Analysis of Continuous Use (CU)

The Confirmatory Analysis of Continuous Use (CU) was done using three items namely, I will frequently use the SAKAI LMS in the future to supplement my studies (CU1), I will use the SAKAI LMS on a regular basis in the future to do a learning activity (CU2) and I always try to use the SAKAI LMS to do my academic work as it has important features (CU3). The results are presented in Table 4.31.

Table 4.31: Confirmatory Factor Analysis of Continuous Use (CU)

	Coef.	Std. Err.	z-value	p-value	RMSEA	CFI	TLI
CU1	1	(constrained)					
Constant	3.684	0.037	99.050	0.000	**0.000**	**1.000**	**1.000**
CU2	0.853	0.075	11.360	0.000			
Constant	3.727	0.039	95.660	0.000			
CU3	1.024	0.068	15.050	0.000			
Constant	3.679	0.034	107.780	0.000			

Table 4.31 indicates that all the coefficient of the variables measuring Continuous Use were significant, revealing a significant path relationship to the latent variable "*Continuous Use*". As well, the value of RMSEA was below 0.05(RMSEA = 0.000). The values of CFI and TLI were all above 0.95 showing that all the variables under Continuous Use (CU1, CU2 and CU3) are conjointly significant ($CFI = 1.000; TLI = 1.000$).

4.8 Structural Equation Modeling on factors that promote the Continuous Utilization of the SAKAI LMS by graduate students through Individual Decision

Structural Equation Modeling on factors that promote the continuous utilization of the SAKAI LMS by graduate students through Individual Decision was done to test for the hypotheses of the study. The results of the structural equation modelling are presented in Table 4.32.

Table 4.32: Structural Equation Model Analysis (Test of Hypothesis)

Variables	Coef.	Std. Err.	Z-value	p-value	95% Confident Interval	
					Lower	Upper
Individual Decision						
Performance Expectancy	0.086	0.037	2.350	0.019	0.0143	0.1577
Effort Expectancy	0.061	0.055	1.100	0.271	-0.0475	0.1693
Social Influence	0.002	0.073	0.030	0.973	-0.1396	0.1444
Facilitating Conditions	0.906	0.099	9.150	0.000	0.7123	1.1006
User Satisfaction	0.022	0.041	0.540	0.588	-0.0581	0.1024
KAMC (Knowledge, Attitude, Motivation and Challenges)	0.397	0.072	5.490	0.000	0.25542	0.5392
Continuous Use						
Individual Decision	0.704	0.068	10.380	0.000	0.5709	0.8366

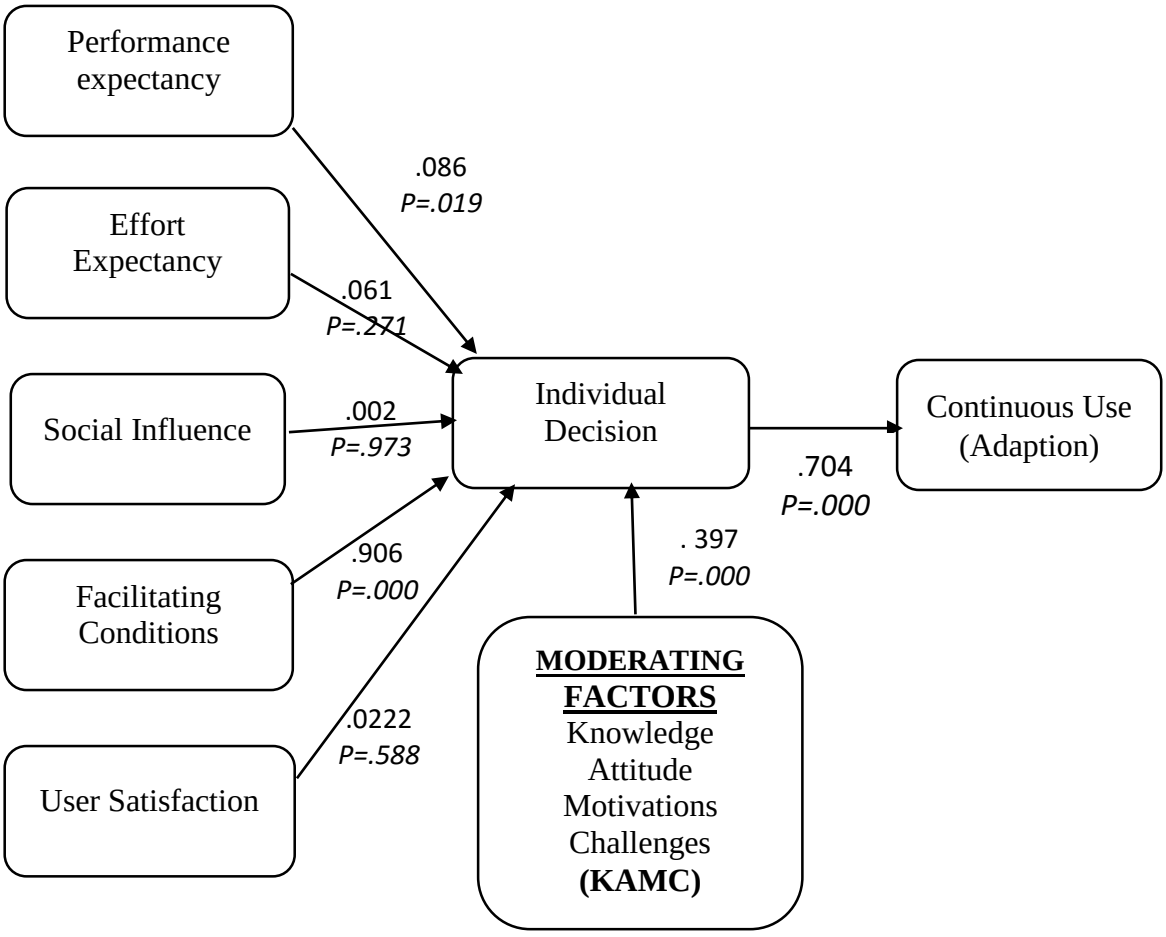
From the Structural equation model, it can be seen that Performance Expectancy($\beta = 0.086; P = 0.019$) and Facilitating Conditions ($\beta = 0.906; P = 0.000$) significantly contribute to graduate students' decision to use the SAKAI LMS, which will lead to continuous utilization of the SAKAI LMS ($\beta = 0.704; P = 0.000$). It was also observed that knowledge, attitude, motivation and challenges jointly and significantly contribute to the decision of graduate students' towards the continuous utilization of the SAKAI LMS($\beta = 0.397; P = 0.000$).

This implies that the hypothesis that Performance Expectancy will have no effect on individual decision to use SAKAI LMS, and the hypothesis that Facilitating Conditions will have no effect on individual decision to use SAKAI LMS were rejected. Whiles the hypothesis that Effort Expectancy will have no effect on individual decision to use SAKAI LMS, Social Influence will have no effect on individual decision to use SAKAI LMS and the hypothesis that User Satisfaction will have no effect on individual decision to use SAKAI LMS was not rejected. With regards to the hypothesis that individual decision will

have no effect on continuous use of the SAKAI LMS was also rejected. Of all the six constructs, **Facilitating Conditions** was seen as a prominent factor that significantly affected Individual Decision($\beta = 0.906; P = 0.000$).

Figure 4. 1: Observed Theoretical Model

Factors Promoting the Continuous Utilization of LMS



Notes: Path Analysis on Factors that promote the Continuous Utilization of the SAKAI LMS by graduate students through Individual Decision

Figure 4.1 shows that among the factors influencing the continuous utilization of the SAKAI LMS by graduate students at the University of Ghana, Performance Expectancy and Facilitating Conditions, were statistically significant and contributed to individual

decision to use. It was also revealed that Knowledge, Attitude, Motivation and Challenges were highly rated and also influenced individual decision to use the SAKAI LMS. This served as moderating factors towards individual decision to use. That is, with a high knowledge about the features, positive attitudes, high motivation and low challenges, graduate students will decide to use the LMS and get addicted to its use. More so, graduate students' decision to continuously use the SAKAI LMS was also highly positively related and statistically significant.

4.9 Summary of Hypotheses Testing

HI: Performance Expectancy will have no effect on individual decision to use the SAKAI LMS.

I tested this prediction using the Structural Equation Model and with the results obtained after data analysis, Performance Expectancy had a significant effect on individual decision to use the SAKAI LMS ($\beta = 0.086$, $p < .05$). This hypothesis was rejected as it can be seen from Table 4.32. Therefore, Performance Expectancy leads to individual decision to use the SAKAI LMS by a graduate student.

H2: Effort Expectancy will have no effect on individual decision to use the SAKAI LMS.

As reported in Table 4.32, Effort Expectancy did not have any significant effect on the individual decision to use the SAKAI LMS by graduate students ($\beta = 0.61$, $p > 0.05$). The hypothesis stated was not rejected based on the Structural Equation Model from the data collected. This implies that Effort Expectancy could not affect a graduate student's decision towards the utilization of the SAKAI LMS.

H3: Social Influence will have no effect on individual decision to use SAKAI LMS.

From Table 4.32, Social Influence did not have any significant influence on individual decision to use the SAKAI LMS by graduate students ($\beta = 0.002$, $p > 0.05$) from the Structural Equation Model with respect to the data collected. This hypothesis was not rejected. This shows that a graduate student's decision to use the SAKAI LMS is not based on Social influence.

H4: Facilitating Conditions will have no effect on individual decision to use SAKAI LMS.

Table 4.32, illustrates that Facilitating Conditions had a significant effect on individual decision to use the SAKAI LMS ($\beta = 0.906$, $p < 0.05$). This hypothesis was rejected in line with the Structural Equation Model on the data analyzed. Hence, it could be said that Facilitating Conditions had an influence on a graduate student's decision to use the SAKAI LMS. It also had a high level of relationship towards Individual Decision.

H5: User Satisfaction will have no effect on Individual Decision to Use SAKAI LMS.

As portrayed in Table 4.32, User Satisfaction did not have any significant effect on individual decision to use the SAKAI LMS ($\beta = 0.002$, $p > 0.05$) based on the data collected. This hypothesis was not rejected by the analysis of the Structural Equation Model. This implies that User Satisfaction cannot have an impact on a graduate student's decision to use the SAKAI LMS.

H6: Individual Decision to use will have no effect on continuous use of the SAKAI LMS.

Table 4.32 depicts that individual decision to use had a significant effect on continuous utilization of the SAKAI LMS ($\beta = 0.704$, $p < .05$) based on the outcome of the Structural

equation model. This hypothesis was rejected. This reveals that individual decision to use the SAKAI LMS can influence a graduate student to continuously use the SAKAI LMS throughout his/her academic studies at the University of Ghana.

Key Findings from Hypotheses

HI: Performance Expectancy will have no effect on individual decision to use SAKAI LMS **(Reject H_0).**

H2: Effort Expectancy will have no effect on individual decision to use SAKAI LMS **(Fail to reject H_0)**

H3: Social Influence will have no effect on individual decision to use SAKAI LMS **(Fail to reject H_0).**

H4: Facilitating Conditions will have no effect on individual decision to use SAKAI LMS **(Reject H_0).**

H5: User Satisfaction will have no effect on individual decision to use SAKAI LMS **(Fail to reject H_0).**

H6: Individual decision will have no effect on continuous use of the SAKAI LMS **(Reject H_0).**

From the above, Performance Expectancy and Facilitating Conditions will affect individual decision to use the SAKAI LMS and individual decision in effect will affect continuous utilization. Again, if Facilitating Conditions are right and KAMC (Knowledge, Attitudes, Motivations and Challenges) are also adhered to, then graduate students will continuously use the LMS.

4.10 Summary of Chapter

This chapter discussed how the data collected from graduate students at the University of Ghana on the Continuous Utilization of the SAKAI LMS were analysed. The analysis of results indicated the level of knowledge about the features of the SAKAI LMS among graduate students as being low although males seemed to have enough knowledge compared to the females. However, age and College of Affiliation of graduate students did not have an influence on the level of knowledge on the features of the SAKAI LMS. The outcome of the results again indicated that graduate students occasionally used the features of the SAKAI LMS. There were significant differences in how male and female graduate students used the features on the SAKAI LMS as they used them at different times and for various purposes. Nevertheless, the extent of use of the features by graduate students with the College of Affiliations (Health, Education and Humanities) was the same.

In terms of attitude, the analysis showed that graduate students at the University of Ghana had a positive attitude to continuously use the SAKAI LMS. From the analysis, male graduate students had a more positive attitude towards the continuous use of the SAKAI LMS compared to their female counterparts. Age and College of Affiliation could not significantly affect the attitudes of graduate students towards the continuous use of the system. Also, from the analysis, graduate students were highly motivated to continuously use the SAKAI LMS at the University of Ghana. Yet, their gender, age and College of Affiliation could not account for any significant differences in their motivation to continuously use the SAKAI LMS.

With respect to the challenges graduate student encountered whiles continuously using the SAKAI LMS, the analysis indicated that they had a lot of challenges. However, there were no statistically significant differences between the challenges encountered by graduate

students with regard to their gender, age and College of Affiliation. The result of the structural equation model (Test of hypothesis) revealed that Performance Expectancy and Facilitating Conditions had influence on graduate students' use the SAKAI LMS, subsequently leading to continuous use and adaptation. The next chapter presented a detailed discussion of the results obtained with respect to existing literature.

CHAPTER FIVE

DISCUSSION OF RESULTS

5.1 Introduction

The study investigated the continuous utilization of the SAKAI Learning Management System by graduate students at the University of Ghana. In line with the investigation, the study sought to find out the level of knowledge and extent of utilization of the features on SAKAI LMS by the students. The study again examined the attitudes and motivation and factors promoting graduate students continuous utilization of the SAKAI LMS and also determined the challenges they encountered in their continuous utilization of the SAKAI LMS. I tested six (6) hypotheses. Out of the six (6) hypotheses, three (3) hypotheses were rejected while three (3) were accepted. This chapter provided a detailed discussion of the findings obtained from the analyzed data collected. The chapter discussed the findings with respect to the objectives and research questions of the study.

The discussion of findings in this chapter provided detailed understanding and insights emerging from the problem statement stated in Chapter One and supported with related literature in the field of e-learning and educational technology to advance academic knowledge in the continuous utilization of the SAKAI LMS by graduate students at the University of Ghana. The chapter also discussed the observed model by indicating how the proposed model was confirmed or otherwise in relation to technology adaptation and continuous utilization.

5.2 Level of Knowledge on the Features of the SAKAI LMS

The findings from the study indicated that graduate students had a low level of knowledge (M= 1.49, SD =0.56) regarding the features of the SAKAI LMS. The low level of knowledge on the features of the SAKAI LMS could partly be attributed to the fact that

the SAKAI LMS is new to the students and not being fully utilized and adapted to as a supplement to the traditional teaching and learning method within certain colleges at the University of Ghana. This could be explained further that since the SAKAI LMS is not always used for all academic work, graduate students within the various departments will surely be less knowledgeable on its features. This finding, on the other hand, did not depart from those mentioned in the literature, that students' lack of knowledge about a particular technology was a key problem in its adaptation and continuous usage (Berg, 2013; Leeder & Lonn, 2014).

The graduate students may also not be prepared to use the SAKAI LMS or even talk about it to their colleagues because they lacked computer skills. Perhaps, the lack of computer skills and time to learn the features of the SAKAI LMS may be a factor influencing their overall knowledge about the system. It is believed that lecturers' knowledge and continuous utilization of the SAKAI LMS may have a direct relationship on the level of knowledge and use of the platform by graduate students. The findings of this present study is in sharp contrast to Darko-Adjei's (2018) survey on undergraduate students' perception and use of the SAKAI LMS at the University of Ghana whose level of knowledge of the features on the SAKAI LMS were very high due to the repeated use of the SAKAI LMS for assignments submission, communicating with lecturers, downloading of lecture materials and others.

However, the findings supported that of Dube & Scott (2014) whose study on the use of the SAKAI LMS at the NUST University in Zimbabwe found that lecturers did not have knowledge about the features of the SAKAI LMS, leading to low utilization of the SAKAI LMS. Likewise, the findings were consistent with that of Juhary (2014) and Arhinful

(2016) in which their respondents exhibited a low level of knowledge on the features of the SAKAI LMS, thus affecting its potential utilization.

Again, the findings corroborated that of Leeder & Lonn (2014, p. 648) whom as part of their study into reasons for low utilization of SAKAI LMS found "Both users and non-users frequently reporting that they were unaware of the existence of the LMS tools". The findings of this study confirmed the assertion by Rogers (2003) that knowledge is a requisite ingredient for the successful adaptation of technologies. This is because according to him when a person lacks knowledge about a particular technology, only the risk takers utilize the technology. As a result, early adopters would be willing to take the risk whilst normal adopters needed to be convinced. From this explanation, a graduate student with little knowledge of the features of the SAKAI LMS may be unwilling to use it.

The findings from this study went contrary to that of Choga (2015) who examined the use of the SAKAI LMS at the Faculty of Communication and Information Science at the National University of Science and Technology (NUST) among undergraduate students. He found out that the respondents had a high level of knowledge on the features of the SAKAI LMS as it was obligatory for them to use it. The discrepancy in findings between the study conducted by Choga (2015) and this present study might have been due to the sample used. The outcome of their study might have been different if they had used graduate students.

In spite of the fact that the general level of knowledge of the features of the SAKAI LMS was low, graduate students seemed to have good knowledge on the Turnitin tool. This may be due to the fact that the Turnitin feature enabled them to improve their academic writing and teaches them how to avoid plagiarism. Another possible explanation for this could be

due to the fact that graduate students at the University of Ghana are mandated to print and attach a copy of a TURNITIN report to their completed Masters/Doctoral Thesis for onward submission to the School of Graduate Studies for grading and hence had knowledge about it. Besides, graduate students had good knowledge of the Forum tool (M=1.79, SD=0.79). This may be attributed to the fact that perhaps graduate students had discussions with each other on course-related topics through the Forum by posting messages to an online message board.

From the data analysis, graduate students additionally exhibited adequate knowledge of the Assignment tool (M =1.66, SD =.0.75). This could be possibly due to the fact that they submitted their take-home assignments using this tool. This confirmed the findings of Soon & Fraser (2011) who were interested in Knowledge Sharing and Knowledge Exchange in Distance Education Online Group Work among distance education students and concluded that their respondents had high knowledge of the Assignment tool. According to the researchers, respondents were persistently informed to submit all their assignments using the Assignment tool. With this tool, a graduate student may not need to print hard copies of assignments for submission.

In addition, most graduate students had sufficient knowledge of the Resources tool (M=1.55, 0.50). This revelation was not surprising. This is because often times, lecturers upload lecture notes, course outlines and reading materials using the Resources tool on the SAKAI LMS. Another possible explanation might be that lecturers do engage graduate students in using the Resources tool as they get soft copies of their reading materials and lecture notes from the SAKAI LMS. These findings confirmed that of Juhary (2014) who found out that majority of the respondents used the Resources tool for sharing handouts, past questions, lecture notes and other materials as a result had good knowledge of it.

Furthermore, a lot of graduate students had ample knowledge of the Email tool (M=1.55, 0.50). A probable explanation is that the Email tool facilitates online communication with and within themselves and their lecturers. For instance, a graduate student who is shy to talk in class could speak out on issues using the Email tool. A graduate student may use the Email tool to convey information to his/her course mates and receive feedback as well. On the other hand, graduate students had very little knowledge on the Announcement tool (M=1.44, SD=0.61) and Calendar tool (M=1.28, SD=0.45). This possibly suggests that majority of graduate students were not even aware of these tools on the SAKAI platform and hence their limited knowledge of them.

Further, from the findings, it is possible that quite a number of graduate students do not visit the SAKAI LMS frequently. Again, with respect to the Calendar and Announcement tools, it could possibly be said that the majority of graduate students relied on their course mates, roommates and friends at the Departments and Halls of residence for announcements and deadline dates for mid-semester examinations, end of semester examinations, project and submission of assignments and communicated joyfully without using the Calendar and Announcement tools. This clearly may imply that when lecturers and teaching assistants do not engage graduate students with these tools, they probably would not utilize them.

