Fall 10-14-2020

STUDENTS' PERCEPTIONS AND USE OF THE SAKAI LEARNING MANAGEMENT SYSTEM IN THE UNIVERSITY OF GHANA

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Abstract

The study investigated students' awareness of the Sakai LMS tools, the extent of use, and the major challenges faced by students. Also, hypotheses were tested in the bid to find out relationships among variables. The study is useful to education practitioners, management of Distance Education, policymakers, and learning management system developers and also pertinent in the COVID-19 era. The study was based on the Technology Acceptance Model and survey methodology with a sample size of 230 level 300 Distance Learning students of the University of Ghana. Convenience sampling was adopted, data were gathered using a questionnaire and analyzed using SPSS. From the findings, the extent of awareness of the Sakai LMS tools was moderate and users became aware through their tutors and the orientation program. However, some of the Sakai tools were not utilized as the result of a lack of awareness; the extent of use of the Sakai LMS was relatively low due to some challenges such as inadequate training on how to use the platform, system errors, and inability to access the Sakai platform at the point of need, difficulty in getting access to the internet, slow internet connectivity, etc. It was recommended the Distance Education unit should provide adequate orientation and training to students, instructors, and tutors on how to use the Sakai LMS tools, provision of an effective support system, high bandwidth for internet connectivity, linking Sakai LMS to social media, and redesigning of the Sakai LMS interface to make it more attractive and interactive.

Keywords: Students' Perceptions, Sakai, Distance, Learning Management System, University, Ghana

1.0 Introduction

The proliferation of Information and Communication Technology (ICT) is an epitome of the rapidly changing world, and this has changed the dynamics of teaching and learning in almost every corner of the globe (Brady & Pradhan, 2020). This brought about the origin of the so-called "digital revolution". The inception and the evolution of the web and internet eventually led to the introduction of electronic learning which is popularly known as e-learning (Ansong, 2015). This has brought about many Learning Management Systems (LMS) opportunities that perform phenomenal roles in the quest for most academic institutions especially tertiary institutions to achieve their academic goals. In view of this, myriads of academic institutions have adopted what Lang and Pirani (2014) have captioned as synchronous and asynchronous learning management systems. Synchronous, on one hand, means learning can take place at the same time, thus learners can be at a different place and access the same materials online and also take part in a discussion forum simultaneously. For instance, a lecturer or instructor can arrange a lesson session on a learning management system platform which will require students to bring out their submissions and interact with each other digitally. On the other hand, asynchronous means that, participants can access learning materials, undertake class activities at their own pace irrespective of the geographical location. Synchronous and asynchronous learning options enables one can sit in his or her comfort zone and still have access to information resources to meet the information needs; learning can take place anywhere provided there is an availability of internet connection with the required bandwidth, communication gadgets, and the requisite skills (Dube & Scott, 2014; Brady & Pradhan, 2020).

In the view of Lippert (as cited in Govender, 2010), the inclusion of a learning management system in teaching and learning provides an instructional perspective, which allows students to proceed and learn at their own pace. According to Patil (2012), a learning management system is a type of software that is designed to deliver, track, and manage online training and education. In the view Ellis (as cited in Ansong, 2015, p.21), learning management systems are software programs used for the administration, documentation, tracking, reporting, and delivery of electronic educational technology (also called e-learning) courses or training programs. Pappas (2016) posits that a learning management system can be referred to as an integral part of the learning design and development process, especially if you have a large audience and a great deal of subject matter to deliver. According to Lang and Pirani (2014, p.1), a learning management system is the integral, behind-the-scenes player in a student's learning experience, serving as the course hub for management of subject mastery. Some widely used learning management systems include Sakai, Edmodo, Moodle, Blackboard, SuccessFactors, and SkillSoft. These discoveries have provided a common platform where lecturers/instructors, tutors, students, Teaching Assistants (TAs), and Graduate Assistants (GAs) can interact digitally (Oheneba-Sakyi & Amponsah, 2018).

According to Lippert (as cited in Govender, 2017, p.6), "learning management system was initially established in Canada when the Department of Education sought to achieve a significant improvement in the pass rates of all students". It was revealed that most students acquired computer literacy and explorative skills through the use of the learning management system. Currently, learning management systems are now pervasive in almost every higher educational institution, thereby bridging the gap between lecturer-student interactions. Learning management systems started to gain a strong foothold in most tertiary institutions when electronic learning also is known as E-learning penetrated almost every corner of the globe. Dube and Scott (2014) stated that E-learning is a technology-based method with time and space independence and facilitated by learning management systems, computer programs used to create, manage, deliver and retrieve learning content such as Sakai. Numerous institutions, according to Graves (2001), are adopting e-learning technologies for two purposes:

1) To enhance the flexibility of traditional classroom-based face to face courses with web access to syllabi, materials, and discussions or

2) As a sole channel of distance education modality that eliminates or reduces on-ground classroom time.

In addition, "business training departments use LMSs to deliver online training, as well as to automate recordkeeping and employee registration" (Ansong, 2015, p.21).

In Ghana and other developing countries, there has been an exponential growth in student enrollment which has led to a mismatch of students and the available educational infrastructure and resources. This has sparked many tertiary institutions to adopt and implement educational models such as the learning management system in order to admit applicants who qualify for admission (Tagoe & Abakah, 2014). Retrospectively, its name has been changed through the development and been used interchangeably with Electronic Learning Systems (ELS), Virtual Learning Environments (VLE), Curriculum Development Systems (CDS), Content Management Systems (CMS), Instructional Improvement Systems (IIS), Knowledge Management Systems (KMS), Instructional Management Systems (IMS), Integrated Learning Systems (ILS), Course Management Systems (CMS), and Collaborative Learning Environments (CLE). Many educators agreed that instruction is not what we should manage through a technology solution, rather, educators must focus more systemically on the main goal: Learning and the management thereof (Suorsa & Eskilsson 2014).

1.1 The Distance Education System at the University of Ghana.

Distance Education was formerly known as "correspondence education" in Ghana which provides the avenue for workers and professionals to upgrade themselves (Edumadz, Ogoe, Essilfie, Edumadze, Graham, & Osei-Gyasi, 2017). According to Sherry (as cited in Mnyanyi & Mbwette, 2009, p.2),

Distance Education (DE) is a learning process in which the teacher and the learner are separated in terms of space and time; communication between the two is mediated by print media and or ICT; learning is under the control of the learner rather than the teacher. In affirmation, Sherry (as cited in Larkai, Ankomah-Asare and Nsowah-Nuamah (2016, p.3) maintained that distance-learning occurs when there is a separation of teacher and learner in space and/or time, volitional control of learning is by the student instead of the instructor and the communication between the two is noncontagious and mediated by print or some form of technology. Many of the institutions studied see distance education as being beneficial, as it provides an opportunity for a large number of qualified applicants who do not get admission into the face-to-face regular programmes due to limited facilities, to have access to tertiary education (Agbofa, 2012). It also provides an opportunity for students who double as workers to be able to actively get involved in-class activities (Edumadz, Ogoe, Essilfie, Edumadze, Graham, & Osei-Gyasi, 2017).

The increasing demand for education over the years has led tertiary education providers and regulators to introduce interventions to increase access to meet the growing demand for tertiary education. For instance, there is a lot of qualified applicants that the University of Ghana is unable to admit to the regular programmes, because of this, some are given the choice to enroll as distance students and at worst, some are not even admitted at all (Tagoe & Abakah, 2014). This issue has been attributed to the limited facilities in most tertiary institutions (Mensah & Owusu-Mensah 2012).

1.1.1 The Sakai Learning Management System (LMS)
In general, the Sakai LMS is an open-source of endless possibilities, course management, and collaborative learning tool that serves faculty, students, and staff digitally (Mtebe, 2015). The Sakai LMS has continued to gain acceptance among many tertiary institutions and some second cycle institutions for a vast array of reasons which include; making it possible for students to learn as if they are in their traditional classroom with an instructor. This helps support blended delivery. "Helping curriculum, instructional resources, assessment strategies, student data, and staff proficiencies". Being considerably cheaper since it saves learners from traveling, buying expensive course materials, online training site rentals, and is very convenient (Ansong, 2015). Providing a common platform where students can have discussions and post comments on subjects. It makes the assessment of students easier and faster especially when dealing with large class sizes (Oheneba-Sakyi and Amponsah, 2018). According to Alhassah (2014), the Sakai LMS will greatly enhance teaching and learning processes in universities, since it will eliminate many barriers to the traditional way of learning such as having to be physically present and spending on printouts. The system will encourage more engagement, between lecturers and students, and amongst students. It will greatly ease the work of lecturers, students, and researchers alike since certain learning processes that are time-consuming for them are automated and instant on the system.

1.1.2 Overview of the Sakai Learning Management System at the University of Ghana, Legon

The use of the E-learning system is not a new idea at the University of Ghana, Legon. In responding to changing trends in internet adoption to enhance teaching, learning, and research, the University of Ghana, secured a Chinese Government loan in 2012 that provided the basic infrastructure to support ICT-base teaching and learning (Oheneba-Sakyi & Amponsah, 2018). Part of the project was aimed to extend e-learning to all regional centers of the Institute of Continuing and Distance Education now School of Continuing and Distance Education as well as to fully equip all computer laboratories and video conferencing centers (Ansong, 2015). The University of Ghana initially introduced the Knowledge Environment for Web-based Learning (KEWL) which is a web-based learning system but unfortunately, a low adoption rate was recorded. Out of the numerous lecturers at the University of Ghana, only 27 of them used the KEWL three years after its introduction (Dadzie, 2009). In an attempt to remedy this situation, the Sakai LMS was introduced to serve as a mobile learning model and to reinforce the university's vision of becoming a world-class research university within the next decade. Again, the Sakai LMS was acquired because the entire university could use it (University of Ghana, 2017).

The Sakai LMS better handles a large number of users; with about three hundred adoptions worldwide (Caminero, 2013). Oheneba-Sakyi and Amponsah (2018) outlined ten (10) reasons why the University of Ghana adopted Sakai LMS: it is hosted by long sight with 24/7 support; characterized by flexibility and easiness; a true power of the community model; a pool of knowledge from world-class universities, examples being Oxford, Harvard, MIT, Michigan, UCT, Cambridge, UNISA, Stanford, Indiana, NYU, Duke, Rutgers; empowers IT, professionals; denotes stability and scalability, cost control, build for educators by educators; a complete system for learning, teaching, research & collaboration; add online elements to traditional face-to-face courses; and to develop completely online courses with no face-to-face or few meetings (Blended Learning; Flipped Classroom; Distance Education) which was highlighted as the ultimate purpose of the adoption of the Sakai LMS.

Another reason is that the Sakai LMS provides an opportunity for the virtual classroom which makes it possible for students to study outside their traditional learning environment. This initiative is also most evident in many tertiary institutions that offer distance learning opportunities to their applicants. The Sakai LMS has been wholly accepted at the Department of Distance Education at the university Ghana as a mode of teaching and learning to supplement the weekend face-to-face tutorials programme (Oheneba-Sakyi & Amponsah, 2018).

