ADOPTION OF WEB 2.0 IN LEARNING MANAGEMENT SYSTEMS IN UNIVERSITIES IN NAIROBI: DEVELOPMENT OF A UTAUT BASED MODEL

BY

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UNITED STATES INTERNATIONAL UNIVERSITY

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A Project Report Submitted to the School of Science and Technology in Partial Fulfillment of the Requirement for the Degree of Master of Science in Information Systems and Technology

UNITED STATES INTERNATIONAL UNIVERSITY

SPRING 2019
DECLARATION

I, the undersigned, declare that this is my original work and has not been submitted to any other college, institution or university other than the United States International University in Nairobi for academic credit.

Signed: ___________________ Date: __________________________
       Moseti Micah Francis (ID No 649313)

This project has been presented for examination with my approval as the appointed supervisor.

Signed: ___________________ Date: __________________________
       Patrick Kanyi Wamuyu, PhD.

Signed: ___________________ Date: __________________________
       Dean, School of Science and Technology
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ABSTRACT

With the compatibility of web technologies 2.0, there have been changes in the way people access and use knowledge and information. Educational institutions are not an exception to the state of Web 2.0 technology that is on the rise in electronic learning. Despite research on the use of Web 2.0 in education, there has not been enough insight into the models that support the exploitation of web technologies in electronic learning environments such as universities in Nairobi.

Web 2.0 refers to technologies on the web such as wikis, blogs, and online forums that allow for the creation, sharing, communication, and sharing of ideas. Interactive platforms like blogs and wikis are known to enhance group work and promote the learning community's needs. For example, wikis have been used to promote collaborative work in educational institutions. An online discussion forum is used to facilitate problem-based learning. Through social networking services, Facebook and Twitter are capable of facilitating social learning. Services like chatting, wall printing, sharing content, and mentoring can increase learning enhancement. Even though Web 2.0 enhances the functionality and effectiveness of problem-based learning, collaborative work, and learning through social networks, African countries have been slow to adopt it.

Employment of Web 2.0 tools in universities in Nairobi could improve if the implementers allowed for incorporation of additional Web 2.0 platforms such as social media and wikis. Learning plus social networking are being ameliorated by synchronous or asynchronous Web 2.0 applications and technologies. These technologies provide an incentive for e-learning where it is assumed that social construction breeds knowledge. Through the Web 2.0 technologies, learning takes place through interactions about problems and action as well as conversations on content. Web 2.0 technologies therefore permit learners to work together in a virtual community and collaborate through social media.

Research methodology was used to delineate the techniques and methodology to be utilized in this investigation just as to investigate and find helpful data with respect to the reception of Web 2.0 innovation instructing to improve learning strategies. Information analysis was performed utilizing SPSS programming, version 17.0. Expressive measurements were utilized to divide the information when certain frequencies were utilized, while others were examined utilizing numerous reactions utilizing the Likert scale to acquire a connection.
From the study findings, some hypotheses in the initial model were found to be non-effective in the adoption of Web 2.0. This left only three constructs; Saving on Time, Ease of Use, and Effectiveness and Efficiency as the primary constructs in the final model. This literature, therefore, aims at making appropriate recommendations on the models and or theories which can be used to properly merge Web 2.0 tools and LMS, and provide guidance to future study work in similar field.
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DEDICATION

I dedicate this project to my parents, Jones Otwori Micah and Dorcah Moraa Onyari and my siblings, Howard Kirriama Micah and Denis Mogaka Micah, for their love and support during the course of this study.
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<td>Learning Management System</td>
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<td>PU</td>
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CHAPTER 1: INTRODUCTION

In the higher education setting, Web 2.0 is instrumental in helping students to engage with their peers as they learn. Web 2.0 can also be helpful in understanding content while at the same time discerning patterns, building relationships, building collaborative knowledge and ultimately creating communities for practice (Sadaf, Newby & Ertmer 2012). While availability and integration of Web 2.0 are widely implemented, utilization of this technology continues to be a challenge (Gabriel & Velenzuela 2013). In USIU, particularly, Web 2.0 tools, like blackboards and Wikis, have been purchased but this resource is not widely utilized by students and lecturers to promote learning. Den Exter, Rowe, Boyd, and Lloyd (2012) asserted that different challenges exist in implementing Web 2.0 platforms like Wikis in the environment of educational institutions.

These challenges include lack of accountability by students and inadequate time to participate. For the instructors, there is lack of clear instructions, rules for use and their presence in using Web 2.0 tools (Tess, 2013). Other issues include the design of the Wikis and the congruence with educational pedagogy or philosophy. In spite of the adoption of Web 2.0 tools in learning institutions, Teo (2012) shows a gap in the adoption of the Web 2.0 technologies in learning management systems (Buabeng-Andoh, 2012). Most learning institutions do not take into consideration the needed infrastructure for the implementation of Web 2.0 in Learning Management Systems (LMS). For instance, Venkatesh, Croteau, and Rabah (2014) indicate that a Web 2.0 integration with the learning management system should be easily rendered on portable devices such as smartphones. This study presents a compelling look on the Web 2.0 learning technologies while making propositions on the adoption of Web 2.0 technology (James et.al, 2014).

1.1 Background of the study

Some universities in Nairobi have been able to implement Web 2.0 in their learning process in different ways. Learning paradigms in various academic institutions have been changed with the help of Web 2.0, however, not all have fully adopted the technology in running their daily learning activities. For instance, Jomo Kenyatta University of Agriculture and Technology uses Moodle as a Web 2.0 technology while USIU uses WebCT in its learning management system (Ngamau, 2013). It is essential to understand the adoption of such
Web 2.0 technologies into the learning management system, to improve interaction and collaboration in learning.

The Web 2.0 concept describes applications which distinguish themselves from the previous generations of software because of the principles which take advantage of web-based networks (Buabeng-Andoh, 2012). Reilly (2004) presented the word Web 2.0 and stated that what matters is not how the software allows web connection, but how it allows services to be conveyed via web. Calisir, Gumussoy, CBayraktaroglu and Karaali, (2014) argue that the efficacy of Web 2.0 depends on collecting intelligence over the web. The term is widely used; however, it does not have a collective definition. Research shows that Web 2.0 platforms are distinguished from the rest of the web because of the applications like Blogs and Wikis where users are able to edit content (Chen, Yen & Hwang, 2013). Blogs, Wikis, and social networks are inherently open to socialization. Even without much change in technology, the Web 2.0 applications have changed from reading to read and write platforms. The educational theories of constructivism and connectivism are dependable on the collaborative characteristic of the Web 2.0. This, therefore, makes Web 2.0 technology attractive for students and professors (Valerio & Velenzuela, 2013). Learning systems have incorporated social bookmarking, blogs and Wikis in learning. Web 2.0 is growing in popularity and so are other popular applications. With the dawn of Web 2.0 tools, it is crucial to reflect on how such tools can transform the learning models. In the traditional setup of electronic learning, the instructor can provide content through learning management systems which are accessible (Calisir, Gumussoy, Bayraktaroglu & Karaali, 2014). Interactive and communication tools are used in communicating. The typical classroom in e-learning is a classroom with students and teachers. However, when Web 2.0 is added, human factors need to be taken into account because very few people have the knowledge of interacting with the Web 2.0 tools.