The findings of Soon & Fraser (2011) supported this study. In their study, they found that respondents lacked knowledge on the Calendar tool, Chat room tool and Announcement tool and as a result barely used it. However, the findings contradict with the study conducted by Choga (2015) that the majority of university students had good knowledge of the Calendar and Announcement tools. In relation to the Chat room tool, Gradebook tool, Dropbox tool, Lessons tool, Tests and Quizzes tool, it could be argued that the

majority of lecturers do not usually use them for their mid-semester examinations and academic tests within the semester as well as submission of academic grades for graduate students. In this case, graduate students may not be aware of them as useful tools on the SAKAI LMS.

5.2.1 Level of Knowledge on the Features of the SAKAI LMS and Gender

Although the level of knowledge on the features was low, gender had a significant influence. From the analysis males (M=1.60, SD=0.35) had a greater knowledge of the features of SAKAI LMS compared to their female counterparts (M=1.26, SD=0.14). Further, the t-test analysis revealed that statistically significant differences existed between males and females on the level of knowledge of the features of the SAKAI LMS ($t_{(188)} = 8.74$, $p=0.00$). This gender gap did not seem to surprise me. This is because earlier assertions made by scholars in the area of gender and use of the LMS reported that females were less competent on the use of computers than their male counterparts (Enoch & Soker, 2006; Tondeur, Van de Velde, Vermeersch & Van Houtte, 2016).

A possible explanation for this finding is that males have a habit of using electronic gadgets such as computers, laptops, ICT tools among others in learning and thus have better knowledge about them than females. Moreover, research carried out over the decades has listed several ways in which women lag behind men in the possession of technologies as well as the development of computer skills. For example, men use more of the internet than women, spend more time online, take more technology classes and are highly motivated to learn digital skills (Yukselturk & Bulut, 2009). This possibly indicates that perhaps males use the internet in job searching, e-banking, posting or uploading materials.

5.2.2 Level of Knowledge on Features of the SAKAI LMS and Age

It is generally assumed that younger people, who have grown up with computers and technologies, are more digitally literate than older people, who became familiar with these technologies at a later age. However, the findings of this study proved otherwise. From the data analysis, it was revealed that regardless of the age (20-59 years) of a graduate student, they all had an equal level of knowledge about the features of the SAKAI LMS (Table 4.3). These findings contradicted the assertion made by Colley & Comber (2003) that the ages of 20-39 years are seen as technological age and hence have more knowledge in the use of e-learning resources. A possible explanation for this finding is that all graduate students had been exposed to online learning through a recent innovation and that older graduate students had the privilege of using an LMS during their undergraduate studies. Again, the findings did not support the ideas of Alampay (2006) whose study in the Philippines discovered that the use of the LMS was more evident among the younger generation.

5.2.3 Level of Knowledge on the Features of the SAKAI LMS and College of Affiliation

With respect to the College of Affiliation of graduate students, there was no significant influence on the level of knowledge of the features of the SAKAI LMS (Table 4.4). Thus, knowledge of SAKAI LMS features was alike among all graduate students within the various Colleges. These findings did not support the assertion made by Darko-Adjei (2018) that the SAKAI LMS had been adopted by the College of Education and its graduate students had a high level of knowledge/awareness of it. It could be argued that Colleges at the University of Ghana might adapt to the SAKAI LMS if it offers them some form of pedagogical advantage in support of their teaching and learning methodologies.

Again, graduate students pursuing certain courses that are not technologically oriented in the three Colleges of Affiliation (Health, Humanities and Education) at the University of Ghana may not be interested in using the SAKAI LMS as they may not see any learning objectives with respect to their course.

Although the overall level of knowledge on the features of the SAKAI LMS was low, the majority of graduate students who participated in the study could possibly be said to be "Digital Natives", and possessed some skills on how to use the computer particularly those in the College of Health Sciences (Table 4.23). This is because Tagoe (2012) contended that undergraduate students at the University of Ghana had good knowledge and skills in using computers and were aware of the SAKAI LMS.

Graduate students' level of knowledge about the features of the SAKAI LMS could possibly influence their Behavioural Intentions leading to continuous usage as earlier explained in the Unified Theory of Acceptance and Use of Technology (UTAUT) model. This is because as one of the obstacles that a graduate student may face in adapting to the SAKAI LMS is his/her belief that using the platform requires knowledge and skills in computer programming and hence it is complicated using it. Thus, knowledge in how to use the SAKAI LMS may be the first footstep a graduate student needs to take in order to effectively become aware of the features of the SAKAI LMS. This is because often, individuals (graduate students) may be afraid of approaching something they do not know a lot about.

Based on the results obtained, it could be said that graduate students' limited knowledge of the features of the SAKAI LMS may be due to their negative beliefs about it and lack of interest in using it. Some graduate students may not have an interest in using the SAKAI LMS because using technology is not part of their daily social life and hence may not use

technology e.g. Facebook in their daily life. It could be further argued that lecturers' limited knowledge on the features of the SAKAI LMS could be one of the main reasons why they do not know how to promote online interactions in practice. From the above discussion, I believe that good knowledge of the features of the SAKAI LMS such as the Chat room tool, Forum tool, Email tool and others could promote collaborative learning, hence boosting the confidence level of graduate students' continuous usage at the University of Ghana as it has been incorporated as a blending learning method to supplement the face to face lecture method. For this reason, it is expected for graduate students to have good knowledge of the SAKAI LMS in order to be addicted to its usage.

5.3 Extent of Utilization of the Features of the SAKAI LMS

The findings obtained from the study revealed that graduate students utilized the features of the SAKAI LMS occasionally (M= 3.32, SD=1.26). This outcome confirms the assertion made by Moor (2002) that the continuous utilization of the SAKAI LMS could be affected if the platform is not well incorporated and accepted into the culture of an educational institution by students and lecturers. Based on this, it could be argued that perhaps in spite of the numerous benefits of the SAKAI LMS to students, graduate students at the University of Ghana have not fully adapted to the use of the platform in all their academic work and research.

Again, there is a possibility that lecturers within the various Colleges of Affiliation to which graduate students belonged were not regularly engaging their graduate students on the platform with the features. The finding supported that of Dube & Scott (2014) and Ssekabubu et al. (2011) who found that respondents hardly utilized the SAKAI LMS as a result of lack of knowledge on its features and that students had a low level of utilization of the features on the SAKAI LMS. On the other hand, the findings did not correspond to

Juhary (2014), Lonn et al. (2009) and Rafi et al. (2015) that university students often visited the SAKAI platform on their own for their academic studies and as a result the extent of use of the platform was high.

Although graduate students generally used the features on the SAKAI LMS once a while the majority of them regularly used the Turnitin tool (M=3.84, SD=1.87). This may be due to the fact that most of the time, graduate students had to submit their class assignments and project reports through the Turnitin tool on the SAKAI LMS and hence its frequent usage as established by Choga (2015) where it was found that students regularly utilized the Turnitin tool to submit their assignments as instructed by their lecturers. Also, their high level of knowledge of this tool confirms its usage.

Again, graduate students use of the Assignment tool on the SAKAI LMS was high (M=3.66, SD=1.75). This finding did not surprise me because the use of the Turnitin tool had a direct positive correlation with the Assignment tool (Table 4.6). As such, in the submission of an assignment, a graduate student was required to attach a Turnitin report as earlier mentioned. Additionally, the findings revealed that graduate students used more of the Resources tool on the SAKAI LMS (M=3.57, SD=0.50). This could be attributed to the fact that graduate students had to frequently visit the SAKAI LMS to download their course outlines and reading materials. This finding was consistent with Soon & Fraser (2011) in which they found that the Resources tool on the SAKAI platform was highly utilized by students.

On the contrary, the findings revealed that graduate students barely used the Forum tool (M=2.24, SD=0.79). This perhaps appears that graduate students do not often enjoy participating in discussions on the Forum. For instance, graduate students may be less interested in using the Forum when they do not receive feedback from colleagues and

lecturers when issues are being discussed or topics are posted. It is also possible that the majority of graduate students appreciated learning on their own without participating in the Forum. Others too may be feeling uncomfortable interacting with colleagues/lecturers on-line especially when writing or typing long sentences that demand time and energy. In a similar study by Lewis, Fretwell, Ryan & Parham (2013) the majority of university students did not learn well through the online Forum interface but rather were passionate about face-to-face instruction.

In addition, graduate students were found not using the Calendar tool on the SAKAI LMS most of the time (M=3.28, SD=0.45). This possibly points to the fact that the majority of graduate students got information concerning assignments deadlines and course scheduled dates from their friends and course mates hence relying less on the calendar tool. This findings further explain why graduate students were found to have limited knowledge on the Calendar tool as found in Table 4.1 (M=1.28, SD=0.45). This reveals that having enough knowledge on a particular feature on the SAKAI LMS could affect the extent of use of the feature with respect to the Unified Theory of Acceptance and Use of Technology (UTAUT) model. Furthermore, the findings portrayed that graduate students were also not using the Lessons tool on the SAKAI LMS in their academic studies regularly. With respect to this tool, it could be argued that lecturers were not constantly engaging their graduate students on the Lessons tool resulting in its low utilization.

In a recent study carried out by Coleman & Mtshazi (2017) on factors affecting the use and non-use of the SAKAI LMS, one of the reasons that accounted for the non-use of the SAKAI LMS by respondents was the issue of time management. According to them, most of their time was already consumed by their academic work and research. As commented by one of the graduate students during the data collection of the study ‘‘*Using the SAKAI LMS takes away all my time’’*. Again as reported in the study some respondents saw the

SAKAI LMS as not easy to use as certain features such as the Resources tool, Dropbox among others demanded a lot of time to learn. Mumtaz (2000) believed that almost every university student desires to use the LMS the majority of them either do not use it regularly or do not know how to properly utilize it.

5.3.1 Extent of Utilization of the Features of the SAKAI LMS and Gender

The findings of the study revealed that gender had an influence on the extent of utilization of the features of the SAKAI LMS (Table 4.7). From the data analysis, it was found that male and female graduate students used the various features such as the Forum, Chat room tool, Dropbox tool, Email tool and others on the SAKAI LMS differently and for a particular purpose. For instance, the results obtained indicated that 43% of males used the Forum tool on the SAKAI LMS once in a month while 16% of females used it once a semester. Again, with respect to the Lessons tool, 90% of males used it once in a week compared to 30% of females who used it only once in the whole semester. However, a critical look at the Syllabus tool revealed interesting findings in which 39% of females used the Syllabus tool once a month against 61% males once a semester. Again, research outcomes on the gender gap in the use of the SAKAI LMS have shown that male and female students differ in terms of utilization.

5.3.2 Extent of Utilization of the Features of the SAKAI LMS and Age

In terms of age and utilization of the system, the analysis indicated that there was no statistically significant association between the ages of graduate students and their extent of utilization of the SAKAI LMS at the Univesity of Ghana campus (Table 4.8). From this, it could be said that though the SAKAI LMS is a new innovation, it is possible that both young and old graduate students had been exposed to its use during their undergradaute degree programme or earlier before entering into tertiary education.

5.3.3 Extent of Utilization of the Features of the SAKAI LMS and College of Affiliation

The findings of the study based on the One-Way Analysis of Variance showed that there was no statistically significant difference between the extent of utilization of SAKAI LMS and the College of Affiliation of graduate students ($F(2,136) = 0.349$, $P > 0.706$). This outcome puts forward that graduate students' use of the features of SAKAI LMS at the University of Ghana is incumbent on the Colleges of Affiliation in assisting their faculty and students to use the system to support teaching and learning.

From the above discussion, the extent to which graduate students were utilizing the SAKAI LMS features was very encouraging and positive. This is because the majority of them perhaps felt that the use of the features on the SAKAI LMS helped them in their studies and learning and eased their contact with their friends and lecturers. In addition, I believe that the ability of graduate students to use the features of the SAKAI LMS at the University of Ghana was very significant because without them being able to easily use the LMS, they may not experience the pedagogical benefits it offers over the conventional classroom teaching and learning environment. Hence, a graduate student need not have to travel long distances to submit an assignment to lecturers on campus but could easily make use of the features of the SAKAI LMS which may serve the same purposes. Furthermore, the regular utilization of the features of SAKAI LMS by graduate students may possibly help them to accomplish their learning tasks and assignments more quickly and increase their learning effectiveness. This is because graduate students have easy access to their lecture notes, reading materials and course outlines on the SAKAI LMS. This may provide the needed convenience to graduate students to concentrate on their studies, without approaching their lecturers and course representatives for course materials.

In addition to the above, the analysis of graduate students' extent of use of the SAKAI LMS may be affected by a number of variables. These variables may involve their level of usage of the features, their interaction with colleagues and lecturers on the platform and the kind of features they use each time they logged unto the system. The findings further indicated that although the University of Ghana has successfully installed the SAKAI LMS, its usage by graduate students seemed not to be encouraging which may signify the consideration of that the system is not yet a well-established part of the University.

Even though the features on the system may be useful for many graduate students' academic work, they do not reflect the true value of the rich variety of SAKAI LMS functions. This is due to the fact that online teaching and learning could be more productive, interactive and interesting if the features were to be used to its full potential by students and lecturers, which may be very important for universities offering fully online courses. Additionally, the use of some of the features on the SAKAI LMS (Appendix D) may require more computer skills and experience than others such as the Resources tool, Forum tool among others.

From the findings, it could be said that graduate student-lecturer interaction could be very significant to the teaching and learning process particularly in online learning and distance education. This is because Lee & Rha (2009) and Wang et al. (2013) posited that interaction was one of the essential ingredients in web-based distance education and in an online environment. As a further explanation, graduate students may be different in their level of motivation and computer skills. Though self-motivated graduate students may show some level of appreciation to a post from their lecturer or friend asking them to find information, some graduate students who may be unable to manage and handle their academic activities on the SAKAI LMS platform may

shun using the system. Based on this, it could be established that the extent of use of the SAKAI LMS may be affected by an individual as well as organizational factors.

5.4 Attitudes Towards the Continuous Utilization of the SAKAI LMS

The findings from the study indicated that graduate students at the University of Ghana had a very positive attitude towards the continuous use of the SAKAI LMS (M=3.67, SD=1.77). This possibly shows graduate students' desire to adapt and continuously use the SAKAI LMS. The positive attitudes meant that graduate students had a favorable perception of the SAKAI LMS and believe that using a technology/innovation such as the SAKAI LMS in their studies could prepare them for the digital future as 21st-century computer skills are essential to be successful at the workplace after completion of their graduate studies. Again, graduate students possibly could communicate with their lecturers and/or colleagues while off-campus using the SAKAI LMS. A further explanation for this finding is that the use of the SAKAI LMS may serve as a life savior for the majority of working students as they could submit their assignments through the platform.

In addition, there is strong evidence to support the positive attitudes exhibited by the graduate students towards the SAKAI LMS for a number of reasons. This is because, from the analysis, graduate students were self-confident (MD= 3.74, SD= 1.83) in the use of the SAKAI LMS, suggesting that they were very much satisfied using the SAKAI LMS in their academic work. This finding supported the work of Elbasuony et al. (2018) where the majority of students confessed to being confident using the LMS.

This outcome shows that the graduate students were not facing problems whenever they return to previous pages on the platform (Effort Expectancy). Graduate students' confidence level could be further explained by the fact that the use of the SAKAI LMS helped them to complete their course work on time (M=3.73, SD=1.82) and as a result

became very productive in their course work (MD=3.72, SD=1.81). This indicates that graduate students believed that using the SAKAI LMS in their academic studies will boost their competence in their projects, presentations and assignments (Performance Expectancy). Furthermore, with the SAKAI LMS, a graduate student could have access to all the course materials, outlines, and lecture notes available to them at any time. This may make their learning friendlier as they indicated that they enjoyed using the SAKAI LMS for their studies (M=3.60, SD=1.77) as posited by Hedonic Motivation in the Unified Theory of Acceptance and Use of Technology (UTAUT) model. This shows that graduate students may prefer using the SAKAI LMS believing it would make their academic work less stressful, more interesting and fun. Again, graduate students were very much interested in courses taught using the SAKAI LMS (MD=3.73, SD=1.82).

An explanation to this may be due to the fact that they could easily download reading materials for such courses from the platform at their own pace and time, be it on a laptop, desktop or tablets as long as they have an internet connection. This could probably save them a lot of time and money from printing reading materials and hand-outs as they could download them from the platform at limited cost. Additionally, the finding of the study corroborated with Qiu et al. (2010) and Lowerison et al. (2006) where positive attitudes towards the use of the SAKAI LMS was found. From their findings, students' derived benefits such as communicating with their lecturers, downloading course materials, submission of assignments and others. On the other hand, the findings of the study did not support the research carried out by Berg (2013) and Choga (2015) where the negative attitude towards the SAKAI LMS revealed a lot of students spending so much time on the platform as some of them ended up searching for unnecessary things while on the internet or its complicated features to use.

With reference to the above discussion on graduate students' attitude towards the continuous utilization of the SAKAI LMS at the University of Ghana, it is very obvious that their attitudes were very encouraging and affected their readiness and the passion to continuously use it in their academics.

Deducing the results to the Unified Theory of Acceptance and Use of Technology (UTAUT) model, it could be said that graduate student attitudes towards the SAKAI LMS could be determined by two key factors: Performance Expectancy and Effort Expectancy. This means that if a graduate student at the University of Ghana is certain to derive enough benefits from using the system by improving his/her academic work and the system is easy to use, he /she would have a positive attitude towards the SAKAI LMS.

5.4.1 Attitudes Towards the Continuous Utilization of the SAKAI LMS and Gender

The findings from the study further revealed gender differences on attitudes towards the continuous utilization of the SAKAI LMS by graduate students at the University of Ghana. The results obtained indicated that males had more positive attitudes (M=3.01, SD=0.22) towards the continuous use of the SAKAI LMS than their female (MD=2.41, SD=0.44) counterparts. The t-test (t (188) =9.94, p=0.00) further showed that there was a statistically significant difference between male and female graduates attitudes towards the continuous utilization of the SAKAI LMS. Hence, males and females may use technology differently and for various purposes. From the data analysis, 80% of female graduate students doubted their confidence in using the SAKAI LMS compared to 90% males who felt energized and self-confident in using the SAKAI LMS in their academic studies. It could possibly be that for female graduate students, the notion of ''*we can, but I can't''* may have affected their confidence level in using the SAKAI LMS. This is because, from a study conducted by Shashaani & Khalili (2001), they concluded that female university students agreed to

the fact that gender inequality existed in the use of technology and females had little confidence in using technology especially in their studies compared to their male counterparts who had so much confidence in themselves. The possible reasons for the differences in the confidence level may be socially constructed as they may not be inborn or inherited. This is because, in our Ghanaian culture, females have been socialized by their parents from infancy to believe that electronics, computers, laptops and other digital technologies are meant for males. Females are expected to take care of the home and children (social and family oriented). These extra responsibilities may affect their regular use of such devices.

In addition, certain subjects such as computer science, information systems, information and communication technology among others had been male dominated with few females. These perceptions about male-technology related issues may have influenced their attitudes, thereby affecting their confidence level concerning the SAKAI LMS. The finding further revealed that the majority of males (80%) enjoyed using the SAKAI LMS compared to females (60%). This confirmed why a lot of males (78%) agreed to the assertion that ‘‘*The SAKAI LMS gives me the opportunity to acquire new knowledge*’. This reveals that perhaps males share a special relationship with the use of technology (SAKAI LMS). These findings confirmed the assertion made by Kayany & Yelsma (2000) that males enjoy using technology in learning than females. A further explanation for this finding is that a lot of female graduate students may have lacked adequate computer skills and knowledge hence were not eager in using the SAKAI LMS.

The majority of male graduate students (95%) believed that using the SAKAI LMS helped them to understand their course better with 44% females believing the same. This finding supported the work of Kadijevich (2000) and Li & Kirkup (2007) who found that males had positive attitudes towards the LMS as they perceived its positive impact on their

programme of study. A possible explanation for this current finding is that males consider technology (computers) as a platform for social activities and are more involved than females in their studies resulting in the use of the SAKAI LMS as an interactive and flexible tool for their academic work. In relation to the above, this study established that 80% males were satisfied with the presentation style of the SAKAI and as a result believed their courses were suitable to be run on the SAKAI LMS as against 70% females who were not. This finding corroborated the assertion made by Hwang, Fisher, & Vrongistinos (2009) who posited that females feel less comfortable using the features on the SAKAI LMS compared to males.

