Students and Instructors Perception on the Use of Moodle-LMS in the Department of Computer Science in Veritas University

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ABSTRACT

Teaching and learning has become a significant factor in today's world, where numerous nations are putting great amount of monetary resource in education in view that education is essential for any nation to develop. The new trend of developing countries are to invest into modern innovations for educational purposes with function to make learning more adaptable, progressively viable and effective. Lots of Nigerian universities still lack the effort to arrange a good structure online learning course that support student learning ability also having access to learning materials from anywhere. Learning is not a popular teaching approach in Nigeria, but most Universities in Nigeria prefer off - campuses for their distant student who enrols in their educational programs. Many universities in Nigerian still practice full-time traditional approach of teaching - school campus. This makes e-learning unpopular in Nigerian Universities. This study used both quantitative and qualitative approaches to analyse students and instructors` perception towards use of Moodle with sample size of 107 participants were used to collect data from the department of computer science at Veritas University. However, the study provides positive and fresh perceptions towards both theoretical and real-life challenges of LMS and the results show that the attitude and perceptual experience of students and instructors within the department of computer science at Veritas University were positively significant and this is due to the fact that new methods are incorporate modern applications with learning activity, this brings more and new approach to school curriculum.

Keywords: E-learning, Moodle, Higher education, Learning Management System, Nigeria.

ÖZ

Eğitim ve öğrenme günümüz dünyasında önemli bir faktör haline gelmiştir, burada birçok ülke eğitimin herhangi bir ülkenin gelişmesi için elzem olduğu için eğitime büyük miktarda parasal kaynak koymaktadır. Gelişmekte olan ülkelerin yeni eğilimi, öğrenmeyi daha uyarlanabilir, aşamalı olarak uygulanabilir ve etkili hale getirme işleviyle eğitim amaçlı modern yeniliklere yatırım yapmaktır. Nijeryalı üniversitelerin birçoğu, öğrencilerin öğrenme becerilerine de her yerden erişebilmelerini destekleyen iyi bir çevrimiçi öğrenme kursu düzenleme çabası göstermemektedir. Öğrenme Nijerya'da popüler bir öğretim yaklaşımı değildir, ancak Nijerya'daki çoğu Üniversite, eğitim programlarına kaydolan uzak öğrencileri için kampüs dışında kalmayı tercih etmektedir. Nijerya'daki birçok üniversite hala tam zamanlı geleneksel öğretim yaklaşımı uygulamaktadır - okul kampüsü. Bu, Nijerya Üniversitelerinde e-öğrenmeyi popüler değil. Veritas Üniversitesi'nde bilgisayar bilimleri bölümünden veri toplamak için bu çalışmada hem katılımcıların hem de eğitmenlerin 107 katılımcı örneklem büyüklüğü ile Moodle kullanımına yönelik algılarını analiz etmek için hem nicel hem de nitel yaklaşımlar kullanılmıştır. Bununla birlikte, çalışma LMS'nin hem teorik hem de gerçek yaşam zorluklarına karşı olumlu ve taze algılamalar sağlar ve sonuçlar Veritas Üniversitesi bilgisayar bilimi bölümündeki öğrenci ve öğretim elemanlarının tutum ve algısal deneyimlerinin olumlu olduğunu ve bunun yeni yöntemlerin modern uygulamaları öğrenme etkinliği ile birleştirmesi, okul müfredatına daha fazla ve yeni bir yaklaşım getiriyor.

Anahtar Kelimeler: E-öğrenme, Moodle, Yükseköğretim, Öğrenme Yönetim Sistemi, Nijerya.

DEDICATION

I dedicate this thesis to my mom for all her support and love.

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LIST OF ABBREVIATIONS

E-learning	Electronic Learning
ICT	Information and Communication Technology
ISA	Information System Achievement
IT	Information Technology
LMS	Learning Management System
PC	Personal Computer
SCORM	Shareable Content Object Reference Model
TAM	Technology Acceptance Model

Chapter 1

INTRODUCTION

1.1 Introduction

Advances in modern technologies are now structured for reasoning and practice in education. The support for and unavoidable utilization of Information and Communication Technologies (ICTs) in instruction have been seen both adversely and emphatically. Critics are doubtful about what they see as an attack of schools and classrooms by business aggregates. They see every promotion about what innovation can do to enhance instructive practice as being the same old thing. For long time, institutions have concentrated on different LMSs mostly in blended or distance learning. Therefore, many opportunities have been created through the educational settings with the use of ICTs. This has an incredible impact in the increase and changed of the manner in which individuals learn all over the place. However, the blended learning has helped to improve the nexus between instructors and learners which also raise some challenges as part of the development (Pishva, Nishantha, & Dang, 2010). For example, Information and communication technologies are widely seen as further improving the quality of learning in both schools and homes, this expectation energizing their fast dispersion and reception all through developed societies (Livingstone, 2012).

With the arrival of ICT in education, instructors' form their own beliefs about the role of ICT as teaching instrument, the worth of ICT for students learning result, their own

personal certainty and competency (Prestridge, 2012). Educators have a sole responsibility in developing new learning models especially the ones that are essential in coordinating educational learning environments (Schibeci, MacCallum, Cumming-Potvin, Durrantet, Kissane and Miller, 2008). This helps instructors to have an obligation of growing modern techniques for reasons to basically re-organizing ICT in classrooms.

Generally, learning management systems (LMS) are e-Learning platforms which are essentially web-based programming enabling educators to oversee materials appropriation, task, and various correspondences about the students' courses (Shawar, 2009). In pedagogy approach, LMSs have transformed into a basic subdivision of the educational systems across numerous universities and the intriguing part is to expand the mixed approaches that is blended learning approach (Pishva et al., 2010). As explained by Landry, Griffeth and Hartman, (2006) that LMS usage to replace regular technique as an instructional tool in learning environments shows that outcome expected look different from the development of LMS, yet its fundamental function is to enhance the conventional address with course content that can be obtained from campus of the internet. While the potential advantages of enlarging the traditional class with LMS have been perceived and talked about in other contexts, what has remained generally unclear are students and instructors responses to utilizing LMS as an expansion to the conventional lecture in context of developing nations.

1.2 The Research Problem

The use of LMS - Blackboard and Moodle can enhance academic activities for students and instructors, this gives learners the opportunity to communicate with their instructors and share study materials as if they are in a face-to-face situation, and also

share ideas in discussion groups (Carvalho Areal & Silva, 2011). For this to take place, the university needs to adopt the modern tools which is being invented into education. Instructors' needs to adapt to modern tools that are introduced by educational managers into the learning environment and this will create a new form of social activities learning environment of which students can enjoy and participate well in any location they find themselves (Awang, Aji, Yaakob, Osman, Mukminin, & Habibi, 2018). Despite the affordance of LMS can bring to the learning environment, little is known about this system in the Nigerian context. This study, helps fill the gap by investigating how learners and instructors perceive the use and implementation of an LMS in the Department of Computer Science in Veritas University.

1.3 Aim of the Study

LMS is one of the newest educational tools which is used in today's learning and teaching environment. The use of LMS provides the enabling platform for instructors and students to engage in combining the traditional classroom learning system with online learning. This enables efficient and flexible environment for learning regardless of time and place for students and instructors. However, the full implementation of such system in Nigerian universities need the attention of researcher on this area. So for this purpose, the study aim at examining the attitudes and perceptions of both students and lecturers in computer science department in Veritas University after the newly design Moodle learning management system has been introduced. The researcher also gathered information on the satisfaction of the students and lecturers who made use of the projected LMS and look at their proposals for more investigations later on.

1.4 The Research Questions

The main aim of this research is answering the following questions listed below:

A. What are students and instructor attitude towards the use of the proposed LMS in the department of Computer Science at Veritas University?

A1. Users' attitude towards LMS platform depending on their Age

A2. Users' attitude towards LMS platform depending on their gender

A3. Users' attitude towards LMS platform depending on their level of education

B. What are students and instructor perceptions towards the use of the proposed LMS in the department of Computer Science?

B1. Users' perception towards LMS platform depending on their Age

B2. Users' perception towards LMS platform depending on their gender

B3. Users' perception towards LMS platform depending on their level of education

C. What are the benefits of implementing LMS for students and instructors to achieve LMS objectives within the department of Computer Science?

C1. What are the benefits of implementing LMS for students to achieve LMS objectives within the department of Computer Science?

C2. What are the benefits of implementing LMS for instructors to achieve LMS objectives within the department of Computer Science?

1.5 Significance of the Study

LMS contributions towards learning outcomes has changed learning in general. Unlike the traditional way of teaching that as to do with the chalk and the board ways of teaching that we know, Learning is more simple and easier through e-Learning. One of the trending educational tools in educational setting is the introduction of LMS

in the academic world which has been in existence for many years now and it keeps improving as many companies are investing heavily on LMS (Siemens, 2013).

LMS facilitates education for example in the ways that the content is accessed, discussed and also shared. It is also consistent in helping the instructors to pass on message to their target audience in a consistent way. All the students receive the same message at the same time. Lack of such functioning systems prompted the research to do a study in this area and also introduce this system to Veritas University. However, the importance of the research is to investigate learners' and instructors' attitude and perception towards the planned LMS usage and fully introducing the LMS to both instructors and students for purpose of achieving the full functionality of LMS needs within the university (Gautreau, 2011).

1.6 Limitations

There are many challenges on the use of LMS in Veritas University; first, the most of the students and lecturer are not used to some functions and functionalities of LMS so the researcher can not ascertain the global view of the study. In addition, the LMS was only tested in the Department of Computer science at Veritas University, which does not completely provide its reliability and validity of the study.

1.7 Definition of Terms

ICT: Information and communications technology (ICT) is often used as an extended synonym or as an umbrella term for information technology (IT), but is a more specific term (i.e. broader in scope) that stresses the role of unified communications and the integration of telecommunications.

LMS: learning management system is a software application for the administration, documentation, tracking, reporting and delivery of electronic educational technology courses or training programs

Chapter 2

LITERATURE REVIEW

The trend of introducing practical applications into education and lots of invention have enhance learning and make it effective for both the instructors and the students. Many countries educational ministries have invested on a lot of new technologies, and higher institutions in many countries have adopted different educational technologies to improve learning and motivate students (Al-Zaidiyeen, Mei & Fook, 2010). The utilization of innovation in instruction has furnished students and instructors with an unlimited number of alternatives for classroom learning. When you think about the history of innovation in instruction, there are some exceptionally interesting realities that have driven us to where we are today. Over the previous years, an astounding number of nations incorporates their instructive framework with ICTs. According to Nguyen (2015), individuals have known classroom as the "brick and wall" place of learning while physical classrooms are beginning to lose their absolute possession.

The scene of traditional instructing and learning method has changed totally due to change in e-learning approach and with the fast growing of technology which is used in higher institutions today everywhere throughout the world. Jamal and Shanaah, (2011) indicated that there are different forms of LMSs for purpose to help the LMS proceedings. Nonetheless, the use of LMS to substitute the customary technique for educating in higher institutions is not the expectation of the development of LMS, yet its fundamental method is to improve the old method of accessing educational

materials through the use the university internet or school library (Landry et al, 2006). LMS ought to be anything but ease of utilize, its simplicity particularly within the institution and outside the countries as a new global trend. The pattern of LMS is purposefully for easy understanding that is easy utilization without much stress or ubiquity among users' so as add creativity to their basic cognitive ability rather than changing to contemporary innovations (Ardito, Costabile, Marsico, Lanzilotti, Levialdi, Roselli and Rossano 2006).

Lots of studies have been done in the field of LMS which focus on LMS to be a tool and technology which is used to manage and share knowledge in an educational setting (Shawar, 2009). Pishva et al (2010) recently investigated the use of LMS like Blackboard and its usefulness in different higher institutions globally. A total of 19 Universities were investigated, and they came to a conclusion that indeed LMS as assisted higher institutions in so many different ways. This chapter will first analyse some basic concepts which relates to e - learning, the design of LMS and LMS categorization and discuss on usage of this innovation in developing countries which is comparable investigation in this field are in the long run review and to be summarized.

2.1 Primary Theory

2.1.1 Information and Communication Technologies (ICTs) and E-learning - Explanations

Although, the concept of ICTs and e-learning are not identical, rather there are numerous features and components that are related to one another. The increase in computers usage and internet accessibility by companies and individual shows significantly in the development of technology (Huseynov & Yıldırım, 2016). These

developments are measured in areas such as education and health. This development is strongly influenced by the introduction of formal and informal ICT training at work, through an institution or through self-training. Training is therefore of the utmost importance, since the current and future users are expected to have adequate ICT skills which includes the powerful utilization of hardware and programs to access, recover, convert, store, arrange, control and present information and data. Be that as it may, the meaning of ICT is progressively centered on specialized gadgets or applications, any advanced innovation which are being utilized for helping people, business and associations to utilize data (Sait, Uthayakumar, Shankar & Kumar, 2019).