Web 2.0 technology is already effective in the well developed countries, for instance, Istanbul and Erbil have been using Web 2.0 since the advancement of digital revolution (Sabeh, Baharudin & Abdullah, 2018). The applications have user interfaces that are friendly and encourage more users. This enables the users’ preferences of more applications of Web 2.0 in their personal and professional lives. The technology has also played a major role in the sharing of information and experiences among people. The most important part is that it has made an improvement in the learning institutions where they are adopted and
used to facilitate learning. African countries like South Africa have better records of using Web 2.0 and in numbers comparable to those in Europe and North America. Seychelles and Mauritius are some other African countries making good use of Web 2.0 technology (Walia & Gupta, 2012).

There are numerous articles highlighting the contribution of Web 2.0 to collective learning and even societal interaction. Educators are realizing that Web 2.0 is helpful in shaping, sharing knowledge and collaborative learning (Chen, Yen & Hwang, 2013). Web 2.0 tools are applied in the higher education setting for it to involve students in learning process (Kristin et. al., 2012). Web 2.0 can also enable students to operate on the theoretical ground of considering where they meditate using user-generated communities in understanding content and discovering relationships and solving problems (Wong, Teo & Russo, 2012). Web 2.0 allows educators to communicate in large or small groups by just clicking. It also contributes in large measure to the knowledge of Web 2.0 in LMS (Kristin et. al., 2012). The table below shows how Web 2.0 technologies contribute to learning and the advantages and challenges that come with them.

![Web 2.0 in the learning process](image)

**Figure 1: Web 2.0 in the learning process illustrating the relationships between students and teachers** Source: Wong, Teo & Russo (2012)

Students will be able to engage in e-learning by invoking the rational choice theory and individuals will undertake decisions that are prudent and logical. When learners find that conventional face-to-face learning in universities in Nairobi offers more benefits from the
learner’s perspective then the learners will forego online learning in favor of conventional classroom learning (Arif & Mahmood, 2012). Through exploitation of Web 2.0 technology, learners getting the learning experience online can approximate the conventional learning experience on social fronts thus motivating more student participation.

In the process of learning, learners are able to interact. Web 2.0 tools are interaction-driven from design, implementation to their use. The embrace and full use of Web 2.0 will enable propagative interaction among learners which is a core aspect of learning, especially in institutions of higher learning such as universities. Interactive platforms such as blogs and Wikis are capable of enhancing group work and raising learning community needs. For instance, Wikis promote collaborative work in learning institutions (Wong & Russo, 2012). Students will be facilitated to develop critical thinking by utilizing the interactive capabilities and features of Web 2.0 applications by embracing the technology. The critical thinking will arise from interactive exchange that allows students to create, share, comment, and critique their work, peer’s work, and the course instructor’s work (George, 2016).

![Web 2.0 features](http://www.entrepreneurweb.com/sites/entrepreneurweb.com/files/website_2_0.jpg)

Figure 2: Web 2.0 features: Source:
http://www.entrepreneurweb.com/sites/entrepreneurweb.com/files/website_2_0.jpg

Web 2.0 has various features that facilitate interaction between students and students and students and lecturer. Figure 2 above shows most of the features of Web 2.0, which include internet, communities, creativity, www, Wikis, video sharing, participation, social networking, interactivity, network, privacy, and blogs (O’reilly, 2009). These features have been proven to be effective in ensuring constant content sharing and interaction between
Web 2.0 users. Universities in Nairobi can benefit a lot from these features when the Web 2.0 platform is fully adopted and implemented in the learning management system.

1.2 Problem statement

This study reports the attempted adoption of Web 2.0 tools such as Wikis, blogs, collaborative writing, video sharing, and social networks, by some universities in Nairobi in supporting their teaching and learning processes. The study seeks to develop a model that will elaborate the benefits of adopting Web 2.0 tools in the learning management systems in universities in Nairobi.

Collaboration as the first problem to be addressed by the adoption of Web 2.0 aims to enhance the collaboration of students and lecturers. For example, Wong and Russo (2012) state that Wikis have been used to encourage collaborative work in learning institutions.

Knowledge structure is defined by Web 2.0 by seeking to elaborate on more processes for information retrieval, by adding a different dimension of accessing information on the web.

Teacher support defines how essential it is for lecturers and tutors to know what the tools are used for. Lack of professional development among tutors contributes to similar lack of impact on learning using Web 2.0. Lecturers ought to learn how to present and support new technologies in the learning environment to be able to benefit together with their students (Al-Adwan, Al-Adwan & Smedley, 2013)

1.3 General Objective

The primary objective of this study is to evaluate and understand the adoption of Web 2.0 technology in LMS, and from the findings, propose a model supporting the adoption of Web 2.0 tools in universities in Nairobi.

1.4 Specific Objectives

1. To explore the contribution and general benefits of Web 2.0 tools in LMS in the universities in Nairobi.

2. To design, evaluate and validate a UTAUT based model to support acceptance of Web 2.0 in LMS in universities in Nairobi.
1.5 Justification of the Study

This study seeks to demonstrate the problems faced by institutions of learning in employing Web 2.0 tools as a learning instrument, while making appropriate recommendations. The research is relevant to many learning institutions because the millennials are continually spending a lot of the time using Web 2.0. Incorporating it in the learning process will therefore increase the engagement between students and lecturers. Also, social media will not be a new technology being introduced thus ease of use cannot be a problem once the appropriate measures are put in place. Ultimately, the research aims at ensuring that institutions can integrate Web 2.0 tools in learning management and achieve positive outcomes like increased engagement away from the classrooms. If Web 2.0 is not integrated in the learning process, institutions will not achieve increased engagement even out of class as more and more students will continue to spend more time in the social sites which use the Web 2.0 tools. Successful incorporation of Web 2.0 in learning management systems in institutions will increase student engagement with the lecturers in learning within and away from campus.

1.6 Scope of the Study

Despite the high popularity of personal application of Web 2.0 in social networks, institutions have infrastructure for the use of Web 2.0 by learners and lecturers, but have difficulties in its adoption (George, 2016). This study explores the use of Web 2.0 tools amongst the faculty and their implementation and aims to support learning theories while giving examples of how Web 2.0 might be implemented in learning management systems. The study is a desktop one which uses library sources to make findings concerning Web 2.0 usage in LMS. The study is focused on challenges experienced in the implementation and the possible solutions for institutions in improving the usage of Web 2.0 by instructors and learners. The desktop study gives an insight in the areas covered concerning employment and adoptability of Web 2.0 in learning management. The study has also used questionnaires to determine to what extent Web 2.0 is being used and the barriers and challenges experienced in using web 20 in learning management systems. The literature specifically focuses on universities in Nairobi: USIU, JCUAT, DAYSTAR and Kenyatta University, with subjects limited to instructors and students. This research emphasizes on the usage and advantages of the key Web 2.0 sites like Wikis and Blackboard to make findings and recommendations to improve learning. The research
has been limited by the school’s requirements and fulfillment of the research within the given timelines taking into consideration that time is of importance to the researcher.