With respect to the above findings, I believe that gender stereotypes may have had a profound effect on male and female graduate students' attitudes towards the continuous use of the SAKAI LMS. This is because social technology has developed into a masculine image resulting in a lot of females feeling less comfortable with its usage. This masculine image of technology and computers may have affected the attitudes of female graduate students who participated in this study. Based on this, female graduate students may have perceived the use of the SAKAI LMS as a male domain hence influencing their attitudes. This confirmed the conclusions reported by Tagoe (2012) that male students are more likely to participate in e-learning than female students

5.4.2 Attitudes Towards the Continuous Utilization of the SAKAI LMS and Age

Generally, it is believed that older adults have more negative attitudes toward computer technology than younger people. There is also a stereotypical perception that older adults are technologically inadequate. However, the findings obtained from this study revealed that there was no statistically significant difference between the attitudes towards the continuous use of the SAKAI LMS and the age of the graduate students (Table 4.13). Thus,

both young and old graduate students had positive attitudes towards the continuous use of the SAKAI LMS at the University of Ghana.

This is because, from the results, both young and old graduate students (20-59 years) were all confident using the SAKAI LMS as it gave them the opportunity to acquire new knowledge and they felt comfortable using the system. However, from the analysis, people may have the tendency to adapt to new innovations such as the SAKAI LMS or may have the right attitude towards its continuous use based on the fact that the use of computers and associated modern technologies have become central to university education and students are expected to have basic computer literacy skills. It could be further argued that the positive attitudes of graduate students (both young and old) towards the SAKAI LMS may be due to the fact that majority of them may have personal computers, laptops and others for use in their studies.

This finding of the study was inconsistent with Mayanja (2002) who concluded that younger students had positive attitudes towards the continuous use of e-learning resources compared to older students. From this finding, both young and old graduate students were satisfied with the presentation methods on the SAKAI LMS and hence wanted their courses to be run on the system. This, however, contradicted Fan & Li (2005) that older students had negative attitudes towards technology due to their inadequate knowledge and experience about computers.

With respect to the above, the SAKAI LMS provides both young and older graduate students appropriate knowledge concerning their courses. I believe that a deeper understanding of age-related differences in attitudes towards the LMS can provide direction for educational institutions who wish to integrate the LMS into their educational curricula. Furthermore, the findings of this study contradicted some of the myths held

about older adults' attitudes towards technology. Hence, the factors (Performance Expectancy, Effort Expectancy, Social Influence, User Satisfaction and Facilitating Conditions) identified in the theoretical framework could affect the attitudes of older graduate students just like the younger ones. In essence, older graduate students could well be taught to use technology in much the same way as the younger graduate students as they all have positive attitudes towards continuous utilization of the SAKAI LMS.

5.4.3 Attitudes Towards the Continuous Utilization of the SAKAI LMS and College of Affiliation

The findings of the study revealed that there were no statistically significant differences between the attitudes towards the continuous utilization of the SAKAI LMS and College of Affiliation (Table 4.14). This outcome indicates that attitudes towards the continuous use of the SAKAI LMS at the University of Ghana by graduate students had no association whatsoever with their College of Affiliation (Health, Education and Humanities). Thus, all graduate students within the three Colleges had positive attitudes towards the SAKAI LMS.

A possible explanation could be attributed to the fact that these Colleges had adapted to the SAKAI LMS and had integrated it successfully in their teaching and learning methodology and as a result graduate students had developed positive attitudes towards its use so far as faculty are concerned. To this end, graduate students within the three Colleges were all interested in studying courses using the SAKAI LMS. In this study, a positive attitude in itself does not mean that a graduate student at the University of Ghana is effectively using the SAKAI LMS in his/her studies unless they also have enough knowledge and relevant LMS skills to do so. However, graduate students with positive attitudes would be able to overcome obstacles that may arise in the adaptation to the

platform. As a result, graduate students with positive attitudes towards the SAKAI LMS may have to overcome their limited knowledge and occasional use of the features on the system. Based on the Unified Theory of Acceptance and Use of Technology (UTAUT) model, I believe that the positive attitudes exhibited by graduate students at the University of Ghana could influence their decision to use the platform regularly. By the principle of the Unified Theory of Acceptance and Use of Technology (UTAUT) model, if a graduate student has a positive perception (Performance Expectancy and Effort Expectancy) about the SAKAI LMS, this may influence their attitudes and further affect their decision to completely adapt to the SAKAI LMS.

5.5 Motivation Towards the Continuous Utilization of the SAKAI LMS

The motivation of students in online learning could be said to be an important factor in driving learning online. The majority of students learning at a distance are motivated by several factors to engage in learning activities (Amponsah, Torto & Badu-Nyarko, 2018). Graduate students' motivation is an imperative factor towards the continuous utilization of the SAKAI LMS at the University of Ghana. With respect to this, high or low motivation may affect its adaptation and continuous use. The study's result indicated that graduate students at the University of Ghana were highly motivated to use the SAKAI LMS (M = 2.73, SD = 1.67) and believed the use of the SAKAI LMS saved them time (M=2.97, SD =1.89) as they had to combine their academic studies with other responsibilities and hence the regular use of the SAKAI LMS made it possible for them to have ample time for their research work (thesis) thus, lessening the burden of always commuting to campus to submit assignments among other things (extrinsic motivation). Similar results were found by Chitanana et al. (2008) that university students were highly motivated to use the LMS as a result of its convenience.

‘‘Intrinsically motivated,’’ graduate students would be enthused about using the SAKAI LMS due to the pleasure derived. Consequently, graduate students at the University of Ghana had fun and enjoyed using the SAKAI LMS (M = 2.95, SD =1.83), which in turn, increased their chances of acquiring good grades in their respective courses (M = 2.61, SD =1.50). The joy graduate students experience from using the SAKAI LMS would likely ginger them to use it often.

In line with this study, perceived enjoyment constituted the extent to which the activity of using the SAKAI LMS is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated by graduate students. Similarly, Davis et al. (1992) found that perceived enjoyment had an effect on behavioral intention to use technology.

By extending these results to the context of the use of the SAKAI LMS, it could be argued that perceived enjoyment would have a positive effect on the extent of utilization of features of the SAKAI LMS such as the Forum, Chat room tool, Email tool and others by graduate students (intrinsic motivation). This may confirm the notion of distributed learning as any learning or instructional activity in which students are separated from faculty members and other students. In the same way, Moore & Kearsley (1996) described distance education as:

> Planned learning that normally occurs in a different place from teaching and as a result requires special techniques of course design, special instructional techniques, special methods of communication by electronic and other technology, as well as special organizational and administrative arrangements. (p. 2)

As a result, graduate students and lecturers could log unto the SAKAI LMS while at different locations independent of time and place for online communication. Graduate

students agreed that the use of the SAKAI LMS could affect their future career (M = 2.96, SD =1.86) and was useful to their studies (M=2.68, SD=1.65). In effect, the use of the SAKAI LMS may have a positive impact on the academic studies of graduate students by increasing their performance (extrinsic motivation). This may imply that students' use and adaptation to the SAKAI LMS was as a result of the system's ability to support their academic needs.

Similarly, a graduate student who acknowledges the importance of the SAKAI LMS in his/her studies would be more inclined and motivated to use it. It was established that graduate students communicated easily with their lecturers and friends (M = 2.94, SD =1.81) and their previous experience of internet resources (M =2.61, SD=1.70) motivated them. A possible explanation of this ease of use (communication) of the SAKAI LMS may be due to the graduate students' knowledge of features and prior experience (extrinsic motivation). The SAKAI LMS offers several communication tools such as live chats (synchronous) and other tools (asynchronous). Hence, in distance learning where lecturers and students are physically separated, using the SAKAI LMS communication tools is essential. It could be said that the regular use of these communication tools may enhance online learning leading to continuous usage. The literature on adult non-formal participatory e-learning demonstrates that there is a broad compromise about the positive correlation between educational goal achievement and personal learners' satisfaction. This is because a lot of scholars believe that developing adult e-learning courses without careful consideration of their peculiar needs may condemn to failure. Hence, the motivation to use the SAKAI LMS by graduate students may be dependent on their online interaction,

As Smart & Cappel (2006) found out, students with more knowledge and experience with technology and e-learning rated it positively. In this case, a computer user's prior knowledge and ease of communication affected their motivation to use technology in

general. Moore & Kearsley (2005) found that learners with previous experience of using media communication and with higher knowledge levels of the subject matter tend to participate more interactively and independently in learning activities. This has implications for design (instruction) to bridge the gap between teachers and learners to support autonomous and independent learning. But for the SAKAI LMS, Chat room and Forum make users “cooperative learners".

5.5.1 Motivation Towards the Continuous Utilization of the SAKAI LMS and Gender

The results of the chi-square analysis presented in Table 4.17 revealed that there were no statistically significant differences existing between motivation to use the SAKAI LMS and gender. The findings indicate that both male and female graduate students at the University of Ghana have the same motivation (intrinsic and extrinsic) to use the SAKAI LMS. Hence, gender as a variable did not account for differences in motivation towards the continuous use of the SAKAI LMS. The outcome of the study challenges the long perceived gender bias that males are much motivated to use computers than females. However, the findings supported studies acknowledging gender equality in motivation and interest in the use of computers by both male and female (Dhindsa & Shahrizal-Emran, 2011). On the other hand, the findings were in contrast with a recent study conducted by Amponsah et al. (2018) who found males to be much motivated than females in professional development and pursuit of higher education.

A possible explanation of this finding is that both male and female graduate students benefited equally from using the SAKAI LMS in terms of time and opportunities. This is because male and female graduate students perceived the use of the SAKAI LMS as useful for their studies and again were able to communicate easily on the system with their colleagues and lecturers (Table 4.17).

From the analysis, graduate students irrespective of gender operated the SAKAI LMS, received and checked their emails and responded to discussions on the Forum (table 4.17). As postulated by Pituch & Lee (2006) computer literacy skills, an external variable in the Technology Acceptance Model affects perceived ease of use (Performance Expectancy) of new technology. The findings of the study, however, contradicted Li & Kirkup (2007) who found males were motivated to use technology than females. They further postulated that females believed computers were traditionally a dominant activity for males and hence females were less interested in using computers compared to males. This might not be the case for graduate students who have used technology in their undergraduate level or are compelled to do so at the graduate level by their respective Colleges.

Again, graduate students (male and female) found the use of the SAKAI LMS similar to other applications such as Microsoft Word, Microsoft PowerPoint and others used in their studies (Table 4.16). This indicates that practical knowledge of applications such as Microsoft Office can help accomplish projects and assignment leading to motivation towards its usage. The revelation that graduate students are motivated towards the continuous use of the SAKAI LMS gave credibility to Knowles' (1980) principle that adult learners are goal-oriented and results-oriented.

Thus, graduate students have specific educational goals they are hoping to achieve. They may prefer to get themselves involved in online learning activities to research their goal and have expectations for what they would derive from using the SAKAI LMS. However, when these expectations are not met, their motivation towards the continuous use of the system may be affected negatively.

Based on the above, one of the critical ingredients for graduate students' use of the SAKAI LMS may possibly be self-motivation. This is because the integration of e-learning into

teaching and learning may depend on the graduate student's personal motivation. This means that for graduate students to continually use the SAKAI LMS, they need to be supported with a richly enhanced e-learning atmosphere. The continuous utilization of the SAKAI LMS could be determined by intrinsic and extrinsic motivation. The results of the study indicated that graduate students' use of the SAKAI LMS could be predicted by both intrinsic motivation and extrinsic motivation. While a graduate student's extrinsic motivation has a significant influence on their use of the SAKAI LMS, their intrinsic motivation becomes the most important predictor of continuous utilization which is consistent with the results of previous studies.

It could be argued that a graduate student who is intrinsically motivated may easily adapt to the SAKAI LMS for its own sake, for the satisfaction it provides or for the feeling of accomplishment and utmost self-aggrandizement. Again, graduate students may prefer taking responsibility for their success or failure at learning. In addition, students' access to modern and flexible online learning environment could facilitate individual and collaborative learning in higher education.

5.5.2 Motivation Towards the Continuous Utilization of the SAKAI LMS and Age

It is commonly perceived that older people feel uncomfortable and less motivated by using modern technology compared to younger people. This perception may place older people at a big disadvantage, because designers of technology may fail to consider older people as potential user group when designing technology. The results of the chi-square analysis (Table 4.18) indicated that there were no statistically significant differences existing between motivation to use the SAKAI LMS and age. The finding indicates that both younger and older graduate students (20-59 years) at the University of Ghana had the same motivation (intrinsic and extrinsic) to use the SAKAI LMS. These findings did not support

the assertion that older students were less motivated to adapt to new technologies than younger students (Czaja & Schulz, 2006) but will do so if those technologies appear to have rich value, for instance in maintaining their quality of life, in this case succeeding in their courses. The findings of the study again imply that to make the SAKAI LMS age-friendly, it is significant to understand the advantages and disadvantages motivating both younger and older graduate students to use it. The outcome suggests that both younger and older graduate students (20-59 years) were motivated to adapt to the SAKAI LMS and continually use it as it was useful for their studies. Hence the most powerful thing lecturers could do to motivate their students is to design engaging and technology-enhanced learning experiences.

An understanding of older graduate students' motivation to use the SAKAI LMS is very important to assist with introducing it to this population and maximizing the potential of the SAKAI LMS to facilitate lifelong learning. According to Xingfu, Xiaoqing & Zhiting (2005) lifelong learning is ''an activity whereby individuals are able to choose learning resources and strategies based on their career requirements and personal needs and to engage in learning at any time, in any place and with any curriculum'' (p 63).

In this direction, in the implementation of the vision of lifelong learning, ICT based distance education and E-learning are playing and continue to play a key role. From the analysis, younger and older graduate students believed the use of the SAKAI LMS affected their future career and saved their time (Table 4.18). This finding did support an earlier study by Mullinix & McCurry (2003) where older students were motivated to use the LMS as its usefulness and usability outweighed their self-efficacy feelings Additionally, it has been proposed that older students with high self-efficacy are highly motivated about, and more likely to use, technology in general. The findings of the study may be consistent with the proposal that if older graduate students were more confident they would be more likely

to use the SAKAI LMS just as the younger ones do, as it is the latest learning technology (Table 4.18).

This study found both younger and older graduate students (20-59 years) were motivated to use the SAKAI LMS from the pleasure of logging unto the system due to their exposure to computer training programmes at the University of Ghana (Table 4.18). On the whole, this finding is may be consistent with the Selection Optimization Compensation (SOC) Theory which assumes that there are three fundamental life management processes: selection (goals), optimization (goal-related means to achieve desired goals) and compensation (reaction to loss in goal-related means to maintain success or desired goals) (Baltes, 1997). According to SOC, as people grow older (graduate students), they allocate a lot of resources toward loss management in maintaining their life goals. Although the study did not directly investigate whether graduate students selected life goals and whether they compensated to maintain their life goals, older graduate students may have been motivated with the importance of e-learning and keeping up-to-date with current technologies such as the SAKAI LMS from the institution's encouragement and determination to succeed. The findings further indicate that older graduate students were motivated to use the SAKAI in the same way as the younger ones because the use of the SAKAI LMS may be associated with lower depression and loneliness, and higher levels of social support, life satisfaction, purpose of life and social capital (bonding with lecturers and course mates) in communicating among themselves. As a result, if the motivation to use the SAKAI LMS reduces loneliness and enhance social networking, it could lead to better physical health for older graduate students at the University of Ghana and continuous usage (addiction).

5.5.3 Motivation Towards the Continuous Utilization of the SAKAI LMS and College of Affiliation

Using the SAKAI LMS for educational purposes may be crucial for teaching, learning, research, communication and information sharing among graduate students within the College of Affiliation (Health, Education and Humanities). The finding of the chi-square analysis revealed that there was no statistically significant association between motivation (intrinsic and extrinsic) to use the SAKAI LMS within the College of Affiliation (Table 4.19). This implies that graduate students within all the three colleges of Affiliation where motivated to use the SAKAI LMS at the University of Ghana as they are motivated to do so by their Colleges (Table 4.19). This suggests that graduate students within the Colleges of Affiliation were probably engaged in active learning on the SAKAI LMS and hence had influenced their learning quality, satisfaction with their new online experience, interest and hence their motivation

In addition to the above, the conventional teaching and learning method may be an appropriate therapy for graduate students who have the motivation and are currently connected to technology. This is because graduate students and lecturers may benefit from using the assessment tools on the SAKAI LMS. With respect to this, graduate students would have a modified method to information attainment that conforms to their academic studies.

5.6 Factors Promoting the Continuous Utilization of the SAKAI LMS

The study focused on examining factors promoting the continuous use of the SAKAI LMS by graduate students. Factors such as Performance Expectancy, Effort Expectancy, Facilitating Conditions, Social Influence and User Satisfaction emanating from the conceptual framework and theoretical framework were identified as possibly influencing

graduate students intentions to use the LMS. The findings of this study provided ample evidence that the Unified Theory of Acceptance and Use of Technology (UTAUT) model construct for Performance Expectancy ($\beta = 0.086$, $p < 0.05$) and Facilitating Conditions ($\beta = 0.906$, $p < 0.05$) had a significantly positive influence on individual decision to use SAKAI LMS. On the other hand, factors such as Effort Expectancy ($\beta = 0.61$, $p > 0.05$), Social Influence ($\beta = 0.002$, $p > 0.05$) and User Satisfaction ($\beta = 0.002$, $p > 0.05$) did not have an effect on their decision to use the SAKAI LMS. Again, the study found that individual decision to use the SAKAI LMS had a high impact on a graduate student's continuous use and adaptation to the system. The outcome of these findings has been further discussed in subsequent paragraphs.

5.6.1 Performance Expectancy and Individual Decision to Use

The findings indicated that Performance Expectancy had an effect on graduate students' decision to use the SAKAI LMS ($\beta = 0.086$, $p < .05$). This means that a graduate student at the University of Ghana may take into consideration Performance Expectancy when deciding to use the SAKAI LMS their studies. A probable explanation for this finding is that graduate students possibly believed the SAKAI LMS was useful and would enable them to accomplish their learning endeavors faster and more efficiently. This is because technology has made learning synchronous and asynchronously done.

Also, perhaps the use of the SAKAI LMS tended to improve their academic performance such as easy submission of assignments on time, reducing their efforts at travelling and eliminating missing their lecturers. Furthermore, the outcome may indicate that a graduate student with a high-Performance Expectancy would be more likely to be addicted to using the SAKAI LMS. The findings of the study support the works of (Pardamean & Susanto,

2012; San Martin & Herrero, 2012) who found positive relationships existing between Performance Expectancy and individual decision to use the SAKAI LMS.

5.6.2 Effort Expectancy and Individual Decision to Use

With respect to Effort Expectancy, the findings revealed no significant effect on individual decision to use ($\beta = 0.61$, $p > 0.05$). This implies that the use of the SAKAI LMS by graduate students had nothing to do with how easy they perceived the system to be. Thus, graduate students at the University of Ghana may desire to use the SAKAI LMS in spite of the challenges they may encounter. Hence, regardless of the challenges a graduate student had to battle with, they may adopt and continuously use the SAKAI LMS. This finding is similar to Al-Adwan, Al-Adwan & Smedley (2013), Bakar et al. (2013) and Lwoga & Komba (2015) who concluded that Effort Expectancy had a significant impact on university student decision to use an innovation. On the other hand, the finding contradicted that of Almarashdeh et al. (2010) who found that Effort Expectancy had a strong association with individual decision to use a particular technology.

5.6.3 Social Influence and Individual Decision to Use

The findings from the study revealed that Social Influence did not have an impact on graduate students' decision to continuously use the SAKAI LMS at the University of Ghana ($\beta = 0.002$, $p > 0.05$). In effect, a graduate student at the University of Ghana would not be influenced by their lecturers, course mates or roommates in using the SAKAI LMS. He or she would use it because the graduate students perceived the benefits they would derive from using the SAKAI LMS on their academic work thus paying less attention to suggestions and pressure from lecturers, friends and others to use the system. Social norms or significant others had little to do with usage. Based on the finding, it could be said that

graduate students may have an intrinsic motivation towards the continuous utilization of the SAKAI LMS and as such did not need any form of recommendations whatsoever from significant others (lecturers). The outcome of the study was in sharp contrast with the view of Burton-Jones & Hubona (2006) that when undergraduate students are faced with complex features on the SAKAI LMS, Social Influence had a significant impact on their decision to use the platform.