Today, it is clear that innovation can assume a huge job in effective instructing and learning outcomes. LMSs and e-learning uniquely add to the satisfaction of the vision of numerous educators and scholars towards the start of the third millennium. They were presenting their models in the mid twentieth century, however they had no adequate equipment for an effective execution by that time (Skalka & Drlik, 2009). E-Learning has conveyed numerous systems to suit the learning environment. E-learning has the principle attributes of adapting any place and anywhere. It can build a free and individualized learning environment and avoid the limitations of the traditional learning (Wen & Lin, 2007).

With the fast and advance of information and communication technologies, e-Learning gives web-based learning environment which enables learning to everybody with computers anytime and anywhere. It brings technology status from traditional learning, gets through the confinements of the ordinary learning and builds a free and individualized learning condition (Khan, 2001). Through the use of technology, teachers can shift their teaching style from face-to-face to blended, online or distance

education any time (Gallagher, Sixsmith, Leveaux, & Simpson, 2017). Students can complete interactive learning exercises with self-restraint through LMS in line with the connection between e-learning and traditional learning.

2.1.2 Learning Management Systems (LMSs)

Understanding the differences between LMS and many more educational tools is to understand the attribute of LMS and it is designed to manage many learning activities accordingly. The LMS structure is configured to communicate and manage many part of instructional, differentiate, to measure all learning activities and maintain good objectivity, tracking for the development and meeting the objectives. Generally, gathering and obtaining information to manage learning activities within learning environment (Szabo, 2002). An LMS conveys content, yet in addition handles course enlistment and organization and announcement (Gilhooly, 2001).

LMS supports e-learning exercises, for example, displaying data, overseeing course contents, assessment of students and feedbacks with the inclusion of utilizing to improve the use of LMS inform of Course Management Systems (CMS) and Learning Content Management Systems (LCMS) (Yueh & Hsu, 2008). There is a number of LMSs available to be used which include Blackboard, Moodle, Google Classroom, Edmodo and EasyClass. Blackboard is the most famous among the LMS utilization in institutions of higher learning (Falvo & Johnson, 2007). Moodle, known as part of free open-source programming bundle which sometimes favoured over Blackboard (Beatty & Ulasewicz, 2006). Moodle has been utilized by numerous colleges, schools, organizations and it is free for the users around the globe. ETutor, Claroline, eFront and Joomla are other open-source applications.

2.1.3 Significance of LMSs within Institutions

The world has moved from the old age to a new dawn called the digital age. The modern instructional framework still maintains the use of data-age, This is affecting or causing the educational system to change the perception of student-teacher interaction by focusing more on the way educators which are making students to stay disengaged and also making to feel that LMSs are as though as they are equals in achieving the comparable things within the same period of time (Reigeluth & Garfinkle, 1994). Reigeluth (1997) indicated that the energy to achieve this differs from students, which affect low self-esteem students and help the brilliant students progress. However, this requires the good and propelled educational framework to help achieve a totally new world-view of teaching and learning.

In a Data Age, authorized world-view of preparing, students are to allow as many times as possible needed to achieve laterality and also allow to continue to forward expeditiously in the wake of showing that predominance, requiring an adjusted tread and management series (Schlechty, 1990). Thus, the approach of data age of cutting edge educational technology with the help of LMS provide study on students' present data and inclination level, instructors performance and students to perceive reasonable learning goals, recognize with sense of direction appropriate for the individuals. Finally, LMSs expecting more noteworthy undertaking in cutting edge technology and can be seen as pursues of the following:

1. Provide many constructivists-conceptual approaches as guidance, focus on survival, student characterized objectives (Reigeluth & Garfinkle, 1994).

2. Learning that is done outside or within learning environment will be supported through collaborative learning, so as to stretch out the learning condition to the students that lives off campus (Taylor, 2004).

3. Better spot modify evaluation, advance following, revealing, and responsiveness to student needs (Reigeluth & Garfinkle, 1994).

4. Genuinely turned out to be foundational, incorporating frameworks consistently to take into consideration enhanced joint effort crosswise over frameworks including partners (Sherry, 1992).

5. Enhance support for expert analysis and improvement for partners, including educators, and enhance cost viability and better use existing assets right now accessible in schools and LMSs (Szabo, 2002).

2.1.4 Advantages of LMSs in Learning Environment

One of the most fundamental credits of LMS is to give a good domain for learning and teaching without the impediment of time or space (Epping, 2010). LMS is comprehensively used in various propelled instruction environments. As indicated by Morris (2004), any establishments planning to work regular based on seminars through web, an LMS is the best application to use in order to have the best genuine courses, staff and students also grades. LMS also gives definite set-up for interactive media course, assignments, and supporting coordinated effort, including discourse get-togethers, visit sessions, and online tests and assessments (Bazylak & Weiss, 2017). Bonk and Graham (2012) referenced the upsides of electronic acknowledging which can be masterminded into three points of view:

1. Improvement in Pedagogic Education: For every LMS pursues pretty much some instructive technique paying little attention to whether designers utilized it purposefully or not. Nonetheless, just some LMSs appear to be constructed deliberately dependent on an explicit educational technique. MOODLE is a genuine case of such academic methodologies, these instructive systems can be founded on

ideas of learning hypotheses, for example, behaviourism, subjective hypothesis, and constructivism. Another genuine model is that LMSs can underline from an academic perception is a more student-centered approach or instructor focused methodology.

2. Extended Access and Adaptability: Access is one of the most basic key factors which have impact on the advancement of learning conditions, LMS makes learning possible, despite students engaging the more prominent impact on their taking-in relating to access and adaptability of LMS over student learning results.

3. Cost-Effectiveness: Online learning is outstanding amongst other arrangements especially cost effectiveness in advanced education as it gives a chance to achieving an expansive, all-inclusive scattered group of onlookers in a brief time frame with steady substance conveyance.

2.1.5 Functions of LMSs in Institutions

It has been demonstrated that LMS is a product-based application that helps us with administrate document, track, report and survey the instructing learning process, planning programs, virtual classes, and e-learning programs. Components of LMS can be exhaustively partitioned three sections and after that sub-parts will be analyzed under the guideline classification:

1. Importance of Stakeholders. Most of the stakeholders has their own functions by which they can be assisted by institutions:

a) Check status and courses completion.

b) Facility to print or view the certificate.

c) Manage, include or erase the substance of the course or modules.

2. The executives of Information:

a) Tracking existing state and the record of their members.

b) Records and measurements accessible based on course-contents and numbers.

3. Performances:

a) LMSs provide a means of transferring, recovering of tasks and assets.

b) LMSs helps in providing on-line independent evaluation.

2.1.6 Classification of LMSs

LMS has various classifications which are based on their usage and sociability. Different LMS as indicated by their classifications:

1.Open-Source LMSs

The open-source LMSs are learning environments that are available under an open free source, giving customers the privilege to use, to change, to mull over, to handle and check course results, to anyone and in any capacity whatsoever. These open-source LMSs include MOODLE and SAKAY that are the fewest well-known in this group.

2. Cloud- based LMSs

Cloud-based LMS accompanies distributed computing highlights and convey the instruction via internet to their student within and outside classroom and across the world, the purpose is to function as a tool that satisfies the usefulness of communication and technology systems e.g, PC, mobiles and electronic gadgets, This includes Talent-LMS, GoToMeeting and Litmos are among the few in this collection.

3. Patented LMSs

These patented LMSs show that the organisation or designer has been authorized under the legitimate rights with the copyright proprietors to clients. Some of the LMSs are Paradiso, Design2Learn and Blackboard. By managing the client using the LMS this is because they are third party clients. It can also be stated that learners are still third-party clients of proprietary LMS and they are the principal administrator for application. The function of instructor is to manage, direct, help and assess students using LMS. Also. The administrator has the right to monitor the social-activities within LMS for their clients.

2.1.7 Related Work

The disposition of users toward a data framework is part of the element that portrays good quality of learning management (Shee & Wang, 2008). In this way, LMS ends up as a profitable factor of learning environment and it is critical to examine the perceptions of students and educators. Lots of researches only considers the students' perception with respect to the use of the LMSs. Sun, Tsai, Finger, Chen and Yeh (2008) examine the attitude of users' towards the use of LMSs considering six measurements: students, educators, pedagogy, innovation, plan, and condition. The review was led at two-state funded colleges in Taiwan and secured 295 students and they found that, PC tension of students, instructors' attitudes with LMS, the versatility and course-content, ease of use and utility towards improving students learning outcomes. Ozkan and Koseler (2009) propose a hexangular form of LMS (HELAM) and was indicated by the theoretical framework, the research were evaluated through six estimations, in particular: framework quality, benefit quality, content quality, student viewpoint, educator knowledge, and challenges that was encountered during the research. Additionally, Horvat, et al (2015) state that the quality attributes towards

LMS include, response average waiting times, quality feedback, material accuracy, material simplicity, website ease of use and material amount were discovered the most vital for positive impression of electronic training utilizing Moodle.Damnjanovic, Jednak, and Mijatovic (2015) examine the use of LMS in four countries and the study suggested that LMS and information quality show no significant effect on students' fulfilment, while openness had the most relevance effect on performance.

Furthermore, Dias and Diniz (2014) explain users' view of the use of the LMS Moodle in four classes. The study reviewed that students see LMS as their storage facility rather than a community-oriented learning environment. Based on students proficiency in PCs there are many shortcomings in the use of learning with LMS and concluded that in a comparable work educators' feeling about LMS, their convictions and mood are the key to make ICT as part of educational innovations. Many researchers suggest that the investigations of the prior ages of Dawes (1999) and Kirkup and Kirkwood (2005), where it appears that numerous educators are not prepared to utilize ICT in their instructing exercises.

According to De Smet,Valcke, Schellens, De Wever and Vanderlinde (2016) the demonstration on the use of LMS shows that spite of the fact that perceptual experience of LMS is very comparative, its flexibility helps students to change their basic cognitive ability rapid, Also, educators required to acclimate in accordance with the better approach for teaching. Emelyanova and Voronina (2014) examine the use of LMS within some universities in Russia. The research recommended that notion of web-based learning environment help prepare both students' and instructors' in various online activities and results showed that thirty-four percent of learners accept that LMS utilization help them to improve on their basic cognitive skills and fourteen

percent agrees that it develops basic cognitive process, and among teachers the percentage were twenty-one and thirty-one. Also, sixty-eight percent of educators found usage of a LMSs are uninteresting, likewise Nineteen percent of the undergrad feel the same. Other challenges with LMSs is that designers view on LMS for evaluating students' academic activities and the results showed that forty-three percent of students tend to assess the using of LMS is not for continually reasonable as teachers misinterpret the usage. Teachers, not withstanding, were confident on the use of LMS despite classroom learning that extends the instructor's activity towards use of educational methodology for students (Emelyanova & Voronina, 2014), in this manner, indicating the distinction among learners' and instructors' perception on the use of LMS for reason to measure student's academic achievement.

Based on the general concept on basic challenges of using LMS by learners and instructors. Wilcox, Thall, and Griffin (2016) survey recently shows that instructors and students utilize LMS in various devices, for instance educators prefer to use the most part plan course-content on PCs also students use mobile phones to download the course content, along these lines, it's causes the issue effortlessly of utilization of the LMS. Also, Almarashdeh (2016) exhibits that the numerical quantity and institutions quality are the most fundamental components impacting the teacher fulfilments and also, instructors' satisfaction emphatically impacted the institutional course process.

Knowing the LMS capability or theoretical account, the repeat of users could be straight advance to their test scores. Venter, Rensburg and Davis (2012) show the job of apparent handiness with respect to Technology Acceptance Model (TAM) that acknowledge LMS usefulness. Research done by Lwoga (2014), shows that openness

is the key determinant of customer satisfaction with the use of LMS, quality-related part (educator and system) and information quality are the main component for this application. However, the research was solemnly reliant on the information-system accomplishment (ISA). According to Wei, Peng, and Chou (2015) the influence of self- regulated learning uncovered LMS usage and the use of documented sign-language on the learners' assessments was examined. The results showed that students' joint effort is dynamically changing on the number of visits especially when arranged for courses which is essentially are for improvement.

2.1.8 Summary of the Chapter

In this chapter, related literature was reviewed to establish the theoretical basis for this research. This chapter was divided into three parts. The first part considered as the Primary Theory which include the brief history and definitions of Information and Communication Technologies (ICTs) and E-learning. Also, the relationship with LMS. The second part comprise the study on LMS application, Significance of LMSs, Classification of LMSs and function of LMS in institutions. The last part was the summary of the related works on LMSs.