1.7 Definition of Terms

**Adoption**- Adoption in this context concerns recognition, integration, and full exploitation of the features that an Information Technology Application or Information System offers (Dalsgaard, 2006).

**LMS**- Learning management systems (Dalsgaard, 2006).

**Web 2.0**- Refers to Internet technologies like Wikis, blogs, and Onnet forums that allow for creation, sharing, communication, and collaboration of ideas (Constantinides & Fountain, 2008).

**Secondary Data**: Secondary data refers to information sourced from published, reputable sources that are either in electronic or paper format (Szabo & Strang, 1997).

**Universities**: Refers to chartered universities, according to Brubacher (2017), that are implementing one or more forms of Learning Management Systems.

**Customer**: Refers to the frontline users of an Information Technology System.

**Web Applications**: Refers to Web 2.0 applications used for e-learning experience (Constantinides & Fountain, 2008).

1.8 Chapter Summary

This chapter has presented a brief background of Web 2.0, the problem statement, the objectives, and the scope. It has also prompted the reader on the problem of execution of Web 2.0 while suggesting resolutions, to be discussed in the following chapters. The chapter has provided an outline of the problem and the approach used to propose solutions. The chapter is also a presentation of the study work and how it is trying to adopt teaching and learning methods while also showing the needs for institutions to improve the technology of Web 2.0. Furthermore, it has shown how students and lecturers grasp the technological advances in their process of sharing and generating knowledge.
CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

This chapter explores Web 2.0 tools and their use in learning as instructional tools. The chapter discusses two main theories of adoption, namely UTAUT and TAM, to look at the decisions put into accepting or rejecting the advancement and extent to which development works. It has a literature review of Web 2.0 technology, and how it is used as a learning tool. The chapter carefully explores literature on various aspects of Web 2.0 including social networking services, internet penetration, Web 2.0 in LMS, and how they influence the adoption of Web 2.0 in learning management systems.

2.2 About WEB 2.0

Web Technologies 2.0 refer to tools on the web such as Wikis, blogs, and online forums that allow for the creation, sharing, communication, and sharing of ideas. Interactive platforms like blogs and Wikis are known to improve group work and promote the learning community's needs. For example, Wikis have been used to encourage collaborative work in learning institutions (Wong & Russo, 2012). An online discussion forum is used to facilitate problem-based learning. Through social networking services, Facebook and Twitter have the potential to facilitate social learning. Services such as chatting, blackboards, content sharing, and mentoring can promote learning changes (Buchanan, Sainter & Saunders, 2013). Web 2.0 increases the effectiveness of problem-based training; collaborative work, and the learning of social networks, learning institutions have been slowly adopting the technology.

Whereas Internet penetration and usage in universities in Nairobi is high, including the number of students with laptops and smartphones, the acceptance of e-learning has been insignificant. With unprecedented progress in demand for higher education in Kenya more than any other country in East Africa, the expectation would be that e-learning would be high. However, that is not the case since implementing e-learning is slow (Wong & Russo, 2012). The erratic adoption of e-learning will inadvertently affect the acceptance and utilization of Web 2.0 tools (Alharbi and Drew, 2014). The factors contributing to the present state of e-learning are numerous but in this context, the study will emphasize the
status of acceptance of Web 2.0 tools in universities in Nairobi, which adds to the comprehensive acceptance of the e-learning topic in Kenya.

According to the rational choice theory, individuals will engage in prudent and logical decisions. If the conventional face-to-face learning in universities in Nairobi offers more benefits from the learner’s perspective (user predisposition), then the learner will forego online learning in favor of conventional classroom learning (Arif & Mahmood, 2012). The benefits of online learning include access to learning irrespective of geographical location and open educational resources that allow for equitable access to information (Al-Adwan et al., 2013). However, the tendency of online learning to become static because interactions fail to self-propagate could be the motivation to shun online learning. Fortunately, Web 2.0 technology offers a remedy to the issue of lack of natural interaction that is self-propagating in Learning Management Systems.

2.3 Web 2.0 in LMS

Vendors of learning management systems such as WebCT, Janson, Moodle, and Blackboard have inbuilt provision for Web 2.0 technology but the full incorporation and exploitation of Web 2.0 technology is meagre in most institutes of learning (Sadaf, Newby & Ertmer 2012). Decisions have to be made on why it is necessary to augment an institution’s LMS with Web 2.0 tools. It is essential for instructional technologies to occur against a background of pedagogical objectives (Tan, 2013). The learners’ selection and use of Web 2.0 tools to sustain their learning can lead to added constructive, collective, and natural way of learning. Lecturers should learn to balance the advantage of presenting new technology tools into the program with the additional workload for lecturers and students (Al-Adwan, Al-Adwan & Smedley, 2013). None of the existing models considers the concern for workload, and reliability of Web 2.0 technology use against learning outcome targets.

LMS vendors such as WebCT, Blackboard, Janson, and Moodle need to focus on ways of effectively integrating and spurring full exploitation of Web 2.0 features into their LMS (Tan, 2013). LMS vendors need to focus on the student and community aspect of learning. There is also concern on whether to open up the collaboration beyond LMS as the LMS environment implies confining the collaboration between class members. A study by
Ngamau (2013) suggests that Web 2.0 is a serious feature in enhancing the perception of e-learning among students in universities in Nairobi.

The study by Arif and Mahmood (2012) sought to make comparisons between the perception of online learning among USIU students and those of JKUAT. Jomo Kenyatta University of Agriculture and Technology uses Moodle as a Web 2.0 technology while USIU uses WebCT in its learning management system (Ngamau, 2013). Most of the respondents cited the static nature of interaction in which course instructors favor uploading of reading material at the expense of engaging in an interactive exchange (perceived satisfaction). The connotation from the findings in the Al-Adwan et al., (2013) study is that learners perceive active interactions by placing them as a priority before the technology. From the study findings, the expectation should be a widened implementation and the proper adoption of Web 2.0 tools.

2.4 Web 2.0 Adoption in LMS

Web 2.0 is a tool that runs operational web-based combined systems. It is a moderately young technology which has unresolved concerns. One of the problems is the acceptance and use of Web 2.0 in learning and lessons. Studies back up the view that Web 2.0 application in learning and training improves hands-on learning, knowledge, teamwork, and information sharing. Other researchers have found that the thinking levels of students who updated their blogs weekly improved. Web 2.0 also provides effective approaches for applying what has been taught by discovering other media. There is a necessity for learning and training institutes to implement innovative technologies that enhance learner commitment amongst other advantages with a focus on a better learner-centered approach. Web 2.0 tools acceptance in learning is low despite the known advantages. This study investigates aspects that can fuel acceptance of Web 2.0 in universities in Nairobi using a modified technology reception model.

Subsequently, the experimental work uses this model to evaluate the attitudes and insights of users to calculate their approval of Web 2.0 tools for learning. The study has invoked supporting theories of the technology acceptance model, and the unified theory of the use and acceptance of technology (UTAUT). The TAM model has been tried and authenticated in business contexts with limited authentications in educational areas, which disqualifies it from being considered in this study. There are several theories that predict the acceptance
technology but the frameworks are relevant to limited cultures and mainly those in advanced economies. An empirical research has been conducted using the current models on specific variables from these models to quantify general acceptance.