The finding of this study contradicted the notion of social presence or influence which asserts that learners feel **present** in a learning environment. The outcome of the study possibly implies that face-to-face interactions, social presence may be high because learners are able to see, hear, and communicate with other learners. However, in an online environment, social presence may not be felt as direct communication factors are absent or diminished. In spite of this, social presence could equally be a critical factor in online learning and can improve learner performance.

5.6.4 Facilitating Conditions and Individual Decision to Use

From the data analysis, Facilitating Conditions were found to have effect on individual decision to use ($\beta = 0.906$, $p < 0.05$) the SAKAI LMS by graduate students at the University of Ghana. This finding possibly indicates that for a graduate student at the University of Ghana to continuously use the SAKAI LMS at the University of Ghana, good and adequate ICT infrastructure, e-learning facilities such as computers, strong internet accessibility, and others needed to be available at all times. The result supports earlier studies carried out which found Facilitating Conditions to significantly predict individual decision to use the LMS (San Martin & Herrero, 2012; Chang, 2013). In agreement with Shahadat et al. (2012) factors such as e-learning policy and adequate training, institutional support may have an impact on a graduate student's decision to the

SAKAI LMS. It is therefore obvious that the rich e-learning environment within which graduate students find themselves at the University of Ghana might have impacted their decision to adapt and continually use the SAKAI LMS.

5.6.5 User Satisfaction and Individual Decision to Use

The findings revealed that User Satisfaction had no influence on individual decision to use the SAKAI LMS by graduate students at the University of Ghana ($\beta = 0.002$, $p > 0.05$) as hypothesized in the conceptual framework of the study. As it may have been expected, the outcome of the study proved otherwise indicating that graduate students' decision to use the SAKAI LMS was not influenced by the satisfaction they derived from it. This finding contradicted the study of Ramayah & Lee (2012) where system quality, information quality and services offered to students had an influence on their level of satisfaction enjoyed.

On the contrary, it is possible that graduate students at the University of Ghana do not consider the variables identified by Ramayah & Lee (2012) in their decision to use the SAKAI LMS.

5.6.6 Individual Decision to Use and Continuous Use

The findings revealed that individual decision to use had an effect on continuous use ($\beta = 0.704$, $p < .05$) of the SAKAI LMS by graduate students at the University of Ghana. This may suggest that a graduate student who decides strongly to use the SAKAI LMS would be addicted to it and continuously use the system. The finding confirmed the argument put forward by Jairak, Praneetpolgrang & Mekhabunchakij (2009) that university students' decision to use technology positively have an influence on continuous utilization. Again, graduate students' continuous utilization of the SAKAI LMS could significantly be

understood by paying particular attention to the factors (Performance Expectancy and Facilitating Conditions) possibly affecting their decision to use the platform.

On the other hand, the continuous use of the SAKAI LMS by graduate students could increase their online social interactions and integration. This social interaction could contribute to the development of effective online social capital that could positively impact both online and offline social activities and interactions. Again, graduate students may experience feelings of loneliness and emptiness when he or she is unable to effectively interact with lecturers and course mates in the Forum, Chat room, among others. Thus, SAKAI LMS addiction may lead to overall mental health benefits and wellbeing for graduate students considering the benefits of continuous usage.

As a consequence of continuous use of the SAKAI LMS, graduate students could develop their critical thinking skills in a blended learning environment for enabling interpersonal interactions between lecturers and students. The critical thinking skills could improve graduate students sustained motivation throughout their post-graduate programme. Further, critical thinking could be a pillar of success in the personal and academic life of graduate students. This is because it could help to improve their leadership skills, decision-making skills, and critical judgment, giving them a competitive advantage for success in their future professional careers. In addition to the above, the continuous use of the SAKAI LMS by graduate student could open up group work which was once practically impossible with face to face interactions. As such, groups or teams working online could increase their productivity and bridge geographical gaps. In furtherance to the regular use of the SAKAI this may change the dynamics among members in the group, placing graduate students on an equal footing, reducing public speaking problems.

The findings have revealed that if a graduate student believes that their academic performance would improve (Performance Expectancy) and quality of studies enhanced as a result of the availability of adequate e-learning resources (Facilitating Conditions) they may see the value and benefits of adapting and continuously utilizing the SAKAI LMS in spite of the challenges encountered.

5.7 Challenges Encountered in the Continuous Utilization of the SAKAI LMS

In spite of the pedagogical advantages of collaborative learning, online learning could sometimes be frustrating. The findings from the study indicated that graduate students at the University of Ghana in their decision to use the SAKAI LMS experienced certain challenges. This finding did not come as a surprise to me because perhaps there is no innovation/technology which when implemented would be 100% free of problems by its users. In spite of this, although some graduate students may find the use of the SAKAI LMS as easy, it is also true that the majority regarded the SAKAI LMS as not easy to use as a result of certain challenges encountered (M=4.22, SD=2.77). This is because some of the features on it may demand a lot of time to learn as a graduate student especially those admitted from other universities. Thus, perfection may be gained over time.

From the data analysis, it was revealed that the majority of graduate students encountered certain difficulties when downloading lecture handouts, course outlines, reading materials among others from the SAKAI LMS (M=4.75, SD=1.62). This finding supported the research of Juhary (2014) where respondents equally faced challenges retrieving reading materials and lecture notes from the LMS. This experience could cause a lot of graduate students to shun away from using the SAKAI LMS and may prefer hard copies of lecture notes, course outlines and other materials handed over to them by their lecturers than being uploaded unto the SAKAI LMS. This assertion corroborated that of Torruam (2012) who

reported that university students in Nigeria were reluctant using LMS as the majority did not have a personal computer and hence preferred hard copies of their lecture notes.

Among the challenges facing graduate students in using the SAKAI was the issue of comfortability (M=4.73, SD=2.19). From the analysis of data, graduate students felt uncomfortable using the SAKAI LMS in their learning. It is possible that many of them perceived the SAKAI LMS platform interface as complex with unfamiliar features. As Dube & Scott (2014) found out the complicated nature of the SAKAI LMS affected the frequent use and adaptation by respondents. This supported the findings of Liaw & Huang (2013) where respondents experienced challenges as a result of the interface of the SAKAI platform. Graduate students possibly found the interface of the SAKAI LMS as complicated as some of the features such as the Lessons tool, the Syllabus tool demanded a lot of time to learn, hence creating anxiety in usage. This emotion could interfere with their online learning experience. Again, graduate students lacking exposure to social networking sites such as Facebook and others may have difficulties understanding and appreciating the interface of the system and thus, would find it incompatible with their way of life.

Again, from results, graduate students found it difficult attempting to log unto the SAKAI LMS (M=49, SD = 2.07). This finding supported that of Leeder & Lonn (2014) who reported that respondents had less knowledge about the features on the SAKAI LMS and as a result had difficulties logging unto the system to either send an email, chat with colleagues or post a piece of information on the Forum. Again, this confirmed the findings of Berg (2013) that poor communication existed among lecturers and their students due to the fact that students had challenges successfully logging unto the system. A possible explanation for graduate students' inability to log unto the SAKAI LMS easily may be due to lack of knowledge on how to effectively use its functional features.

The study further discovered that graduate students sometimes experienced stress as a result of the frustrations they go through when using the SAKAI LMS such as submitting of assignments, checking end of semester examination grades, posting a topic for discussion on the Forum and others. As postulated by Juhary (2014) first-time users got frustrated when trying to use the features on the SAKAI LMS as a result of system log-in failure. The findings of the study concurred with the findings of Wei et al. (2014) who in a study indicated that respondents experienced regular system error whiles using the platform making them feel frustrated using the platform. Hence, graduate students may not perceive the SAKAI LMS as useful when they are dissatisfied and unhappy using it.

From the outcome of the study, it is possible that majority of graduate students were still battling with the transition of having to adjust themselves to their new SAKAI LMS experience and hence were going through the stress of having to submit their assignments on the platform on time in meeting deadlines. These struggles coupled with the numerous responsibilities of graduate students and commitment to family, friends, community and work could affect their adaptation or continuous usage to the system.

Again, the findings of the study revealed that poor internet connectivity was among the challenges faced by graduate students at the University of Ghana (M=4.32, SD=2.93). It is possible that lack of good internet connectivity contributed to the numerous frustrations graduate students had to cope with. This is because as found by Oheneba-Sakyi & Amponsah (2018) the internet is the gateway to the SAKAI platform and very critical in its effective utilization and so challenges with the Internet would invariably affect its usage. This perhaps confirmed the assertion made by Juhary (2014) that university students reluctance towards e-learning is partly due to poor internet accessibility. The findings of the study supported that of Darko-Adjei (2018) and Mtebe & Raisamo (2014) who found that poor internet connectivity robbed students from enjoying the SAKAI LMS.

However, the study did not support that of Sclater (2008) as his respondents did not experience any form of internet problems and as a result used the LMS effectively, making the use of the SAKAI LMS at the Open University less stressful.

5.7.1 Challenges Encountered in the Continuous Utilization of the SAKAI LMS and Gender

The findings of the study revealed that both male and female graduate students' encountered similar challenges when using SAKAI LMS (Table 4.21). These challenges included lack of computer skills, poor internet connectivity, difficulties in downloading materials and lecture notes form the SAKAI LMS and others. Hence, regardless of the gender of a graduate student, they all experienced some form of stress when attempting to use the SAKAI LMS either for their studies or research or as a result got frustrated sometimes. For instance, 65% of male graduate students got frustrated while using the SAKAI LMS as against 34% of female graduate students. This finding did not support that of Ikolo & Okiy (2012) who in their study found that both male and female university students encountered similar challenges such as lack of computer skills when using e-learning resources.

5.7.2 Challenges Encountered in the Continuous Utilization of the SAKAI LMS and Age

The results of the data analysis suggest that with respect to age, both young and old graduate students encountered similar challenges when using the SAKAI LMS (Table 4.22). The findings revealed that irrespective of the age of a graduate student, they all had to battle with poor internet connectivity, at the University of Ghana. Both young and old graduate students got frustrated and exhausted each time they encountered problems

downloading their lecture notes and other reading materials and others from the SAKAI LMS possibly as a result of poor internet connectivity on campus coupled with a lack of adequate computer skills.

The findings of the study did not support the assertion made by Mayanja (2002) that younger students' encountered less/few problems in using ICT compared to the older population. This is because, with reference to this study, there were no statistically significant differences between the challenges faced by graduate students and their various ages (20-29, 30-39, 40-59 and 50-59). However, older graduate students may acquire psychomotor skills more slowly than their younger counterparts and may experience more difficulties reading small fonts and seeing images on the SAKAI LMS screen. They may prefer to learn online by doing and practicing rather than listening to lecturers' offline. The use of the SAKAI LMS could enhance graduate students experiential learning by helping them to link theory with practice and develop valuable, lifelong skills and strategies for their future endeavors. .

5.7.3 Challenges Encountered in the Continuous Utilization of the SAKAI LMS and College of Affiliation

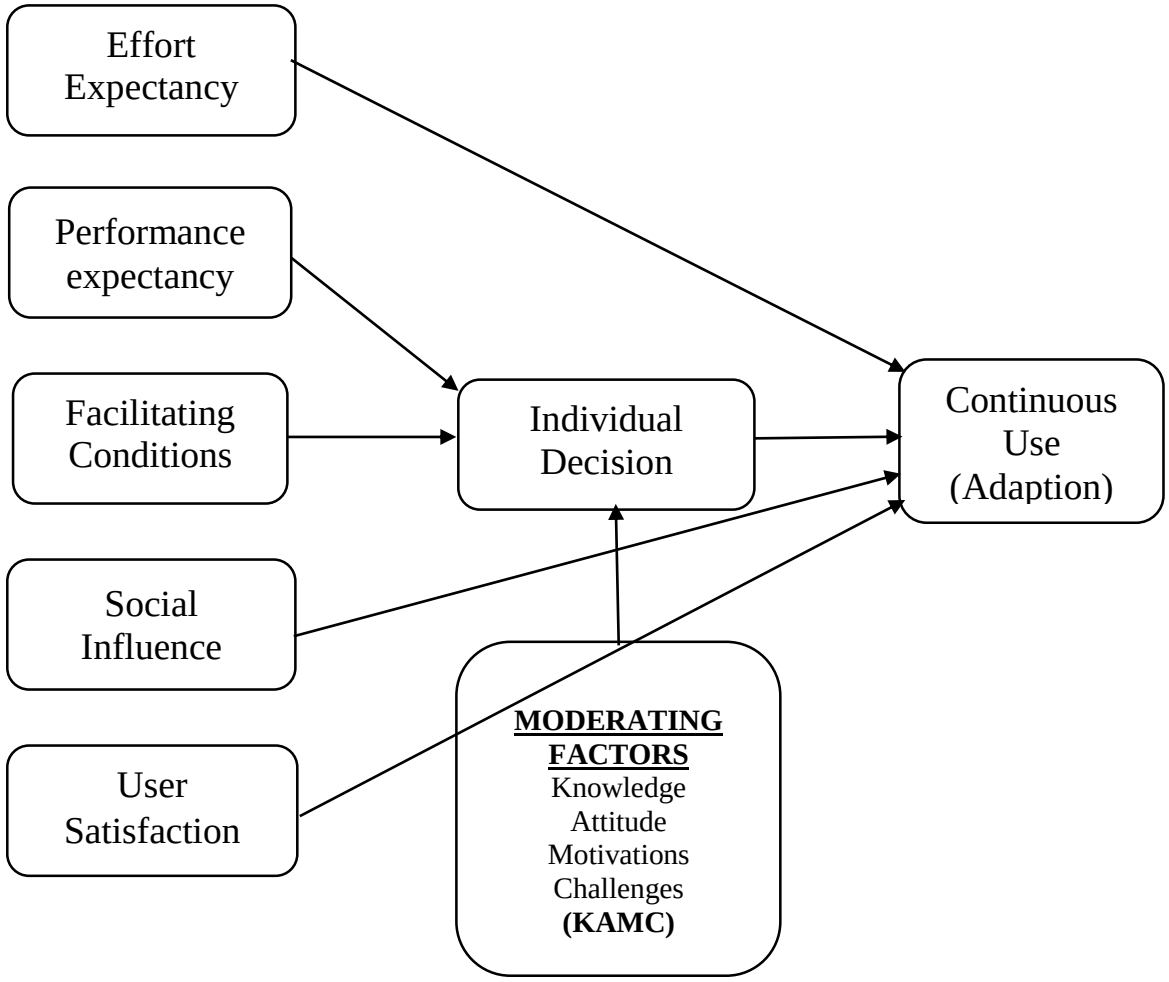
The outcome of the findings revealed that the College of Affiliation did not have any significant impact on the kind of challenges encountered by graduate students (Table 4.23). Graduate students belonging to the three Colleges namely Health, Humanities and Education were faced with lack of computer skills, poor internet connectivity, had difficulties downloading reading materials on the SAKAI LMS and others. For instance, 67 % of graduate students affiliated to the College of Health Sciences had problems logging unto the SAKAI LMS, with only 17 % of graduate students in the College of Humanities, experiencing the same challenge. Again, 14% of graduate students at the

College of Education agreed to the fact that they struggled when logging unto the SAKAI LMS. This meant that graduate students in the College of Health Sciences experienced a lot of challenges than their counterparts.

Newly admitted graduate students learning how to use the platform may obviously go through a period of crisis and adaptation. Those of them who have taken online courses previously (during their first degree) would just have to brush up on certain computer skills and those who have not taken online courses may not have experience on how to operate the platform. Hence, not knowing what to do or not understanding the steps to follow may be overwhelming. The challenges encountered by graduate students as indicated in this study could possibly affect the constructs in the Unified Theory of Acceptance and Use of Technology (UTAUT) model such as Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions. This means that, when the challenges associated with the SAKAI LMS are minimal, it will positively affect its continuous utilization by graduate students at the University of Ghana.

Based on the discussion, a model for the continuous utilization of the SAKAI LMS has been adopted for the current study. The model could be adapted to examine the continuous usage of the LMS in further studies. Figure 5.1 shows the adopted model for the continuous utilization of the SAKAI LMS.

Figure 5.1: Adopted Model for Continuous Utilization of the SAKAI LMS.



5.8 Summary of Discussion Chapter

The chapter discussed the results obtained after the analysed data collected from the graduate students. The next chapter provided a summary of the entire study, contributions of the study to knowledge, limitation and suggestions for future studies and conclusion. Finally, implications and recommendations are made based on the findings.

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

The previous chapters (1 – 5) considered the background of the study, review of literature, methodology, data analysis and discussion of research findings. This chapter provided a summary of the entire study, conclusion, the implications of the study and recommendations for the adaptation and continuous utilization of the SAKAI LMS at the University of Ghana and beyond. The chapter also discussed the limitation and suggestions for future studies.

6.2 Summary of Study

Over the past decades, higher education has changed significantly, with more and more resources being consumed on technology supporting both face-to-face, distance education and online learning. At present, the majority of web-based and web-supported courses use specialized educational technologies referred to as learning management systems (LMS). The growth in the electronic world has made it possible for educational institutions to easily provide information compared to only using conventional methods of teaching and learning such as the regular face-to-face interactions between teachers and students using the chalk and blackboard. Again, while the fast growth in modern technology has been ongoing, the transfer of improved technologies into different application fields has become a current issue in higher education.

The SAKAI Learning Management System (or course management system) is extensively used not only for online learning but also as a support and enhancement tool for traditional face-to-face teaching and learning at the University of Ghana. Through the review of current literature, it was found that there are many advantages derived from using the

SAKAI LMS such as timely access to resources, cost-effectiveness among others. On the other hand, studies conducted have indicated a lack of interest and/or knowledge of its features particularly among university students. However, little empirical research has actually been carried on students' utilization of the SAKAI LMS, especially from the perspective of graduate students' as several studies have focused their attention on undergraduate students. It is against this background that the current study was conducted to explore the continuous utilization of the SAKAI LMS by graduate students at the University of Ghana and establish strategies towards its effective use. In line with this purpose, the following research questions were stated:

1. What is the knowledge base of students on the features of the SAKAI LMS?
2. To what extent are the features of the SAKAI LMS being used?
3. What are the attitudes of students towards the continuous utilization of the SAKAI LMS?
4. What is the motivation of students towards the continuous utilization of the SAKAI LMS?
5. What significant factors promote the continuous utilization of the SAKAI LMS?
6. What challenges do graduate students encounter in the continuous utilization of the SAKAI LMS?

The study also tested the following hypotheses.

1. Performance Expectancy will have no effect on individual decision to use SAKAI LMS.
2. Effort Expectancy will have no effect on individual decision to use SAKAI LMS.
3. Social Influence will have no effect on individual decision to use SAKAI LMS.
4. Facilitating Conditions will have no effect on individual decision to use SAKAI LMS.

5. User Satisfaction will have no effect on individual decision to use SAKAI LMS.
6. Individual Decision will have no effect on continuous use of the SAKAI LMS.

The Unified Theory of Acceptance and Use of Technology (UTAUT) model was used as a theoretical framework for the study. The model was adopted for the study as it popularly used to study students' intention, adaptation and utilization of e-learning resources in higher educational institutions. The constructs of the model comprise *Performance Expectancy, Effort Expectancy, Facilitating Conditions, Social Influence* and *behavioral intention to use*. These construct have been used over the years to explain and understand individuals' use of information systems.

As a quantitative study, questionnaires were administered to a total number of two hundred and nine (209) graduate students after a pilot study had been carried out on twenty (20) graduate students at the Department of Statistics and Actuarial Science (College of Basic and Applied Sciences). The internal consistency of all the items on the questionnaire was measured to establish the reliability and validity of the questionnaire using the Cronbach alpha of 0.835. The study used the multi-stage sampling technique, however, the respondents (209) were selected using the systematic random sampling technique. Out of this number, 205 questionnaires were retrieved and 190 finally used. Of the 190 graduate students, 102 (54 %) were males, 88 (46) % were females. A majority of the graduate students were within the age range of 30 to 39 (56%) years. No respondents was 60 years and above or below 20 years. In terms of Colleges, a lot of the respondents belonged to the College of Health (45%), followed by the College of Humanities (43%) with the College of Education having the least (12%). The data collected were analyzed using both descriptive and inferential statistics.