Chapter 3

RESEARCH METHODOLOGY

The study presents the methods to collect and analyse data in this chapter. It demonstrates how population of the research were identified, procedures followed to test the reliability and validities for this study.

This study main task was to measure the influence of Moodle LMS on the students and instructors and move to keep up the progressing positive standard that might be noticeable after the study. This section summaries the method utilized for the research and the study concentrated on the chosen paradigm, design and methodology. There is provision of the basis for utilization of the chosen paradigm and the research design with descriptions of the research technical utilized. This research adopted a descriptive procedure, for the purpose of describing and interpreting the use of Moodle as an instructing and learning instrument.

3.1 Research Procedures

The research procedures in all fields should have different research customs of their own selection based on the technique that is going to be suitable before undergoing any research. However, there are two main approaches for research procedures which are quantitative and qualitative methods or mixed method. These methods can be used in the social world. Basically, the researcher utilized two methods in this research, which means that the study used mixed method. Mix method is a methodology for conducting research that involves collecting, analysing and integrating quantitative -

experiments, surveys and qualitative - focus groups, interviews research (Bryman, 2017).

3.1.1 Quantitative Research

This is the research methodology that is used to measure real situation by turning it to numerical data, and the purpose is to measure manners, beliefs, activity and many other defined factors to obtain a suitable result from a defined sample population. Its approach for data gathering means using existing survey methods which include online surveys or paper surveys. According to Yilmaz (2013), are phenomena that use quantitative research on numerical data to analyse data using statistically approach as medium to measure data. Quantitative research explains the theory behind data analysis by examining the measurements that is suitable for scientific and strategies.

3.1.2 Qualitative Research

The research procedure for qualitative research is to test hypotheses through examining relationship that exist among multi-variant and covariant (Kutlu & Korkmaz, 2013). This multi-variant and covariant are always measured using an instrument that measure numbers of the data using qualitative method (Watson, 2015). The qualitative method is a structured approach that comprise literature reviews, proposal, composition, methodology, discourse and outcome (Sandelowski & Barroso, 2003). This is appealing to the personal opinions or individuals that have experienced on the research topic with expectations on the results of the outcome, subject to self-confidence without susceptibility, any form of control for elective explication, unbiased with findings.

3.2 Research Design

This research, used an experimental research methodology approach in Veritas University, Department of Computer Science. It is conducted with mixed method

which comprises qualitative and quantitative methods. These two methods were used to gather information from respondents so as to have a well cautious and sorted out outcome. A purposive sampling were used because is a form of non-probability sampling in which researchers rely on their own judgment when choosing members of the population to participate in a particular study (Palinkas, Horwitz, Green, Wisdom, Duan, & Hoagwood, 2015) and by using purposive sampling method researchers invite data rich subjects to participate the research. However, the students were selected by the course instructors and the teachers were by the members of the university faculty. All the respondents were willing to participate. This study investigates students' and lecturers' discernments through questionnaire and semi structured interview on the utilization of LMS during one semester in their department.

3.3 Survey Method

Galliers (1992) proposed a taxonomy of information systems research approaches which identified and compared the following ten research strategies used in IS research: theorem proof, laboratory experiments, field experiments, case studies, surveys, forecasting, simulation, argumentative studies, interpretive studies and action research. Most of the previous research undertaken in LMS adoption had been conducted through the surveys (Granell, 2015). Jafari, Salem, Moaddab, & Salem, (2015) defined survey method as an approach use for collecting questionnaire either directly from the target respondent or indirectly. Survey methods including statistical data processing and comparative analysis of results (Mozhaeva, Feshchenko, & Kulikov, 2014). Most survey results are constructed tables of relative (%) and absolute (quantity) frequencies, contingency tables (cross tabulations).

3.4 Data Collection Instruments

Different methods such as questionnaire, interviews, focus groups, tests and alike are utilized when collecting data while conducting research, However, this study was conducted with the use of a questionnaire (see Appendix A) and semi-structured interview as instrument (see Appendix B) for collecting qualitative data. It is more of discussion and open-ended questions with the respondent. Simply, the study used mixed method. Firstly, a link was given to the respondents (http://www.veritasmoodleonline.com) to create user name and password and to login as individual as shown in (Appendices C, D, E, and F) including other screen shots such as courses contents, and features of LMS and later asked to filled the questionnaire through Google form on their perceptions and attitude on the use of the system.

The function of Google Form is to create and edit the questionnaire while respondents logged in with their g-mail account to access the questionnaire and fill and submit the questionnaire online, of which was the convenient way researcher could have collected the data from the participant as well as using digital tools to collect data aligned well with the objectives of the research. However, the use of different type of questionnaires for collecting information is a common practice in a research study. Researcher sent the questionnaires online via Goggle Form to 107 students email and asked questions from students by using the questionnaire on how effective the LMS was. All students (N=107) responded to the questionnaire. Moreover, semi structured interview was utilized as instrument to gather data from the instructors and students about their perceptions regarding the LMS.

3.4.1 Questionnaire

According to Saunders and Lewis (2012), a questionnaire is always regarded as much more effective approach in collecting quantitative data. A questionnaire is constantly viewed as the best technique to gather quantitative information. Likewise, Creswell, Hanson, Clark Plano and Morales, (2007) suggested that questionnaire is more efficient technique for gathering big data within a limited period, as it can effectively cover more extensive geological areas than face to face interviews without including any additional costs of time or travel, and they wipe out subjectivity.

The questionnaire utilized (Appendix A) in this research was mainly for undergraduate students, Masters' and Ph.D in the department of computer science in Veritas University. The questionnaire therefore was selected carefully so that at the end the results or findings of the study can be used and make an understanding of the entire population. In this study the sample size of 107 participants were used to collect data from undergraduate students, Masters' and Ph.D which also include instructors from the department. However, the questionnaire comprises two divisions: first part of comprise questions on e-learning usability, second section of the questionnaire comprise questions on users' perceptual experience on the use of proposed LMS - Moodle.

3.4.2 Semi-structured Interviews

This form of qualitative analysis is quality and adaptable interviews, which enable new thoughts or questions to be made during the procedure of an interview, depending on what the interview participant wants. Yin (2008), for example, confirmed that semi structured interview is very legitimate, as they enable those participating to discuss about the research thoroughly, while giving inside and out data that is significant in

making substantial ends. Nevertheless, Creswell, Hanson, Clark Plano & Morales, (2007) explained that use of semi-structured interview is time consuming and expensive, and could likewise decrease the reliability of research discoveries, as it could present subjectivity. This study considers the use of both quantitative and qualitative approaches for more accurate results. The researcher conducted interviews with the instructors (N = 4) on use and implementation of LMS within the department of computer science at Veritas University. The researcher asked instructors questions concerning the attitude and perceptions on the use of LMS in Veritas university. It was voluntary in nature to encourage collaboration based on the research and the interviews were recorded. Then, the researcher by using open-ended questions asked from participants about their experience of using proposed LMS and their suggestions for making the system easier and user-friendly. The interview was collected through online both (Skype, Facebook and whatsapp video call) and offline recorded by mobile phone recorder. The motivation behind the interview was to acquire an insight about the utilization of the Moodle system in the department, the instructors' perceptions and their experiences, and if they encountered any challenges prior to, or after, the implementation of the Moodle system.

3.5 Participants

Population is defined as a collection or totality of the considerable number of objects, subjects or individuals that fit in with a lot of specifications (Polit & Hungler, 1999). In this research the population were undergraduate students, Masters' and Ph.D. from the department of computer science in Veritas University. Data were gathered from 107 students through the quantitative method - questionnaire. As shown in Table 1 the summaries of participants demographic information such as gender, age and education level. The results from the population indicate that 51.4% were female, and male were

48.6%. The recurrence of male and female indicate that respondents responded well to the survey and results show that 72.9% of the respondents were between (16 - 24), 10.3% were in (25 - 34) of years, around 7.5% were between (35 - 44) year's age, 5.6% were (45 - 54) years and 3.7% were between (55 - 64) year's old range.

Table 1. User's Demographic Information

	Level	**Frequency (F)**	**Percentage (%)**
Gender	Female	55	51.4
	Male	52	48.6
Age	16 - 24	78	72.9
	25 - 34	11	10.3
	35 - 44	8	7.5
	45 - 54	6	5.6
	55 - 64	4	3.7
Education Level	Undergraduate	103	96.2
	Masters	3	2.8
	Ph.D.	1	0.9
	Total	107	100.0

As shown in Table 1; 75 students whose ages (16-24) were mostly undergraduate, three masters' students of whose were (55 - 64). Also, only one Ph.D. whose age was between (55 - 64). At education level, the result shows that 96.2 % of participants were mostly undergraduate and 2.8 % masters' and only 0.9% were PhD. This result shows that the undergraduate students were greater part that participated in this

study. Ph.D. took the last position by population and three Master's degree participated in the research.

3.6 Data Collection Procedure

Questionnaires are being used by researchers to collect information from participants in a research about their experience, perceptions and beliefs. Paraho (2014) defined a questionnaire as a research instrument consisting of a list of questions with instructions on how to record the answers. Moreover, psychologically the way people think and their different beliefs towards things is what the researcher is interested about. This research examines the instructors' and learners' perceptual experience towards LMS usage. So, questionnaire and interview are appropriate data collection tools for this research. Both two instruments were conducted by researcher according to the research questions indicated in Chapter One. Questionnaire was administered to voluntary students in the department who used proposed system. The context of the questionnaire was used to collect participant demographic data. Written questions was also revealed to students' perception and needs likewise instructors were interviewed on the use of LMS to understand their different thought about the system.

3.6.1 Role of Researcher

The researcher first asked for permission to conduct the research study. Letters were issued to the Research and Ethics Committee requesting permission to conduct a study at department of computer science in Veritas University. After permission was granted the researcher sought consent from the randomly selected participants in the department of computer science in Veritas University. Consented individuals were then handed questionnaires and interviewed. The researcher informed of their rights which include, to participate at will, the right not to complete the questionnaire if they are not happy with the content or feel that the questions asked are of prejudice to them

and that they are not obliged to answer all questions. Lastly, collection of the questionnaires from participants and interview from instructors were done which paved the way for data analysis, interpretation and findings.

Throughout this research process the researcher employed non-participant role as suggested by Kervin, Vialle, Herrington and Okley (2006). Therefore, the researcher was not "able to be seen by the participants as the researcher [watched] from outside setting" (Kervin et al., 2006, p. 85).

3.6.2 Validity and Reliability

In every exploration, the analyst ought to have the option to present the precision in the information gathered also examine the analysis with instrument that are dependable and reliable of the study. Golafshani (2003) analysed the validity and reliability of both mixed method and observed that validity of a quantitative research relies upon instrument development, while validity and reliability in subjective research allude to the capacity and abilities of the analyst. Besides, in quantitative research, quality methods means the outcome is replicable and validity shows the level of consistency of results and validity suggest that whether the estimation is precise and whether they are really estimating what they plan to measure. Then again, the terms for making a decision about the nature subjective report depends on quality, consistency, and relevance (Golafshani, 2003) so as to keep up the great unwavering good reliability and validity. Therefore, the study adopted the questionnaire from Kar, Saha and Mondal, (2014), and Rhema and Miliszewska (2014) and the result of the study Cronbach's Alpha at average of 0.88 and 0.87 respectively and the overall result showed a similar result of 0.82.

3.6.3 Data Analysis

The fundamental reason for investigating is for data cleansing and re-model the data so as to increase valuable of information produced by approach used for the analysis. This study, information was dissected by utilizing Statistical Package for the Social Sciences (SPSS). This analytical tool uses windows - based application for purpose of performing data analysis, to edit, for creating tables and charts. SPSS is equipped for dealing with a lot of information and can be used to analyse a whole lot of content properly (Howell, 2010).

Generally, data were analyzed using SPSS version 24. A number of different statistical tests such as ANOVA was used for analyzing this data see the (Appendix A), and the relation and correlation of them with variables were tested. SPSS is a software with high functionality in examining data and providing accurate statistics in descriptive and graphical format. Consequently, for Semi-structured interview content analyses was used. The researcher based on the research questions as shown Table 11 deducted codes as suggested by Attride-Stirling (2001) and based on these codings, analyzed the perceptions of instructors on the proposed LMS system. At the end of both quantitative and qualitative analysis, the researcher put forward the outcomes founded in this study.

Chapter 4

RESULT AND FINDINGS

This study is designed to investigate how learners and instructors perceive the use and implementation of this newly design Moodle-LMS in department of computer science at Veritas University. The study was divided into two parts. The first part of the data were collected from population of 107 students and the form was created using Google forms as questionnaire and the participants logged in with their g-mail account to access the questionnaire and fill and submit the questionnaire online. In the second phase, the study used the data analysis to evaluate the data obtained from quantitative methods. The study used reliability test on the knowledge on e-learning, the importance of LMS in an institution, usage, level of computer literate and comfortability of LMS in an institution that investigate the teachers and students' behavioural factors towards LMS. Therefore, this section first reports the quantitative data findings followed by qualitative findings and aims to answer the research questions given in Chapter 1.