 The Sakai LMS was implemented at the University of Ghana, Legon in the 2013/2014 academic year after it had been tested for one year. It was then at the Department of Distance Education, the

"Department of Adult Education, and the Business School". It was rolled out completely in the 2015/2016 academic year, and many departments and courses have been enrolled in the system. The Sakai LMS is increasingly being used by some faculty members in departments and schools across all the four colleges of the University for the delivery of instructional materials, course content, and assessment (Oheneba-Sakyi & Amponsah, 2018).

 The critical importance of the Sakai LMS can be evident at the University of Ghana, where some lecturers and tutors are now utilizing it to teach and share course materials which include lecture notes, video tutorials, links, and also use for online discussion. Sakai LMS has myriads of phenomenal features as follows: it is used for class announcements, quizzes, online video tutorials, plagiarism checking, conducting interim assessments, and student group discussions. Another interesting feature of Sakai LMS is the fact that students can access their results instantly with the aid of the grade book which generates scores of students. Besides, it has a calendar for viewing deadlines, distributes and collects data from course members, etc (Dube & Scott, 2014).

Currently, the Department of Distance Education uses the Sakai platform to supplement its traditional face-to-face learning which takes place at the various learning centers during weekends. Instructors use the platform to interact with students and to share relevant course materials and other related information. In addition, the department conducts an Interim Assessment (IA) using the platform. According to Oheneba-Sakyi and Amponsah (2018), the Sakai LMS has made it possible for the University's Distance Education programme to transition from paper-based modules to a multi-mode format where web-based (online) courses have been integrated with the face-to-face meeting, facilitated by assistant lecturers and tutors.

1.2 Statement of the problem

The value and relevance of every electronic learning platform will be evidenced by the extent of its use. According to Chen (2011), most learning management systems used in learning are not utilized to their full potentials. Again, Suorsa and Eskilsson (2014) revealed in their study that the learning management systems which are often adopted for students' use are underutilized and in many cases ignored by the intended end-users. In the same vein, Liyanagunawardena (2008, p.1) found out in a study that, every time an assignment or a new resource material was made available on the learning management system platform, only a few students were often aware. The Sakai e-learning platform at NUST was underutilized by undergraduate students in the Faculty of Communication and Information Science (Choga, 2015). Underutilization of the Sakai LMS was evident when a random and preliminary investigation by the researcher indicated that at various intervals of checking students who are online on the Sakai platform, an average of not more than 5% of the total students in the faculty were found at all intervals. In the same study, to measure the students' attitudes and perceived

usefulness of the Sakai LMS, the researcher sought to understand what motivates students to use the Sakai LMS. Most respondents indicated that they only use the system when they are instructed by their lecturers or instructors to do so.

The researcher solicited the views of some undergraduate Distance Learning students from the University of Ghana about the use of the Sakai LMS and it was revealed that despite the numerous functionalities and perceived phenomenal benefits of the Sakai LMS, most students shun away from using the system and rather rely on colleagues who visit the platform for information. The only time that most students access the system is when they are compelled to submit an assignment, write their Interim Assessments (IAs), or quizzes using the system. Hence, the system has been underutilized.

Numerous studies have been conducted on the impact of the various learning management systems on teaching and learning in higher educational institutions. Also, numerous studies on learning management systems focus on adoption and acceptance by intended end-users but very limited studies have been conducted on the end-users' perceptions and use of the Sakai LMS.

Moreover, since the time of implementing the Sakai LMS in the University of Ghana, little research has been conducted on the students' perception and its use. Based on this background, the researcher found it imperative to conduct this study to find out the perceptions of students and to unravel why they do not elect to use the Sakai LMS. This piece of research would therefore contribute to filling this knowledge gap.

The purpose of the study was to determine the perceptions and use of the Sakai LMS among Distance Learning students of the University of Ghana and to come out with some recommended strategies to improve its use.

1.3 The objectives of the study were:
    i.   To determine students' awareness of the Sakai LMS tools.
    ii.   To investigate the extent of use of the Sakai LMS by Distance Learning students.
    iii.   To ascertain the major challenges Distance Learning students faced when using the Sakai LMS.

1.4 Hypothesis
To measure the above objectives, the following hypotheses were formulated to be tested.
    i.   Students' computer literacy skills will correlate their perceived ease of use of the Sakai LMS.
    ii.   Students' perceived usefulness of the Sakai LMS will correlate the extent of use of the Sakai LMS.

1.5 Theoretical Perspective

Theory guides the entire research, and serve as an organizing model for the research questions and as well as data collection procedure (Creswell, 2013). Again, "a theoretical framework is analogous to the frame of the house just as the foundation supports a house, a theoretical framework provides a rationale for predictions about the relationship among variables of a research study" (Mehta, 2013, p.3)

1.4.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was adopted for this study. Davis, Bagozzi, and Warshaw (1989) are the brains behind the Technology Acceptance Model (TAM). The model posits that when users come into contact with new technology, several factors influence their decision about how and when they will use it. "The goal of the TAM is to explain the determinants of computer acceptance that is general; capable of explaining user behaviour across a broad range of end-user computing technologies and user populations, whilst at the same time being both parsimonious and theoretically justified" (Davis, Bagozzi & Warshaw, 1989, p. 6). "The system features and characteristics serve as variables to determine whether a system will be accepted or rejected", Davis noted (as cited in Suorsa & Eskilsson, 2014, P. 6). According to Davis (1993), Perceived Usefulness (PU) and Perceived Ease of Use (PEU) have been theorized as the two main factors which determine how an individual perceives a system and how it will be put to use with less effort. To be able to understand why students perceive a system in a certain way, there is a need to be able to understand the origins of their views.

Figure 1 Technology Acceptance Model (TAM)
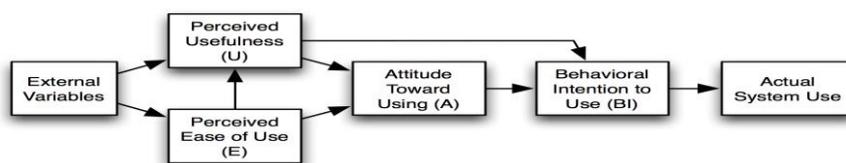
Davis, Bagozzi & Warshaw (1989)

2.0 Literature Review

The mode of course delivery is gradually changing as many academic institutions are now adopting at least one of the numerous learning management systems as a supplement to the traditional mode of teaching and learning. It is therefore pertinent to research in the area of e-learning to bring to light the ongoing dialogue. According to Neuman (2011), a literature review is based on the assumption that knowledge accumulates and that people learn from and build on what others have done. A literature

review is an act of reviewing other authors' researches which are very pertinent to the area of your area of studies (Boote & Beile, 2005).

2.1 Concept of Electronic Learning

The term electronic learning also known as e-learning was originated in the early '90s when the internet was emerging and penetrating to different areas across the world. The big idea" was that it would provide the platform for students to access learning materials and take part in-class activities in the comfort of their home or anywhere convenient. That is the well-known motto of "learning everywhere and at every place, which originated a trend that was given the name of e-Learning (Ansong, 2015). According to Noh, Isa, Saman & Isa (2012; Brady & Pradhan, 2020), many higher learning institutions across the globe are gradually supplementing the mode of teaching and learning with e-learning platforms.

There have been myriads of controversies regarding how best e-learning can be defined as the results a lot of researchers have viewed e-learning with varied lenses. Ansong, (2015, p.16) defined e-learning as "a complexity of elements which makes researchers and practitioners suggest different definitions concerning the technologies involved, their extent of integration into learning processes and how learning occurs among participants in terms of time". An e-Learning system is a mode of teaching and learning which is flexible and convenient based on internet connectivity with the paramount reasons for alleviating the issue of increasing student enrollments and inadequate teachers and learning facilities (Pituch & Lee, 2006; Selim, 2007). In the view of Ferrer & Alfonso (as cited in Suorsa & Eskilsson, 2014, p.1), **"**E-learning is defined as the use of the internet to access learning content and resources, interacting with instructors and other students, to gain knowledge". "E-learning is usually defined as a type of learning supported by information and communication technology (ICT) via the internet, intranets, extranets, or many others to improve the quality of teaching and learning" (Tagoe, 2012, p.1). However, after several debates over the best definition that is suitable for e-learning, a consensus was reached in Europe upon the use of a unified definition for e-learning, which was understood as the application of new multimedia technologies and the internet in education, to improve its quality by enhancing access to resources, services, exchange of information and cooperation (Simonova, 2010 as cited in Ansong, 2015).

2.2 Learning Management Systems.

In the view of Lucian (2016), a learning management system is a software tool designed to manage interventions between students and instructors. Learning management systems are classified into three main categories: proprietary systems which are considered as commercial, examples; Blackboard and Desire2Learn, also, free/open-source systems, these are available online for free but may be

customized to suit the interest of the adopter example; Sakai and Moodle. (Lucian, 2016). Due to the proliferation of e-learning, learning management systems have been in vogue for the past decades and its phenomenal benefits as far as teaching and learning is concerned cannot be overemphasized. Learning management systems have been widely used in tertiary institutions because of its phenomenal benefits in terms of flexibility in learning time and enable instructors and students to interact digitally especially for distance learners (Hamuy, 2009). According to Burrell-Ihlow, Angeli, Salisbury, and Ellis (as cited in Govender, 2010), it is gradually gaining root in most academic institutions as the most effective way of teaching and learning, fast dissemination of information. According to Hawkins and Rudy (as cited in Lonn, Teasley & Krumm, 2009), it was reported that over 90% of higher education have implemented one or more learning management system to allow instructors to disseminate instructional materials, make a class announcement, upload, and download assignments and course materials more easily. For instance, the number of students who are enrolled in various institutions every year continues to double up as confirmed in a study which was conducted by Tagoe (2012) in which it was revealed that, in Ghana and other developing countries, due to the continuous increase in students enrollment and with the limited available educational infrastructure and resources, many have at least adopted a learning management system to reduce the situation of turning away of qualified applicants from being admitted to pursue their chosen programmes of interest.

2.2.1   Sakai (LMS)

Sakai includes course management tools, project tools, and other components, and can be connected to the library resources (Wei, Wu & Zheng, 2014). Furthermore, Srichanyachon (2014), added that the Sakai LMS can be used to manage curriculum, training materials, and evaluation tools. It can also be extended with modules for tracking learning activities and results such as assignments, quizzes, grading. Besides, the Sakai LMS users to learn outside the classroom. It can either support face-to-face teaching or create online courses and learning engagingly. The phenomenal benefits of a learning management system in teaching and learning especially in distance education cannot be overemphasized. According to Mtebe (2015, p.1), learning management systems are now increasingly been installed in many higher education institutions not only in the westernized world but also evident in sub-Saharan Africa and one that is widely adopted is the Sakai LMS. The Sakai LMS is one of the open-source systems which enables users such as instructors and students to be enrolled into various course site and also project site for researchers (Ansong, 2015). Sakai LMS was built using a grant provided by the Mellon Foundation in 2004 when Stanford University, Michigan University, Indiana University, Massachusetts Institute of Technology University, and University of Berkeley began building a common Courseware Management System (Dube & Scott, 2014). The original intent of the collaboration was to improve teaching, learning, and research by providing a compelling alternative to propriety learning systems. The University of Michigan was the topmost university that contributed

greatly to the development of the project. The project was named after famed Iron Chef Hiroyuki Sakai. This is because " the early versions of the tool were based, in part, on the University of Michigan's course management system" (Biggers, 2009).