6.3 Summary of Findings

- The level of knowledge on the features of the SAKAI by graduate students at the University of Ghana was limited (M= 1.49, SD= 0.56). Significant differences existed between gender with males being more knowledgeable on the features than females. However, in terms of age and College of Affiliation, no significant differences were found.
- Graduate students used the features on the SAKAI LMS occasionally (M=3.32, SD=1.26). There were statistically significant differences in term of gender. Thus, males used more of the features than females. On the other hand, no significant differences was found with respect to age and College of Affiliation.
- The Attitude of graduate students towards the SAKAI LMS was positive (M=3.67, SD=1.77). Significant differences existed in terms of gender. Males had slightly higher positive attitudes compared to females. On the other hand, College of Affiliation and age did not have any such significant differences.
- Graduate students were highly motivated to use the SAKAI LMS for their academic work (M=2.73, SD=1.67). There were no statistically significant differences in terms of gender, age and College of Affiliation on motivation to use the SAKAI LMS by graduate.
- Graduate students experienced high levels of challenges when using the SAKAI LMS (M=4.22, SD=2.77). However, there were no significant differences in terms of age, gender and College of Affiliation on the challenges encountered by graduate students when they are using the SAKAI LMS.
- Performance Expectancy significantly had an influence on individual decision to use ($\beta = 0.086$, $p < .05$).

- Facilitating Conditions significantly had an influence on individual decision to use ($\beta = 0.906$, $p < 0.05$).
- Individual decision had a significant effect on continuous use ($\beta = 0.704$, $p < .05$)

6.4 Limitation of the Study

The limitation of this study was that all the respondents were selected from one university (University of Ghana) and were limited to only graduate students. As a result, the findings obtained cannot be generalized to all students using the SAKAI LMS at the University of Ghana.

6.5 Conclusion

The introduction of digital technology in education requires in effect, a complete rethinking and redesigning of teaching systems and staff skills. It could be concluded from the current study that graduate students at the University of Ghana had limited knowledge of the SAKAI LMS and barely used it as a result of the major challenges such as poor internet connectivity, problems of logging into the system and difficulty in downloading learning materials. In spite of these challenges they are momentously motivated to use the LMS and as a result, have developed positive attitudes towards it. Additionally, graduate students, while being self-motivated to create their own online learning environment to fulfil their course requirements and achieve personal academic success were identified as independent learners, academically ready and technologically prepared to personally commit themselves towards lifelong usage of the system in their respective course of study. Furthermore, Performance Expectancy and Facilitating Conditions would affect their Individual Decision to use the SAKAI LMS and in effect affect continuous usage. Again, if Facilitating Conditions are in place and Knowledge, Attitudes, Motivation and

Challenges are also observed, then the continuous utilization of the SAKAI LMS would be achieved. The study echoed the notion that today university graduates face a world transformed by digital technologies, hence there would be the need for preparation of both human and technological resources by higher educational institutions to embrace the paradigm shift as students' addiction to technology may create a lifelong learning environment filled with enthusiasm.

6.6 Contribution to Knowledge

This study has made contributions to technology adaptation and continuous utilization in institutions of higher learning. I hope that the knowledge gained may be used to assess, evaluate and bring about significant sustainable changes on how technology may be implemented in a beneficial way for effective teaching and learning in Ghanaian higher educational institutions and beyond. However, major contributions of the study have been done with the Adopted Model for continuous utilization of the SAKAI LMS.

6.6.1 Adopted Model for Continuous Utilization of SAKAI LMS

A model for continuous use of the SAKAI LMS has been developed and adopted. The model took into account the already existing Unified Theory of Acceptance and Use of Technology (UTAUT) model concepts (Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions) with respect to graduate students' decision to continuously use the SAKAI LMS. The model has provided useful findings that the University of Ghana can use to develop effective strategies to encourage the continued use of the SAKAI LMS by faculty members and students.

6.6.2 Online Learning

When it comes to issues of learning, adults are not oversized children. Maturity may bring unique features that affect how adults are motivated to learn**.** The study contributed to online learning research by illustrating that students should have a good attitude towards technology and make sure they are well trained on and have experience with online learning before adopting it in their courses. Lecturers may play a major role on students' use of online resources and should know how to position their courses, design their courses in online learning content and activities in such a way that is beneficial to students and improve learning outcomes. Besides, lecturers need to ensure that students are self-motivated and have a positive perception of the ease and usefulness of online learning. Similarly, LMS developers should constantly improve the quality of LMS and ensure its richness, capability, flexibility, reliability, speed, and interactivity for students in general. The study also illustrated that the success of the adaptation of LMS in a blended learning setting has a positive impact on student's continuous utilization. Once students use the LMS, perceive it to be easy and useful, and are satisfied with it, they will continue to use it. The study has again provided higher institutions thinking of introducing online learning into their educational curricula useful insights on critical factors for students' continuous utilization particularly in a blended learning environment like the University of Ghana. The study indicated that without technological knowledge, it may become difficult for students to easily participate in online learning.

6.6.3 Controlled Learning

An addition to this thesis is the strategy of *controlled learning*. Adult learners usually want a sense of control and self-direction. That is, they may prefer making choices in their new online learning environment. The study contributes to controlled learning by revealing that

once adult learners decide to further their education, their learning could be greatly affected by the kind of learning environment and approach they encounter. Hence, taking into account the unique qualities of adult learners, instructors could design more effective and motivating online courses to suit their expectations while supervising and monitoring their learning and outcomes through the LMS. As such, online instructors could use inquiry-based learning (IBL), which requires learners to explore and respond to online questions concerning their courses. As a result of this, sending announcements through the online system (LMS) about dates and assignment submission could be an effective strategy towards a successfully controlled learning activity.

6.6.4 Addiction to Technology

For students to be addicted to the use of technology (SAKAI LMS) there must be a commitment to succeed on the part of the student. The use of the SAKAI LMS must be made mandatory to students and lecturers to ensure continuous use leading to addiction. Again, students need to have the passion and interest to use the SAKAI LMS for all their academic work where necessary.

Within the university context, it is essential for the LMS developers to develop a smooth system interface, functionality and user-friendliness to enhance students' addiction towards its usage. The findings from this study suggest that graduate students at the University of Ghana find the SAKAI LMS useful to their academic studies. Nevertheless, their continuous utilization and adaptation would improve if their lecturers motivate them to use the platform always. The university should solicit ideas and suggestions from students on how the platform could be modified to suit their needs. This approach will enhance students' addiction to the SAKAI LMS as it will boost their confidence, self-

esteem and prepare them in such a way that they could use critical thinking skills proactively.

6.7 Implications of the Study

The study was aimed at examining the continuous utilization of the SAKAI Learning Management System by graduate students at the University of Ghana. The findings of this study have paramount implications for curricula development in Adult Education, Human Resource Development, Educational Technology and Theory Development.

6.7.1 Curricula Development in Adult Education

Many students who attend computer basic skills classes may be older adults who had never been introduced to computer technology at a young age. For adults who lack familiarity with computers, life in the modern age may become a challenge. This is because technology is involved in almost every aspect of our lives, the integration of ICT/Digital technologies is very vital in Curriculum Development for educational stakeholders (lecturers, students and administrators).

With the increasing technological advances in education, adult learners are able to learn anywhere and anytime. Based on the findings, psychological principles for adult e-learning courses as well as the practice of adult education should be given significant attention by Adult Educators so as to stimulate the interest of adult learners' adaptation and continuous utilization of e-learning resources. As a result, Adult Educators should implement effective strategies that would align adult learners' expectations with technology adaptation for e-learning. Also, the significance of educational technology in the preparation of university graduate students for the digital world cannot be overlooked. As a result, adult psychology teaching methods should be used by adult educators in an e-learning environment.

In this case, adult learners could make a connection of their academic courses to the real world benefits and applications. Also, adult educators should increase the engagement of adult learners by integrating real-life scenarios into e-learning courses. Therefore, digital skills are appropriate in the field of adult education for adult learners to participate in the digital revolution.

6.7.2 Instructional Delivery in Distance Learning

E-learning may unite two main areas in education, learning and technology. The SAKAI LMS has a significant role to play in Distance Education (DE) for workers and adults returning to the classroom for continuing education. Again, the integration of the SAKAI LMS in distance education could encourage adult learners to further explore topics on their own and take ownership of their learning. Lastly, the behavioural intentions of Adult learners to use the SAKAI LMS is influenced by Performance Expectancy and Facilitating Conditions. The use of the SAKAI LMS has the potential to enhance adult learners' ability to construct new knowledge.

With the advent of numerous technologies, adult educators have a lot of modern technologies to leverage in making their teaching more effective. They could gain great knowledge through the internet. Becoming a self-directed learner is vital for adults as they could acquire information at their own pace.

6.7.3 Educational Technology

Given the abundance of educational technological tools, it is essential that students feel comfortable and confident about their ability to use them effectively. The majority of some graduate students possibly grew up without access to technologies like the personal computer and the internet, but students of today are raised in an environment soaked with

computer technology. Mature students create a margin of power because learning is essential. Furthermore, for mature students, technology usage could be perceived as a source of power because according to the theory of Margin "a ratio between the 'load' (L) of life, which dissipates energy, and the 'power' (P) of life, which allows one to deal with the load. 'Margin in life' is the ratio of load to power. More power means a greater margin to participate in learning" (Merriam, Baumgartner & Caffarella, 2007, p. 93).

Again in the area of educational technology, the findings of this study suggest that in the adaptation and continuous use of innovation/technology, there should be a conducive and enjoyable-learning atmosphere. The supporting environment should take into careful account adaptation factors such as Effort Expectancy, Social Influence and individual decision. When this is done, the introduction of the educational technology agenda in tertiary institutions would be beneficial to both faculty members and students.

Furthermore, educational policy-makers of tertiary institutions could take advantage of the educational technology as it has become widely accepted and integrated into teaching and learning as well as implementing policies that will support active learning and sustain the continuous utilization of e-learning resources.

6.7.4 Theory Development

The application of the Unified Theory of Acceptance and Use of Technology (UTAUT) as the theoretical framework in examining the factors promoting the adaptation and continuous utilization of the SAKAI LMS at the University of Ghana from the perspective of graduate students was very useful in bridging the research gap. The findings revealed that graduate students' perceptions of Performance Expectancy were fundamental in arousing their decision to continuously utilize the SAKAI LMS using the e-learning system. As a result, some of the ways of improving Performance Expectancy would be to

create awareness and provide graduate students and lecturers with proper training on the benefits of using the SAKAI LMS. Based on the findings, it could be concluded that the Unified Theory of Acceptance and Use of Technology (UTAUT) model can be employed to understand students' and lecturers' satisfaction, in a learning environment where the use of SAKAI LMS is mandatory for students and lecturers. The developed model again explained the adaptation and continuous utilization of the SAKAI LMS regardless of the age, gender and College of Affiliation of graduate students.

6.7.5 Human Resource Development

Technology is one of the most widely documented forces affecting nature of work in contemporary time. The findings of the study suggested that university graduates must be prepared adequately with digital technology skills for their future professional careers as they graduate from school. Again, there will be the need to fully equip students with technological skills for entrepreneurship for the 21st Century. This is because remarkable evolution in the twentieth century has been a result of a new perspective in understanding the importance of investing in individuals and organizational human resources, and the implementation of capacity building strategies in various organizations and in societies. Using digital platforms such as the SAKAI LMS could go a long way to increase the efficiency and effectiveness of capacity building and training activities tailored to the needs of students and lecturers. However, capacity building may demand time and as a result, both lecturers and students must be motivated and encouraged to use it. Hence, digital technologies (SAKAI LMS) and pedagogy should be a vital ingredient of higher educational institution's strategies for teaching and learning.

6.8 Recommendations of the Study

6.8.1 Human Resource Development

The development of digital skills may be very essential for graduate students. The University of Ghana School of Graduate Studies could create an attractive learning atmosphere such as reading rooms with Laboratories, internet accessibility and connectivity, availability of ICT instructors/technicians, twenty-hour (24) hour technology sessions for graduate students to develop their technological knowledge and skills. Since graduate students may be connected already to technology, they need to be engaged by their lecturers to guide and mentor them towards deeper conceptual understanding and to develop core competencies that could allow them to critically analyze information and engage successfully in the 21st century work.

6.8.2 Mandatory Institutional Policies

Mandatory institutional policies may play an important role in fostering adaptation and continuous utilization of technology-enhanced pedagogies. The University of Ghana School of Graduate Studies should have a mandatory policy for the utilization of the SAKAI LMS by graduate students. With this policy, both lecturers and graduate students would be encouraged and forced to use the SAKAI LMS.

6.8.3 Orientation and Training of Graduate Students

Graduate students at the University of Ghana School of Graduate Studies should be provided with adequate orientation and initial training of at least three (3) continuous days for admitted graduate students. The orientation should be tailored to the significant features of the SAKAI LMS. This will help create awareness of the various features on the system and empower them with the necessary knowledge they need to properly use the

SAKAI LMS. Graduate students should be made to practice using the features of the SAKAI LMS in order to familiarize themselves with the system.

6.8.4 Good Internet Connectivity

Internet connectivity is a major challenge faced by graduate students when using the SAKAI LMS. The University of Ghana School of Graduate Studies should ensure the provision of good internet connectivity for graduate students on campus at all times is essential. This to a very large extent must be on their priory list. In relation to this, graduate students would effectively engage themselves in online learning with less difficulty.

6.9 Areas for Further studies

Researchers/investigators who want to research into the continuous utilization of the SAKAI Learning Management System by graduate students at the University of Ghana in the near future should consider the following for further research.

- A qualitative research approach in the Continuous Utilization of the SAKAI LMS to be able to predict better user Behavioural Intentions.
- A comparative study in the Continuous Utilization of a Learning Management System by graduate students in Public and Private universities in Ghana.
- Faculty perceptions and resistance to use LMS in teaching and learning.

REFERENCES

Abbad, M. M., Morris, D., & de Nahlik, C. (2009). Looking under the bonnet: Factors affecting student adoption of e-learning systems in Jordan. *The International Review of Research in Open and Distance Learning, 10*(2). doi: org/10.19173/irrodl.v10i2.596

Adams, B. L., Cain, H. R., Giraud, V., & Stedman, N. L. (2012). Leadership, motivation and teamwork behaviors of principal investigator's in interdisciplinary teams: A synthesis of research. *Journal of Leadership Education, 11*(2).71-76. Retrieved July 10, 2019 from https://www.learntechlib.org/primary/p/148790/.

Adeoye, B. & Wentling, R.M. (2007). The relationship between national culture and the usability of an e-learning system. *International Journal on E-learning, 6*(1), 119-146. Retrieved July 10, 2019 from https://www.learntechlib.org/primary/p/6226/.

Adkins, S.S. (2013). *The Africa market for self-paced e-learning products and services: 2011-2016 forecast and analysis*. Retrieved July 12, 2019 from http://www.ambientinsight.com/Resources/Documents/AmbientInsight-2011-2016 AfricaSelfPaced-eLearning-Market-Abstract.pdf.

Afzal, H., Ali, I., Aslam Khan, M., & Hamid, K. (2010). A study of university students' motivation and its relationship with their academic performance. *International Journal of Business and Management, 5*(4), 80-88. doi:10.5539/ijbm.v5n4p80

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In *Action Control* (pp. 11-39). Springer, Berlin, Heidelberg. Retrieved July 10, 2019 from https://link.springer.com/chapter/101007/978-3-642-69746-3_2.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179-211.doi:org/10.1016/0749-5978 (91)90020-T

Ajzen, I., & Fishbein, M. (1980).*Understanding attitudes and predicting social behavior.* Englewood Cliffs, NJ: Prentice Hall.

Al-Adwan, A., Al-Adwan, A., & Smedley, J. (2013). Exploring students' acceptance of e-learning using technology acceptance model in Jordanian universities. *International Journal of Education and Development using ICT, 9*(2), 4-18.

Al-Alwani, A. E. S., & Soomro, S. (2009). *Integration of information technology in science education at Yanbu, Kingdom of Saudi Arabia*. INTECH Open Access Publisher. Retrieved July, 19 2019 from http://cdn.intechweb.org/pdfs/9419.pdf.

Alampay, E. (2006). Analysing socio-demographic differences in the access & use of ICTs in the Philippines using the capability approach. *The Electronic Journal of Information Systems in Developing Countries*, *27*(1), 1-39. doi: org/ 10. 1002/ j.1 681- 4835.2006.tb0018

Al-Awadhi, S., & Morris, A. (2008). The use of the UTAUT model in the adoption of e-government services in Kuwait. In *Proceedings of the 41st annual Hawaii International* Conference *on System Sciences* (HICSS 2008), 219-219. doi: 10.1109/HICSS.2008.452

Al-Busaidi, K. A., & Al-Shihi, H. (2010). Instructors' acceptance of learning management systems: A theoretical framework. *Communications of the IBIMA, 2010* (2010), 1-10. doi:10.5171/2010.862128

Al-Harbi, K. A. S. (2011). E-learning in the Saudi tertiary education: Potential and challenges. *Applied Computing and Informatics*, *9*(1), 31- 46. doi:10.1016/ j.aci. 2010.03.002

Allen, I. E., & Seaman, J. (2003). Sizing the opportunity: The quality and extent of online education in the United States, 2002 and 2003. *Sloan Consortium (NJ1)*. Retrieved July 20, 2019 from http://sloanconsortium.org.

Almarashdeh, I. A., Sahari, N., Zin, N. A. M., & Alsmadi, M. (2010). The success of learning management system among distance learners in Malaysian universities. *Journal of Theoretical & Applied Information Technology*, *21*(2), 56-57.

Al-Qeisi, K. I. (2009). *Analyzing the use of UTAUT model in explaining an online behavior: Internet banking adoption* (Doctoral dissertation, Brunel University Brunel Business School PhD Theses). Retrieved July 10, 2019 from http://bura. brunel .ac.uk/handle/2438/3620.

Amponsah, S., Torto, B. A., & Badu-Nyarko, S. K. (2018). Ghanaian mature students' motivation to pursue degree programmes through distance education. *International Review of Education*, *64*(5), 585-606. doi: 10.1007/s11159-018-9728-8

Anastasiades, P. & Retalis, S. (2001). The educational process in the emerging information society: Conditions for the reversal of the linear model of education and the development of an open type hybrid learning environment. In C. Montgomerie & J. Viteli (Eds.), *Proceedings of ED-MEDIA 2001--World Conference on Educational Multimedia, Hypermedia & Telecommunications* (pp. 43-48). Norfolk, VA USA: Association for the Advancement of Computing

in Education (AACE). Retrieved July 12, 2019 from https: // www. Learntechlib. org/primary/p/8324/.

Ansong, E. (2015). *Determinants of e-learning adoption in universities: Evidence from a developing country*. Published Mphil Thesis. Department of Operations and Management Information Systems, University of Ghana. Retrieved July 14, 2019 from http://ugspace.ug.edu.gh/handle/123456789/8052

Apereo.org. (2019). *Apereo*. Retrieved July 21, 2019 from https://www.apereo.org/ incubation.

Aramide, K. A., Ladipo, S. O., & Adebayo, I. (2015). Demographic variables and ICT access as predictors of information communication technology usage among science teachers in federal unity schools in Nigeria. *Library Philosophy and Practice*, 1. Retrieved 8 June 2019 from https://search.proquest.com/openview/ bdc332818ec26d99f5b7dc84857680fc/.

Arasteh, B., Pirahesh, S., Zakeri, A., & Arasteh, B. (2014). Highly available and dependable e-learning services using grid system. *Procedia-Social and Behavioral Sciences*, *143*, 471-476. doi: org/10.1016/j.sbspro.2014.07.519

Arhinful, L. (2016). *Learning management system adoption in the university: Exploring the experiences of Canadian and international students*. Published MA dissertation. Brock University. Retrieved July 10, 2019 from http:// hdl. handle. net/10464/10415.

Aryeetey, E. (2014). *Vice-Chancellor's address at matriculation – University of Ghana.* Retrieved June 29, 2019 from http:// www. ug. edu. gh/ news/ vicechancellor % E2%80%99s-address-matriculation.