It has emerged that the model of technology acceptance regularly used by scholars to foresee technology acceptance does not always hold through cultures. For instance, variances were noticed between teachers of Singapore and those in Malaysian pre-service. Other studies have investigated relations concerning perceived usefulness (PU), computer attitude (CA), perceived ease of use (EoU). On the other hand, the behavioral intention (BI) was confirmed as important while the link between behavioral intention (BI) and motivation to use (MtU) was insignificant.

When carrying out the study on Web 2.0 adoption model, researchers have a few ethical considerations that should be accommodated and used in the study process. For instance, it is essential to respect the anonymity and confidentiality of the participants. This is achieved by keeping their responses confidential. Their identification should also not be sought when collecting data. Other ethical considerations include informed consent, beneficence, and respect for privacy. All these must be achieved when collecting data to facilitate a successful project study.

2.5 Acceptance of Technology

The Buabeng-Andoh study (2012) established that students came up short on the information and abilities to utilize Web 2.0 innovation. Course instructors had not had room schedule-wise to execute Web 2.0 innovation to take care of students' issues in learning the executives framework. Instructors likewise felt that the utilization of Web 2.0 innovation introduced certain dangers like security, classification and expert issues. The overview likewise uncovered that the establishment did not have adequate HR to execute Web 2.0 innovation of the incorporated learning of the board framework. In the cross-sectional spellbinding study, respondents demonstrated that the absence of satisfactory HR to actualize Web 2.0 innovation was the real boundary to utilizing Web 2.0 innovation.

Also, Calisir, Gumussoy, Bayraktaroglu, and Karaali (2012) refered to a deficient number of well-prepared staff to strengthen the usage of Web 2.0 innovation in LMS. Some advanced education organizations don't utilize Web 2.0 innovation in their eLearning board
frameworks, chiefly on the grounds that they have constrained staff to direct the usage and support of Web innovation 2.0 (Cheung & Vogel, 2013). The course instructor’s knowledge and skills to implement Web 2.0 technology in LMS and adequacy of support staff are the main motivating factors for universities implementing an LMS not offering Web 2.0 technology. The general supposition is that the contemporary students ought to have the option to utilize Web 2.0 innovation, yet as indicated by Chen, Yen and Hwang (2012), this is not the situation. Students may have distinctive innovative information and aptitudes.

According to Cochrane (2014), new revelations have emerged about the hesitance of students to embrace Web 2.0 innovation in their separate web based learning stages. A few interviewees referenced inadequate time to take an interest and the duty of unmanaged undergraduates (Lai, 2017). There were problems with the requirement for clear clarifications, directions and principles of utilization. A few students revealed the requirement for the educator's quality, an issue identified with students caught off guard for synergistic learning. A noteworthy number of students reported experiencing issues with Wiki plan and consistency with the way of thinking of training.

Den Exter, Rowe, Boyd and Lloyd (2012) also report the disappointment of usage and task of Wikis to invigorate student cooperation in learning. Furthermore, they clarified the explanations behind their lack of engagement in the utilization of Wikis in the separate colleges. The foundation of the board frameworks included weight from different courses, which relate to instructive limitations (great conditions). Different reasons refered to by students for wasteful use of Wikis at times requires certain skills to use them, thus interfering with an individual’s self confidence. (Lai, Wang & Lei, 2012). Likewise, there are students who have demonstrated an all out absence of intrigue. Iqbal and Qureshi (2012) propose that an improved structure that makes a Wiki framework in the course might be expected to improve the utilization of Wikis for community learning.

The adoption of Web 2.0 innovation will assist in learning process due to the web based interactions of students and lecturers. Lwoga (2012) recommends that innovation is the essential tool utilized by the educator to accomplish the ideal learning results in a LMS situation. In spite of the fact that Wikis are ground-breaking innovative devices in their own right, course educators assume a crucial job in drawing in students and keeping up a significant connection (Lai, 2017). As learners see their improvement, they are probably
going to proceed to take an interest and even turn out to be roused as supporters of the learning procedure (Holden & Karsh, 2010). The achievement of students utilizing Web 2.0 innovation relies upon the information and abilities of the educator in utilizing Web 2.0 innovation, for example, a Wiki.

2.5.1 Lack of Policy to Infuse Knowledge and Skills for Educators.
While innovation is always advancing, including the general execution of the Learning Management System and related Web 2.0 applications, teachers once in a while overhaul their insight (Iqbal & Qureshi, 2012). Most advanced education organizations don't require LMS educators to refresh their insight into the framework (Holden & Karsh, 2010). As noted before, because of the remaining burden, teachers will probably abstain from utilizing Web 2.0 applications to maintain a strategic distance from pointless outstanding burden. The Lai, Wang, and Lei (2012) study shows that reason for the low degree of information and experience is the low take-up and misuse of Web 2.0 innovations to provide interactive learning in LMS. It is imperative to address how course instructors familize with Web 2.0 features available on an LMS.

2.5.2 Ineffective Content Creation and Presentation.
Creating and presenting content for e-learning needs to infuse creativity that the learner can easily notice. The utilization of mixed media substance should accomodate the need to be brief and interactive (Tan, 2013). Be that as it may, educators do not generally comprehend inventiveness from the student's perspective, which decreases the expanded association on Web 2.0 applications. Sánchez, Cortijo and Javed (2014) found that educators don't generally pursue best practices when planning and imparting substance to their students. For instance, Sadaf, Newby, and Ertmer (2012) found that course lecturers now and then force a substantial remaining burden on students while disregarding the intuitive needs of the learning experience which tends to make online learning more of an exchange of files.

2.5.3 Independent Learner Constraint
By its tendency, e-learning advances develop learning in which the student is progressively independent and directs learning himself (Teo, 2012). Students must exhibit these attributes so as to utilize all highlights of the learning board framework, including Web 2.0 innovation (client inclination). Course educators with a solid online nearness additionally help increment learning fulfillment. As indicated by the Tan (2013) study, effective web based learning requires clearness as far as clarifications and necessities for the utilization of online
devices, including instructor help. Tarhini, Hone, Liu and Tarhini (2017) prescribe creating conventions to enable learners to improve online correspondence by allowing them the chance to play and practice, incorporating exploring different avenues regarding tools. The arrangement of an instructor model and a case of framework learning is likewise fundamental for fruitful utilization of the learning of the executives framework (Wang, Woo, Quek, Yang & Liu, 2012). The reception of Web 2.0 innovation by students will likewise rely upon the nearness of the instructor in the online condition to energize and approve student cooperations. Wikis can be utilized to enable students to get comfortable with Web 2.0 tools.

Another factor that may affect the appropriation of Web 2.0 innovation implanted in the Learner Management System is the issue of association. Social and psychological issues influence students attempting to adjust to internet learning (Wang, Woo, Quek, Yang & Liu, 2012). In light of these communication issues, learners are not constantly prepared to take part in basic talk in a web based learning condition. The other constraint in student commitment arises from the tendency of course instructors relying on moral judgement in determining the extent to which lecturers involve students (Manca & Ranieri, 2013). It depends on the convictions of the course educator, with respect to instructing, to decide the level of student’s investment in community work.