According to Derakhshan (2012), as of 2009, it was recorded that, over 100 institutions were using the Sakai LMS, with about 200, 0000 users. Today, the total number of institutions has increased to over 350 educational organizations worldwide, including Columbia University, Duke University, Stanford University, Universite de Poitiers, Bradley University, University of Notre Dame, The University of North Carolina in the USA and in Africa it includes the University of Ghana, National University of Science and Technology, Bulawayo, Zimbabwe, University of Cape Town, and the University of South Africa, etc (Oheneba-Sakyi & Amponsah, 2018). Sakai LMS and others such as Blackboard, Moodle, Desire2Learn are counted among the most popularly and widely use learning management systems in education (Riddell, 2013). Similarly, according to Caminero, Hernandez & Ros (2013), the Sakai LMS is one of the most preferred open-source learning management systems due to its flexibility, ease of use, popularity, and compatibility. In the same study, it was further added that the Sakai LMS better handles a large number of users with about three hundred adoptions worldwide.

2.2.2 Sakai LMS tools

The Sakai LMS have myriads of functional tools that students, lecturers, tutors, and course assistants, etc utilize as far as teaching and learning are concerned. The following are some of the tools:

Assignment tool

An assignment allows users to be taking and submission of assignments online. It allows students to upload and submit assignments and projects and for instructors to grade and comment on students' submissions (Oheneba-Sakyi & Amponsah, 2018).

Grade book

A Gradebook allows the instructor to grade assignments or examinations and share that information with students, who view only their scores. The system does an instant calculation and it does not only distribute the grades but also store the grades for future references (Oheneba-Sakyi & Amponsah, 2018).

Forum tool

A forum tool allows for discussions of topics, the creation of private or public groups, etc. (Mtebe, 2015).

Syllabus Tool

A syllabus tool for a summary of courses (course outlines). Instructors may use this tool to post their syllabus as HTML or an attachment (Mtebe, 2015).

Test and quizzes Tool

A test and quizzes tool for taking all kinds of tests and quizzes online. It allows lecturers and instructors to conduct quizzes, interim assessments (IA), and end of semester examinations. It is normally in the form of "fill in" and multiple-choice questions. One interesting aspect about this tool is the fact that it allows for questions to be randomized to prevent students from cheating (Oheneba-Sakyi & Amponsah, 2018).

Chat Tool

A chat tool allows for chatting between lecturers and students, among course mates and between individuals participants on the Sakai platform. All exchanged messages are saved automatically and viewable for all site participants and it could be an asynchronous or synchronous mode of conversation (Mtebe, 2015).

Resource Tool

A resource tool for sharing course materials like slides, handouts and books, past questions, links for documents, audio, and video tutorials (Choga, 2015).

Announcement Tool

"An announcement tool keeps students informed about upcoming tests/events, change of lecture times/venues", and any other information that instructors or Teaching Assistants (TA) may want to give to students (Choga, 2015).

Calendar Tool

A calendar tool marks important dates of events, deadlines, and any other activities about each course. It is linked to announcements, assignments, materials, etc (Choga, 2015).

Email Tool

An email tool is used for sending emails to lecturers, course mates, or individuals (Mtebe, 2015).

Plagiarism checker Tool (Turnitin)

It has a 'Turn it in' tool which automatically measures the plagiarism index of research work. It helps to detect and fish out plagiarized research work (Ansong, 2015). For example, the management of the University of Ghana integrated the "Turn it in" with the Sakai LMS in 2014 to check for the

plagiarism index of assignments and project works of all undergraduate and postgraduates students (Oheneba-Sakyi & Amponsah, 2018).

Teaching and learning features.

These courses management and learning tools allow instructors to build and plan lessons, create and grade assignments, develop and offer tests and other assessments, and share files via a dropbox (Choga, 2015).

2.3 Awareness of the Sakai LMS Tools.

Awareness is an indispensable factor in the implementation of every learning management system and influences the extent of its use. End-users of a system will not benefit from its value if they are not aware of it. Mtebe (2015, p.1) asserts that "lack of awareness amongst users on the existence or value of LMS has an impact on LMS usage". In the light of this background, it is therefore imperative for students to be aware of the Sakai LMS tools for its intended purpose to be achieved. An end-user may be aware of a system but if its various functional tools are not known, the system will not be fully utilized (Juhary, 2014). This is analogous to the Sakai LMS. Users may be fortunate to get informed about the existence of the Sakai LMS however, users will not fully benefit from the Sakai tools if they are not made known.

Stephanie (n.d), investigated the specific use of the Sakai LMS tools, among the tools such as announcements tool, assignments tool, grade book tool, test and quizzes tool, calendar tool, syllabus other tools/uses, etc., the resources tool appeared as the most frequently used tool. The study further revealed that students frequently use the resource tool to download their electronic reading materials. However, the calendar appeared to be the least frequently used tool. This phenomenon was attributed to the fact that most of the instructors usually inform the students in class about deadlines for assignments submissions or quizzes hence they didn't pay attention to the function of the calendar tool. Also in the works of Choga (2015), most students became aware of the Sakai tools since it is been mandatory for them to take tests and submit assignments using the test and quizzes tools and the assignment tools respectively. Also, it is through the quizzes and tests tool that students obtained their grade, therefore, they became aware of the Sakai grade tool. In the same vein, Soon & Fraser (2011) investigated the extent of use of the various tools of the Sakai LMS among various groups. The study showed that most of the members had similar opinions about the system. It was observed that the calendar was not a popular tool that the postgraduate student groups could effectively use to mark events and set reminder dates in their project and a considerable number of the respondents were not aware of the email tool.

Again, Derakhshan (2012) made extensive research on the various features of the learning management system and it was revealed that user's awareness of the functional tools of the learning management system was fueled by the lecturer or instructor involvement of the users. For instance, in the same study, it was revealed that the assignment tool had the highest level of users' awareness and it was elucidated that, the lecturers and course instructors involved the users in using it for their daily academic activities. This finding was in accord with what Soon and Fraser (2011). The study revealed that regardless of the numerous tools of the Sakai LMS, the assignment tool was recorded as the most highly used tool. It was further explained that the majority of the respondents were aware of it because they were constantly informed to submit their assignments using it.

Another, Juhary (2014) investigated the perceived usefulness and ease of use of the Sakai LMS as a learning tool using a 4-point Likert scale, the researcher sought to seek the most used tools of the learning management system. From the data collected, most respondents used the Sakai LMS for downloading their lecture slides with a mean score of 1.95 as well as completing their homework with a mean score of 2.14. Also, to collect extra notes for reading with a mean score of 2.17. The least used tool appeared to be the forum with a mean score of 2.62. It was further explained that instructors and lecturers were not engaging students by not putting any striking topics for students to bring out their submissions.

In summation, the overall assessment of the Sakai LMS tools shows that students become aware of the tools when they are been engage by instructors or tutors in using them for academic activities.

2.4 Extent of Use of the Sakai LMS

Numerous institutions especially tertiary institutions and colleges have at least adopted one or two learning management systems to supplement the conventional mode of teaching and learning. It has gained a strong root in most western countries and this is not surprising because that's where the idea of learning management system originated (Suorsa and Eskilsson, 2014). Most African universities and colleges are no exception, they are also gradually adopting learning management systems. This can be evident in the study which was conducted by (Namisiko, Munialo & Nyongesa, 2014) where it was observed that governments and management of academic institutions in African countries have demonstrated much interest in the incorporation of learning management systems with the conventional way of teaching and learning. For instance, in Ghana, the University of Ghana, Legon has adopted Sakai LMS while Kwame Nkrumah University of Science and Technology and University of Professional Studies, Accra has adopted the Moodle learning management system and many others. The paramount rationale behind this initiative is to reduce the undesired issue of turning away many qualified applicants who attempt to enter tertiary institutions especially the public institutions (Ansong, 2015). Also, in the works of Juhary (2014), it was found that respondents were

interested in using the Sakai LMS hence, the high level of usage was recorded among the students. The finding was supported by the mean score of 2.89 hence they were greatly utilizing the Sakai platform. Similarly, Lonn, Teasley, and Krumm (2009) investigated undergraduates' perceptions and use of learning management systems using two campuses such as residential campus and commuter campus. Students from both campuses were actively engaged in the use of the various functional tools of the learning management system.

Further, Stephanie (n.d) conducted a survey on the evaluation of the Sakai LMS among three Universities such as the University of Michigan, Texas State University, and the University of Limerick. In general, it appeared that most of the students' visited the Sakai platform and utilized the tools. It was further explained that the level of computer proficiency was considerably high, students obtained training on the use of the system and instructors constantly engaged the class in activities using the system. This finding was congruent with what Pituch and Lee (2006) prostituted; external variables such as prior computer experience, level of computer skills may influence the intention and extent of use of technology platforms. Additionally, Arhinful (2016), explored the experience of Canadian and international students on Sakai LMS adoption. The findings showed that the majority of the students used the Sakai platform for submitting their assignments, downloading course articles, reading announcements, and checking PowerPoint presentations hence, and was concluded that the system was highly used. Also, in the works of Rafi, Samsudin, and Hanafi (2015), the study compared the perceived benefits and user satisfaction between an open-source learning management system (Sakai) and a proprietary learning management system in the universities. It was reported that "an independent-samples t-test indicated that the learning management system uses mean scores (4.02 were significantly higher for the group that used the Sakai platform than for the group that used the proprietary systems (3.86). From these statistics, it is evident that there was an exponential use of the Sakai LMS.

On the flip side, Dube & Scott (2014) investigated the extent of use of the Sakai platform where the findings show that the platform was underutilized. The low utilization of the platform was attributed to the fact that instructors were not engaging the students on the platform. Consequently, the platform was underutilized, robbing the students of an enjoyable, flexible, convenient, and interesting learning atmosphere. Above all, the institution is deprived of realizing the anticipated return on their technological investment.

Further, according to Choga (2015), some tools available on the Sakai platform have never been used by the students in as much as they have been made available for use by their respective lecturers and tutors. Such examples include the email tool, announcement tool, and many other tools of the system that have been neglected. Consequently, the extent of use of these tools on the Sakai by students was

very low. However, in the same study, the respondents were tasked to indicate the reasons for using the Sakai platform and the frequency of its use. The findings brought to bear that a high percentage of the respondents used the platform for downloading lecture materials, for submitting assignments and others, and further, the findings revealed that there were using these tools on the platform because it was mandatory for them to use for taking quizzes and interim assessments. In contrast to what Choga (2015) brought to bear, Soon & Fraser (2011) investigated "knowledge sharing and knowledge exchange in distance education online group work". It was indicated that the majority of the students frequently used the Sakai platform for chatting and sending an email, these tools on the Sakai platform are optional tools to the students but were highly utilized.