4.1 Quantitative Results

4.1.1 Participant Experience in using E-learning Environment

With respect to students' participant experience in using E-learning environment within the department of computer science in Veritas University, the results from Table 2 show that 73.6% of users are currently using various types of e-learning applications within university and 26.4% users are not using E- learning platform in any form.

Table 2. Participant Experience in using E-learning Environment

Participant Experience in using E-learning Environment	Level	Frequency(F)	Percentage (%)
Are you currently using any LMS?	No	29	26.4
	Yes	78	73.6
Frequencies If Yes, which LMS?	Moodle (web-based platform)	45	57.6
	Edmodo	5	6.4
	Moodle (mobile platform)	2	2.6
	More than one LMSs	26	33.3
The many of the courses student enrol in the University are	50% for online, 50% for face-2-face (blended learning)	45	42.1
	Distance or Online learning	2	1.9
	Conventional classroom	15	14.0
	Teaching approach with heavy online component		

	Conventional Face-2-Face Teaching approach with little or no online component	45	42.1
Do you consider yourself computer competent and comfortable with the use of internet apps and software?	No	4	3.7
	Yes	103	96.3

Also, the majority of the courses enrolled in the University is basically through 50% for online, 50% for face-2-face (blended learning) at 42.1% that is the university uses both classroom instructional approach and online method, while 42.1% of users follow conventional classroom instructional approach with either online or without online method, Also, 14.0% of the respondents supported conventional classroom teaching approach with heavy online component. Therefore, the university follows the modern trend of combining both classroom learning methods and online methods as the mode of teaching to improve both students and instructors. Finally, user's level of competency is high as shown in Table 2, 96.3 % of users show a very high level of computer competency and 3.7 % have low computer competency or inconvenient with the use of internet apps and software

4.1.2 Users' Attitudes Towards LMS Platform

As indicated by Table 3 that most users' attitudes toward the use of LMS platforms were absolutely positive with mean of 4.59 and Q2 result having highest average of 4.78 having Standard Deviation (SD) of 0.56 in this section. Secondly, it was found

that the use of e-learning applications helped improve the educational quality of learning by integrating various kind of multimedia having average value of 4.64 with SD of 0.69. Thirdly, the e-learning applications are more which shows a sign of significant component in learning environment with average of 4.61 and SD of 0.66. Also, the use of e-learning applications makes users' feel confident with average of 4.50 and SD of 0.70. Also, users' response in Q5 implied the negative feeling towards LMS having average of 4.46 and SD of 0.75. The outcome of Cronbach's α values are all above 0.70 as stipulated by Hair, Black, Babin and Anderson, (2013) which shows a significant existence of a robust reliability.

Table 3. Users' Attitude Towards LMS Platform

Users' Attitude Towards LMS Platform	N	Mean	S D
Q1. I feel confident in using computers	107	4.50	0.70
Q2. I believe that e-learning will give me the opportunity to acquire new knowledge.	107	4.78	0.56
Q3. I believe that convenience is an important feature of e-learning	107	4.61	0.66
Q4. E-learning increases the quality of learning because it integrates all forms of media	107	4.64	0.69
Q5. Adopting ICT and E-learning allows for increased student satisfaction	107	4.46	0.75

4.1.2.1 Users' Attitude Towards LMS Platform Depending on Their Age

As indicated by Table 4 that most users' attitudes toward the use of e-learning applications were between 16 - 24 with population of 78. To be specific Q1 shows that the age group were between 45 to 54 with mean of 4.83 and standard deviation of 0.408. This result show that users had high self-confidence in the use of e-learning applications due to past experience and usage of LMS platform. Also, Q2 age group were between 35 and 44. The result show an average of 4.00 with SD of 0.93, this means that this age group had a low self-esteem on the use of such e-learning applications which can be otherwise stated that the age group lack confidence to use the e-learning applications due to many reasons. Also, from Table 4, Q3 shows that all the age groups produce a mean that were greater than the average value of 4.89. This result shows that most users supported the mutual gain of using e-learning to acquire new psychological feature. All the same, the age group between 16 and 24 with mean of 4.50 and SD of 0.62. Also, the age group between 45 and 54 with mean of 4.83 SD of 0.41. This shows that the age group had a moderate mean with low SD which can be justified by the fact that this group does not agree that e-learning applications provide the chance to adopt new way of learning due to their age and lack of experience over the use of e-learning applications. Furthermore, the result for Q3 shows that the average mean in this section is 4.62 and age group between 25 and 34 shows a higher mean compare to other mean which consider e-learning features has a convenient to use application for their daily activities.

Also, Q4 stated that the use of e-learning applications contributes effectively towards learning outcome due to the integration of many multimedia into learning. This again, shows that the younger and middle generation between 16-24; 25-34; 35-44 and 45-

54 gives a higher value compare to the average mean of 4.51 compared to the older generation between 55 and 64.

Table 4. Users Attitude Towards LMS platform Depending on their Age

Users attitude Towards LMS platform	Age	N	Mean	Standard Deviation
Q1.I feel confident in using computers	16 - 24	78	4.50	0.69
	25 - 34	11	4.73	0.47
	35 - 44	8	4.00	0.93
	45 - 54	6	4.83	0.41
	55 - 64	4	5.00	-
	Total	**107**	**4.61**	**.50**
Q2.I believe that e-learning will give me the opportunity to acquire new knowledge.	16 - 24	76	4.72	0.62
	25 - 34	11	4.91	0.30
	35 - 44	8	5.00	0.00
	45 - 54	6	4.83	0.41
	55 - 64	4	5.00	0.00
	Total	**107**	**4.89**	**0.53**
Q3.I believe that convenience is an important feature of e-learning	16 - 24	77	4.62	0.69
	25 - 34	11	4.82	0.60
	35 - 44	8	4.38	0.52
	45 - 54	6	4.50	0.55
	55 - 64	4	4.75	0.50
	Total	**107**	**4.62**	**0.57**
	16 - 24	77	4.64	0.69

Q4.E-learning increases the quality of learning because it integrates all forms of media	25 - 34	11	4.91	0.30
	35 - 44	8	4.75	0.46
	45 - 54	6	5.00	0.00
	55 - 64	4	3.25	0.50
	Total	**107**	**4.51**	**0.39**
Q5. Adopting ICT and E-learning allows for increased student satisfaction	16 - 24	77	4.36	0.81
	25 - 34	11	4.82	0.40
	35 - 44	8	4.88	0.35
	45 - 54	6	4.83	0.41
	55 - 64	4	4.25	0.50
	Total	**107**	**4.63**	**0.49**

The result shows that older generation works towards retire from social activities with educational system so they were not interested and attentive to the new generation of technology and this is because the younger and middle generation are more interested to use technology especially as an integration LMS platform with education. The Q5 shows that the age group between 16-24; 25-34; 35-44 and 45-54 also gives a higher value compare to the average mean of 4.25, this shows that users' of e-learning are more satisfied with the applications and the younger generation between 16 and 24 and older generation were not interested and unsatisfied with the use of e-learning. However, this study therefore in-line with the criteria of Bangor et al. (2009) and Orfanou, Tselios, & Katsanos, (2015) stated that the usability of the evaluated LMSs is satisfactory.

4.1.2.2 Users' Attitude Towards LMS Platform Depending on Their Gender

As indicated by Table 5 below, the total sample size for female is 55 and for male is 52. This result for Q1 shows that female population had the highest mean of 4.56, and SD of 0.63. Also, the result for female, Q2 showed the highest mean of 4.89 and SD of 0.53. This shows that female enjoys the use of e-learning applications and also increase their satisfaction.

Table 5. Users' Attitudes Towards LMS Platform Depending on Their Gender

Users' attitude towards LMS platform	Gender	N	Mean	Standard Deviation
Q1.I feel confident in using computers	Female	55	4.56	0.63
	Male	52	4.48	0.75
Q2.I believe that e-learning will give me the opportunity to acquire new knowledge.	Female	55	4.89	0.31
	Male	52	4.66	0.72
Q3.I believe that convenience is an important feature of e-learning	Female	55	4.58	0.63
	Male	52	4.67	0.68
Q4.E-learning increases the quality of learning because it integrates all forms of media	Female	55	4.71	0.57
	Male	52	4.57	0.78
	Female	55	4.54	0.64

Q5. Adopting ICT and E-learning allows for increased student satisfaction	Male	52	4.39	0.85

In general, the results indicated that the outcomes, for female populace has a supportive mind-set toward LMS even though male students were indifference with the use of LMS. Contrary to previous research on gender attitude towards the use of LMS application found that students' gender does no significantly affect LMS usage (Orfanou, Tselios, & Katsanos, 2015).

4.1.2.3 Users' Attitude Towards LMS Platform Depending on Their Level of Education.

Based on Table 6 most respondents were undergraduate students (N=103). One PhD student and three masters' students. The Q1 result shows that, higher mean are those with master degree and greater than others and the average mean for master's student is 5.00 with SD of 0.00. Though, the population of both masters' and Ph.D. were not considered in this analysis because of low numbers, Master (N=3) and Ph.D (N=1) while students who are undergraduate had (Mean=4.75 with SD=0.698). Generally, both Masters' and Ph.D. are experienced with e-learning technologies. However, most undergraduate students have less experience with this new technology because of the newest of this technology.

Table 6. Users' Attitudes on LMS Platform Depending on Their Level of Education

Users Attitude towards LMS platform	Level of Education	N	Mean	Standard Deviation
Q1.I feel confident in using computers	Undergraduate	103	4.50	0.69
	Master	3	5.00	0.00
	Ph.D.	1	5.00	-
	Total	**107**	**4.20**	**0.75**
Q2.I believe that e-learning will give me the opportunity to acquire new knowledge.	Undergradu ate	103	4.77	0.56
	Master	3	5.00	0.00
	Ph.D.	1	5.00	-
	Total	**107**	**4.11**	**0.65**
Q3.I believe that convenience is an important feature of e-learning	Undergradu ate	103	4.61	0.66
	Master	3	5.00	0.00
	Ph.D.	1	5.00	-
	Total	**107**	**3.79**	**1.07**
Q4.E-learning increases the quality of learning because it integrates all forms of media	Undergraduate	103	4.63	0.69
	Master	3	5.00	0.00
	Ph.D.	1	5.00	-
	Total	**107**	**4.45**	**0.75**
Q5. Adopting ICT and E-learning allows for	Undergraduate	103	4.45	0.75
	Master	3	5.00	0.00

increased satisfaction	**student**	Ph.D.	1	5.00	-
		Total	**107**	**4.15**	**0.87**

Also, the result for Q5, shows that the same answer like Q1 (M=5.00, SD= 0.00) meaning that the result indicates that respondents support because LMS increases with quality of learning if learning through online could give more opportunity to academic pursuit. Therefore, the result of students' attitude towards the use of LMS platform pertaining their level of education shows that most undergraduate use the platform often based on their population similar to the result found by Nurakun Kyzy, Ismailova, & Dündar, (2018).

4.1.3 Users' Perception Towards Proposed LMS Platform

As indicated by Table 7 below that summaries users' perception on proposed LMS platform is that fairly satisfactory. The result of the Q1 shows that mean is 4.27 and standard deviation is 0.74 and Q2, users' perception toward proposed LMS application shows that the planned LMS is easy to use and friendly with mean equals to 4.19 and SD of 0.81. The results of Q3 shows that users perception toward proposed LMS application on level of computer competency has the mean of 4.35 and SD of 0.65. For Q4, users' perception toward planned use of LMS on overall the framework of the LMS with mean equals to 4.35 and SD of 0.721. Likewise, Q5: users perception toward proposed LMS application on the links course within the platform are understandable and easy to use with mean equals to 4.44 and SD of 0.588 and the results shows satisfaction in the proposed LMS application.

Table 7. Users' Perception on the Proposed LMS Platform

Users' Perception Towards Proposed LMS Application	Mean	Standard Deviation
Q1. The language used in proposed system is easy to understand.	4.27	0.740
Q2. The links between the pages are clear and easy to follow.	4.19	0.813
Q3. Design of the proposed system is user- friendly.	4.35	0.650
Q4. I like using proposed system because I am computer literate.	4.35	0.721
Q5. The connections between the pages are clear and easy to follow	4.44	0.588

Therefore, the result for Q1 and Q2 mean were lower than the other questions which indicate that users of e-learning application are not finding it easy to understand and e-learning application is not flexible.