2.5.4 Inadequacy in Rendering Web 2.0 technology

The absence of an unmistakable objective for community information creation will negatively affect e-learning. Wikis are intended to be utilized as a community stage and some other use will be wasteful and hazardous. The choice of Web 2.0 instruments depends partially on the academic way of thinking hidden in the program. The discoveries of Marangunić and Granić (2015) indicate that it is fundamental to pick the privileged academic way of thinking or to execute the suitable Web 2.0 innovation to improve the viability of community learning through Web 2.0 applications (Park, Nam & Cha, 2012). Administration, structure and configuration are basic components that empower students to practice a profound and important learning approach (Mnkandla & Minnaar, 2017).

2.5.5 Individualistic Tendencies Due to Social Web Technologies

Marangunić and Granić (2015) explain that a few students like to work alone rather than in groups (behavioral intent). Identity formation will in general happen when students take an interest in the joint formation of Web 2.0 actuation relics, and the utilization of
Wikis isn't sufficient for certain students' inclinations to work alone. Students can pick Wikis in light of the fact that they feel less confined, while students in the field favor this as a decent method of getting to know class individuals. The investigation likewise discovered that individual students have investigated different approaches to make up for the absence of up close and personal contact, including self-composed sound conferencing sessions (Motaghian, Hassanzadeh & Moghadam, 2013).

2.6 Assimilation of Technology

Tess (2013) found that learning of Web applications was a deciding variable in educators' expectation to utilize Web applications in instruction. Information and experience have additionally affected educators' enthusiasm for utilizing web applications as a learning instrument (Wong, Teo & Russo, 2012). Experienced members as often as possible utilized web applications for various purposes, utilizing them to appropriate learning assets, including to improve the job of the dynamic student (Venkatesh, Croteau and Rabah, 2014). Knowledgable and experienced members in Web 2.0 innovation have demonstrated expanded utilization of these tools and for various purposes, which are clarified by a superior comprehension of the usefulness of the instruments (Tarhini, Hone, Liu & Tarhini, 2017). Past experience in utilizing Wiki enhanced the greater use of the tool when incorporated in the online learning system.

2.6.1 Perceived Usefulness

This is the belief that using technology will improve performance that constitutes perceived usefulness of the technology. It is an indicator of the utilization of the PC framework (Tan 2013). Utility is a significant factor in deciding a client's expectation to use the innovation. Lai (2017) contends that extra utility is one of the variables related with the force of utilization of a specific innovation. The employment of Web 2.0 innovation in advanced educational establishments ought to be viewed as improving the nature of instructive procedures (Sadaf, Newby & Ertmer, 2012). Teachers utilizing Web 2.0 in their teaching have distinguished highlights that urge them to rouse and energize students as fundamental (Teo, 2012). This view of utility may relate to the students' and educators' impression of the importance of innovation in learning.
The studies of Sánchez, Cortijo and Javed (2014) on the effect of the apparent value of Web applications in learning and teaching have demonstrated that these decide the frame of mind to embrace the application.

The age of clients influences their utilization of innovation. Users have various desires and goals when utilizing innovation, incorporating Web 2.0 in LMS. Motaghian, Hassanzadeh and Moghadam (2013) show that age influences the utilization of web applications. Users of at least 30 years of age will in general utilize social bookmarking more than youthful clients. Clients of Web application younger than 30 utilize person to person communication benefits all the more broadly to impart reports to the online network and for the sake of entertainment purposes (Iqbal and Qureshi, 2012). The inclination of clients of Web applications who are older than 30 who favor social bookmarking comes from the way that these application administrations contain some level of expert utility (Marangunić & Granić, 2015). Age negatively influences the recurrence of utilization of the innovation as indicated by Persico, Manca and Pozzi (2014). Contrasted with more seasoned clients, more youthful clients are probably going to effectively utilize the innovation.

On informal organizations, clients more than 45 will in general express formalism and control more than those who are 13 to 30 years (Iqbal & Qureshi, 2012). Youthful clients like to compose casually when utilizing web based life stages. Clients beyond 30 years will in general feel that they deserve a place with a network more than more youthful clients. Correspondence between mature clients aged 40 and over will in general be steady. Be that as it may, more youthful individuals take less time looking for data online contrasted with more seasoned clients. The study by Wang, Woo, Quek, Yang, and Liu (2012) attests to the effect of age on the selection and utilization of Web 2.0.

2.6.2 Hedonic Motivation

Hedonic motivation affects the user involvement in intelligent online gatherings. Excessive inspiration is an evaluation of seen client fulfillment for Web 2.0 applications. Clients will in general incline towards the use of fun web applications (Motaghian, Hassanzadeh & Moghadam, 2013). The libertine factor is the bliss of utilizing a specific innovation in this unique situation and students, and instructors, are probably going to receive Web 2.0 advancements in the event that they see that this innovation can be amusing to utilize (Ngamau, 2013). Gluttonous inspiration may change contingent upon the socioeconomics

2.6.3 Expectation Confirmation Theory

The Validation of Expectations theory holds that expectations accompanied by perceived performance leads to post-purchase satisfaction. The impact is mediated through a positive or negative deconfirmation between performance and expectations. When a product exceeds expectations, then post-purchase will occur (Brown et al., 2012). Negative deconfirmation occurs when a product does not meet consumer expectations, resulting in dissatisfaction. Predicted behavior aligns with predictive expectations (Hsu and Lin, 2015). In this context, training both learners and educators in the use of Web 2.0 on the learning management system can increase positive deconfirmation and improve the adoption of Web 2.0.

Cochrane (2014) recommends that instructive educators ought to take steps to create students mindful of Web 2.0 innovation in e-learning. Learner information and aptitudes within the utilization of Web 2.0 innovation were recognized as key outside sub-factors essential to the choice to actualize Web 2.0 innovation within the learning administration framework. Agreeing to the consideration by sanctum Exter, Rowe, Boyd, and Lloyd (2012), course teachers must clarify the applications of LMS and Web 2.0 innovation to inspire input, reaction, and engagement from students within the classroom in order to achieve dynamic learning. The conclusion of Dabbagh and Kitsantas (2012) authenticates the contention that course instructors need time to actualize Web 2.0 innovation. The hole in cooperation, of course, from educators to the usage of Web 2.0 innovation may be due to work overload and low staff numbers.

Another issue refered to as a hindrance to executing Web 2.0 innovation in LMS is simply the dangers related to utilizing the innovation itself (Huang, Hood & Yoo, 2013). Issues related with Web 2.0 innovation as dangers incorporate the worry for security, protection, and the way of practicing expert. These issues lopsidedly influence instructors (Dhume, Pattanshetti, Kamble & Prasad, 2012). As per most LMS clients who actualize Web 2.0 innovation, the unmonitored environment may not be suitable for learning. Different investigations claim that students grow socially when they team up with their friends (Escobar-Rodrguez, Carvajal-Trujillo & Monge-Lozano, 2014). Most creators see the connection as a focal component of the instructive experience that ought to be one of the
principle objectives of e-learning, in situations where propagative communication isn't ensured.