From the foregoing related literature, it can be deduced that the authors arrived at diverging results as far as the extent of use of the Sakai LMS is concerned. However, arguably, some determinants led to the extent of use of the Sakai LMS such as a student's involvement by instructors or tutors, users perceived usefulness of the system, as well as training on the system, etc.

2.5 Challenges in the Use of the Sakai LMS.

Despite the numerous uses of the Sakai LMS, it is saddled with some challenges as discussed below;

2.5.1 Inadequate Training

Several studies such as Nuta & Pusca (2017); Choga (2015); Ansong (2015) etc have confirmed that low utilization of a learning management system is due to the lack of support services such as orientation and proper training on the use of the system. In the same token, Unwin (2010) embarked on a survey on digital learning management systems in Africa with 358 respondents from 25 countries. It was brought to light that, 74% of the respondents indicated a lack of training and technical support impeded them from making full use of the learning management system. These findings are consistent with the work of Chitanana, Makaza & Madzima (2008) which focused on the digital learning management systems in Africa in four universities in Zimbabwe. It was realized in the study that the adopted learning management system was underutilized. The finding was attributed to a lack of training and proper orientation for users. In the same vein, similar research was embarked on at the University of Botswana where it was reported that lack of training and support services hindered 503 students which were more than half of the entire respondents from utilizing the learning management system (Tella, 2012). Nuta & Pusca (2017) also confirm from a study that assessed distance education learning platform options and opportunities. The findings showed that lack of training coupled with poor knowledge in the features of the learning management system made many groups who are potential users of the system to shun away from using it. Again, Dube & Scott (2014) investigated the use of the Sakai LMS and brought to bear that the majority of respondents (77.3%) indicated the lack of training hindered them from using the Sakai platform as expected. Further,

Cavus & Zabadi (2014) postulated based on the findings of a study that focused on a comparison of open-source learning management systems. The findings showed that the learning management platform looked so complex and it was attributed to the fact that the users lacked the requisite skills to use the platform due to lack of training on the platform.

2.5.2 Lack of ICT Infrastructure

Furthermore, Choga (2015) revealed that students developed a negative attitude towards the use of the Sakai LMS and the cause was attributed to the fact that there was a lack of ICT infrastructure. Again Salawudeen (2010) noted that users an adopted learning management platforms found it expensive to purchase personal computers or laptops in Nigeria taking into consideration the income level of an average worker in the country as the results and even those who were privileged to have laptops were still offline because it attracted extra cost to go online.

2.5.3 Lack of Computer Skills

Choga (2015) reported that a handful of students confirmed their knowledge and experience in using the Sakai platform and this resulted in the underutilization of the platform. Precisely, surprisingly, undergraduates students from the Faculty of Communication and Information Science (CIS) who were the target population made a good number of those who confirmed lacking knowledge about the use of the Sakai platform. The finding confirms the works of Dube & Scott (2014) in which it was revealed that Lecturers/Instructors and tutors did not use the Sakai platform for teaching as expected mainly due to lack of the needed basic skills to use the platform, hence they failed also to engage students to utilize the phenomenal features of the Sakai LMS. Smet (2012) recommended that users need to acquire basic knowledge in computer technology before they can fully utilize the adopted learning management system. Besides, it was also confirmed by Salawudeen (2010) where a lack of computer skills was one of the major challenges end-users face when using the learning management system. It was observed that most of the students had low computer educational background, consequently, they were afraid of operating one. Some even went to the extent of hiring experts to complete basic online forms in the quest to complete their registration to gain admission.

2.5.4 Lack of Internet Access

Another setback that extant literature has revealed is the fact that the lack of internet accessibility is one of the major hindrances to the use of the Sakai LMS. For instance, (Ngeze, 2016; Ssekakubo, 2011; Unwin, 2010; and Lwoga, 2012), found that low internet facility is the paramount reason why users do not use the Sakai platform as anticipated by management. Again the findings of Mtebe and Raisamo (2014) are not different from what has already being found. It was learned in the study that 9 out of 11 institutions in Tanzania had low bandwidth thus it was less than 20mbps and consequently hinders users from using the Sakai platform. The findings from Mtebe and Raisamo (2014) were

incongruent with what Berg (2013) found out in a study that focused on "the teaching assistants' and undergraduate students' first online teaching and learning experiences in an open distance learning context". It was revealed that the major challenge that users were saddled with was the inability to access the internet facility, coupled with low bandwidth and this served as a great impediment for users to fully utilize the Sakai LMS. Furthermore, the World Bank (2012) revealed that one critical challenge that weighs down the use of learning management systems is the lack of computer infrastructure and the internet. The phenomenon predominantly occurs in institutions in developing countries especially those in sub-Saharan Africa. Also, in the works of Juhary (2014), the majority of the respondents attributed unwillingness to use the learning management system to the internet problem including slow access and failure to get access.

2.5.5 System Error (Failure)

Juhary (2014) reported that most students developed negative attitudes to the use of a learning management system because of a constant system crash which deprived them of accessing the platform either in the middle of retrieving or downloading course materials. "The learning management system sometimes crashes and occasionally cannot be accessed. Also, frequent system error was indicated in the study by Wei, Wu & Zheng (2014) on the application of the Sakai LMS at the University of Science and Engineering. Respondents reported that they continuously experienced system error when using the Sakai platform and consequently, they were unable to complete their academic tasks.

Further, Nasser, Cherif, and Romanowski (2011) revealed similar findings on a research study that focused on the factors influencing student usage of the learning management system in Qatari schools. The study found that technical challenges such as system crash and freeze of the system took away the delight to use the system by the respondents. Similarly, Berg (2013) revealed that the majority of students arrived at a consensus in terms of challenges associated with the learning management system. It was brought to light that learning management was difficult to access especially at the crucial time when it was needed most. Again, Juhary (2014) brought to bear that the Sakai LMS was weighed down in terms of usage due to some technical challenges such as loading problems, and system errors when logging in.

2.5.6 Lack of Awareness.

Furthermore, another critical setback that contributes to the low utilization of the Sakai LMS is the lack of awareness about the functional features, or sometimes users are not even aware of its existence at all. This was evidenced in research that was carried out by Leeder and Lonn (2014). From the findings, it was noted that both users and non-users were not aware of some features of the Sakai platform. Further, on updates on the learning management platform was revealed, for instance, in the

works of Berg (2013), some students were not aware when assignments were published online. From the respondents, since information can be disseminated via cell phones and the learning platforms should be embedded with their phones so that they can receive automatic alerts updates from their instructors.

2.5.7 System Log in Failure

Also, Juhary (2014) observed that students were lumbered with login failure, especially when accessing the Sakai platform for the first time, and also response time in terms of system loading was very low to the expectation of the users.

2.5.8 Unstable Power Supply

In the works of Dube (2017); Choga (2015) unstable power supply was reported as a disturbing phenomenon to hampers users from utilizing the Sakai LMS. Similar findings were observed by Kulshrestha and Ramswaroop (2013) who undertook a study on the benefits of the Learning Management System (LMS) in Indian Education where the findings showed that there were constant power cuts.

2.5.9 Complex System Interface.

In the works of Dube and Scott (2014), the study found that the complexity of the Sakai learning management system is a major factor influencing the adoption and its usability. Davis (2005) undertook a study that focused on the impression of Sakai LMS. It was revealed that the Sakai interface was not user-friendly as expected.

3.0 Methodology

According to Leedy (as cited in Ankrah, 2014, p.115) "the word method is coined from two Greek elements: meth and odors. The meaning of meth being "after" and odos, "way". The term research methodology refers to the method adopted in carrying out a research study. The survey research methodology was adopted for this study. A survey provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of the population. Hence, from the results of the sample, the researcher can then either make a claim or generalize about the population (Creswell, 2013). Students from the Department of Distance Education at the University of Ghana were used as the target population for this study. The researcher decided to use students from the Department of Distance Education because it is one of the departments where the Sakai LMS was piloted in the 2013/2014 academic year before it was finally rolled over to other departments in the 2015/2016 academic year (Ansong, 2015). The population for this study comprised all level 300 studies students and they are enrolled in the following programmes; Bachelor of Arts, Bachelor of

Science in Administration, Bachelor of Science in Nursing, and Bachelor of Science in Information Technology. The total number of students was 790, which constituted the population of the study. Regarding the sampling ratios proposed by Alreck and Settle (1985), the proportionate sample size was selected from each level for the study. The proportionate sample size for each programme was calculated using the following formula:

$$P.S = \frac{\text{Total number of Distance Learning students reading a programme}}{\text{Total number of all Distance Learning students}} \times 237$$

Where P.S = Proportionate Sample size.

A total sample size of 237 was chosen from a population of 790 students for the study. The following statistics show the population and proportionate sample size for each level.

Bachelor of Arts,   P.S   = $\frac{199}{790}$ X 237 = 59.699999982   =   60

Bachelor of Science in Administration   P.S   = $\frac{224}{790}$ X 237 = 67.200000001   =   67

Bachelor of Science in Nursing   P.S   = $\frac{316}{790}$ X 237 = 94.8   =   95

Bachelor of Science in Information Technology   P.S   = $\frac{18}{790}$ X 237= 15.299999994   =   15

Therefore, the total sample size (60+67 +95+15) = 237

The convenience sampling technique was used for this study because of the busy nature and unavailability of the subjects. Thusly, the subjects were distance students and were not always present for their weekend tutorials, therefore, it will be difficult to gather them at a go to gather data from them.

4.0 Major Findings and Discussion.

4.1 Awareness of the Sakai LMS Tools.

Learning management system tools refer to the functional features that users can utilize to achieve a specific purpose (Pappas, 2017). If an effort is exerted for intended users to become aware of an available information system, however, and if they are not made aware of its various tools, the system will still be underutilized. In light of this background, the respondents were asked to select the tools

on the Sakai platform that they were aware of. Table 2 shows the awareness of the Sakai LMS tools available to the Distance Learning students.

Table 2: Awareness of the Sakai LMS Tools.