Asabere, N. Y. & Enguah, S. E. (2012). Integration of expert systems in mobile learning. *International Journal of Information and Communication Technology Research, 2* (1), 55–61.

Asampana, I., Akanferi, A. A., & Ami-Narh, J. (2017). Reasons for poor acceptance of web-based learning using an LMS and VLE in Ghana. *Interdisciplinary Journal of Information, Knowledge and Management, 12*, 189-209. doi:org/10.28945/3742

Asparouhov, T., & Muthen, B. (2009). Exploratory structural equation modeling. Structural equation modeling: *A Multidisciplinary Journal*, *16*(3), 397- 438. doi:org/10.1080/107055

Azmi, I. A. G. (2011). Information technology usage and attitudes towards online resources students perspective. *African Journal of Business Management*, *5*(7), 2582-2589.

Azumah, F. Y. (2016). *An Assessment of E-learning Adoption in Universities: Evidence from a Developing Country*. Published Doctoral dissertation. University Of Ghana. Retrieved July 10, 2019 from http://ugspace.ug.edu.gh/handle/123456789/23312.

Babbie, E. (2007). *The practice of social research*. Belmont, CA: Wadsworth/Thomson.

Badu-Nyarko, S. K. (2011). *Basic research method in social sciences.* Accra: BB Printing Press.

Badu-Nyarko, S. K. (2013). *Basic research methods in social science* (revised ed.). Accra: Woeli Publications.

Bakar, A. A., Razak, F. Z. A., & Abdullah, W. S. W. (2013). Assessing the effects of UTAUT and self-determination predictor on students continuance intention to use student portal. *World Applied Sciences Journal*, *21*(10), 1484-1489. doi: 10.5829/idosi.wasj.2013.21.10.2920

Baltes, P. B. (1997). On the incomplete architecture of human ontogeny: Selection, optimization and compensation as foundation of developmental theory. *American psychologist*, *52* (4), 366.doi:10.1007/978-1-4615-0357-6_2

Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, *52*(1), 1-26. doi:org/10.1146/annurev.psych.52.1.1

Becta (2008). *Harnessing technology: Next generation learning 2008–14, Coventry, Becta*. Retrieved July 11, 2019 from http://publications.becta.org.uk/display.Cfm?ResID=37348.

Bennett, J., & Bennett, L. (2003). A review of factors that influence the diffusion of innovation when structuring a faculty training program. *Internet and Higher Education, 6,* 53-63. doi: org/10.1016/S1096-7516 (02)00161-6

Berg, A., & Dolphin, I. (2011). *Sakai CLE courseware management: The Official Guide*. Packt Publishing Ltd.

Berg, V. D. (2013). *Teaching assistants' and undergraduate students' first online teaching and learning experiences in an open distance learning context*. Retrieved June 12, 2019 from http://www1.curtin.edu.my/tl2015/tl2013/PDF/.

Bhalalusesa, R., Lukwaro, E. E. A., & Clemence, M. (2013). Challenges of using e-learning management systems faced by the academic staff in distance based institutions from developing countries: A case study of the Open University of Tanzania. *Journal of the Open University of Tanzania, 14*(1), 89-110.

Brown, L. (2008). A review of the literature on case study research. *Canadian Journal for New Scholars in Education, 1*(1), 1-13.

Burns, N., & Grove, S.K. (2009). *The practice of nursing research: Conduct, critique and utilization*. London: WB Saunders Company.

Burton-Jones, A., & Hubona, G. S. (2006). The mediation of external variables in the technology acceptance model. *Information & Management, 43*(6), 706-717. doi: org/10.1016/j.im.

Buunk, A. P., & Van Vugt, M. (2008). *Applying social psychology: From problems to solutions*. Los Angeles, CA: Sage.

Cambridge Business English Dictionary (2011) Cambridge, United Kingdom: Cambridge University Press.

Cavus, N., & Kanbul, S. (2010). Designation of eeb 2.0 tools expected by the students on technology-based learning environment. *Procedia-Social and Behavioral Sciences, 2*(2), 5824-5829. doi: org/10.1016/j.sbspro.2010.03.950

Cavus, N., & Zabadi, T. (2014). A comparison of open source learning management systems. *Procedia-Social and Behavioral Sciences, 143*, 521-526. doi:org/10. 1016/j.sbspro.2014.

Chang, C. C., Yan, C. F., & Tseng, J. S. (2012). Perceived convenience in an extended technology acceptance model: Mobile technology and English learning for college students. *Australasian Journal of Educational Technology, 28*, 809-826. doi: org/10.14742/ajet.818

Chen, H. R., & Tseng, H. F. (2012). Factors that influence acceptance of web-based e-learning systems for the in-service education of junior high school teachers in Taiwan. *Evaluation and Program Planning, 35*(3), 398-406. doi: org/10.1016/j. evalprogplan.2011.11.007

Chen, Y., Wang, Q., & Xie, J. (2011). Online social interactions: A natural experiment on word of mouth versus observational learning. *Journal of Marketing Research, 48*(2), 238-254. doi:org/10.1509/jmkr.48.2.238

Cheurprakobkit, S., Hale, D. F., & Olson, J. N. (2002). Technicians' perceptions about web-based courses: The University of Texas system experience. *The American Journal of Distance Education, 16*(4), 245-257. doi:org/10.1207/S15389286AJDE1603_3

Chitanana, L., Makaza, D., & Madzima, K. (2008). The current state of e-learning at universities in Zimbabwe: Opportunities and challenges. *International Journal of Education and Development Using ICT, 4(2)*, 5-15.

Chiu, C. M., & Wang, E. T. (2008). Understanding web-based learning continuance intention: The role of subjective task value. *Information & Management*, *45*(3), 194-201.

Choga, E. (2015). *The use of SAKAI e-learning platform by undergraduate students in the faculty of communication and information science at NUST*. Published Bachelor Dissertation. National University of Science and Technology. Retrieved May 10, 2019 from https://s3.amazonaws.com/academia.edu.documents/51190995/.

Christensen, L. B., Johnson, R. B., & Turner, L. A. (2015). *Research methods, design and analysis*. Ahmet Alpay. Ankara: Anı. 12. doi:org/10.30794/pausbed.424359.

Christie, M. F., & Garrote Jurado, R. (2007). UkeU and Sweden's Net University: A comparative study. In *International Conference on Engineering Education & Research, December 2-7, 2007 Melbourne, Australia*. Proceedings of iNEER conference. Retrieved July 14, 2019 from http://www.diva-portal.org/ smash/ record.jsf?pid=diva2%3A887880&dswid=7203

Clark, R. C., & Mayer, R. E. (2003). *E-learning and the science of instruction*. San Francisco: Jossey-Bas.

Coates, H. (2005). The value of student engagement for higher education quality assurance. *Quality in Higher Education 11* (1), 25–36. doi:10.1080/13538320500074915

Coates, H., James, R., & Baldwin, G. (2005). A critical examination of the effects of learning management systems on university teaching and learning. *Tertiary Education and Management*, *11*, 19-36.doi:org/10.1007/s11233-004-3567-9

Coleman, E., & Mtshazi, S. (2017). Factors affecting the use and non-use of learning management systems (LMS) by academic staff. *South African Computer Journal*, *29* (3), 31-63. doi: org/10.18489/sacj.v29i3.459

Colley, A., & Comber, C. (2003). School subject preferences: Age and gender differences revisited. *Educational Studies, 29*(1), 59-67. doi:org/10.1080/03055690303269

Conole, G., & Oliver, M. (2007). *Contemporary perspectives in e-learning research.* London: Routledge.

Creswell, J. W. (2014). *A concise introduction to mixed methods research*. Thousand Oaks, CA: Sage.

Creswell, J.W, & Plano Clark,V. L. (2011). *Designing and conducting mixed methods research* (2nd ed.). Thousand Oaks, CA: Sage.

Czaja, S., & Schulz, R. (2006). Innovations in technology and aging introduction. *Generations, 30*(2), 6-8. doi: 10.4018/IJDLDC.2015070101

Dadzie, P. S. (2009). E-learning and e-library services at the University of Ghana: Prospects and challenges. *Sage Journals, 25*(3), 207-217. doi:org/10.1177/ 026 666 6909340791

Dalsgaard, C. (2006). Social software: E-learning beyond learning management systems. *European Journal of Open, Distance and E-learning, 9*(2), 12-24. Retrieved July 13, 2019 from http://www.eurodl.org/materials/contrib/2006/Christian/Dalsgaard . htm.

Darko-Adjei, N. (2018). *Students' perceptions and use of the SAKAI learning management system in the University of Ghana*. Published MPhil dissertation. University of Ghana. Retrieved July 10, 2019 from http://ugspace.ug.edu.gh/handle/12345678 9/268

Davis, F. D. (1989). Perceived usefulness, perceived ease of use and user acceptance of information technology. *MIS quarterly,* 319-340. doi: 10.2307/249008

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1992). Extrinsic and intrinsic motivation to use computers in the workplace 1. *Journal of Applied Social Psychology, 22* (14), 1111-1132. doi:org/10.1111/j.1559-1816.1992.tb00945.x

Davis, G. B. (2000*). Information systems conceptual foundations: Looking backward and forward*. Norwell, MA: Kluwer Academic Publishers.

Davis, N., & Coulon, A. (2007). *Evaluation of the UNESCO Institute for Statistics*. Martin, Jenkins & Associates. Retrieved July 20, 2019 from http://uis.unesco.org/ sites/default/files/documents/evaluation-of-the-unesco-institute-for-statistics-2007-en.pdfDe Smet, C., Bourgonjon, J., De Wever, B., Schellens, T., & Valcke, M. (2012). Researching instructional use and the technology acceptation of learning management systems by secondary school teachers. *Computers & Education, 58*(2), 688-696.

Deng, L., & Tavares, N. J. (2013). From Moodle to Facebook: Exploring students' motivation and experiences in online communities. *Computers & Education, 68*, 167-176. doi:org/10.1016/j.compedu.2013.04.028

Derakhshan, N. (2012). *Student and faculty perceptions of the features of mobile learning management systems in the context of higher education*. Published Doctoral dissertation. Oklahoma State University. Retrieved July 10, 2019 from https:// shareok.org/bitstream/handle/11244/9739/Derakhshan_okstate_0664M_11915.pdf?sequence=1

Dhindsa, H. S., & Shahrizal-Emran (2011). Using interactive whiteboard technology-rich constructivist learning environment to minimize gender differences in chemistry achievement. *International Journal of Environmental & Science Education, 6*(4), 393-414.

Dobozy, E., & Reynolds, P. (2010). From LMS to VLE or from supermarkets to airports: Classifying e-learning platforms using metaphors. In *Proceedings of the 5th International LAMS Conference* (Vol. 201, pp. 92-103). doi:org/10.1111/j.1559-1816.1992.tb00945.

Dougiamas, M., & Taylor, P. (2003). Moodle: Using learning communities to create an open source course management system. In *EdMedia Innovate Learning* (pp. 171-178). Association for the Advancement of Computing in Education (AACE).

Dube, S., & Scott, E. (2014). An empirical study on the use of the SAKAI learning management system (LMS). *Proceedings of the E-Skills for Knowledge Production and Innovation*, 101-107. Retrieved June 29, 2019 from http:// proceedings. e-skillsconference.org/2014/e-skills101107Dube851.pdf.

Dublin, L. (2003). If you only look under the street lamp or nine e-learning myths. *The E-learning Developers Journal*. Retrieved July 10, 2019 from https:// www. E learningguild.

Dutton, W. H., Cheong, P. & Park, N. (2004). The social shaping of a virtual learning environment. *Electronic Journal of e-learning, 2*(2), 1-12. Retrieved July 11, 2019 from http://www.ejel.org/volume-2/vol2-issue1/issue1-art3.htm.

Dzogbenuku, R.K. (2013). Banking innovation in Ghana: Insight of students' adoption and diffusion. *Journal of Internet Banking and Commerce, 18*, 1–20. Retrieved July 13, 2019 from https:// pdfs. semanticscholar. org/ 75e6/ e3cf92de93 20 7d51c 54b55fc3632d7da83.pdf.

Edelstein, S., & Edwards, J. (2002). If you build it, they will come: Building learning communities through threaded discussions. *eLearn Magazine*, *2002*(4), 3. Retrieved July 11, 2019 from http://citeseerx.ist.psu.edu/viewdoc/ download? Doi =10.1.1.463.1064&rep=rep1&type= pdf.

Elbasuony, M. M. M., Gangadharan, P., Janula, R., Shylaja, J., & Gaber, F. A. (2018). Undergraduate nursing students 'perception and usage of e- learning and Blackboard learning management system. *Middle East Journal of Nursing, 12*(2), 3-11. doi:10.5742/MEJN.2018.93394

Elkaseh, A. M., Wong, K. W., & Fung, C. C. (2016). Perceived ease of use and perceived usefulness of social media for e-learning in Libyan higher education: A structural equation modeling analysis. *International Journal of Information and Education Technology, 6*(3), 192. doi:10.7763/IJIET.2016.V6.683

En.wikipedia.org. (2019). *Sakai (software)*. Retrieved July 20, 2019 from https://en. wikipedia.org/wiki/Sakai_(software).

Enoch, Y., & Soker, Z. (2006). Age, gender, ethnicity and the digital divide: University students' use of web-based instruction. *Open Learning, 21*(2) 99-110. doi:org/ 10.1080/02680510

Ertmer, P., Anne, O. L., & Tondeur, J. (2015). Teacher beliefs and uses of technology to support 21st century teaching and learning. *International Handbook of Research on Teachers' Beliefs* (pp. 403–419). New York, NY, USA: Routledge.

Esterhuyse, M., & Scholtz, B. (2015). Barriers to e-learning in a developing country: An explorative study. In *Proceedings of the 9th IDIA conference*. Retrieved July 10, 2019 from https://pdfs.semanticscholar.org/ b919/bfc4cf5 e784ed9f7 97d0 156 c1 3358a109f3c.pdf.

Faaeq, M. K., Alqasa, K., & Al-Matari, E. M. (2015). Technology adoption and innovation of E-Government in Republic of Iraq. *Asian Social Science, 11*(3), 135 doi: 10. 5539/ass.v11n3 p135

Fan, T., & Li, Y. (2005). Gender issues and computers: College computer science education in Taiwan. *Computer & Education, 44*, 285-300. doi:org/10.1016/j. compedu.2004.02.003

Fidani, A., & Idrizi, F. (2012). Investigating students' acceptance of a learning management system in university education: A structural equation modeling approach. *ICT Innovations 2012 Web Proceedings, 2*(23), 311-320. Retrieved July

13, 2019 from https://pdfs.semanticscholar. org/92fa/9dce 84860a54 cec1 d165c 6a2a891f6772946.pdf.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research.* Reading, MA: Addison-Wesley. Retrieved July 12, 2019 from https://trove.nla.gov.au/work/14275432?selectedversion=NBD450968.

Fisher, M. J., & King, J. (2010). The self-directed learning readiness scale for nursing education revisited: A confirmatory factor analysis. *Nurse Education Today, 30*(1), 44-48. doi: org/ 10.1016/j.nedt.2009.05.020

Fowler, F. J. (2002). *Survey research methods*. Thousand Oaks, CA: Sage Publications.

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). *How to design and evaluate research in education* (8th ed.). New York: Mc Graw-HIll.

Frazee, R. V. (2003). Using relevance to facilitate online participation in a hybrid course. *Educause Quarterly, 26*(4), 67-71.

Gaba, A. K., & Sethy, S. S. (2010). Learners' perception towards information and communications technologies: A case study of Indira Gandhi National Open University. *Indian Journal of Open Learning*, 19(3), 143-157.

Gakio, K. (2006). *African tertiary institutions connectivity survey (ATICS)-2006 Report.* Retrieved July 4, 2019 from https://idl-bnc- idrc.dspacedirect.org/bitstream/ handle/10625/50710/IDL-50710.pdf?sequence=1.

Garrison, D. R., & Shale, D. (1987). Mapping the boundaries of distance education: Problems in defining the field. *American Journal of Distance Education, 1*(1), 7-13.doi:10.1080/0892364870952656

George, D., & Mallery, P. (2010). *SPSS for windows step by step: A simple guide and reference 11.0 update* (4th ed.). Boston: Allyn & Bacon.

Golafshani, N. (2003). Understanding reliability and validity in qualitative research. *The Qualitative Report, 8*(4), 597-606. doi: 10.12691/ajis-1-1-2

Gold, M. S., & Bentler, P. M. (2000). Treatments of missing data: A Monte Carlo comparison of RBHDI, iterative stochastic regression imputation and expectation-maximization. *Structural Equation Modeling, 7*(3), 319-355.

Gotschall, M. (2000). E-learning strategies for executive education and corporate training. *Fortune, 141*(10), S5-S59.

Gotz, O., Liehr-Gobbers, K., & Krafft, M. (2010). Evaluation of structural equation models using the partial least squares (PLS) approach. In *Handbook of partial least squares* (pp. 691-711). Springer, Berlin, Heidelberg.

Graf, S., Liu, T. C., Chen, N. S., & Yang, S. J. (2009). Learning styles and cognitive traits their relationship and its benefits in web-based educational systems. *Computers in Human Behaviour, 25*(6), 1280-1289. doi:10.1016/j.chb.2009.06.005

Gravetter, F. J., & Forzano, L. B. (2006). Research methods for the behavioral sciences. *South African Journal of Psychology, 36* (2), 450.

Greene, J. C. (2007). *Mixed methods in social inquiry*. San Francisco: Jossey-Bass.

Guirdham, M. (2002). *Interactive behavior at work*. Essex: Pearson Educational Limited.

Hair, J.F., Black, W.C., Babin, B.J. & Anderson, R.E. (2010). *Multivariate data analysis: A global perspective* (7th ed.). New Jersey: Pearson Prentice Hall.

Hall, B. (2002). *Steps to developing a successful e-learning initiative.* New York: McGraw- Hill.

Hedberg, J., & Ping, L. C. (2004). Charting trends for e-learning in Asian schools. *Distance Education, 25*(2), 199-213.doi:org/10.1080/0158791042000262148

Henderson, M., Selwyn, N., & Aston, R. (2017). What works and why? Student perceptions of 'useful 'digital technology in university teaching and learning. *Studies in Higher Education, 42*(8), 1567-1579. doi:org/10.1080/03075079.2015.1007946

Hogan, R., & Kedrayate, A. (2010). E-learning: A survival strategy for developing countries. *Eleventh Annual Conference of the Sir Arthur Lewis Institute of Social and Economic Studies*. Republic of Trinidad and Tobago: University of the West Indies. Retrieved July 15, 2019 http://sta.uwi.edu/conferences/ 09/salises/ documents/R%20Hogan.pdf.

Hodges, W. (2019). Sakai 19 release notes. Retrieved July 21, 2019 from https:// confluence.sakaiproject.org/display/DOC/Sakai19 Release Notes

Hogg, M., & Vaughan, G. (2005). *Social Psychology* (4th ed.). London: Prentice-Hall.

Horton, W. (2006*). E-learning by design*. San Francisco, CA: Pfeiffer.

Hwang, Y. S., Fisher, W., & Vrongistinos, K. (2009). Calibrating a measure of gender differences in motivation for learning technology. *Journal of Instructional Psychology, 36*(3), 256.

Ikolo, V. E., & Okiy, R. B. (2012). Gender differences in computer literacy among clinical medical students in selected southern Nigerian universities. *Library philosophy and practice*, 1. Retrieved July 10, 2019 from http://digitalcommons.unl.edu/ libphilprac/745.

Isaacs, S., & Hollow, D. (2012). *The e-learning Africa 2012 report*. Berlin: ICWE.

Ismail, S. (2010). International students' acceptance on using social networking site to support learning activities. *International Journal for the Advancement of Science & Arts*, *1*(2), 81-90.

Israel, M., & Hay, I. (2006). *Research ethics for social scientists*. London: SAGE Publications Ltd.

Issifu, S. J. (2018). *Satisfaction with e-learning resources: A study among distance education nursing students at the University of Ghana*. Unpublished MPhil Thesis. University of Ghana.