4.1.3.1 Users' Perception Towards the Proposed LMS Platform Depending on Age

As indicated by Table 8, the result shows that the population of group age between 16 and 24 is higher than others of 78. From Q1 - users' perception toward proposed LMS application on the communication tool used during the course of using the LMS is easy to use and friendly. The overall participants satisfaction with the terminology used

during the course of using the LMS was high with overall average mean of 4.20. With the regard to the age group between 35-44 with mean of 4.13 and standard deviation of 0.99 and the age ground of 55-64 with mean of 3.50 with standard deviation of 1.00 respectively. The result demonstrated that the age range were least satisfied based on the language used for proposed LMS application while other groups have a better understanding and easy to use approach of LMS application. Also, Q2 shows that users' ages ranging between 16-24, 35-44 and 55-64 have less interest about proposed e-learning application with age group of 35-44 having the lowest mean of 3.50. For Q3, users perception toward proposed LMS application on using proposed system because of level of computer competency with average mean of 4.53 and considering the age ranges 16-24, 25-34 and 35-44 with mean equals to 4.29 and SD of 0.67; mean of 4.17, SD of 0.69 and; mean equals to 4.13 and SD of 0.354 respectively with low mean, this shows that these age groups have the low level of computer competency on the use of LMS application as shown in Table 8. Q4 shows that the same range as Q3 which can be stated that the structure of the LMS is not spectacular.

Table 8. Users' Perception Towards Proposed LMS Platform Depending on Their Age.

Users' Perception Towards Proposed LMS platform	**Age**	**N**	**Mean**	**SD**
Q1. The language used in proposed system is easy to understand.	16 - 24	78	4.27	0.69
	25 - 34	11	4.27	0.79
	35 - 44	8	4.13	0.99
	45 - 54	6	4.83	0.41
	55 - 64	4	3.50	1.00
	Total	**107**	**4.20**	

Q2. The links between the pages are clear and easy to follow.	16 - 24	78	4.17	0.82
	25 - 34	11	4.50	0.53
	35 - 44	8	3.75	1.16
	45 - 54	6	4.83	0.41
	55 - 64	4	4.00	0.00
	Total	**107**	**4.25**	
Q3. Design of the proposed system is user friendly.	16 - 24	78	4.29	0.67
	25 - 34	11	4.40	0.69
	35 - 44	8	4.13	0.35
	45 - 54	6	4.83	0.42
	55 - 64	4	5.00	0.00
	Total	**107**	**4.53**	
Q4.I like using proposed system because I am computer literate.	16 - 24	78	4.33	0.68
	25 - 34	11	4.10	0.88
	35 - 44	8	4.25	1.04
	45 - 54	6	4.67	0.52
	55 - 64	4	5.00	0.00
	Total	**107**	**4.47**	
Q5. The overall design of the learning management system is welcoming.	16 - 24	78	4.42	0.62
	25 - 34	11	4.40	0.52
	35 - 44	8	4.50	0.54
	45 - 54	6	4.83	0.41
	55 - 64	4	4.25	0.50
	Total	**107**	**4.48**	

However, Q5 shows that the age population ranges among 16-24, 25-34 and 55-64 have the least mean ranges due to users' age and perception toward proposed LMS application on the connections between within LMS pages are visible with good direction. Generally, students' and teachers' perceptions of LMS usage may vary as also found by Emelyanova & Voronina, (2014).

4.1.3.2 Users' Perception Towards Proposed LMS Platform Depending on Their Gender.

As indicated by Table 9 below which summaries that female population are more than male as also found by Cavus, (2011). In Q1, the users' perception on the proposed LMS application on the communication aspect of the proposed system is easy and friendly and the mean for female equals to 4.31 with SD of 0.77. The result implies that female have tendency to enjoy the use of LMS more than the male. Also, Q2 shows that female has mean value that is equals to 4.38 with SD of 0.65 and believes that users' perception toward proposed LMS is user-friendly unlike the male with mean equals to 4.30 and SD of 0.65. Also, the outcome of Q3 for users perception toward proposed LMS application on using proposed system because of level of computer competency" having the same mean of female population of 4.35 with SD of 0.73 and male having mean value that is equals to 4.35 and SD of 0.72 that is their level of competency is average. Q4, shows that female standard mean equals to 4.49 which shows that female enjoy the structure of LMS. Also, Q5: users perception toward proposed LMS application on connections between within LMS pages are visible with good direction and the male population shows a mean equals to 4.28 with SD of 0.67 which is greater than female mean equals to 4.13 with SD of 0.92. The outcome of the study indicated that the main focus of male is that they understand and follow the links with the LMS while female find it difficult to do so.

Table 9.Users' Perception Towards Proposed LMS Platform Depending on Their Gender.

Users' Perception Towards Proposed LMS Application	Gender	N	Mean	SD
Q1. The language used in proposed system is easy to understand.	Female	55	4.31	0.77
	Male	52	4.21	0.72
Q2. The links between the pages are clear and easy to follow.	Female	55	4.38	0.65
	Male	52	4.30	0.65
Q3. Design of the proposed system is user-friendly.	Female	55	4.35	0.73
	Male	52	4.35	0.72
Q4.I like using proposed system because I am computer literate.	Female	55	4.49	0.51
	Male	52	4.38	0.67
Q5. The overall design of the learning management system is welcoming.	Female	55	4.13	0.92
	Male	52	4.28	0.67

Contrary to previous research on gender perception towards the use of LMS application found that students' gender does no significantly affect LMS usage (Orfanou, Tselios, & Katsanos, 2015).

4.1.3.3 Users' Perception Towards Proposed LMS Platform Depending on Their Level of Education

Table 10 below summarizes the population of undergraduates (N=103) are far more than master and Ph.D. users (N=3) and (N=1). Also, from the result which shows that

the lowest population cannot be fully trusted and accepted. Therefore, Q1 shows that users perception toward proposed LMS application on the communication is simple and friendly with mean equals to 4.73, the result ascertain that undergraduates the mean equals to 4.23 and SD of 0.74 which is greater than the standard mean. The master' and Ph.D. having mean of 5.00 as the highest mean compare to others since it has just 3 and 1 the result is ignored. However, in the Q2: users perception toward proposed LMS application on structure of the proposed LMS is user-friendly with average of 4.73 which makes the mean of undergraduates equals to 4.32 with standard deviation of 0.65 again as the highest mean compare to others. However, the master degree and Ph.D. have mean of 5.00 as the highest mean compare to others. Since, it had just 3 and 1, the result is neglected. Q3 shows that users perception toward proposed LMS application on using proposed system because of level of computer competent with mean of 3.79 and the mean of undergraduates equals to 4.32 with SD of 0.65 higher mean than average mean. However, the master degree and Ph.D. have mean of 5.00 as the highest mean compare to others since it has just 3 and 1, the result is neglected. Q4, users perception toward proposed LMS application seem to enjoy the structure of LMS with average of 4.70. Also, undergraduate result shows a mean that is equals to 4.43 and SD of 0.59 and masters' having mean equals to 4.67 with SD of 0.58. The result shows that the mean less than average and the group believes the structure of LMS is not attractive at all. Finally, Q5 shows that users perception toward proposed LMS application on designing of the proposed LMS is simple and attractive with the mean equals to 4.15 which shows that the undergraduates mean equals to 4.17 with SD of 0.81 have a greater mean than average. Nevertheless, the master degree and Ph.D. have mean of 5.00 as the highest mean compare to others since it has just 3 and 1, the result is neglected.

Table 10. Users' Perception towards the Proposed LMS Platform Depending on Their Level of Education

Users' Perception Towards Proposed LMS Platform	Level of Education	N	Mean	Standard Deviation
Q1. The language used in proposed system is easy to understand.	Undergraduate	103	4.23	0.744
	Master	3	5.00	0.00
	Ph.D.	1	5.00	-
	Total	**107**	**4.73**	**0.752**
Q2. The links between the pages are clear and easy to follow.	Undergraduate	103	4.32	0.647
	Master	3	5.00	0.00
	Ph.D.	1	5.00	-
	Total	**107**	**4.73**	**0.655**
Q3. Design of the proposed system is user-friendly.	Undergraduate	103	4.32	0.723
	Master	3	5.00	0.00
	Ph.D.	1	5.00	-
	Total	**107**	**3.79**	**0.723**
Q4.I like using proposed system because I am computer literate.	Undergraduate	103	4.43	0.589
	Master	3	4.67	0.577
	Ph.D.	1	5.00	-
	Total	**107**	**4.70**	**0.583**
Q5. The overall design of the learning management system is welcoming.	Undergraduate	103	4.17	0.813
	Master	3	5.00	0.00
	Ph.D.	1	5.00	-
	Total	**107**	**4.15**	**0.813**

These findings align with prior studies on the positive impact of e-learning systems on student learning based on their educational level (Alkhalaf, Drew, & Alhussain, 2012; Cavus, 2011). Notwithstanding, most literature generalize their finding on students which comprises undergraduate and graduate levels (Cavus, 2011; Ozkan, & Koseler, 2009).

4.2 Qualitative Analysis

The research utilised semi-structured interviews on the usability and perception towards the proposed LMS platform. In this section the study answers the first research question -What are the benefits of implementing LMS for students and instructors to achieve LMS objectives within the department of Computer Science? The interview questions are taken from Amen (2017) (Appendix B). The researcher conducted interviews with the instructors (N = 4) who participated in the research and with students (N=5) who use' LMS from the Department of Computer Science, Veritas University with various views about proposed system this is because of the following questions. Following the interviews, all data was analysed and coded as Attride-Stirling (2001) recommends. The codes include I1, I2, I3, I4 and I5 and what they refer to are given in Table 11.

Table 11. Research Questions and Terms used for Interview

Interview Questions	Terms used for Interview
I1. Overall, do you feel impressed on the use of LMS as part of your education in this semester?	Instructor and student impression over the LMS usage
I2. As a user, Does the use of LMS meet your overall performance?	Instructor and student perception over the LMS performance

I3. As a user, Does LMS platform meet your needs?	Need to know whether LMS meet the need of instructor and student
I4. Do you enjoy LMS usefulness for teaching and learning?	Its usefulness for instructor and student
I5. Do student/instructor encounter issues before the full implementation of LMS in the university?	Instructor and student issues over the LMS usage

4.2.1 What are the benefits of implementing LMS for instructors to achieve LMS objectives within the Department of Computer Science?

Part one of the second phase of this study is to conduct an interview with instructors from Veritas University, Computer Science Department using semi-structured approach and the focus are the research questions from Table 11, and this includes instructor's feeling and impression about LMS usage. Their beliefs on LMS platform fosters learning, straight forward, and it makes teaching and learning effective. Also, the instructors believe about LMS effectively and efficiently to deliver teaching and course materials as well as conduct online tests for students.

I1. Overall, Do Instructors feel impressed on the use of LMS as part of their education in this semester?

The instructors supported the idea that it is necessary to implement e-learning in University:

T1: To be precise, the Veritas Moodle Online reminds me of Rosemont College online classroom (Moodle), Edx, and some other Massive Open Online Courses

(MOOC), I have participated in through distance learning. Therefore, I am so impressed using the LMS here in Veritas University, Abuja.

Another participating teacher indicated the friendliness and the usability of the learning systems with the following words:

T2: said: user friendly, easy to use and satisfactory.

T3: very fast, convenient and easy to use. In terms of accessing information, writing tests and submitting assessments.

T4: My impression of learning management system is that, it is very interesting and motivating as it helps in easy research and understanding though it can be stressful and data consuming.

This means that instructors supported the proposed use of LMS platform in Veritas University through good impressions of the LMS as part of proposed implementation.

I2. Do Instructors' evaluations on the use of LMS meet the overall performance?

The instructors' views on system performance of proposed use of LMS platform in Veritas University are satisfactory. This was indicated with the following words:

T1: it has been a great pleasure to be a part of the users of this LMS system and I strongly encourage the continual use.

T2: The system performance of the LMS used in this semester is explicit.

T4: Satisfactory.

On the other hand, a participant teacher indicated some challenges such network connection and time allotted for course on LMS with the following words;

T3: There was delay in network connection and time allotted for the course was not enough which leads to fastness during learning process.

Therefore, it can be concluded that, the use of LMS is a good way of delivering courses once the problems regarding network connection is removed and more time is allocated for course.

I3. Do instructors as a user of LMS platform meet your needs?

All participant teachers provided positive perceptions regarding the use of the LMS platform to comply with the user requirements. The typical response was "*Yes, it is satisfying for me as a user*".

I4. Do instructors enjoy LMS usefulness for teaching and learning? Why?

All participants provided positive feedback in terms of the usefulness of the LMS in instruction and the following are the comments gathered from the participants:

T1: Yes, because it an effective method for carrying out learning process.