Sakai Tools	Yes		No	
	Freq.	**%**	**Freq.**	**%**
Assignment tool	212	92.2	18	7.8
Chat tool	190	82.6	40	17.4
Grade book tool	205	89.1	25	10.9
Test and quizzes tool	230	100	-	-
Forum tool	170	73.9	60	26.1
Calendar tool	159	69.1	71	30.9
Syllabus tool	158	68.7	72	31.3
Resource tool	192	83.5	38	16.5
Announcement tool	199	86.5	31	13.5
Email tool	117	50.9	113	49.1
Plagiarism checker tool	48	20.9	182	79.1

Source: Field data, 2019

Table 2, shows that all the respondents 230 (100%) indicated that they are aware of the tests and quizzes tool. Also, 212 (92.2%), 190 (82.6%), and 205 (89.1%) of the respondents are aware of the assignment tool, chat tool, and grade book tool of the Sakai LMS respectively. It can also be shown from the table that; 170 (73.9%) of the respondents were aware of the forum tool, 159 (69.1%), 158 (68.7%) of the respondents were aware of the calendar tool and syllabus tool respectively. The rest of the responses on the awareness of the Sakai LMS tools were as follows; resource tool 158 (68.7%), announcement tool 199 (86.5), email tool 117 (50.9), and plagiarism checker tool 48 (20.9%). However, 182 (79.1%) of the respondents were not aware of the Plagiarism checker tool. It can, therefore, be observed that the majority of the respondents were aware of the tests and quizzes tool which suggests that almost every Distance Learning student is aware of the test and quizzes tool. Also, on average, the respondents indicated that they are aware of the email tool which also suggests that students do not utilize it. Further, as shown from the table, the level of awareness on the plagiarism checker tool was minimal and this also brings to the realization that most lecturers and tutor do not instruct students to submit their assignments and projects to the Sakai platform to check for the plagiarism index since it is not a strict requirement.

The study unraveled that respondents were aware of most of the Sakai LMS tools at their disposal which they are recommended to use as far as course delivery is concerned. The study found out that most of the students are aware of the tests and quizzes tool, assignment tool, and grade tool and it can be attributed to the fact that, it was required for students to take their IA and quizzes, check their

grades and submit their assignments using these tools on the Sakai platform. These findings are consistent with the works of Choga (2015) who found that most students became aware of the tests and quizzes tool because it was mandatory for them to use it. Also, can therefore be explained that ultimately students became aware of the grade tools because it enabled them to access their tests and quizzes results.

Again, the findings corroborate with the study by Soon and Fraser (2009) where the assignment tool was reported as the most highly used tool on the learning management platform. It was further elucidated that the high level of awareness of the assignment was the result of the end-users being constantly informed to submit their assignments using the assignment tool. Also, most of the students are aware of the resource tool. This is not surprising because, it is one of the tools that instructors and tutors engage students in using, thus students get most of their lecture notes and other relevant course materials via the Sakai platform. Similar findings were found in the study of Juhary (2014) where most end-users used the Sakai LMS for downloading their lecture slides. As indicated, the resources tool is used for sharing course materials like slides, handouts, and books, past questions, links for documents to mention but a few. However, from these findings the few numbers of the Distance Learning students who do not visit the Sakai platform for the course materials on their own means they rather rely on their course mates for the course materials.

On the flip side, the study revealed that a considerable number of students are were aware of the calendar tool and more than half of the respondents were not aware of the email tools. This finding is consistent with the works of Soon & Fraser (2011) where it was found that the calendar tool was not popular with the students because they were not aware of it likewise the email tool. With regard to the awareness of the calendar tool, it can be explained that students depended on their colleagues for information concerning updates and deadlines. This also attests to the fact that when students are not directly engaged by instructors or tutors in using any particular learning management system tools the patronage of the said tools will be low. Also, the low level of awareness of the email tool brings to mind that students are often not instructed to utilize it by their instructors or tutors.

Although the ultimate goal of the Technology Acceptance Model is to measure the actual use of technology (Tegoe, 2012), several authors have revealed that "Technology Awareness" as it is popularly known in existing literature has a significant influence on the intention to use information technology which intends to influence the extent of use (Abubakar & Ahmad, 2013; Yaqub, Yaqub, Bello, Adenuga & Ogundeji, 2013). These authors were of the view that technology awareness is an external variable of the TAM which needs to be considered before researchers can holistically assess the actual usage of any information systems. Similarly, it was observed from this study that awareness of the Sakai tools has a significant influence on its use and this is evident in the use of the test and

quizzes, assignment tools, grade tool, and resource. It can be explained from these findings that before students can highly be motivated to use the Sakai platforms and its tools, great attention needs to be given to awareness creation. The findings signify that instructors and tutors play a crucial role in making the tools on the Sakai platform known to the Distance Learning students.

4.2 Extent of Use of the Sakai LMS

Macmillan dictionary defined extent as "the degree to which something happens or is likely to happen". Many authors (Choga, 2015; Tegoe, 2012, etc) have related the TAM to confirm that the extent of using an information system is dependent on the two main constructs: perceived usefulness and perceived ease of use. Determining the extent of use of the Sakai LMS will, therefore, enable the researcher to know how often the Distance Learning students visit the Sakai platform. This section brings to light how often do the student use the Sakai platform, the instructors/tutors influence on the extent of use of the Sakai Platform as well as reasons and frequency of use of the Sakai platform.

4.2.1 Frequency of Use of the Sakai platform

To be able to fathom the extent of use of the Sakai platform by the Distance Learning students it is imperative to ascertain how often the respondents use the system. Given this background, the respondents were asked to indicate how often they use the Sakai platform. The results are represented in Table 3

Table 3: Respondents Frequency of Use of the Sakai platform period

Usage Frequency	Frequency	Percent
Daily	38	16.5
Weekly	73	31.7
Monthly	45	19.6
Once a while	74	32.2
Total	**230**	**100**

Source Field data 2019

As shown in Table 4.14, 74 (32.2%) of the respondents indicated that once a while they visit the Sakai platform, 73 (31.7%) of the respondents visit the platform weekly. Also, 45 (19.6%) do visit the platform monthly and 38 (16.5%) indicated daily. It can, therefore, be surmised from this output that most students do visit the platform when instructed by their instructor or tutor. Based on the responses, it can be observed that most students visit the Sakai platform occasionally as compared to those who visit the platform daily as expected. This finding is consistent with the works of (Choga, 2015), hence, this is an indication that the Sakai platform has been underutilized.

4.2.2 Instructors/Tutors Influence on the Extent of Use of the Sakai Platform

In academic institutions, instructors/tutors directly engage students in course delivery. In light of this, it is critical to know if instructors/tutors influence the extent of use of the Sakai platform. The responses obtained are presented in Figure 2.

Figure 2: Instructors/Tutors Influence on the Use of the Sakai platform
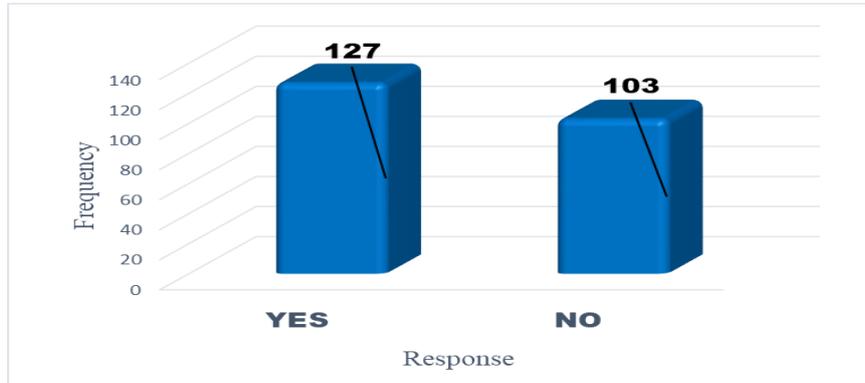
Source Field data 2019

As shown from Figure 2, it was revealed that 127 (55.2%) of the respondents confirmed they only visit the Sakai platform when there is an announcement from their instructors/tutors whilst 103 (44.8%) reported no. These responses suggest that a considerable number of students won't visit the platform if there is no announcement from their instructor or tutors.

4.2.3 Respondents Reasons and the Frequency of Use of the Sakai Platform

The use of every information system is sparked by some reasons. These reasons also influence the extent of the use of the system. For the researcher to know the reasons that propel students to use the Sakai LMS, respondents were asked to indicate the reasons for the use and frequency of use of the Sakai LMS. The responses can be seen in Table 4.

Table 4: Respondents Reasons and the Frequency of Use of the Sakai Platform

Reasons for using the Sakai platform	Frequency of use					
	Frequently		**Rarely**		**Never**	
	Freq.	**%**	**Freq.**	**%**	**Freq.**	**%**
For downloading course outline and lecture materials	116	50.4	84	36.5	30	13.0
For downloading and submitting assignments	147	63.9	83	36.1	-	-
For receiving class announcements.	119	51.7	90	39.1	21	9.1
For discussing subject areas with course mates and tutors	70	30.4	109	47.4	51	22.2
For sending emails to course mates or tutors	48	20.9	99	43.0	83	36.1
For taking Interim Assignments (IA) and quizzes	171	74.3	59	25.7	-	-
For viewing video tutorials	27	11.7	71	30.9	132	57.4
For checking plagiarism of assignments	2	0.9	39	17.0	89	82.2

Source Field data 2019

As shown in Table 4, it was reported that 116 (50.4%) of the respondents frequently use the Sakai platform for downloading course outline and lecture materials, 84 (36.5%) rarely use it whilst 30 (13.0%) of the respondents had never used it. Again, 147 (57.4%) of the respondents indicated that they frequently use the Sakai platform for downloading and submitting assignments, the rest of the respondent 88 (36.1%) brought to bear that they rarely used it and none of the respondents chose "Never". Those who reported that they rarely used the platform creates a picture that, either their tutors don't frequently instruct them to submit their assignments via the Sakai platform or they are usually not given assignments. Another, 119 (51.7%) of the respondents identified that they use the Sakai platform for receiving class announcements, 90 (39.1%) of the respondents reported that they rarely use it whilst 21 (9.1%) indicated they had never used the platform. This is a clear indication that some depend on their colleagues for announcements.

Furthermore, 109 (47.4%) respondents indicated that they rarely use the Sakai platform for discussing subject areas with course mates and tutors whilst 70 (30.4%) reported that they frequently use it for such effect. However, it was revealed that 51 (22.2%) of the respondents never used it for such purpose. It can be inferred from this data that a considerable number of students don't use the platform for discussion. Also, it was reported that 99 (43.0%) of the respondents rarely use the Sakai platform for sending emails to course mates or tutors whilst 48 (20.9%) of the respondents frequently use it for such purpose. However, it was observed that 83 (36.1%) of the respondents had never used it. This output shows that most of the students do not utilize email tools as expected. Another, out of the 230 respondents, 171 (74.3%) indicated that they frequently use the Sakai platform for taking Interim Assignments (IA) and quizzes, 59 (25.7%) of the respondents indicated they rarely use the Sakai platform for such purpose.

It was also brought to bear that a significant number 132 (57.4%) of the respondents never used the Sakai platform for watching video tutorials, 71 (30.9%) reported that they rarely use the Sakai platform while 27 (11.7%) indicated they frequently use it for the said purpose. It can be inferred from this output that, most students don't utilize the video on the Sakai platform. Also, it was reported that 89 (82.2%) of the respondents indicated they had never used the Sakai platform for checking the plagiarism index of their assignments, 39 (17.0%) reported they had rarely used it whilst only 2 (0.9%) of them indicated they frequently use it. This is an indication that those who use a plagiarism checker tool might have used it for their personal works since the tool is mostly used by the graduate students as compared to those at the undergraduate level.