Jairak, R., Praneetpolgrang, P., & Mekhabunchakij, K. (2009). An investigation of trust in e-learning for instructors and students in private and public universities. In *Proc.6th eLearning for Knowledge-Based Society Conf., Thailand* (pp. 17-18). Retrieved July 10, 2019 from http:// cmruir. cmru. ac. th/ handle/ 123 4567 89/416.

Johnson, H. (2004). Investigating the dilemmas of ethical social research. *Journal of International Women's Studies, 6*(1), 41-51.

Johnson, R., Stewart, C., & Bachman, C. (2013). What drives students to complete online courses? What drives faculty to teach online? Validating a measure of motivation orientation in university students and faculty. *Interactive Learning Environments, 21*(1), 1-16. doi: 10.1080/10494820.2013.788037.

Jones, P., Packham, G., Miller, C., & Jones, A. (2004). An initial evaluation of student withdrawal within an e-learning environment: The case of e-college Wales. *Electronic Journal on E-learning*, *2*(1), 113-120.

Juhary, J. (2014). Perceived usefulness and ease of use of the learning management system as a learning tool. *International Education Studies, 7*(8), 23-34. doi: 10. 5539/ ies. v7n8p23

Kadijevich, D. (2000). Gender differences in computer attitude among ninth-grade students. *Journal of Educational Computing Research, 22*(2), 145-154.doi: org/ 10.2190/K4U2-PWQG-RE8L-UV90

Kallaya, J., Prasong, P., & Kittima, M. (2009). *An acceptance of mobile learning for higher education students in Thailand*. Retrieved July, 12, 2019 http:// cmruir. cmru.ac.th/handle/123456789/416.

Kalpana, V. (2010). *Future Trends in E-learning*. IEEE 2010 4th international conference on distance learning and education (ICDLE). Retrieved July 12, 2019 from http:// toc.proceedings.com/09449webtoc.pdf.

Kayany, J. M., & Yelsma, P. (2000). Displacement effects of online media in the socio-technical contexts of households. *Journal of Broadcasting & Electronic Media, 44* (2), 215-229. doi:org/10.1207/s15506878jobem4402_4

Keller, C., & Cernerud, L. (2002). Students' perception of e-learning in university education. *Learning, Media and Technology*, *27*(1), 55-67.

Knowles, S. M. (1980). *The modern practice of adult education: Andragogy versus pedagogy*. Englewood Cliffs, NJ: Prentice Hall, Cambridge Adult Education.

Kocur, D., & Kosc, P. (2009). E-learning implementation in higher education. *Acta Electrotechnica et Informatica*, *9*(1), 20-26. Retrieved July 13, 2019 from https:// pdfs.semanticscholar.org/1a47/1730f8fcfda9de30226db65e1bd61fb967ee.pdf.

Kulshrestha, T., & Kant, A. R. (2013). Benefits of learning management system (LMS) in Indian education. *International Journal of Computer Science & Engineering Technology (IJCSET), 4*(8), 1153-1154.

Lai, C. H., Yang, J. C., Chen, F. C., Ho, C. W., & Chan, T. W. (2007). Affordances of mobile technologies for experiential learning: The interplay of technology and pedagogical practices. *Journal of Computer Assisted Learning*, *23*(4), 326-337.

Lee, H. J., & Rha, I. (2009). Influence of structure and interaction on student achievement and satisfaction in web-based distance learning. *Journal of Educational Technology & Society*, *12*(4), 372-382.

Lee, M. C. (2010). Explaining and predicting users' continuance intention toward e-learning: An extension of the expectation–confirmation model. *Computers & Education*, *54*(2), 506-516. doi:org/10.1016/j.compedu.2009.09.002

Lee, Y. H., Hsieh, Y. C., & Hsu, C. N. (2011). Adding innovation diffusion theory to the technology acceptance model: Supporting employees' intentions to use e-learning systems. *Journal of Educational Technology & Society*, *14*(4), 124-137.

Leeder, C., & Lonn. S (2014). Faculty usage of library tools in a learning management system. *College & Research Libraries, 75*(5), 641- 663. doi: org/10.1108/RSR-07-2015-0037

Lewis, C. C., Fretwell, C. E., Ryan, J., & Parham, J. B. (2013). Faculty use of established and emerging technologies in higher education: A unified theory of acceptance and use of technology perspective. *International Journal of Higher Education*, *2*(2), 22-34.

Li, J. P., & Kishore, R. (2006). How robust is the UTAUT instrument? A multigroup invariance analysis in the context of acceptance and use of online community

weblog systems. In *Proceedings of the 2006 ACM SIGMIS CPR conference on computer personnel research: Forty four years of computer personnel research: achievements, challenges and the future* (pp. 183-189). ACM. doi:10.1145/1125170.1125218

Li, N., & Kirkup, G. (2007). Gender and cultural differences in internet use: A study of China and the United Kingdom. *Computers & Education, 48*(2), 301-317. doi: org/10.1016/j.compedu.2005.01.007

Liaw, S. S., & Huang, H. M. (2013). Perceived satisfaction, perceived usefulness and interactive learning environments as predictors to self-regulation in e-learning environments. *Computers & Education, 60* (1), 14-24.

Limayem, M., & Cheung, C. M. (2011). Predicting the continued use of Internet-based learning technologies: The role of habit. *Behavior & Information Technology, 30*(1), 91- 99. doi: org/10.1080/0144929X.2010.490956

Lin, J., Chan, H., & Jin, Y. (2004). Instant messaging acceptance and use among college students. *PACIS 2004 Proceedings*, 15. Retrieved July 12, 2019 from https:// aisel. aisnet.org/pacis2004/15.

Lincoln, Y. S., Lynham, S. A., & Guba, E. G. (2011). Paradigmatic controversies, contradictions, and emerging confluences, revisited. *The Sage Handbook of Qualitative Research, 4,* 97-128.

Liu, Y., & Wang, H. (2009). A comparative study on e-learning technologies and products: From the east to the west. Systems research and behavioral science*: The Official Journal of the International Federation for Systems Research, 26*(2), 191-209. doi: org/10.1002/sres.959

Lonn, S. D. (2009*). Student use of a learning management system for group projects: A case study investigating interaction, collaboration and knowledge construction.* Published Doctoral Thesis. Department of Education, University of Michigan. Retrieved May 19, 2019 from: http://hdl.handle.net/2027.42/64743

Lonn, S., Teasley, S. D., & Krumm, A. E. (2009). Investigating undergraduates' perceptions and use of a learning management system: A tale of two campuses. In *Annual Meeting of the American Educational Research Association, San Diego, California.* Retrieved July 10, 2019 from https://ctools. umich. edu/ access/ content/group/research/papers/Survey_Final Paper_AERA09. Pdf .

Lowerison, G., Sclater, J., Schmid, R. F., & Abrami, P. C. (2006). Student perceived effectiveness of computer technology use in post-secondary classrooms. *Computers & Education*, *47*(4), 465-489.

Lwoga, E. (2014). Critical success factors for adoption of web-based learning management systems in Tanzania. *International Journal of Education and Development using ICT, 10*(1), Open Campus, The University of the West Indies, West Indies. Retrieved July 14, 2019 from https://www.learntechlib.org/p/147447/.

Lwoga, E. T., & Komba, M. (2015). Antecedents of continued usage intentions of web based learning management system in Tanzania. *Education Training*, *57*(7), 738-756. doi:org/10.1108/ET-02-2014-0014

Marchewka, J. T., & Kostiwa, K. (2007). An application of the UTAUT model for understanding student perceptions using course management software. *Communications of the IIMA, 7*(2), 10.

Marfo, J. S., & Okine, R. K. (2010). Implementation of e-learning in Ghanaian tertiary institutions (A case study of Kwame Nkrumah University of Science and Technology). Retrieved July 10, 2019 from http:// dspace. knust. edu. gh/ handle/ 123456789/1433.

Markwei, E. M. (2017). *Use of course website to enhance face-to-face instruction: A study of students' perception.* PowerPoint presentation at the meeting of an Inter-college lecture series, University of Ghana.

Mathieson, K. (1991). Predicting user intentions: Comparing the technology acceptance model with the theory of planned behavior. *Information Systems Research*, *2*(3), 173-191.

Mayanja M. (2002) *Uganda school-based telecenters: An approach to rural access to ICTs*: Knowledge Enterprise, Inc. Retrieved July 10, 2019 from http:// www. wougnet.org/Events/IARW/School BasedTelecenter_Mayanja.pdf.

Mayoka, K. & Kyeyune, R. (2012). An analysis of e-learning information system adoption in Ugandan Universities: A case of Makerere University Business School. *Information Technology Research Journal, 2*(1), 1–7.

Merriam, S., Baumgartner, L., & Caffarella, R. (2007). *Learning in Adulthood: A comprehensive guide*. San Francisco: Jossey-Bass.

Merriam-Webster Dictionary (2020). Continuous. https://www.merriamwebster. com/dictionary/continuous. Retrieved June 19, 2020.

Mishra, S., & Panda, S. (2007). Development and factor analysis of an instrument to measure faculty attitude towards e-learning. *Asian Journal of Distance Education, 5*(1), 27-33. Retrieved July 11, 2019 from http:// www. asianjde. org/ 2007v5. 1. Mishra.pdf.

Moghavvemi, S., Hakimian, F., Feissal, T., & Faziharudean, T. M. (2012). Competitive advantages through IT innovation adoption by SMEs. *Socialinės Technologijos / Social Technologies, 2*(1), 24-39. Retrieved July 13, 2019 from https:// papers. ssrn.com/Sol3/papers.cfm? abstract_id=2383134.

Mohammed, M., & Hassan, N. (2015). Perceptions and attitudes towards blended learning for english courses: A case study of students at University of Bisha. *Center of Science and Education, 8*(9), 40–50.

Moor, A. H. (2002). Open-source learning: Lens on the future. *EDUCAUSE Review, 57*(5), 42-51. doi:10.3102/0034654308325691

Moore, M. G., & Kearsley, G. (1996). *Distance education*: *A systems view.* New York: Wadsworth Publishing Company.

Moore, M. G., & Kearsley, G. (2005). *Distance education: A systems view*. Belmont, CA: Thomson Wadsworth.

Morris, J. (2004). Features and functions are merely trifles in the selection of a course management system. *THE Journal, 31*(11), 24-25.

Mtebe, J. (2015). Learning management system success: Increasing learning management system usage in higher education in sub-Saharan Africa. *International Journal of Education and Development using ICT, 11*(2), 51-64.

Mtebe, J. S., & Raisamo, R. (2014). Investigating perceived barriers to the use of open educational resources in higher education in Tanzania. *International Review of Research in Open and Distance Learning, 15*(2), 43–65. doi: org/ 10. 19173/ irrodl. v15i2.1803

Mullinix, B., & McCurry, D. (2003). Balancing the learning equation: Exploring effective mixtures of technology, teaching and learning. *The Technology Source.* Retrieved July 12, 2019 from http:// technology source. org/ article/ balancing_ the_ learning_ equation/.

Mumtaz, S. (2000). Factors affecting teachers' use of information and communications technology: A review of the literature. *Journal of Information Technology for Teacher Education, 9*(3), 319-342. doi: 10.1080/14759390000200096

Murithi, N., & Indoshi, F.C. (2011). Attitude of teachers and students toward use of computers in teaching of computer studies curriculum in secondary schools. *International Journal of Current Research,* 3(11), 191-195.

Namisiko, P., Munialo, C., & Nyongesa, S. (2014). Towards an optimization framework for e-learning in developing countries: A case of private universities in Kenya. *Journal of Computer Science and Information Technology, 2*(2), 131–148.

Nasser, R., Cherif, M., & Romanowski, M. (2011). Factors that impact student usage of the learning management system in Qatari schools. *The International Review of Research in Open and Distributed Learning, 12*(6), 39-62. doi: 10.1 9173 / irrodl. v12i6.985

Nemet, G. F., & Johnson, E. (2012). Do important inventions benefit from knowledge originating in other technological domains? *Research Policy, 41*(1), 190-200.

Neuman, W. L. (2003). *Social research methods: Qualitative and quantitative approaches*. Boston: Allyn and Bacon.

Nugent, M.S. (2013). *Awareness.* Retrieved July 10, 2019 from https://psychology dictionary.org/awareness.

Nuta, A. C., & Pusca. A. C. (2017). An assessment of distance learning education platform options and opportunity. *Journal of Public Administration, Finance and Law, 11*(3), 113-120.

O'neill, K., Singh, G., & O'donoghue, J. (2004). Implementing eLearning programmes for higher education: A review of the literature. *Journal of Information Technology Education: Research*, *3*(1), 313-323.

Obasa, A. I. (2010). *Development of an integrated virtual classroom system*. Published Doctoral dissertation. Federal University of Technology, Akure. Retrieved July 14, 2019 from https://pdfs.semanticscholar.org/2182/ d968b4f23c407ed385e421e8bc 44a20d47b4.pd.

Odunaike, S., Olugbara, O., & Ojo, S. (2013). E-learning implementation critical success factors. *Innovation*, *3*(4). Retrieved July 12, 2019 from https:// pdfs. Semantic scholar.org/0192/c842e85c8e07712afafe0df5f136d2c7043b.pdf.

Oheneba-Sakyi, Y., & Amponsah, G. K. (2018). *Still offline and behind in this digital world? Join the SAKAI LMS experience.* PowerPoint presentation at the meeting

of an Inter- college lecture series, University of Ghana. Retrieved June 28, 2019 from https://coe.ug.edu.gh/news/inter-college-lecture-still-offline-and-behind-digital-world-join-SAKAI-lms-experience.

Onwuegbuzie, A.J., & Johnson, R.B. (2006). The validity issue in mixed methods research. *Research in the Schools, 13*, 48-63.

Ozkan, S., & Koseler, R. (2009). Multi-dimensional students' evaluation of e-learning systems in the higher education context: An empirical investigation. *Computers & Education, 53*(4), 1285-1296.doi:org/10.1016/j.compedu.2009.06.011

Pan, M., & Jang, W. (2008). Determinants of the adoption of enterprise resource planning within the technology-organization-environment framework: Taiwan's communications industry. *Journal of Computer Information Systems, 48*, 94-102.

Pankaja, N., & Mukund Raj, P. K. (2013). Proprietary software versus open source software for education. *American Journal of Engineering Research, 2*(7), 124-130.

Pardamean, B., & Susanto, M. (2012). Assessing user acceptance toward blog technology using the UTAUT model. *International Journal of Mathematics and Computers in Simulation, 1*(6), 203-212.

Park, S.Y. (2009). An analysis of the technology acceptance model in understanding university students' behavioral intention to use e-learning. *Journal of Educational Technology & Society*, *12*(3), 150-162.

Piccoli, G., Spalding, B. R., & Ives, B. (2001). The customer-service life cycle: A framework for improving customer service through information technology. *The Cornell Hotel and Restaurant Administration Quarterly, 42*(3), 38-45. doi: org/ 10. 1016/S0010-8804 (01) 81023-5

Pinheiro, R., Ouma, G. W., & Pillay, P. (2012). The dynamics of university transformation: A case study in the Eastern Cape province of South Africa. *Journal of Higher Education in Africa/Revue de l'enseignement supérieur en Afrique, 10* (1), 95-120.

Pintrich, P. R. (2003). A motivational science perspective on the role of student motivation in learning and teaching contexts. *Journal of Educational Psychology, 95*(4), 667.

Pituch, K. A., & Lee, Y. K. (2006). The influence of system characteristics on e-learning use. *Computers & Education, 47*(2), 222-244. doi: org/ 10. 1016/ j. compedu. 2004. 10.007

Plouffe, C. R., Hulland, J. S., & Vandenbosch, M. (2001). Richness versus parsimony in modeling technology adoption decisions—understanding merchant adoption of a smart card-based payment system. *Information Systems Research, 12*(2), 208-222.

Prasad, C. V., Lalitha, P., & Srikar, P. V. N. (2015). Barriers to the use of information and communication technology (ICT) in secondary schools: Teacher's perspective. *Journal of Management Research, 7*(2), 190-208. doi: 10.18421/TEM6320

Prensky, M. (2001). Digital natives, digital immigrants part 1. *On the Horizon, 9*(5), 1-6. doi:10.1108/10748120110424816

Qiu, M., Wright, C. N., & Xu, S. (2010). *Information technology and distance education*. Retrieved June 8, 2019 from http://iacis.org/iis/2010/689-695_LV2010_1551.pdf.

Rafi, A., Samsudin, K., & Hanafi, H. F. (2015). *Differences in perceived benefit, use, and learner satisfaction between open source LMS and proprietary LMS*. Retrieved June 8, 2019 from https://cdn.intechopen.com/pdfs-wm/48750.pdf.

Rahman, K. A., Ghazali, S. A. M., & Ismail, M. N. (2010). The effectiveness of learning management system (LMS) case study at Open University Malaysia (OUM). *Journal of Emerging Trends in Computing and Information Sciences, 2* (2), 73-79.

Ramayah, T., & Lee, J. W. C. (2012). System characteristics, satisfaction and e-learning usage: A structural equation model (SEM). *Turkish Online Journal of Educational Technology-TOJET, 11*(2), 196-206. Retrieved July 11, 2019 http:// ww. tojet. net/ articles/v11i2/11221.

Rivera, J.C., McAlister, M.K. & Rice, M.L. (2002). A comparison of student outcomes and satisfaction between traditional and web-based course offerings. *Online Journal of Distance Learning Administration, 5*(3), 1-11. Retrieved July 14, 2019 from https://www.learntechlib.org/p/94888/.

Roca, J. C., Chiu, C. M., & Martínez, F. J. (2006). Understanding e-learning continuance intention: An extension of the technology acceptance model. *International Journal of Human Computer Studies, 64*(8), 683-696. doi: 10.1016/j.ijhcs.2006.01.00

Rogers, E. M. (2003). *Diffusion of innovations*. New York: Free Press.

Rouse, M. (2005). Distance learning (e-learning). Retrieved July 12, 2019 from *http://whatis. techtarget.com/definition/distance-learning-e-learning*.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development and well-being. *American Psychologist, 55*(1), 68–78. doi: 10.1037110003-066X.55.1.68

Salawudeen, O.S. (2010). *E-learning technology. The Nigerian experience.* Retrieved June 10, 2019 from https://www.fig.net/resources/proceedings/fig_proceedings/fig2006/papers/ts

Sallum, S. A. (2008). Learning management system implementation: Building strategic change. *Distance Learning, 5*(1), 68-72. Retrieved July 12, 2019 from http:// www. iiis.org/cds2008/cd2008sci/EISTA2008/PapersPdf/E295SV.pdf.

San Martin, H., & Herrero, A. (2012). Influence of the user's psychological factors on the online purchase intention in rural tourism: Integrating innovativeness to the UTAUT framework. *Tourism Management, 33*(2), 34-35. doi: org/ 10. 1016/ j. tourman.2011.04.003

Sarantakos, S. (2013). *Social research*. (4th ed.). New York: Palgrave Macmillan.

Schaeffer, R., Mendenhall, W., & Ott, L. (1986). *Elementary survey sampling*. Boston: Duxbury Press.

Schar, S. G., & Krueger, H. (2000). Using new learning technologies with multimedia. *IEEE multimedia, 7*(3), 40-51. doi:10.1109/93.879767

Sclater, N. (2008). Web 2.0, personal learning environments and the future of learning management systems. *Research bulletin, 13*(13), 1-13.

Selim, H. M. (2007). Critical success factors for e-learning acceptance: Confirmatory factor models. *Computers & Education, 49*(2), 396-413. doi:org/ 10. 1016/ j. compedu.2005.09.

Shahadat, H. K., Mahbub, H., & Che, K. C. (2012). Barriers to the introduction of ICT into education in developing countries: The example of Bangladesh. *International Journal of Instruction, 5* (2), 1380 -1470.

Shashaani, L., & Khalili, A. (2001). Gender and computers: Similarities and differences in Iranian college students' attitudes toward computers. *Computers & Education, 37*(3-4), 363-375. doi:org/10.1016/S0360-1315 (01)00059-8

Shih, H. P. (2008). Using a cognition motivation control view to assess the adoption intention for web-based learning. *Computers & Education, 50*(1), 327-337. Retrieved July 14, 2019 from https://www.learntechlib.org/p/66642/.

Simpson, O. (2008). Motivating learners in open and distance learning: Do we need a new theory of learner support? *Open Learning: The Journal of Open, Distance and E-Learning*, 23(3), 159-170.