T2: I strongly believe that LMS is necessary for instruction because it helps the instructor and the learners to gain effective, easy, faster and first-hand knowledge of the subject matter taught and it equally broadens their learning horizon.

T3: Yes, I do, So much. Because it's the best way to get knowledge without having to stay away from the things you love doing. It's easy to access and use. Makes me love what I do (computing).

T4: Yes. Because they enabled me to effectively and efficiently deliver my teaching and course materials as well as conduct online tests for my students.

I5. Do instructors encounter issues before the full implementation of LMS in the university?

On the contrary to other findings, there are issues on the use of planned LMS. As reported by instructors many obstacles are mentioned below so as to enable fully implementation on the use of LMS in Nigeria such as:

T1: Poor or inadequate ICT infrastructure, Poor network facilities, Insufficient trained manpower, the burden of buying data to be able to use internet facilities, Lack of adequate government/ school management support and Poor funding of ICT related projects.

T2: Computer illiteracy, lack of interest, lack of basic facilities.

T3: The encountered issues before the full implementation of LMS are as follows: lack of stable network, cost of using the network for browsing, lack of stable and adequate power supply, lack of fund, poverty of infrastructural facilities for LMS operations, and lack of expertise and technical-known-how of the LMS.

T4: Little or no attention is paid to this area by the government agencies and the law makers and inadequate finances and orientation.

Similar to the result, (Davis, 1989; Fathema, Shannon & Ross, 2015) state that LMS is positively affected by intention that influences their actual use of LMS. Therefore, when educational stakeholders measure the level of usability of the LMS, it helps educational development also develop a positive attitude towards it which is similar to the outcome of this study. These findings show that only four instructors were interviewed which serves as a disadvantage for the proposed LMS system.

4.2.2 What are the benefits of implementing LMS for students to achieve LMS objectives within the department of Computer Science?

The second part two of this study is the results of interview with students from Veritas University, computer science department and the focus are the research questions from Table 11, includes students' feeling and perception about LMS usage. Their beliefs on LMS platform and the purpose for using LMS. Also, the students believe that using LMS is an effective and efficient way to deliver teaching and course materials as well as conduct online tests. The following reports show students' responses.

I1. Overall, do students' feel impressed on the use of LMS as part of their education in this semester?

One of the participants pointed out that the proposed LMS made it easy for them to access information and this in return enhanced their education;

S1: Educative and easy access to information.

Another student indicated that the LMS made their course more interesting so they were more enthusiastic in taking and participating in the course;

S2: It has really been interesting and educating because it helps me to develop critical thinking ability and help me explore more opportunities as a student.

S3: It helps me develop critical thinking ability and help me explore more opportunities as a student.

S4: I'm starting to be more enthusiastic to learn. This is because the LMS is user friendly and makes learning easy and achievable.

Based on the above responses of the students, conclusively students supported proposed use of LMS platform in Veritas University through good impressions of the LMS as part of new educational innovation.

I2. Do students' evaluations on the use of LMS meet the overall performance?

The students' views on system performance of proposed use of LMS platform in Veritas

University is satisfactory. This was indicated with the following words**;**

S1: Good.

S2: I enjoyed it, but had a little challenge with network.

S3: It's quite interesting.

S4: It is indeed impressive and has taught me a lot.

This means that students' views on system performance of proposed use of LMS platform in Veritas University are satisfactory and impressive.

I3. Do students as a user of LMS, has this platform meet the needs?

All participant students provided positive perceptions regarding the use of the LMS platform as comply with the user requirements. Their responses were "Yes" which means that students are satisfied with LMS platform.

S1: Yes, of course it really gave me all I needed in the course of my study

S2: Yes

S3: Yes, it does

S4: Yes

This means that students adapt to the conditions to use of LMS in Veritas University.

I4. Do students enjoy LMS usefulness for teaching and learning? Why?

All participants provided positive feedback in terms of the usefulness of the LMS in learning and the following are the comments gathered from the participants:

S1: Yes. It helps students to acquire more skills in computer usage.

S2: Yes, I do. Reason: For ease of use, satisfaction and increased learn ability

S3: Yes, because it is convenient to use and user friendly.

S4: Yes, because it makes easier for the student by also using media to influence learning.

All participants (students) believe enjoy LMS usefulness for learning. Their responses were "Yes" which means that students believe in LMS services.

I5. Do student encounter issues before the full implementation of LMS in the university?

There are obstacles students mentioned on using the proposed implementation of LMS system which include the following:

S1: Practical learning not sufficient.

S2: Illiteracy and lack technology.

S3: Lack of Internet connectivity for mobile device or pc.

S4: Lack of adequate finances and implementation by the government.

Similar to the results by Fadel, Elbilgahy, Ibrahim and Elmashad. (2019), this study also shows positive attitudes toward LMS usability and the ability to increase students' interest in the long time. Therefore, students measure the level of usability of the LMS, its usefulness to educational development shows positive attitude and perception towards LMS. This is in-line with the interview with the instructors and students. This

is due to instructors and students' attitude and perceptions towards the use of LMS, it can be concluded that although there are many advantages using an LMS, there are some limitations of using it. It is therefore stated that both instructors and students - research participants, prefer the advantages of LMS, in terms of role, usage and comfortability of LMS. On the contrary, only few issues were spotted by instructors and students such as little or no attention is paid to this area by the government agencies and the law makers such as inadequate finances and orientation; a deficiency of power, a low nature of web supplied and security issues may be part of the challenges. These issues should be the targets of educational community if it is aimed at fully implementing LMS in education.

Finally, the study was conducted using mixed (quantitative and qualitative) methods, and concluded that the attitude and perceptions of students and instructors towards the exploitation of LMS which combine both benefits and challenges for using the application in the universities. However, from the results and findings most students and instructors that participated in this research express their feelings, because this will promote the improvement in many areas such as planning, designing and performance on the use of LMS system in Nigerian educational system. Also, there are some difficulties of which students and instructors pointed out as part of LMS limitations for veritas university especially computer science department.

Chapter 5

CONCLUSIONS AND FUTURE WORKS

5.1 Conclusions

The study concludes by investigating the attitude and perceptions of students and instructors towards the use of Moodle LMS in Computer Science Department, Veritas University;

- Generally, the LMSs have the potential to become an effective solution for providing to teaching-learning process along with other new methods. It is important to understand instructors and students' attitude and perception towards using e-learning applications in higher education.

- The use of LMS can be added advantage to existing traditional method to improve learning process and enhancing the instructor's acceptance and further show ease of use, usefulness, educational quality, technology complexity attributed towards user's intention on the adoption of LMSs in institutions.

- Countries in Sub-Sahara region in Africa need E-learning application to improve educational equality both in private and public institutions as part of education for all. However, illiteracy and lack technology, practical learning not sufficient, lack of adequate finances and implementation by the government might resulted into pessimistic approach and perceptual

experience toward LMS and general increase familiarity towards the LMS features and functionalities (Tawalbeh, 2018).

- In this study both students and instructors are not new LMS - functionalities and quality of this application. However, delay in network connection and time allotted for the course was not enough which leads to fastness during learning process made LMS non-effective as the proposed system is below expectation towards the research assumption. Notwithstanding, the results show that both students and instructors are increasingly perceptive on incorporating innovation as a major aspect of the new-age innovations with both of them adjusting and accepting the new practical applications.

- From the findings the results show that 73.6% of users are currently using various types of e-learning applications within university and 26.4% users are not using E- learning platform in any form, most users' attitudes toward the use of e-learning applications were between undergraduates, female populace has a supportive mind-set toward LMS than male students. users' perception on proposed LMS application is that fairly satisfactory, most users' perception toward the use of e-learning applications were between undergraduates with female support the use of LMS more than male

- Also, based on the qualitative analysis it can be, conclusively that both lecturers and students supported proposed use of LMS platform in Veritas University through good impressions of the LMS as part of new educational innovation.

- In conclusion, the absence of recognition with the e-learning strategies and all critically issues, adaptation, level of computer competency are the biggest issues for most universities. Hence, it is vital for educational stakeholders in institutions to help improve on most of the issues faced by instructors and students by equipping them with basic requirement for 21st century technologies.

5.2 Implications of the Study

The theoretical implications for this investigation demonstrates the approach and perceptual experience toward LMS in Department of Computer Science, Veritas University were positively significant this is due to the technology functionalities that are now integrated into learning activity, this brings more and new approach to school curriculum such as flip-classroom, blended learning, Massive Open Online Courses.

Second, the practical implication of this study shows the designers and providers some clear view of the potential and perceptions of e-learning systems in educational settings. One such implication from this study is that LMSs are complex for teaching, communicating and collaborating which are the core value of e-learning systems process (Cidral, Oliveira, Di Felice & Aparicio, 2018). According to our findings, instructors would benefit if designers and providers consider ways of minimizing the complexity of the content, collaboration and communication with the platforms.

5.3 Future Works

Although the study provides positive and fresh perceptions towards both theoretical and real-life challenges, however nothing without its own drawback. LMS has been used and it fully functional in institutions across the globe. However, there are still

some challenges, adding more functionality such cloud-based platform, gamification might be added advantage for LMS. Working on the impact of integrating LMS in institutions that focus on students' academic and learning outcomes which might be added advantage. Furthermore, doing the seminars, workshops or a training course before working on LMS application, gives more added advantage to LMS user. Future study can also focus on comparing the use of LMS with other institutions inform of comparative analysis of e-learning platforms with other universities.

REFERENCES

Alkhalaf, S., Drew, S., & Alhussain, T. (2012). Assessing the impact of e-learning systems on learners: A survey study in the KSA. *Procedia-Social and Behavioral Sciences*, 47, 98-104.

Almarashdeh, I. (2016). Sharing instructors experience of learning management system: A technology perspective of user satisfaction in distance learning course. *Computers in Human Behavior*, 63, 249-255.

Amen, H. H. (2017). *The Effectiveness and Application of the Moodle LMS (Learning Management System) According to the Students' and Instructors' Perceptions at the University of Sulaimani, School of Basic Education* (Master's thesis, Eastern Mediterranean University EMU-Doğu Akdeniz Üniversitesi (DAÜ)).

Al-Zaidiyeen, N. J., Mei, L. L., & Fook, F. S. (2010). Teachers' Attitudes and Levels of Technology Use in Classrooms: The Case of Jordan Schools. *International education studies*, 3(2), 211-218.

Ardito, C., Costabile, M. F., De Marsico, M., Lanzilotti, R., Levialdi, S., Roselli, T., & Rossano, V. (2006). An approach to usability evaluation of e-learning applications. *Universal access in the information society*, 4(3), 270-283.

Attride-Stirling, J. (2001). Thematic networks: an analytic tool for qualitative research. *Qualitative research*, 1(3), 385-405.

Awang, H., Aji, Z. M., Yaakob, M. F. M., Osman, W. R. S., Mukminin, A., & Habibi, A. (2018). Teachers' intention to continue using Virtual Learning Environment (VLE): *Malaysian context. JOTSE*, 8(4), 439-452.

Bangor, A., Kortum, P., & Miller, J. (2009). Determining what individual SUS Scores mean: adding an adjective rating scale. *Journal of Usability Studies,* 4(3), 114–123.

Bazylak, J., & Weiss, P. E. (2017). Online Evolution: Advantages and Challenges of Online Course Components. *Proceedings of the Canadian Engineering Education Association (CEEA).*

Beatty, B., & Ulasewicz, C. (2006). Online teaching and learning transition: Faculty perceptions on Moving from Blackboard to the Moodle learning management system. *TechTrends*, 50(4), 36–45. doi:10.1007/s11528-006-0036-y.

Bonk, C. J., & Graham, C. R. (2012). The handbook of blended learning: *Global perceptions, local designs*. John Wiley & Sons.

Bryman, A. (2017). Quantitative and qualitative research: further reflections on their integration. *In Mixing methods: Qualitative and quantitative research* (pp. 57-78). Routledge.

Carvalho, A., Areal, N., & Silva, J. (2011). Students' perceptions of Blackboard and Moodle in a Portuguese university. *British Journal of Educational Technology*, 42(5), 824-841.

Cavus, N. (2011). Investigating mobile devices and LMS integration in higher education: Student perspectives.*Procedia Computer Science* 3 1469-1474.

Cidral, W. A., Oliveira, T., Di Felice, M., & Aparicio, M. (2018). E-learning success determinants: Brazilian empirical study. *Computers & Education*, 122, 273-290.

Creswell, J. (2002). Educational research: Planning, conducting, and evaluating *quantitative and qualitative research*. Upper Saddle River, NJ: Merrill Prentice Hall.

Creswell, J. W., Hanson, W. E., Clark Plano, V. L., & Morales, A. (2007). Qualitative research designs: Selection and implementation. *The counseling psychologist*, 35(2), 236-264.