The findings showed that the majority of the Distance Learning students once a while visited the Sakai platform. This finding corroborates with the previous studies by Choga, (2015); Dube and Scott (2014) where the majority of the respondents reported they only visit the Sakai platform when there is

an announcement from their instructors or tutors hence the extent of use of the Sakai platform as reported was relatively low. However, this finding is inconsistent with Juhary (2014) where distance students frequently visit the Sakai platform on their own for their academic works, and the extent of use was high. Also, the findings support the works of (Lonn, Teasley & Krumm (2009); (Rafi Samsudin & Hanafi (2015) where a high extent of use of the system was reported. It can be observed from these findings that students don't visit the platform as expected by the Distance Learning units of the University of Ghana. This is because, the Sakai platform has been wholly accepted as a supplement to the face-to-face weekend tutorials, and it is therefore expected for students to visit the platform almost every day, and perhaps the Sakai platform can also be considered as the second classroom of the Distance Learning students. Therefore, management of the Distance Learning units needs to work assiduously not only to make sure that courses are delivered on the Sakai platform but also to focus on how to increase its usage.

Also, on the reasons for using the Sakai platform, the study found that most of the respondents use the Sakai platform for taking interim assessment and quizzes, downloading, and submitting assignments. The findings corroborate with the study of Choga (2015) where the reason for utilizing the Sakai platform was as a result of the fact they have been instructed by their tutors to do so. However, this finding is inconsistent with Soon and Fraser (2011) in which the Sakai platform was utilized not because they have been forced by their instructor to do so. For instance, most students used the platform for downloading lecture materials, for chatting, and sending emails to friends and tutors which are not considered as mandatory tools. It can be observed that the reasons for the use of the Sakai platform by the Distance Learning students are skewed to the tools which are mandatory for them to use. However, reasons such as; using the Sakai platform for discussion, sending emails, checking updates, and watching video tutorials that are not compulsory to use are relatively low, however, the reasons for the use of the platform are centered on the Sakai tools that are compulsory to the students. Indeed, the overall frequency of use of the Sakai platform by the Distance Learning students is relatively low. This means much effort needs to be fueled into motivating the users to willingly utilize and explore the features of the Sakai platform.

4.3 Challenges in the Use of the Sakai LMS.

 "Despite the notion that university students may be "tech-savvy", they are likely to encounter challenges concerning navigating their new academic context physically, psychologically, emotionally, and technologically" (Arhinful, 2016, p.3). Users are usually saddled with different kinds of challenges when exposed to e-learning platforms especially when it is newly implemented. Based on this background, respondents were asked to indicate the challenges they do face when using the Sakai platform. The responses from the respondents are depicted in Table 5

Table 5: Challenges Respondents encounter when using the Sakai Platform.

Challenges	Yes		NO	
	Freq.	(%)	Freq.	(%)
There is inadequate training on how to use the Saka Platform.	172	74.8	58	25.2
Difficult to get access to the internet.	162	70.4	68	29.6
There is slow internet connectivity.	170	73.9	60	26.1
The Sakai platform interface look complex and I am unfamiliar with the features	103	44.8	127	55.2
Sometimes I experience system error and unable to access the Sakai platform.	172	74.8	58	18.1
Sometimes I don't get informed when there is an announcement on the Sakai platform.	142	61.7	88	38.3
I don't have a personal computer to access the Sakai platform.	109	47.4	121	52.6
Power outages sometimes deny me of accessing the Sakai platform	137	59.6	93	40.4

Source: Field data 2019

As it is shown in Table 5, 172 (74.8) of the respondents reported that there is inadequate training on how to use the Saka Platform, on the same breath, 172 (74.8) of the respondents indicated that sometimes they do experience system error and unable to access the Sakai platform. Also, 162 (70.4%) of respondents reported that they find it difficult to get access to the internet, and 170 (73.9%) brought to bear that they experience slow internet connectivity. This is an indication that internet connectivity becomes slow even if they get access to it.

Further, 103 (44.8) of the respondents indicated the Sakai platform interface looks complex and they are unfamiliar with the features. However, a significant number of the respondents 127 (55.2%) did not observe such challenges. It was also revealed that 142 (61.7%) of the respondents indicated sometimes they don't get informed when there is an announcement on the Sakai platform. Also, 109 (47.4%) of the respondents shown that they don't have a personal computer to access the Sakai platform. Another critical challenge was noted by 137 (59.6%) of the respondents on the assertion "power outages sometimes deny me of accessing the Sakai platform". These aforementioned challenges are compelling and will help assist the researcher to make prudent recommendations to help improve the use of the Sakai platform.

No system is 100% effective when implemented. The third objective of this study was to ascertain some challenges that the Distance Learning students encounter when using the Sakai platform. The findings from this study revealed the following challenges which mitigate against the use of the Sakai platform; students shun the Sakai platform because of inadequate user training and proper orientation on the use of the Sakai platform. This finding supports the research which was undertaken by (Chitanana, Makaza & Madzima (2008) in which it was found that low utilization of the learning management system was, a result of inadequate training and proper orientation. The finding also corroborates with the works of Tella (2012); Nuta & Pusca (2017); Dube & Scott (2014) where lack

of training on the use of the learning management system was reported by the majority of the respondents.

Again, the finding of this study revealed system error and unable to access the Sakai platform. This finding is in agreement with a similar study which was undertaken by Juhary (2014) where it was found that constant system crash deprived the users of accessing the platform either in the middle of retrieving or downloading course materials. Also, a similar finding was found in the works of Wei, Wu & Zheng (2014) and also not different from what Nasser, Cherif & Romanowski (2011) unraveled where system crash and intermittently freezing with error signal which eventually took away the delight of users of utilizing the platform. Another, the finding brought to bear that users of the Sakai platform find it quite difficult to get access to the internet, and those with access occasionally experience slow internet connectivity. The issue of the internet as a critical impediment to the use of e-learning especially in the learning management system has been confirmed by several researchers such as Ngeze (2016); Ssekakubo (2011); Lwoga (2012), Mtebe & Raisamo (2014); Berg (2013). Further, since the internet is the gateway to the Sakai platform as postulated by Oheneba-Sakyi and Amponsah (2018), it is compelling for the management of the Distance unit to pay critical attention to internet connectivity.

Furthermore, other challenges are as follows; the Sakai platform interface looks complex and unfamiliar with the features. A similar finding was found by Dube and Scott (2014) where the complex nature of the learning management system affected user adoption and usability and also consisted of what Davis (2005) found where the interface of the Sakai platform was remarked as unfriendly. Again, another challenge from the findings is that sometimes the respondents don't get informed when there is an announcement on the Sakai platform, some also don't have a personal computer to access the Sakai platform which is consisted with Salawudeen(2010) in which it was noted that users find it expensive to purchase personal computers or laptops in Nigeria. Furthermore, the findings brought to bear that power outages sometimes deny the Distance Learning students from accessing the platform and this is no different from the works of Dube (2017); Choga (2015); Kulshrestha and Ramswaroop (2013) where power cut was a big challenge to the users of the learning management system.

 Also, difficulty logging onto the Sakai platform for the first time was revealed from the finding of the study. This finding supports the works of Juhary (2014) where users faced challenges in an attempt to log on onto the platform. Also, the lack of awareness about some functional features of the Sakai platform was shown in the findings. This conforms to the study by Leeder and Lonn (2014) where a lack of awareness of the learning management system as well as its functional features led to low utilization. Besides, lack of computer skills which is compelling for students to use the Sakai platform

with ease was left unmentioned. A similar finding was reported in the works of Dube & Scott (2014), the study showed that low utilization of the Sakai platform was as the result of a lack of computer skills.

As mentioned earlier, there is no deniable fact that the implementation of every e-learning platform is usually saddled with some inherent challenges, such a phenomenon has been shown in the implementation of the Sakai platform in this study. As theorized in the TAM by Davis (1993) the challenges faced by the Distance Learning students as evidenced in this study are related in the TAM are external variables that influence the perceived usefulness and perceived ease of its use. This means that when challenges associated with a system are minimal it will positively affect the perceived usefulness and perceived ease of use of the system and ultimately affect the extent of its use.

4.4 Hypothesis Testing

Hypothesis refers to an educated guess of the relationship among variables. It helps to establish the relationship between variables before a conclusion can be drawn. According to Ankrah (2014, p.229), "hypothesis is a specific statement of prediction. It describes in concrete (rather than theoretical) terms what the expectation will be in the study. A single study may have one or many hypotheses". In this study, Chi-Square was used to test the relationship between two variables. According to Onchiri (2013), "a Chi-square test compares proportions observed in a study with the expected to establish if they are significantly different". Among the various non-parametric tests, the Chi-square test is considered as one of the commonly used non-parametric tests by researchers. Its correct application is an uphill task for most researchers (Kothari, 2007).

Hypothesis One

H_0: Students' computer literacy skills will not affect their perceived ease of use of the Sakai LMS.

H_1: Students' computer literacy skills will affect their perceived ease of use of the Sakai LMS.

Where,

H_0 is the "Null hypothesis"

H_1 is the "Alternative hypothesis"

The significant level (α) for this study is 0.05 and the test statistic is a Chi-Square and is given as;

$$\chi^2 = \sum_i \frac{(O_i - E_i)^2}{E_i}$$

Where E_i is the expected frequencies

X^2 is Chi-Square

DF is Degree of Freedom

COR is the Correlation Coefficient.

Table: 6 Relationship between Students' Computer Literacy Skills and the Perceived Ease of Use of the Sakai LMS

Items			Perceived Ease of Use of the Sakai LMS					
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Computer literacy skills	Basic	Count	10	3	13	19	5	50
		Expected Count	5.4	5.9	13.9	19.6	5.2	50.0
	Intermediate	Count	12	19	44	49	9	133
		Expected Count	14.5	15.6	37.0	52.0	13.9	133.0
	Advanced	Count	3	5	7	22	10	47
		Expected Count	5.1	5.5	13.1	18.4	4.9	47.0
Total		Count	25	27	64	90	24	230.0
		Expected Count	25.0	27.0	64.0	90.0	21.0	230

Source: Field data, 2019 $\quad \chi2 = 19.808 \quad DF = 6 \quad COR = 0.149$

The degree of freedom (DF) is given as;

(r-1)(c-1)

Where r is the number of rows

    c is the number of columns

From Table 6, the degree of freedom is;

(3-1)(5-1) = 2 x 4 = 6

From the chi-square table, a DF of 6 at α = 0.05 is given as 12.592

Table 7: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	19.435	8	.013
Likelihood Ratio	18.584	8	.017
Linear-by-Linear Association	5.295	1	.021
N of Valid Cases	230		

Source: Field data, 2019

Table: 8 Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.152	.069	2.323	.021
Ordinal by Ordinal	Spearman Correlation	.147	.069	2.248	.026
N of Valid Cases		230			

Source: Field data, 2019

The calculated Chi-Square from Table 7 = 19.435 and the Chi-Square value from a Chi-Square distribution table at a Degree of Freedom of 6 = 12.833. Since the calculated Chi-Square value is greater than that of the Chi-Square table, therefore the H_O is rejected and H_1 is accepted, hence, the conclusion that students' computer literacy skills will affect their perceived ease of use of the Sakai LMS. This is a positive relationship between students' computer literacy skills and perceived ease of use of the Sakai LMS. When the value of the Person's correlation (R) is greater than 0.5, it is an indication of a strong relationship and weak when less than 0.5. Based on this rule, from Table 8, the Person's Correlation (R) = 0.152 which is an indication of a weak relationship between students' computer literacy skills and perceived ease of use of the Sakai LMS.