Holden and Karsh (2010) note that Web 2.0 advancements, for example, wikis, permit correspondence through nonconcurrent communication plan alternatives. A group of students can keep up their responsibility to the online condition. Dhume, Pattanshetti, Kamble, and Prasad (2012) assessed the Knowledge Forum, a Web 2.0 innovation tool for synergistic work in secondary school, and talked about the significance of social dynamics, social collaborations, knowledge creation and social infrastructure. As indicated by Huang's investigation, Hood and Yoo (2013), social connection rose as a predominant variable isolating the gathering talks expected to make a feeling of network.

### 2.7 Use of web 2.0 Technology

Web 2.0 is the term used to delineate a grouping of destinations and applications that empower anyone to form and share online information or files they have made. A key component of advancement is that it empowers people to form, share, collaborate and communicate (Mnkandla & Minnaar, 2017). Web 2.0 contrasts with diverse sorts of destinations in that it doesn't require structure or web dispersing aptitudes, which makes it less difficult to create, disperse or give work the world over (Ajjan & Hartshorne, 2008). The thought of this development makes it a fundamental and normal strategy for passing on information to a small gathering of people or on a large group of individuals. The college can utilize these instruments to talk with students, staff, and the entire educational organization. It can also be an effective strategy to give and interface with students and inquire about accomplices. There are different sorts of Web 2.0 applications, counting Wikis, web diaries, casual organizations, folksonomy, podcasting, and content hosting services. The endless larger part of the foremost well known destinations are Web 2.0 regions, for illustration, Wikipedia, YouTube and Facebook (Ajjan & Hartshorne, 2008).

#### 2.7.1 Use of Wikis

In addition to blogs, Wikis are amongst the web applications most widely used by higher education institutions. A Wiki refers to a web page that can be modified by a group of participants who have access to it. Wikis were originally created as tools to facilitate collaborative online editing of texts. They then became tools of collaboration in the context of learning (Manca & Ranieri, 2013). Wikis allow the accumulation of knowledge over
some period, but should not be used for quick fixes. Wikis encourage collaboration and group work by facilitating the sharing of ideas and information, including allowing the use of the tool to create and control events (Mnkandla and Minnaar, 2017). The Wikis most commonly used in universities are those that allow the use of private labels. Teachers can also use Wikis as ePortfolios because they can track individual contributors as students act on a collaborative document.

Persico, Manca and Pozzi (2014) examined the utilization of a Wiki to make digital books in an underlying preparing program. The outcome of the study suggests that use of wikis enhances collaboration among pre-service lecturers and helps develop their higher order thinking due to the creation of the content on their account. Reich, Murnane and Willett (2012) examined the use of a wiki to improve the scholarly composition abilities of student instructors who were relied upon to satisfy scholastic composition guidelines. Educators were required to show their insight into the subjects by composing, referencing and supporting their composing likewise. The study outcome implied that using wikis for writing increased awareness of the lecturer’s opinion on people including the hidden users visiting wikis (Sadaf, Newby & Ertmer, 2012). On account of the wiki stage, the learner instructors got remarks from their companions and utilized them to modify their composition.

The slow uptake of Wikis as Web 2.0 technology can be attributed to several factors. The need to regularly update Wikis is an issue for their adoption in education. Failure to update Wikis regularly negatively impacts construction of knowledge. Participants in the creation of content on Wikis are also affected when, for instance, no one reads or comments on the contribution. Sánchez, Cortijo, and Javed (2014) also established that learners who detested grading by peers tended to shun Wikis. Such learners who were forced by circumstances to post on Wikis tended to be frustrated when peers rejected much of their contribution on the Wiki. The other reason for poor acceptance of Wikis in the learning setting is the risk of unverifiable information or information that is poorly cited, making a further expansion on the knowledge posted a challenge (Teo, 2012).

2.7.2 Suitability of Blogs
A blog alludes to a lot of individual remarks that the creator thinks are vital. It is anything but difficult to make and use just as control by permitting the expansion of connections for more data is. The client likewise profits by virtue of composing the property. The perusers
of a blog can take an interest in a discussion with the creator, trade conclusions, present thoughts and offer the data introduced regarding the matter. Sites are utilized in training with every one of their highlights that help sight and sound substance to encourage the production of exercise content on the Web (Sadaf, Newby & Ertmer, 2012). Thus, web journals can be utilized as an approach to share learning assets.

Staff, personnel and students use online journals to share learning and energize exchange, including support exploration and scatter data. Teachers can recommend subjects for students to write in online journals (Wang, Woo, Quek, Yang & Liu, 2012). By writing in online journals, students, in general, improve their composition abilities, their feeling of basic reasoning and the outflow of their sentiments. Learners can likewise practice peer altering and network building. Sánchez, Cortijo and Javed (2014) found that the quantity of websites presented related intently on what was considered in class. The utilization of blogs advances the improvement of a network by giving students the way to impart their insights and encounters, just as helping their companions.

The challenge of using blogs in LMS, according to Motaghian, Hassanzadeh, and Moghadam (2013), is that learners can find unverifiable and erroneous information. Blogs allow the expression of independent ideas when examining specific topics. Teo (2012) observed the inability of students to find engaging motives to read each other’s work plus engaging in sharing ideas as impediments for the adoption of bloggers in LMS. The other challenges from adopting bloggers in LMS stems from peer pressure in which some students deliberately limit their participation to maintain the perfect image of their personality and philosophy. Course instructors also find reading students’ blogs time-consuming, according to Tarhini, Hone, Liu, and Tarhini (2017).

2.7.3 Suitability of Podcasts
Podcasts refer to audio recordings which can be shared via the internet. The faculty can record their lectures, including other instructions available, for students to download onto their devices. Podcasts can be sued to teach and facilitate learning by recording lectures (Park, Nam & Cha, 2012). Students can also be encouraged to create their own podcasts. In Tan’s (2013) study, teachers used podcasts to capture their thoughts on their workshop teaching and got responses as well as remarks from peers (Park, Nam & Cha, 2012). The teachers also got emotional support from peers through podcasting. Podcasts may be suitable where learners have to share personal experiences and increase human touch in
their interaction. Reich, Murnane, and Willett (2012) discovered that the application of podcasting in higher learning spurred the interest of learners.

2.7.4 Suitability of Social Networking

Social networks are web services that enable clients to make open profiles inside connected frameworks to empower them to verbalize a rundown of different clients with whom they share an association. Interpersonal organizations enable clients to wind up mindful of their connections (Wang, Woo, Quek, Yang & Liu, 2012). The person to person communication destinations in LMS are intended to enable students to create connections inside their courses by getting to the web journals and connecting with other individuals. Through interpersonal organizations, students can make a feeling of network and help stretch out study hall cooperations to empower them to interface with individuals who are pertinent to their instructive advantages. Tess (2013) examined the effect of interpersonal organizations on student’s execution and learning results in advanced education programs (Wang, Woo, Quek, Yang, & Liu, 2012). The study found that the utilization of informal communication applications improves the learning procured during the course.