Damnjanovic, V., Jednak, S., & Mijatovic, I. (2015). Factors affecting the effectiveness and use of Moodle: students' perception. *Interactive learning environments*, 23(4), 496-514.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, 319-340

Dawes, J. (1999). The relationship between subjective and objective company performance measures in market orientation research: further empirical evidence. *Marketing bulletin-department of marketing massey university*, 10, 65-75.

De Smet, C., Valcke, M., Schellens, T., De Wever, B., & Vanderlinde, R. (2016). A Qualitative Study on Learning and Teaching with Learning Paths in a Learning Management System. *Journal of Social Science Education*, 15(1), 27-37.

Dias, S. B., & Diniz, J. A. (2014). Towards an enhanced learning management system for blended learning in higher education incorporating distinct learners' profiles. *Journal of Educational Technology & Society*, 17(1), 307-319.

Emelyanova, N., & Voronina, E. (2014). Introducing a learning management system at a Russian university: Students' and teachers' perceptions. *The International Review of Research in Open and Distributed Learning*, 15(1).

Epping, R. (2010). Innovative use of Blackboard® to assess laboratory skills. *Journal of Learning Design*, 3(3), 32-36.

Fadel, E. A., Elbilgahy, A. A., Ibrahim, I. A., & Elmashad, H. A. M. (2019). Undergraduate Nursing Students' and Lecturers' Attitudes towards Modular Object-Oriented Dynamic Learning Environment: A Quasi Experimental Study. *American Journal of Nursing*, 7(1), 24-30.

Falvo, D. A., & Johnson, B. F. (2007). The use of learning management systems in the United States. *TechTrends,* 51(2), 40–45. DOI:10.1007/s11528-007-0025-9.

Fathema, N., Shannon, D., & Ross, M. (2015). Expanding the Technology Acceptance Model (TAM) to examine faculty use of Learning Management Systems (LMSs) in higher education institutions. *Journal of Online Learning & Teaching*, *11*(2).

Fraenkel, J. R., & Wallen, N. E. (2006). How to design and evaluate research in education (5th ed.). New York: McGraw-Hill Publishing.

Gallagher, S., Sixsmith, A., Leveaux, R., & Simpson, H. (2017, January). Transitioning the classroom: The shift towards blended and flipped learning. In *Proceedings of the 30th International Business Information Management Association Conference, IBIMA 2017-Vision 2020: Sustainable Economic development, Innovation Management, and Global Growth*.

Galliers, R. D. (1992). *Choosing information systems research approaches*.

Gautreau, C. (2011). Motivational factors affecting the integration of a learning management system by faculty. *Journal of Educators Online*, 8(1), n1.

Gilhooly, K. (2001). Making e-learning effective. *Computerworld,* 35(29), 52-53.

Golafshani, N. (2003). Understanding reliability and validity in qualitative research. *The Qualitative Report*, 9(4), 597-606.

Granell, X. (2015). Research methods for studying multilingual information management: an empirical investigation. *Multilingual Information Management*, 89–114.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2013). Multivariate data analysis: *Pearson new international edition*. Pearson Higher Ed.

Horvat, A., Dobrota, M., Krsmanovic, M., & Cudanov, M. (2015). Student perception of Moodle learning management system: a satisfaction and significance analysis. *Interactive Learning Environments*, 23(4), 515-527.

Howell, D. C. (2010). *Fundamental statistics for the behavioral sciences*, 7th edition (7th Edition ed.).

Huseynov, F., & Yıldırım, S. Ö. (2016). Internet users' attitudes toward business-to-consumer online shopping: A survey. *Information Development*, 32(3), 452-465.

Jafari, S. M., Salem, S. F., Moaddab, M. S., & Salem, S. O. (2015, August). Learning Management System (LMS) success: An investigation among the university students. In 2015 *IEEE Conference on e-Learning, e-Management and e-Services (IC3e)* (pp. 64-69). IEEE.

Jamal, H., & Shanaah, A. (2011). The Role of Learning Management Systems in Educational Environments: *An Exploratory Case Study*.

Kar, D., Saha, B., & Mondal, B. C. (2014). Attitude of university students towards elearning in west Bengal. American Journal of Educational Research, 2(8), 669-673.

Kervin, L., Vialle, W., Herrington, J. & Okley, T. (2006). *Research for educators.* Melburne, Australia: Thomson.

Khan, B.H. (2001): Web-Based Training, Educational Technology Publications, *Englewood Cliffs*, NJ, 2001

Kirkup, G., & Kirkwood, A. (2005). Information and communications technologies (ICT) in higher education teaching—a tale of gradualism rather than revolution. *Learning, Media and Technology*, 30(2), 185-199.

Kutlu, M. O., & Korkmaz, S. (2013). Student perceptions on Study Skills in a Turkish State Secondary School Sample from Adana. *World Journal of Education*, 3(6), 15- 26.

Landry, B. J., Griffeth, R., & Hartman, S. (2006). Measuring student perceptions of blackboard using the technology acceptance model. Decision Sciences. *Journal of Innovative Education*, 4(1), 87-99.

Livingstone, S. (2012). Critical reflections on the benefits of ICT in education. *Oxford review of education*, 38(1), 9-24.

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).

Morris, J. (2004). Features and functions are merely trifles in the selection of a course management system. *THE Journa*l, 31(11).

Mozhaeva, G., Feshchenko, A., & Kulikov, I. (2014). E-learning in the evaluation of students and teachers: LMS or social networks?. *Procedia-Social and Behavioral Sciences*, 152, 127-130.

Nanayakkara, C. (2007). A model of user acceptance of learning management systems: A study within tertiary institutions in New Zealand. *The International Journal of Learning*, 13(12), 223-232.

Nguyen, T. (2015). The effectiveness of online learning: beyond no significant difference and future horizons. *Online Learning and Teaching*, 11(2).

Nurakun Kyzy, Z., Ismailova, R., & Dündar, H. (2018). Learning management system implementation: a case study in the Kyrgyz Republic. Interactive *Learning Environments*, 26(8), 1010-1022.

Orfanou, K., Tselios, N., & Katsanos, C. (2015). Perceived usability evaluation of learning management systems: Empirical evaluation of the System Usability Scale. *The International Review of Research in Open and Distributed Learning*, 16(2), 227-246.

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.

Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. Administration and policy in mental health and mental health services research, 42(5), 533-544.

Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and policy in mental health and mental health services research*, 42(5), 533-544.

Paraho, k. (2014) *Nursing research: principles, process and issues* (Third edition ed.)

Pishva, D., Nishantha, G. G. D., & Dang, H. A. (2010, February). A survey on how Blackboard is assisting educational institutions around the world and the future trends. In 2010 *The 12th International Conference on Advanced Communication Technology (ICACT)* (Vol. 2, pp. 1539-1543). IEEE.

Polit, D. F., & Hungler, B. P. (1999). Nursing Research: Principles and Methods.

Prestridge, S. (2012). The beliefs behind the teacher that influences their ICT practices. *Computers & education*, 58(1), 449-458.

Reigeluth, C. M. (1997). Educational standards: To standardize or to customize learning?. Phi *Delta Kappan*, 79, 202-206.

Reigeluth, C. M., & Garfinkle, R. J. (1994). Systemic change in education. *Educational Technology*.

Rhema, A., & Miliszewska, I. (2014). Analysis of student attitudes towards e-learning: The case of engineering students in Libya. *Issues in informing science and information Technology*, 11(1), 169-190.

Sait, A. R. W., Uthayakumar, J., Shankar, K., & Kumar, K. S. (2019). Introduction to Multimedia Tools and Applications. *In Handbook of Multimedia Information Security: Techniques and Applications* (pp. 3-14). Springer, Cham.

Sandelowski, M., & Barroso, J. (2003). Writing the proposal for a qualitative research methodology project. *Qualitative health research*, 13(6), 781-820.

Saunders, M. N., & Lewis, P. (2012). Doing research in business & management: *An essential guide to planning your projec*t. Pearson.

Schibeci, R., MacCallum, J., Cumming-Potvin, W., Durrant, C., Kissane, B., & Miller, E. J. (2008). Teachers' journeys towards critical use of ICT. *Learning, Media and Technology*, 33(4), 313-327.

Schlechty, P. C. (1990). Schools for the Twenty-First Century: Leadership Imperatives for Educational Reform. *The Jossey-Bass Education Serie*s. Jossey-Bass Inc., Publishers, 989 Market St., San Francisco, CA 94103.

Shawar, A. (2009). Learning Management System and its Relationship with Knowledge Management. 19 -22.

Shee, D. Y., & Wang, Y. S. (2008). Multi-criteria evaluation of the web-based elearning system: A methodology based on learner satisfaction and its applications. *Computers & Education*, 50(3), 894-905.

Sherry, M. (1992). Integrated learning systems: What may we expect in the future. *Educational Technology*, 32(9), 58-59.

Siemens, G. (2013). Learning analytics: The emergence of a discipline. *American Behavioral Scientist*, 57(10), 1380-1400.

Skalka, J., & Drlík, M. (2009). Avoiding Plagiarism in Computer Science E-Learning Courses. *Problems of Education in the 21st Century*, 16.

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.

Szabo, M. (2002). Cmi theory and practice: Historical roots of learning managment systems. In E-Learn: World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education . *Association for the Advancement of Computing in Education* (AACE) (pp. 929-936).

Tawalbeh, T. I. (2018). EFL Instructors' Perceptions of Blackboard Learning Management System (LMS) at University Level. *English Language Teaching*, 11(1), 1-9.

Taylor, F. P. (2004). Education technology helps unite school communities, improve academic achievement. *THE Journal (Technological Horizons In Education)*, 31(10), 46.

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).

Watson, R. (2015). Quantitative research. *Nursing Standard* (2014+), 29(31), 44.

Wei, H. C., Peng, H., & Chou, C. (2015). Can more interactivity improve learning achievement in an online course? Effects of college students' perception and actual use of a course-management system on their learning achievement. *Computers & Education*, 83, 10-21.

Wen, T. S., & Lin, H. C. (2007, April). The study of e-learning for geographic information curriculum in higher education. In Proceedings of 6th international conference on applied computer science, Hangzhou, China,

published by *World Scientific and Engineering Academy and Society* (pp. 626-621).

Wilcox, D., Thall, J., & Griffin, O. (2016, March). One canvas, two audiences: How faculty and students use a newly adopted learning management system. In Society for Information Technology & Teacher Education International Conference(pp. 1163-1168). *Association for the Advancement of Computing in Education* (AACE).

Yilmaz, K. (2013). Comparison of quantitative and qualitative research traditions: Epistemological, theoretical, and methodological differences. *European Journal of Education*, 48(2), 311-325.

Yin, R.K. (2008) *Case Study Research: Design and Methods*. 4th Edition, Sage Publications, Thousand Oaks.

Yueh, H. P., & Hsu, S. (2008). Designing a learning management system to support instruction. *Communications of the ACM*, 51(4), 59-63.

APPENDICES

Appendix A: Students Consent and Questionnaire

Dear Students,

If you have any inquiry about any aspect of the questionnaire, please don't hesitate to contact with me or with my supervisor. If you will into participate please fill your name and surname in the given blank space and sign.

Name and Surname.....

Sign.....

Date.....

Part A.

1.Institution: ……

2.Age: 18-22 ( ) 23-29 ( ) 30-37 ( ) 37-49 ( ) 50-59 ( ) 60+ ( )

3.Gender: Female ( ) Male ( )

5.Education Level:

Diploma ( ) Bachelor ( ) Master ( ) PHD ( )

6. What is your LMS role? (if you have LMS in your university) Learner / Student (

)Facilitator / Instructor/Professor ( ) Administrator ( ) Other ( )

Part B.

Please answer the following questions according to your university policies toward LMS.

7. Which Learning Management System Do You Currently Use In Your University?

Blackboard ( ) Moodle ( ) Desire2Learn ( ) Sakai ( )

Firstclass

( ) We don't use LMS ( ) Other ( )

8. The majority of the courses I take at my institution are:

Traditional Face-to-Face Instruction - Little or no online component ( ) Traditional Face-to-Face Instruction - Heavy online component ( ) Hybrid (50% online, 50% face-to-face) ( )

Online Only/Distance Learning ( )

9. Do you consider yourself computer literate and comfortable with using online applications and software's?

Yes ( ) No ( )

Part C.

10. Please answer the following question by selecting the appropriate level of agreement on the following statements. Strongly Agree = 5, Agree = 4, Neutral = 3, Disagree = 2, Strongly Disagree = 1.

Q	Users attitude towards LMS Platform	Strongly agree	Agree	Neutral	Strongly Disagree	Disagree
1	I feel confident in using computers					
2	I believe that e-learning will give me the opportunity to acquire new knowledge					

3	I believe that convenience is an important feature of e-learning					
4	E-learning increases the quality of learning because it integrates all forms of media					
5	Adopting ICT and E-learning allows for increased student satisfaction					

Part D.