Despite the weak relationship revealed from the chi-square test, it is imperative for the Distance Learning unit of the university to pay critical attention to training as it has a high propensity to enhance the computer literacy skills of the students and in effect will increase their perceived ease of use of the Sakai LMS and ultimately increases the actual extent of use (Davis, 1993).

Hypothesis Two

H_0: Students' perceived usefulness of the Sakai LMS will not increase the extent of use of the Sakai LMS.

H_1: Students' perceived usefulness of the Sakai LMS will increase the extent of use of the Sakai LMS.

Where,

H_0 is the Null hypothesis

H_1 is the Alternative hypothesis

The significant level (α) for this study is 0.05 and the test statistic is a Chi-Square and is given as;

Where O_i are the Observed frequencies

Where E_i are the expected frequencies

X^2 is Chi-Square
DF is Difference
COR is the Correlation Coefficient.

Table 9: Relationship between Students' Perceived Usefulness of the Sakai LMS and the Extent of Use of the Sakai LMS

Items			The extent of use of the Sakai LMS				
			Daily	Weekly	Monthly	Once a while	Total
Usefulness of the Sakai LMS	Strongly Disagree	Count	11	8	7	12	38
		Expected Count	6.3	12.1	7.4	12.2	38.0
	Disagree	Count	7	25	18	17	67
		Expected Count	11.1	21.3	13.1	21.6	67.0
	Neutral	Count	12	19	13	29	73
		Expected Count	12.1	23.2	14.3	23.5	73.0
	Agree	Count	6	17	7	16	46
		Expected Count	7.6	14.6	9.0	14.8	46.0
	Strongly Agree	Count	2	4	0	0	6
		Expected Count	1.0	1.9	1.2	1.9	6.0
Total		Count	38	73	45	74	230
		Expected Count	38.0	73.0	45.0	74.0	230.0

Source: Field data, 2019 $X^2 = 19.758$ DF = 12   COR = .005

The degree of freedom (DF) is given as;

 (r-1)(c-1)

Where r is the number of rows

     c is the number of columns

From Table 4.20, the degree of freedom is;

 (5-1)(4-1) = 4 x 3 = 12

From the Chi-Square table, a DF of 12 at $\alpha = 0.05$ is given as 21.026.

Table 10: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	19.758	12	.072
Likelihood Ratio	21.675	12	.041
Linear-by-Linear Association	.005	1	.942
N of Valid Cases	230		

Source: Field data, 2019

Table 11: Symmetric Measures

		Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Interval by Interval	Pearson's R	.005	.068	.073	.942c
Ordinal by Ordinal	Spearman Correlation	.018	.068	.269	.788c
N of Valid Cases		230			

Source: Field data, 2019

From Table 10, the calculated Chi-Square value = 19.758 and the Chi-Square value from a Chi-Square distribution table at a difference of 12 = 21.026. The calculated Chi-Square value is less than that of the Chi-Square table, therefore the H_0 is accepted and H_1 is rejected, hence, the conclusion that students' perceived usefulness of the Sakai LMS does not affect the extent of use of the Sakai LMS, this is an indication of a negative relationship between students' perceived usefulness of the Sakai LMS and the extent of use of the Sakai LMS. However, from Table 11, the Person's Correlation (R) = 0. 005 which is an indication of a weak relationship between students' perceived usefulness of the Sakai LMS and the extent of use of the Sakai LMS.

As the chi-square test revealed a negative relationship between perceived usefulness and the extent of use of the Sakai platform even though the relationship is very weak. This means that the perceived usefulness of the Sakai platform by Distance Learning students does not affect the extent of its use. This finding, therefore, did not support the assertion in the TAM which states perceived usefulness affects the extent of use of a system. This finding is inconsistent with the study of (Lonn, Teasley & Krumm, 2009). Based on this revelation, it can be assumed the Distance Learning students of University Ghana are not much motivated to use Sakai LMS due to its usefulness, therefore, it is a clear direction that much works need to be done to increase the perceived usefulness of the Sakai platform since it is one of the critical variables of the TAM and perhaps which underpin this study.

4.5 Theoretical Interpretations of the Findings

In the areas of user acceptance, adoption, perception, and use of information systems, numerous researches have adopted the Technology Acceptance Models (TAM) to predict and explain their studies. Even though there have been some other proposed models over the years and some "researchers who have shared mixed opinions regarding its theoretical assumptions and practical effectiveness the TAM has captured the attention of the Information Systems community" (Chuttur, 2009, p.1). Three critical variables are considered as determinants of the actual use of any information systems in the TAM. These two factors have been considered by Davis (1993) a user's motivation and they comprise perceived usefulness, perceived ease of use. Perceived usefulness and perceived ease of use of a system are influenced by external variables such as computer skills, awareness, and prior knowledge in using the system (Pituch & Lee, 2006). Therefore, Perceived usefulness and perceived ease of use influence the actual extent of use which is one of the measured variables in this study (Pituch & Lee; 2006) and Hayashi; Chen, Ryan, and Wu, 2008).

5.0 Conclusion

Currently, the use of instructional technologies has become compelling for higher institutions especially as the world is battling with the novel COVID-19 in the quest to enhance teaching and learning. No wonder e-learning has no more been regarded as a luxury but rather an inevitable tool

and because of its phenomenal positive impact on teaching and learning especially in the area of distance learning. The use of learning management systems is gaining roots in most tertiary institutions with the intent to supplement the traditional face to face teaching and learning and in the bid to accelerate easy access and quality education and to alleviate issues such as; students lecture ratio which ultimately leads to some qualified applicants not being able to get the opportunity to be enrolled.

As it is evident in this study that the use of the Sakai platform has been a great support to the Distance Learning students of the University of Ghana as perceived by the respondents such as quick and easy access to course materials, convenient and flexible course instruction, reduce the cost of physical course materials and transport and it helps gain extra skills to mention but a few. However, many researchers in the area of e-learning hold the view that learning management systems are still underutilized due to certain challenges associated with its use as evidence in this study and concerted effort from the management of the Distance units and all stakeholders need to be exerted to arrest these challenges to the barest least.

6.0 Recommendations

Based on the findings, it was recommended the Distance Education unit should provide adequate orientation and training to students, instructors, and tutors on how to use the Sakai LMS tools, provision of an effective support system, high bandwidth for internet connectivity, linking Sakai LMS to social media, and redesigning of the Sakai LMS interface to make it more interactive.

References

Abubakar, F. M., Ahmad, H. B. (2013). The moderating effect of technology awareness on the relationship between UTAUT constructs and behavioural intention to use technology: A conceptual paper. *Australian Journal of Business and Management Research, 3*(2), 14- 23.

Acheampong, E. K. (2016). *Students' use of electronic resources in University of Professional Studies, Accra*. (Unpublished MPhil Thesis). Department of Information Studies, University of Ghana, Legon.

Agbofa. F. J. (2012). *Challenges and prospects facing students of distance education in Ghanaian public universities: The case of University of Cape Coast study centre*. (Unpublished MA Dissertation), University of Cape Coast.

Alhassah, H. (2014). *Legon students to start switching between physical and online lecture room.* Retrieved from http://ugfile.com/legon-students-to-start-switching-between- physical-and-online-lecture-rooms.

Alreck, P. & Settle, R. B. (1985). The survey research handbook. Illinois; IRWIN.

Ankrah, E. (2014). *The impact of information systems strategy on bank performance in Ghana*. (Unpublished Doctoral Thesis). Department of Information Studies, University of Ghana.

Ansong, E. (2015). *University of Ghana determinants of e-learning adoption in Universities: Evidence from a developing country*. (Unpublished Mphil Thesis). Department of operations and management information systems, University of Ghana Business School, University of Ghana.

Arhinful, L. (2016). *Learning Management System adoption in the university: Exploring the experiences of Canadian and international students*. (Unpublished MA Dissertation). Faculty of Social Sciences, Brock University St. Catharines, Ontario

Berg, V.D. (2013). *Teaching assistants' and undergraduate students' first online teaching and learning experiences in an open distance learning context*. Retrieved from http://www1.curtin.edu.my/tl2015/tl2013/PDF/Teaching%20assistants'%20and%2

Biggers, L. (2009). *Sakai: Open Source..Open Minds.* Retrieved from https://www.learningsoluutionsmag.com/articles/216/sakai-open-source-open-minds

Boote, D. N., & Beile, P. (2005). Scholars before researchers: On the centrality of the dissertation literature review in research preparation. *Educational Researcher*, *34*(6), 3-15.

Brady, A. K & Pradhan, D. (2020). Learning without Borders: Asynchronous and Distance Learning in the Age of COVID-19 and Beyond. *ATS Scholar 1*(3), 233–242.

Caminero, A. C., Hernandez, R., & Ros, S. (2013). Choosing the right LMS: A performance evaluation of three open-source LMS. *Global Engineering Education Conference,* 287– 294.

Chen, J. L. (2011). The effects of education compatibility and technological expectancy on e-learning acceptance. *Computers & Education*, *57*(2), 1501–1511.

Choga, E. (2015). *The use of Sakai e-learning platform by undergraduate students in the faculty of communication and information science at NUST*. (Unpublished Bachelor Dissertation), Library and Information Science, National University of Science and Technology.

Chuttur, M. (2009). Overview of the Technology Acceptance Model: Origins, Developments and Future Directions. *Working Papers on Information Systems*, *9*(37).

Chitanana, L., Makaza, D., & Madzima, K. (2008). The current state of e-learning at universities in Zimbabwe: Opportunities and challenges. *International Journal of Education and Development Using ICT*, *4*(2), 5–15.

Cavus, N., & Zabadi. T. (2014). A comparison of open source learning Management Systems. *Social and Behavioral Sciences,* 143, 521 – 526

Creswell, J. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches.*(3rd Ed.). Lincoln: Sage Publications.

Davis, R. (2005). *First Impression of Sakai 2.0: Better than I expected*. Retrieved from https://immagic.com/eLibrary/ARCHIVES/GENERAL//BLOGS/F050623F.pdf

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, *35*(8), 982-1003. Retrieve from http://dx.doi.org/10.1287/mnsc.35.8.982.

Davis, F. (1993). User acceptance of information technology: system characteristics, user perceptions and behavioral impacts. *International Journal of Man-Machine Studies.*

Dadzie, P. S. (2009). E-learning and E-Library Services at the University of Ghana: prospects and challenges. *Information Development, 25*(30), 207-217.