Singleton, R., & Straits, B. (2010). Straits. *Approaches to Social Research* (5th ed.). New York: Oxford University Press.

Smart, K. L., & Cappel, J. J. (2006). Students' perceptions of online learning: A comparative study. *Journal of Information Technology Education: Research, 5* (1), 201-219. Retrieved July 14, 2019 from https://www.learntechlib.org/p/101752/.

Soon, L., & Fraser, C. (2011). Knowledge sharing and knowledge exchange in distance education online group work. *International Journal of Information and Education Technology, 1*(2), 156. doi: 10.7763/IJIET.2011.V1.26

Sorebo, O. Halvari, H., Gulli, V. F., & Kristiansen, R. (2009). The role of self-determination theory in explaining instructors' motivation to continue to use e-learning technology. *Computers & Education, 53,* 1177–1187. doi:10.1016/ j. compedu.2009.06.001

Srichanyachon, N. (2014). EFL learners' perceptions of using LMS. *The Turkish Online Journal of Educational Technology, 13(4).* Retrieved July 12, 2019 from http;// tojet.net/articles/v13i4/1344.pdf.

Ssekakubo, G., Suleman, H., & Marsden, G. (2011). Issues of adoption: have e-learning management systems fulfilled their potential in developing countries? In *Proceedings of the South African Institute of Computer Scientists and Information Technologists Conference on Knowledge, Innovation and Leadership in a diverse, Multidisciplinary Environment* (pp. 231-238). ACM. doi: 10.1145/ 2072221. 20 7 2248

Sun, P. C., Tsai, R. J., Finger, G., Chen, Y. Y., & Yeh, D. (2008). What drives a successful e-learning? An empirical investigation of the critical factors influencing learner satisfaction. *Computers & Education, 50*(4), 1183-1202. doi:org/ 10.1016/ j. compedu.2006.11.007

Suorsa, J., & Eskilsson, N. (2014). *Students' perceptions of learning management systems. An explorative case study of upper secondary school students*. Retrieved June, 25 2019 from http://hdl.handle.net/2077/36431.

Tagoe, M. (2012). Students' perceptions on incorporating e-learning into teaching and learning at the University of Ghana. *International Journal of Education and Development using ICT, 8*(1), 91-103.

Tashakkori, A., & Teddlie, C. (Eds.). (2010). *Sage handbook of mixed methods in social & behavioral research*. Sage. Retrieved July 13, 2019 from https:// us.sagepub. com/en-us/nam/sage-handbook-of-mixed-methods-in-social-behavioral-research/book233405.

Taylor, S., & Todd, P. A. (1995). Understanding information technology usage: A test of competing models. *Information Systems Research*, *6*(2), 144-176.

Technopedia. (2014). *Course management system (CMS)*. Retrieved July, 14 2019, from Technopedia.com:http://www.techopedia.com/definition/6651/course-management-system-cms.

Teo, T. (2009). Modelling technology acceptance in education: A study of pre-service teacher. *Computers & Education, 52*(2), 302-312. doi:10.1016/ j.compedu. 2008. 08.006

Thompson, B. (2004). Exploratory and confirmatory factor analysis: Understanding concepts and applications. *Applied Psychological Measurement*, *31*(3), 245-248.

Thompson, R. L., Higgins, C. A., & Howell, J. M. (1991). Personal computing: Toward a conceptual model of utilization. *MIS quarterly*, *15*(1), 125-143. doi: 10. 2307/ 24 9443

Tondeur, J., Van de Velde, S., Vermeersch, H., & Van Houtte, M. (2016). Gender differences in the ICT profile of university students: A quantitative analysis. *Journal of Diversity and Gender Studies*, *3*(1), 57-77. Retrieved July 13, 2019 from https://biblio.ugent.be/publication/7029749/file/7029758.

Torruam, J.T. (2012): Application of e-teaching and e-learning in Nigerian educational system. *Academic Research International*, *3*(1), 30.

Turner, D. W. (2010). Qualitative interview design: A practical guide for novice investigators. *The Qualitative Report*, *15*(3), 754-760. Retrieved July 12, 2019 from https://nsuworks.nova.edu/tqr/vol15/iss3/19.

Turyasingura, W. (2011). *Interdependency of knowledge management and learning: the case of higher education institutions in Uganda*. Published Doctoral dissertation. University of the Witwatersrand. Retrieved July 11, 2019 from http://wiredspace. witz.ac.za/bitstream/handle/10539/10895/PHD%20Thesis%20Turyasingura%20Final%20.pdf.

Twigg, C. A. (2002). Quality, cost and access: The case for redesign. In M. S. Pittinsky (Ed.), *The wired tower: Perspectives on the impact of the internet on higher education* (pp. 111-143). Upper Saddle River, NJ: Prentice Hall.

University of Ghana. (2014). *Strategic Plan 2014-2024*. Retrieved July 10, 2019 from http://www.ug.edu.gh/sites/default/files/documents/UG%20Strategic%20Plan.pdf

University of Ghana. (2017a). *Facts and Figures.* Retrieved June 13, 2019 from https:// www.ug.edu.gh/pad/sites/pad/files/u6/paddocs/Facts%20and%20figure.pdf.

University of Ghana. (2017b). Handbook: University of Ghana general information. Accra: University of Ghana. Retrieved June 10, 2019 from http://www.ug.edu.gh/sites/default/files/aad/Humanities%20handbook%202017%20%28website%29-min.pdf.

Urbach, N., & Muller, B. (2012). The updated DeLone and McLean model of information systems success. *In Information Systems Theory* (pp. 1-18). Springer, New York, NY. Retrieved July 12, 2019 from: https://link.springer.com/chapter/10.1007/978-1-4419-6108-2_1.

Uziak, J., Oladiran, M. T., Lorencowicz, E., & Becker, K. (2018). Students' and instructor's perspective on the use of Blackboard platform for delivering an engineering course. *The Electronic Journal of E-learning, 16*(1), 1-15. Retrieved July 13, 2019 from http://www.wiete.com.au/journals/WTE&TE/Pages/Vol.14,%20No.2%20(2016)/03-Uziak-J.pdf.

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science, 46*(2), 186-204. doi:10.1287/mnsc.46.2.186.11926

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS quarterly*, 425-478. doi: 10.2307/30036540

Venkatesh, V., Thong, J. Y., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS quarterly*, *36*(1), 157-178.doi:10.2307/41410412

Venter, P., van Rensburg, M. J., & Davis, A. (2012). Drivers of learning management system use in a South African open and distance learning institution. *Australasian Journal of Educational Technology*, *28*(2). doi:org/10.14742/ajet.868

Wang, J., Doll, W.J., Deng, X., Park, K. & Yang, M.G. (2013). The impact of faculty perceived reconfigurability of learning management systems on effective teaching practices. *Computers & Education, 61*(1), 146-157. Retrieved July 14, 2019 from https://www.learntechlib.org/p/132217/.

Web.archive.org. (2019). Community | Sakai Project. Retrieved July 21, 2019 from https://web.archive.org/web/20140108022526/http://www.sakaiproject.org/organization-list.

Wei, Y., Wu. Y., & Zheng, Z. (2014). The application of SAKAI in University of Science and Engineering. *Education Journal, 3(4),* 224-228. doi: 10.11648/j.edu. 2014 03 04.13

Whelan, R., & Bhartu, D. (2007). Factors in the deployment of a learning management system at the University of the South Pacific. *Proceedings Ascilite* Singapore, 1053-1062. Retrieved July 13, 2019 from http://www.ascilite.org/ conferences/ singapore07/procs/whelan.pdf.

Wong, N., Rindfleisch, A., & Burroughs, J. E. (2003). Do reverse worded items confound measures in cross-cultural consumer research? The case of the material values scale. *Journal of Consumer Research, 30,* 72-91. doi: 10.1086/374697

Wong, W.T., & Huang, N.T.N. (2015). The effects of e-learning system service quality and users' acceptance on organizational learning. *International Journal of Business and Information, 6*(2), 205-225.

World Bank (2008). *The road not travelled: Education reform in the Middle East and North Africa.* Retrieved July 12, 2019 from http://siteresources.worldbank. org/ INTMENA/Resources/EDU_Flagship_Full_ENG.pdf.

Wright, M. F., & Li, Y. (2011). The associations between young adults' face-to-face prosocial behaviours and their online prosocial behaviours. *Computers in Human Behavior*, *27*(5). doi/10.1016/j.chb.2011.04.019

Xingfu, D., Xiaoqing, G., & Zhiting, Z. (2005). The Chinese approach. *Lifelong learning & Distance Higher*, 63. Retrieved June 20, 2019 from http:// oasis. col. org/ bitstream/handle/.

Yukselturk, E., & Bulut, S. (2009). Gender differences in self-regulated online learning environment. *Journal of Educational Technology & Society, 2*(3), 12- 22.

Yusuf, M. O. (2005). Information and communication technology and education: Analyzing the Nigerian national policy for information technology. *International Education Journal 6*(3), 316 - 321. Retrieved July 13, 2019 from https:// files. eric.ed.gov/fulltext/EJ854985.Pdf.

Zemsky, R. (2007). E-learning: Successes and failures. *Chronicle of Higher Education, 53*(18), 1-5.

APPENDICES

Appendix A: Research Questionnaire

UNIVERSITY OF GHANA

COLLEGE OF EDUCATION

DEPARTMENT OF ADULT EDUCATION AND HUMAN RESOURCE STUDIES

Dear Respondent,

I am a PhD student in Adult Education and Human Resource Studies at the University of Ghana, Legon campus. I am conducting a study on the Continuous Utilization of the SAKAI Learning Management System (LMS) by graduate students at the University of Ghana. By completing this questionnaire, you have consented to be part of the study. Your responses to the questions asked will be duly appreciated and treated with the utmost confidentiality. Please do not write your name or any comment that could easily identify you. Thank you.

SECTION A: DEMOGRAPHIC VARIABLES

Please tick [√] where appropriate.

1. **Gender**: Male ( )
   Female ( )

2. **Age:** 20 – 29 ( )
   30 - 39 ( )
   40 - 49 ( )
   50-59 ( )
   Above 60 years ( )

3. **College of Affiliation**
   Health Sciences ( )
   Humanities ( )
   Education ( )

SECTION B: LEVEL OF KNOWLEDGE ON THE FEATURES OF THE SAKAI LEARNING MANAGEMENT SYSTEM (LMS)

The following questions seek to ascertain your level of knowledge concerning the features on the SAKAI Learning Management System.

Please tick [√] where appropriate.

ITEM	FEATURES	LOW (1)	MODERATE (2)	HIGH (3)
1.	Forum tool			
2.	Gradebook tool			
3.	Lessons tool			
4.	Quizzes and Test tool			
5.	Syllabus tool			
6.	Chat room tool			
7.	Resources tool			
8.	Announcement tool			
9.	Calendar tool			
10.	Dropbox tool			
11.	Email tool			
12.	Assignment tool			
13.	Turnitin tool			

SECTION C: EXTENT OF UTILIZATION OF THE FEATURES OF THE SAKAI LEARNING MANAGEMENT SYSTEM (LMS)

The following questions seek to find out the extent to which you utilize the following features of the SAKAI Learning Management System.

Please tick [√] where appropriate.

ITEM	FEATURES	None (1)	Once a Semester (2)	Once a Month (3)	Once a Week (4)	Everyday (5)
1.	Forum tool					
2.	Gradebook tool					
3.	Lessons tool					
4.	Quizzes and Test tool					
5.	Syllabus tool					
6.	Chat room tool					
7.	Resources tool					
8.	Announcement tool					
9.	Calendar tool					
10.	Dropbox tool					
11.	Email tool					
12.	Assignment tool					
13.	Turnitin tool					

SECTION D: ATTITUDES TOWARDS THE CONTINUOUS UTILIZATION OF THE SAKAI LEARNING MANAGEMENT SYSTEM (LMS)

The following questions seek to find out your attitude towards the continuous use of the SAKAI Learning Management System. Please show how you agree or disagree with the following sets of statements using the guide below.

1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

Please tick [√] where appropriate

ITEM	STATEMENTS	1	2	3	4	5
1.	I feel confident in using the SAKAI LMS.					
2.	I enjoy using the SAKAI LMS for my studies.					
3.	The SAKAI LMS increase my productivity in my coursework.					
4.	The SAKAI LMS can enhance my learning experience.					
5.	The SAKAI provides me with new knowledge.					
6.	The SAKAI LMS increases the quality of my Learning.					
7.	I am interested in studying courses that use SAKAI LMS.					
8.	I am satisfied with the presentation methods of the SAKAI LMS.					
9.	The SAKAI LMS helps me better understand my course.					
10.	The SAKAI LMS helps me to complete my course work.					
11.	The SAKAI LMS easy return to previous display pages.					
12.	The course(s) is/are suitable to be run on the SAKAI LMS.					

SECTION E: MOTIVATION TOWARDS THE CONTINUOUS UTILIZATION OF THE SAKAI LEARNING MANAGEMENT SYSTEM (LMS)

Please indicate what motivated you to continuously use the SAKAI Learning Management System with **3 being highly motivated, 2 being moderately motivated and 1 the least motivated.**

Please tick [√] where appropriate

ITEM	STATEMENTS	1	2	3
1.	The use of SAKAI LMS can affect my future career.			
2.	Using the SAKAI LMS saves time.			
3.	The SAKAI makes it easy to communicate with my Lecturers and friends.			
4.	I receive emails from my friends on the SAKAI LMS.			
5.	I respond to the discussion group on the SAKAI LMS.			
6.	The SAKAI LMS is appropriate with how I learn.			
7.	The SAKAI LMS requires me to change my study habits.			
8.	I am not worried about making mistakes by clicking on the wrong item when I use the SAKAI LMS.			
9.	I can use the SAKAI LMS at a comfortable pace.			
10.	I find the SAKAI LMS useful in my studies.			
11.	The use of the SAKAI LMS I increase my chances of getting a better grade.			
12.	The SAKAI LMS motivates me to learn.			
13.	SAKAI LMS is the latest learning technologies.			
14.	The SAKAI LMS is compatible with other applications I use (such as MS Power-point, MS Word, etc).			
15.	Working with the SAKAI LMS is fun.			
16.	Computer literacy training program organized for students			
17.	Previous personal experience with Internet resources.			
18.	Lecturers aligning SAKAI LMS usage with learning objectives.			
19.	The frustration of attending face-to-face lecture session.			

SECTION F: FACTORS PROMOTING THE CONTINUOUS UTILIZATION OF THE SAKAI LEARNING MANAGEMENT SYSTEM (LMS)

The following questions seek to find out from respondents the factors that promote the continuous utilization of the SAKAI Learning Management System. Please show how you agree or disagree with the following sets of statements

1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

ITEM	PERFORMANCE EXPECTANCY	1	2	3	4	5
1.	Using the SAKAI LMS will improve my performance in the course.					
2.	I'll find the system useful in my learning activities.					
3.	Using the SAKAI LMS enables me to accomplish my learning activities more quickly					
4.	Using the SAKAI LMS improves the quality of my learning activities.					
5.	Using the SAKAI LMS makes my learning activities easier.					
6.	Using the SAKAI LMS enhances my effectiveness in my learning activities.					
	EFFORT EXPECTANCY	**1**	**2**	**3**	**4**	**5**
1.	Learning to operate the SAKAI LMS will be easy for me					
2.	My interaction with the SAKAI LMS will be clear and understandable.					
3.	It'll be easy for me to become skilful at using the SAKAI LMS.					
4.	I'll find the SAKAI LMS easy to use.					
	SOCIAL INFLUENCE	**1**	**2**	**3**	**4**	**5**
1.	People who influence my behavior think I should use the SAKAI LMS.					
2.	People who are important to me think I should use the SAKAI LMS.					

3.	Lecturers have been helpful in the use of the SAKAI LMS.					
4.	Using the SAKAI LMS is academically status-enhancing for students					
	FACILITATING CONDITIONS	**1**	**2**	**3**	**4**	**5**
1.	I have the resources necessary to use the SAKAI LMS.					
2.	I have the knowledge necessary to use the SAKAI LMS.					
3.	The SAKAI LMS is not compatible with other systems I use.					
4.	A specific person is available for assistance with the SAKAI LMS difficulties					
5.	Using the SAKAI LMS fits my learning style.					
	USER SATISFACTION	**1**	**2**	**3**	**4**	**5**
1.	I am satisfied with the performance of the SAKAI LMS					
2.	I am pleased with the experience of using the SAKAI LMS					
3.	I am satisfied with the features on the SAKAI LMS					
	INDIVIDUAL DECISION	**1**	**2**	**3**	**4**	**5**
1.	I have decided to use the SAKAI LMS to enrich my studies					
2.	I believe I will use the SAKAI LMS for my academic work.					
3.	I am interested in using the SAKAI LMS					

SECTION G: CHALLENGES ENCOUNTERED IN THE CONTINUOUS UTILIZATION OF THE SAKAI LEARNING MANAGEMENT SYSTEM (LMS)

The following questions seek to ascertain the respondent's challenges encountered in the continuous use of the SAKAI Learning Management System. Please show how you agree or disagree with the following sets of statements

1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

ITEM	CHALLENGES	1	2	3	4	5
1.	Using the SAKAI LMS is stressful.					
2.	It is frustrating using the SAKAI LMS.					
3.	I am not always comfortable with the use of the SAKAI LMS.					
4.	I lack adequate skills on how to use the SAKAI LMS.					
5.	Poor internet connectivity affects my usage of the SAKAI LMS.					
6.	I find it difficult downloading learning materials from the SAKAI LMS.					
7.	I encounter problems logging unto the SAKAI LMS.					

SECTION H: CONTINOUS UTILIZATION OF THE SAKAI LEARNING MANAGEMENT SYSTEM (LMS)

The following questions seek to ascertain the respondent's continuous utilization to use the SAKAI Learning Management System. Please show how you agree or disagree with the following sets of statements

1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

ITEM	STATEMENTS	1	2	3	4	5
1.	I will frequently use the SAKAI LMS in the future to supplement my studies.					
2.	I will use the SAKAI LMS on a regular basis in the future to do a learning activity.					
3.	I always try to use the SAKAI LMS to do my academic work as it has important features.					

Thank you for your cooperation

Appendix B: Informed Consent Form

I have been informed about the relevance of the study and my rights as a respondent has duly been made known to me in a language that I understand. I have had the opportunity to ask questions about it and any questions I have asked the researcher have been answered to my satisfaction. I therefore consent voluntarily to participate in this study and understand that I have the right at any point to withdraw from the study without it affecting my position as a graduate student at the University of Ghana.

Please you could contact me on:

Jonathan Odame
Adult Education and Human Resource Studies
University of Ghana.
Tel: +233243755649
Email:jonathanodame@yahoo.com

…… ……

Signature of Respondent **Date**

I trust the respondent is giving an informed consent to be participate in this study.

…… ……

Signature of Researcher **Date**

Appendix C: Ethical Clearance

UNIVERSITY OF GHANA
ETHICS COMMITTEE FOR THE HUMANITIES (ECH)
P. O. Box LG 74, Legon, Accra, Ghana

21st February, 2018

My Ref. No.....

Mr. Jonathan Odame
Department of Adult Education and Human Resources Studies
University of Ghana
Legon

Dear Mr. Odame,

ECH 110/17-18: UTILIZATION OF A LEARNING MANAGEMENT SYSTEM (SAKAI) BY GRADUATE STUDENTS AT THE UNIVERSITY OF GHANA

This is to advise you that the above reference study has been presented to the Ethics Committee for the Humanities for a full board review and the following actions taken subject to the conditions and explanation provided below:

Expiry Date:	20/02/19
On Agenda for:	Initial Submission
Date of Submission:	15/01/18
ECH Action:	Approved
Reporting:	Bi-Annually

UG./ISSER/ECH VALID UNTIL 20 FEB 2019 APPROVED DOCUMENT

Please accept my congratulations.

Yours Sincerely,

Rev. Prof. J. O. Y. Mante
ECH Chair

CC: Prof. Olivia A. T. F. Kwapong, Department of Adult Education and Human Resources Studies, University of Ghana.

Tel: +233-303933866 Email: ech@ug.edu.gh | ech@isser.edu.gh

Appendix D: Sakai Interface