2.7.5 Motivations against Adopting Web 2.0 technology

The difficulty in accessing students’ activities is the primary motivation in shunning web applications and Web 2.0 technology despite the advantages that these technologies bring to the LMS. Different assessment strategies are needed in evaluating student web authoring (Wong, Teo & Russo, 2012). There is a perception among instructors that they do not have significant control over student activities and the technology itself with respect to Web 2.0 technology in LMS. For instance, community creation is hard to assess in the light of the fact that students can expel or adjust commitments from their friends. Once more, the composition style utilized in web works contrasts with the great composition style utilized for different works due to many web applications that enable students to incorporate photographs, sound, connections and recordings (Wang, Woo, Quek, Yang & Liu, 2012).

Without a doubt, a few teachers demoralize the utilization of a non-scholarly composition style, making it hard to track the student. Once in a while the course teacher needs to pursue the connections installed in the learners’ undertakings (Wong, Teo & Russo, 2012). At the farthest point, a few instructors have taken the standard of utilizing a non-scholastic composition style. The inspiration of this last gathering is to enable their students to express their considerations in a characteristic manner and not be obliged by formal composition
transcriptions (Wang, Woo, Quek, Yang & Liu, 2012). Vulnerability about the assignment of collective work in an informal organization condition makes it hard to decide the commitment of every student to the assessment. Troubles in assessing students with the least exertion may block the consequent appropriation of Web 2.0 innovation in the Learning Management System.

Wong, Teo and Russo (2012) encourage the meeting of the least desires so as to successfully assess results when utilizing web applications in the learning of the executives framework. Tess (2013) proposes that the plan and execution of student appraisal ought to unmistakably determine how the production of Web 2.0 innovation coordinates with different structures and components of assessment.

The learner assessment should be linked to specific learning objectives and generate evidence of those objectives. The assessment of learners in the learning management system should generate evidence of expected learning outcomes (Wang, Woo, Quek, Yang & Liu, 2012). The assessment of the student in the learning management system must be supported by a sufficient number of instructions and rubrics. The implementation and assessment of the student through the learning management system should encourage academic integrity and recognize the rights of all authors, including the provision of explanatory commentary (Venkatesh, Croteau & Rabah, 2014).

Learning institutions tend to be measured when implementing the Web 2.0 technology applications that allow for publication of content such as blogs and wikis by students. The risk from the use of this Web 2.0 technology by students is the issue of copyright (Alharbi, 2014). Students may not understand the moral and legal consequence of copy-pasting, editing and share audio, visual, audiovisual and textual data without proper adherence to the original author’s copyright dictates (Calisir, Gumussoy, Bayraktaroglu & Karaali, 2014). The way forward is for copyright laws to accommodate the possibility of improper copyright use in a learning context without the express intention to benefit individually or organizationally (Alharbi, 2014). Since it is a legal debatable area, learning institutions would prefer to minimize applications that heighten such risks as blogs and wikis.

Al-Adwan, Al-Adwan and Smedley (2013) report that both learners and teachers find that LMS and associated Web 2.0 technologies create additional workload and time constraint. The time needed to set up and manage Web 2.0 technologies, track contributions and assess
learners constitutes lengthened teaching time as well as the workload for the course instructor (Alharbi, 2014). Naturally, educators will try to minimize the use of some features of the LMS to cut down on workload (Buchanan, Sainter & Saunders, 2013). The students may also welcome overlooked features of the LMS to save time and lessen workload that would come with such. Students tend to feel the flexibility provided by online learning gets canceled out by the increased workload and increased need to spend more time online (Arif & Mahmood, 2014). With such attitudes, the adoption of Web 2.0 technology in LMS by both learners and instructors is minimal and ineffective when operationalized.

On a lesser level, the lack of need to manage student interactions in Web 2.0 technology applications can demotivate learners and instructors in embracing Web 2.0 technology in LMS. There is a need for a supporting culture of student involvement in the creation of content for successful LMS implementation (Al-Adwan, Al-Adwan & Smedley, 2013). Appropriate forms of interaction have to be maintained in social contexts with respect to collaborative online learning. There is a risk of privacy and appropriation as the use of Web 2.0 technology allows for the sharing of artifacts for others in the public domain to react (Alharbi, 2014). There is also the need to be cautious of small businesses that offer Web 2.0 technology tools as “free” intending to offer advertising on the platform or to its users.

### 2.8 Barriers and challenges in the model

Web 2.0 involves sharing ideas online via the World Wide Web. The adoption of this model in universities in Nairobi may face various barriers and challenges. Some of the possible barriers are user support, accessibility and voluntariness. According to Gitau and Omwenga’s (2014) study, some e-learning systems based on multimedia do not give support for sufficient learner-content interactivity. This becomes a major challenge when it comes to the motivational aspect of online collaboration.

#### 2.8.1 User Support

User support is an essential element of an information system. The end users of Web 2.0 must be aware of what it entails and its various functions. When coming up with the model, developers interacted with various development systems and integrated them to perform the required function. User support is identified as a barrier when the end users experience some difficulties in operating or interacting with the model. A user-friendly model is a
primary solution to barriers of user support. Secondly, there must be a support team to deal with any complaints or problems brought up by the users (Dwi, 2014). The support team should be in constant communication with the users for a smooth operation of the model. Gitau and Omwenga (2014) also add that instructors and students face major challenges especially of lack of skills in e-pedagogy. Enough skills in using Web 2.0 consequently increase collaboration and communication.

2.8.2 Accessibility
Accessibility is mandatory when it comes to applications involving internet and information sharing. There is a significant increase in the number of students owning smartphones and laptops, however, the two cannot fully function without an internet connection. To access Web 2.0 services, it is mandatory to have an internet connection. Most of the public universities in Kenya have unstable internet connections. This poses a major challenge in the form of accessibility. Adopting Web 2.0 in the universities' systems requires full and stable internet connectivity across the universities. Accessing blogs and Wikis would be productive for the students if they had a strong and reliable internet connection for accessing information and sharing ideas online (Conole and Alevizou, 2010). It is essential to also consider the visually impaired students.

Organizations and institutions operate under certain policies and rules. These policies should be flexible enough to allow for accessibility of information in the internet. Some institutions have limitations on internet usage within their environs, accessing certain websites using the institution's internet is often limited or blocked. Such scenarios are barriers to accessibility when dealing with Web 2.0. The adoption of Web 2.0 requires full accessibility to the information shared through blogs or other appropriate and secure information sharing sites linked to Web 2.0. Web 2.0 accessibility can solve several challenges experienced and also provide various methods in enhancing online communication and collaboration (Gitau & Omwenga, 2014).

2.8.3 Voluntariness
The adoption of the new model into the universities in Nairobi would require testing before full implementation. A given number of students or lecturers might be required to volunteer and give some reliable feedback on their experience in using Web 2.0. It is often challenging, getting people to show up on their own will provide the required feedback. This is often a challenge to most systems developers or in any case a new model is being
adopted. Getting participants to volunteer may seem to be a major challenge, however, the crucial challenge is the information received from them. Quality and reliable feedback would be of great use to the system's developers. Voluntariness or in other words compliance effect, might negatively impact the adoption of Web 2.0. This is supported by an individual’s perceptions through attitudinal and social beliefs (Sharif Abbasi, Hussain Chandio, Fatah Soomro, & Shah, 2011).