11. Please answer the following question by selecting the appropriate level of agreement on the following statements. Strongly Agree = 5, Agree = 4, Neutral = 3, Disagree = 2, Strongly Disagree = 1.

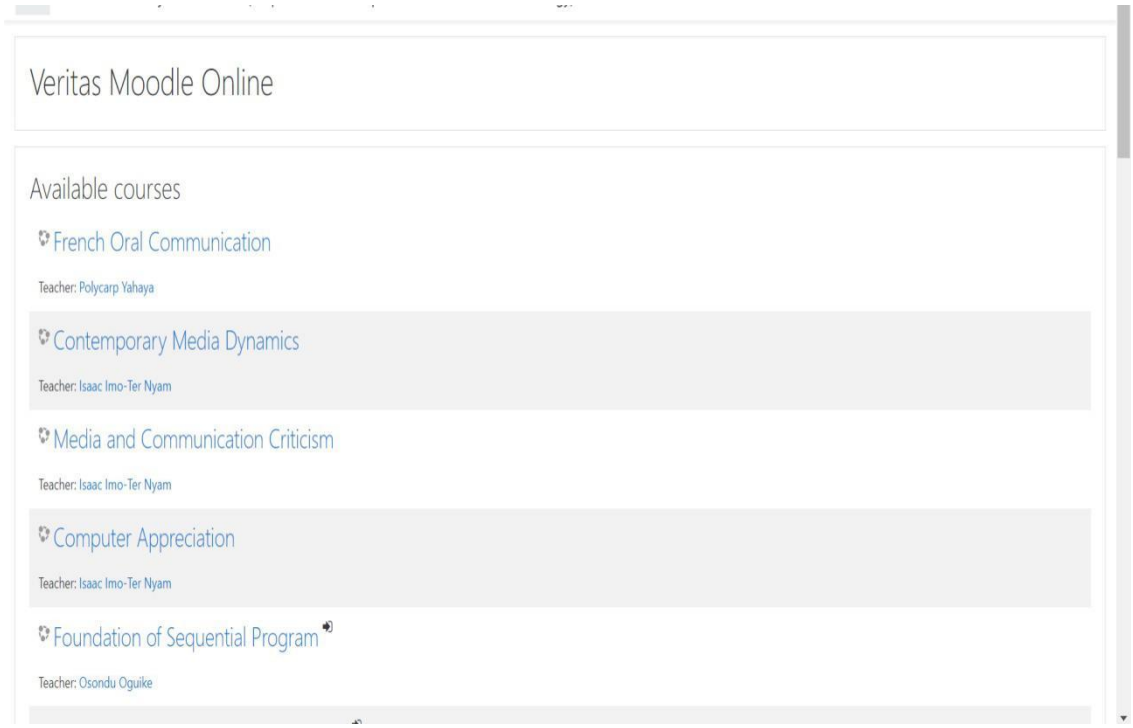
Q	**Perception of users toward proposed LMS application**	**Strongly agree**	**Agree**	**Neutral**	**Strongly Disagree**	**Disagree**
1	The language used in proposed system is easy to understand					
2	The links between the pages are clear and easy to follow					
3	Design of the proposed system is user-friendly					

4	I like using proposed system because I am computer Literate					
5	The overall design of the learning management system is welcoming?					

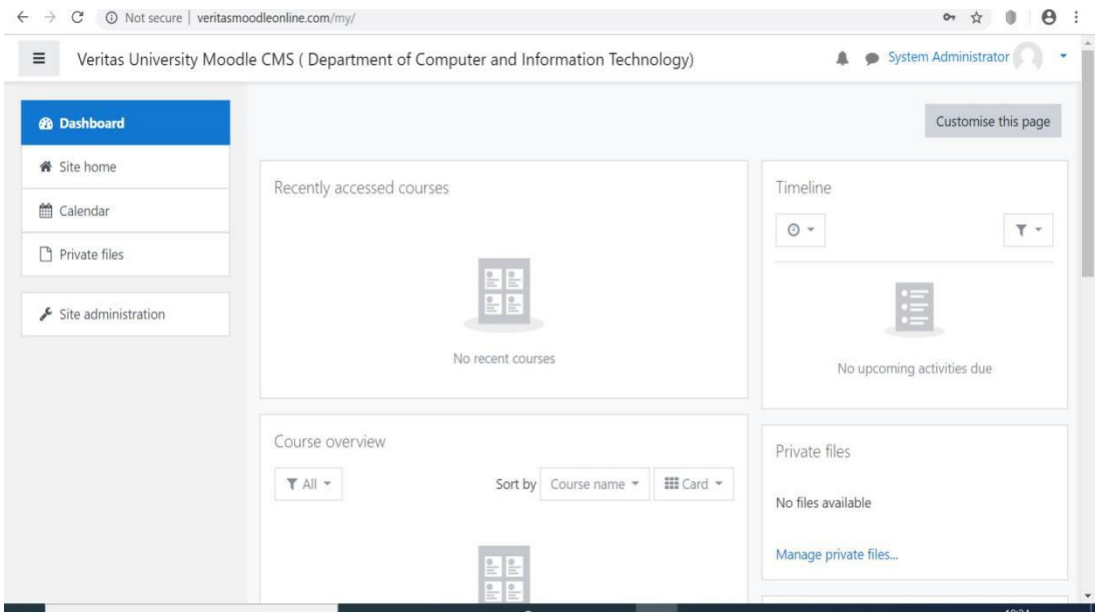
Appendix B: Semi-Structured Interviews with Instructors and students taken from Amen, (2017)

Interview Questions	Comments
I1. Overall, do you feel impressed on the use of LMS as part of your education in this semester?	
I2. As a user, Does the use of LMS meet your overall performance?	
I3. As a user, Does LMS platform meet your needs?	
I4. Do you enjoy LMS usefulness for teaching and learning?	
I5. Do student/instructor encounter issues before the full implementation of LMS in the university?	

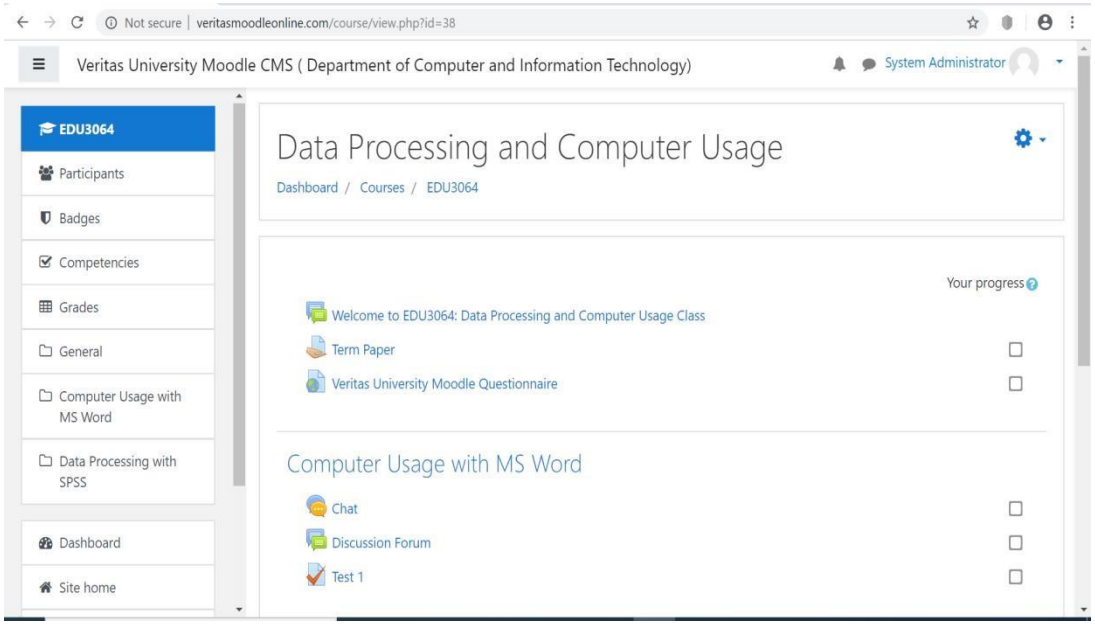
Appendix C: Moodle LMS Main Page and Courses



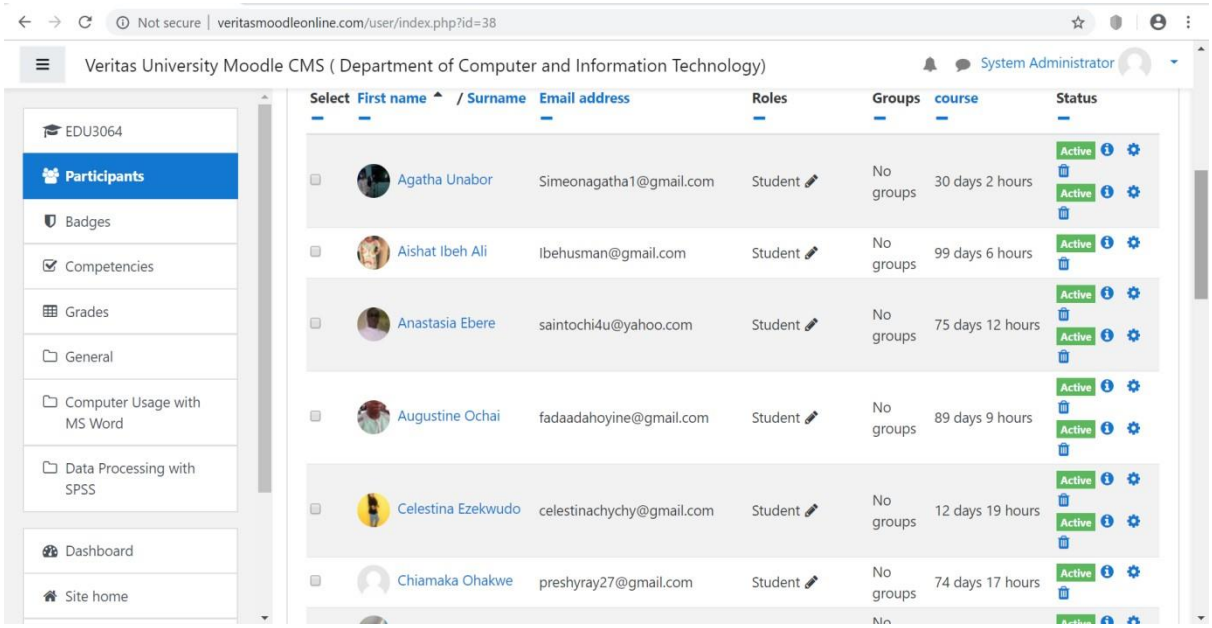
Appendix D: Administrator Screenshot Page



Appendix E: Course Page Screenshot



Appendix F: Students Users Page Screenshot



Appendix G: Approval to Conduct the Research Letter

Veritas University, Abuja
(The Catholic University of Nigeria)
Bwari Area Council, FCT
Website: http://www.veritas.edu.ng

Department of Computer and Information Technology
College of Natural and Applied Sciences

25-01-2019

Dear Asst. Prof. Dr. Ilideniz Ozverir,

Sequel to your letter introducing Mr. Augustine A. Jaja and requesting that he be granted access to distribute questionnaires to the instructors and students of the Computer Science Department and to collect data required to facilitate his Master Degree thesis, I write to accept the request as long as he conducts his activities in line with the ethics of research.

Thanks.

25/01/19

Emmanuel Mkpojiogu
Ag. Head of Department

Appendix H: Application Letter Requesting to Conduct the Research

EASTERN MEDITERRANEAN UNIVERSITY
www.emu.edu.tr

To: The Head of the Department of Computer Science, Veritas University
Date: 23th January 2019

To whom it may concern:

The student whose name and surname appears below is a master student at the Faculty of Education, Department of Computer Education and Instructional Technologies at the Eastern Mediterranean University (EMU) in North Cyprus. His thesis is entitled as "Students and Instructors Perspectives in the Use of Moodle Learning Management System in the Department of Computer Science in Veritas University". As part of his research, he requests to administer questionnaire with students and instructors in the Department of Computer Science at Veritas University. Therefore, he kindly requests you permit him to collect the required data from students and the lecturers in the Department of Computer Science at Veritas University. The identity and information gathered from participants (both students and instructors) will be strictly kept confidential and will be used for the research study purposes only.
Your permission to this request will be highly appreciated. Please do not hesitate to contact me for any further information.

Student Name and Surname: **Augustine A. Jaja**
Student Number: **16500014**
E-mail: **16500014@students.emu.edu.tr**

Cordially,
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