Derakhshan, N. (2012). *Student and faculty perceptions of the features of mobile learning management systems in the context of higher education*. (Unpublished MSc Dissertation).   Faculty of the Graduate College of the Oklahoma State University.

Dube, S., & Scott, E. (2014). An empirical study on the use of the Sakai Learning Management System (LMS). *Proceedings of the e-Skills for Knowledge Production and Innovation,* 101-107. Retrieved from http://proceedings.e-skillsconference.org/2014/e-skills101-107Dube851.pdf.

Edumadze, K.E., Ogoe, J. I., Essilfie, G., Edumadze, G. E., Graham.E. & Robert., E. Osei-Gyasi, A. (2017). E-learning at the University of Cape Coast, Ghana-are our distance education students technologically ready? *The Online Journal of Distance Education and E-Learning, 5*(1).

Govender, D. W. (2010). Attitudes of students towards the use of a learning management system in a face-to- face learning mode of instruction. *Africa Education Review, 7*(2), 244-262. Retrieve from https://doi.org/10.1080/18146627.2010.515394

Graves, W. H. (2001). The New Challenges of E-Learning. *Communications of   ACM*, *1*(43). Retrieved. http://portal.acm.org.ezproxy.massey.ac.nz/citation.cfm?id=359429andcoll=portalanddl

Hamuy, E. & Galaz, M. (2010). Information versus communication in course management system participation. *Computers & Education*, 54, 169–177.

Juhary, J. (2014). Perceived usefulness and ease of use of the learning management system as a learning tool. *International Education Studies, 7*(8), 23–34. Retrived from https://doi.org/10.5539/ies.v7n8p23.

Kautonen, T., Gelderen, M & Fink, M. (2015). Robustness of the theory of planned behavior in Predicting entrepreneurial intentions and actions. *Entrepreneurship Theory & Practice*, *39*(3), 655-674.

Kothari, C. R. (2007). *Quantitative techniques*. New Delhi, UBS Publishers LTD.

Kulshrestha, T., Ramswaroop, S. (2013). Benefits of Learning Management System (LMS) in Indian   Education. *International Journal of Computer Science & Engineering Technolog (IJCSET)*, *4* (8)

Lang, L., & Pirani, J. A. (2014). The learning management system evolution. *Educause Annual Conference Research Bulletin*, 1–9. Retrieved from http://www.educause.edu/annual-conference.

Larkai, A. T., Ankomah-Asare, E. T., & Nsowah-Nuamah, N. (2016*). Distance education in Ghana: An overview of enrolment and programme patterns.* Retrieved from http://www.incedi.org/wp-content/uploads/2016/11/Distance-Education-In-Ghana-an-overview-of-enrolment-and-programme-patterns-Larkai-A.T.-Ankomah- Asare-E.T-Nsowah-Nuamah-N.N.N..Pdf

Leeder, C., & Lonn. S (2014). Faculty usage of library tools in a learning) management   system. *College & Research Libraries, 75*(5), 641-663.

Liyanagunawardena, T. R. (2008). Measuring student perceptions and actual usage of online learning management system. *Communications of the IBIMA*, 4, 165-168. Retrieved from https://www.academia.edu/1444608/Liyanagunawardena_T.R._2008_._Measuring_Student_Perception_and_Actual_Usage_of_Online_Learning_Management_System_Communications_of_the_IBIMA_vol_4_165-168.

Lonn, S., Teasley, S.D., & Krumm, A. E. (2009). Investigating undergraduates' perceptions and use of a learning management system: A tale of two campuses.*Ctools.Umich.Edu,* 1- 166 Retrieved from https://ctools.umich.edu/access/content/group/research/papers/Survey_FinalPaper_AERA 09.pdf.

Lucian, V.N. (2016). Learning management systems in higher learning institutions in   Tanzania: Analysis of students' attitudes and challenges towards the use of UDOM LMS in teaching and learning at the University of Dodoma. *International Journal of Computer Applications. 11(*136*), 0975 – 8887.*

Lwoga, E. (2012). Making learning and Web 2.0 technologies work for higher learning   institutions in Africa. *Campus-Wide Information Systems*, *29*(2), 90–107.

Mehta, R. (2013). *Conceptual and theoretical framework* (PowerPoint Slides). Retrieved from https://www.slideshare.net/rsmehta/conceptual-and-theoretical-framework

Mensah, S. K., & Owusu-Mensah, F. (2012). *Priorities and strategies for capacity building in* 168 *tertiary distance education for human resources development in Ghana.* Retrieved from http://siteresources.worldbank.org/EDUCATION/Resources/278200-1099079877269/547664-1099079956815/Ghana_capacity_building_En02.pdf

Mtebe, J.S. & Raisamo, R. (2014). Investigating perceived barriers to the use of Open Educational Resources in higher education in Tanzania. *International Review of Research in Open and Distance Learning*, *15*(2) 43–65.

Mtebe, J. S. (2015). Learning management system success: Increasing learning management system usage in higher education in sub-Saharan Africa. *International Journal of Education and Development using Information and Communication Technology, 11(2), 51-64.*

Mnyanyi, C. B., & Mbwette, T. S. A. (2009). *Open and distance learning in professional development in third world countries*. Retrieved from https://www.ou.nl/Docs/Campagnes/ICDE2009/Papers/Final_paper_280Mnyanyi.pdf.

Neuman, W. (2011). *Basics of Social Research: Qualitative and Quantitative Approaches (2nd Ed.).* New Jersey: Pearson Education.

Ngeze, L.V. (2016). Learning management systems in higher learning institutions in Tanzania: Analysis of Students' Attitudes and Challenges towards the use of UDOM LMS in

Teaching and Learning at the University of Dodoma. *International Journal of Computer Applications, 136* (11), 0975 – 8887

Namisiko, P., Mindila, R., Chepkoech, E., & Nyeris, R. (2014). A review of application of web 2.0 and open source softwares in e-learning: A Baseline survey in a private   university, Kenya. *International Journal of Computer Science Issues, 11(2).*

Nasser, R., Cherif, M., & Romanowski, M. (2011). Factors that impact student usage of the learning management system in Qatari schools. *International Review of Research in Open   and Distributed Learning*, *12*(6). Retrieved form http://www.irrodl.org/index.php/irrodl/article/view/985/1956

Noh, N. M., Isa, P. M., Samah, S. A., & Isa, M. A. (2012). Establishing an organisational e-learning culture to motivate lecturers to engage in E-learning in UiTM. *Procedia - Social and Behavioral Sciences 67*, 436 – 443.

Nuta, A. C., & Pusca. A. C. (2017). An assessment of distance learning education platform options and opportunity. *Journal of Public Administration, Finance and Law, 11*(3), 113-120

Onchiri, S. (2031). Conceptual model on the application of chi-square test in education and social sciences. *Global Journal of Art and Social Science Education, 1*(1), 016-026.

Patil, R. (2012). A study on the impact of learning management systems on students of a University College in Sultanate of Oman. *International Journal of Computer Science Issues, 9*(2), 379–385.

Pappas, C. (2016). *The top learning management systems benefits.* Retrieved from https://elearningindustry.com/top-8-benefits-of-using-learning-management-q-systems.

Pituch, K. a., & Lee, Y. (2006). The influence of system characteristics on e-learning use. Computers &Education, *47*(2), 222–244.

Oheneba-Sakyi, Y., & Amponsah, G. K. (2018). *Still offline and behind in this digital world? Join I the Sakai LMS experience.* PowerPoint presentation at the meeting of an Inter- college lecture series, University of Ghana.

Rafi, A., Samsudin, K., & Hanafi, H. F. (2015). *Differences in Perceived Benefit, Use, and Learner Satisfaction between Open Source LMS and Proprietary LMS.* Retrieved from   https://cdn.intechopen.com/pdfs-wm/48750.pdf.

Salawudeen, O.S. (2010). *E-learning technology. The Nigerian experience.* Retrieved from https://www.fig.net/resources/proceedings/fig_proceedings/fig2006/papers/ts84/ts84_ 03_salawudeen_0593.pdf.

Selim, H. M. (2007). Critical success factors for e-learning acceptance: Confirmatory factor models. *Computers & Education*. 396–413.

Smet, C. De, Bourgonjon, J., Wever, B. De, Schellens, T., & Valcke, M. (2012). Researching instructional use and the technology acceptation of learning management systems by secondary school teachers. *Computers & Education, 58*(2), 688–696.

Soon, L., & Fraser. C. (2011). Knowledge Sharing and Knowledge Exchange in Distance Education Online Group Work. *International Journal of Information and Education Technology, 1(*2).

Srichanyachon, N. (2014). EFL learners' perceptions of using LMS. *The Turkish Online Journal of Educational Technology, 13*(4).

Ssekakubo, G., Suleman, H. & Marsden, G. (2011). Issues of adoption: Have e-learning management systems fulfilled their potential in developing countries? In *Proceedings of the South African Institute of Computer Scientists and Information Technologists. Conference on Knowledge, Innovation and Leadership in a Diverse, Multidisciplinary Environment*. Cape Town, South Africa, 231–238.

Stephanie, T. (n.d). *Using Surveys to Evaluate Sakai: Goals & Results*. Retrieved form https://ctools.umich.edu/access/content/group/research/presentations/Sakai_Vancouver_Teasley_Lonn_etal.pdf.

Suorsa, J. M., & Eskilsson, N. (2014). *Students' perceptions of learning management systems*. (Unpublished Doctoral Thesis). University of Gothenburg, Sweden.

Tagoe, M. (2012). Students' perceptions on incorporating E-learning into teaching and learning at the University of Ghana. *International Journal of Education and Development using Information and Communication Technology. 8(1)*, 91-103.

Tagoe, M., & Abakah, E. (2014). Determining distance education students' readiness for mobile learning at University of Ghana using the Theory of Planned Behavior. *International Journal of Education, 10*(1), 91-106.

Tella, R. (2012).System-related factors that predict students' satisfaction with the Blackboard Learning System at the University of Botswana. *African Journal of Library, Archives and Information Science*, *22*(1), 41.

University of Ghana. (2017). *Distance Education Programme handbook*. Retrieved from https://www.ug.edu.gh/announcements/distance-education-programme-20172018-academic-year

Unwin, T. (2010). Digital learning management systems in Africa: myths and realities. *Open Learning. The Journal of Open and Distance Learning*, *25*(1), 5–23.

Wei,Y., Wu.Y., & Zheng, Z. (2014). The Application of Sakai in University of Science and Engineering. *Education Journal, 3*(4), *224-228.*

World Bank (2012). *The Transformational Use of Information and Communication Technologies in Africa*. Retrieved from http://siteresources.worldbank.org/EXTINFORMATIONANDCOMMUNICATIONAND TECHNOLOGIES/Resources/282822-1346223280837/Summary.pdf.

Yaqub, J., Bello, H. T., Adenuga, I. A., & Ogundeji, M. O. (2013). The Cashless Policy in Nigeria: Prospects and Challenges. *International Journal of Humanities and Social Science, 3*(3), 200-212.