2.9 Adoption after Long Use

The adoption of Web 2.0 is only possible after it has functioned for a given period. A long use of the model will identify certain factors to determine whether the application is suitable for adoption. These factors include time, usability, affordability, efficiency and effectiveness, room for improvement, benefits, cutting on costs, and follow up. Web 2.0 has been in use in some states, which implemented the technology to improve the learning experiences of the students.

2.10 Measuring Improved Interaction

Web 2.0 is aimed at improving interactions between facilitators and students. The interactions should be tracked and effort should be made to ensure that a positive trend is kept, for the success of the model (Pilgrim, 2008). Implementing Web 2.0 in the universities in Nairobi must be of help to both the students and the facilitators. Therefore, there has to be metrics used to measure improved interactions. The first metric to consider is the number of conversations completed. The interaction between facilitators and students is achieved through a conclusive conversation. A student seeking assistance from the facilitator via Web 2.0 will open a conversation that can only be completed when the student receives a satisfying feedback from the facilitator. The number of completed conversations can be used to identify the improvement in interactions and a large number of such completed conversations means that interaction is improving.

The second mode of measure is the number of students helped through the platform. Developing and implementing a model in the university would not necessarily imply that the model will automatically be of help. Measuring the success of the model should go to an extent of identifying the number of students assisted by the model. Web 2.0 is basically made to assist students in their educational activities, therefore, it is mandatory to have a way of keeping tabs on the number of students helped (Pilgrim, 2008). This measure is
essential for keeping up with the progress of the model and identifying whether or not there is improved interaction in the adopted model by the universities.

Lastly, the satisfaction derived by students and lecturers is another model used to measure improved interaction. The end user's satisfaction is identified from the support received by the students. The measure of this is determined by how a conversation went and whether it was productive or not. The measure is used after an interaction is completed. This can be used in the provision of trends in improving the model or maintaining its productiveness (Pilgrim, 2008). Surveys can be recommended for use in this case, sending surveys after every 24 hours of an interaction would significantly assist in tracking interactions in the model. The surveys can be filled by the participants and submitted as feedback. This is one of the primary modes of measuring improved interaction that can be incorporated in Web 2.0.

2.11 Chapter Summary

What is emerging from the literature review is that there is sufficient information on the reception of innovation yet there are not many studies on the most proficient method to effectively embrace Web 2.0 in Learning Management Systems. Existing research centers around reception of LMS, however few handle the moderate acknowledgment and use of Web 2.0 instruments. Colleges satisfactorily comprehend the job of intuitive internet adapting yet they are slow in adopting moder technologies in e-learning. The reason for this ineffective practice is not really known. Web 2.0 innovations allude to advancements on the Internet, for example, Wikis, web journals, and online discussions that take into consideration the creation, sharing, correspondence, and cooperation of thoughts. Intelligent stages, for example, web journals and Wikis are known to improve gathering work and encourage learning network needs. For instance, Wikis have been utilized to advance community oriented work in instructive foundations (Wong & Russo, 2012). There are different hypothetical models of innovation appropriation and use, for example, dissemination of development, innovation preparation model, task-situated innovation, contemplated activity hypotheses, and hypothesis. arranged conduct, deteriorated hypotheses of arranged conduct, innovation acknowledgment model, and innovation model amendments. There is no institutionalized model for improving the take-up and utilization of Web 2.0 advances in learning the executives frameworks (Wong & Russo, 2012).
CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

The rationale of this section is to illustrate the methods and procedure used in this study and to explore and discover useful information regarding the adoption of the instructional delivery of Web 2.0 technologies in order to improve learning and teaching methods in universities. The research design target population, data collection methods and procedures, data analysis and data interpretations are presented as the operational framework for the study.

3.2 Research Design

An illustrative report was utilized in the study as it concentrated on the aim of instructors to incorporate Web 2.0 advancements into educating and learning. The plan was picked as a result of its capacity to sum up the outcomes to a more extensive populace. The plan likewise depicts the particular wonder in current patterns, recent developments and connections between various factors at present, Kothari, (2004). The sort of information utilized was the primary information acquired from the questionnaires regulated to the chosen respondents. A quantitative methodology was used as the study concentrated on acquiring numerical outcomes so as to get a reliable representation. For a proper design in scientific research, there are guidelines that are recommended which include problem relevance, research contributions, and design as a search, among others. This study makes good use of these principle to ensure that its objectives are achieved and that the methods applied are appropriate for primary data collection.

3.3 Target Population

The target population for this study was students and faculty from private and public universities in Kenya. The study focused on students and faculty in universities in Nairobi, USIU, JKUAT, DAYSTAR and Kenyatta University. It limited itself to instructors and students. When choosing on the target population, it was important to have both public and private universities in order to avoid any form of bias when collecting data. This was also supported by research study factors especially time available, limited budget, and accessibility, which supported the target population of universities within the Nairobi region. The chosen universities also have a record of many enrolled students from different
parts of the country and from other nations. This was essential in collecting varied responses from the sample population.

*Table 1 Chosen Universities and their total population*

<table>
<thead>
<tr>
<th>Target Universities</th>
<th>Estimated Student Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>USIU</td>
<td>7000</td>
</tr>
<tr>
<td>JKUAT</td>
<td>29500</td>
</tr>
<tr>
<td>DAYSTAR</td>
<td>4000</td>
</tr>
<tr>
<td>KENYATTA UNIVERSITY</td>
<td>38000+</td>
</tr>
</tbody>
</table>


Table 2 Sample Size

<table>
<thead>
<tr>
<th>Target Universities</th>
<th>Sample Size (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USIU</td>
<td>98</td>
</tr>
<tr>
<td>JKUAT</td>
<td>100</td>
</tr>
<tr>
<td>DAYSTAR</td>
<td>98</td>
</tr>
<tr>
<td>KENYATTA UNIVERSITY</td>
<td>100</td>
</tr>
</tbody>
</table>

### 3.4 Sampling Procedure

Simple random sampling procedure was used. This was achieved by calculating the sample size (n) for the given population (f<0.05), with a confidence level of 95%. The population size is (N), and a maximum population variability (p = q = 0.5), while assuming the sampling error (E) as 3%. With the full population, numbers of students and lecturers, and from the population random samples are chosen following this mathematical formula:

\[
n = \left[ \frac{z^2 \times p \times q + ME^2}{ME^2 + z^2 \times p \times q / N} \right].
\]

In this case we specify the margin of error, the confidence level, compute alpha, determine critical standard score (z), and assume the population proportion is same as its past value over the last 3 years. Every student and the instructors across all the private and public universities had equal chances of being interviewed. Simple random sampling is one of the best sampling procedures because it gives everyone an equal chance of being sampled (Sevil & Yildiz, 2017).
3.5 Data Collection

The data collection instrument utilized in the research was questionnaires. Questionnaires are the most appropriate quantitative methods for primary data collection, various studies on the adoption of innovation have their quantitative approaches based on questionnaire-based surveys (Kumar, 2017). In developing the survey, we started by envisioning mistakes that could lead respondents to offer incorrect data or even not to respond to an inquiry totally. This was done to limit the dangers and to steady quality and legitimacy that might be available in the study. We additionally ensured that the operational definitions compared to the hypothetical ideas and guaranteed that the example populace would respond to the inquiries effectively. Since this was a quantitative study, physical questionnaires were administered to the respondents. The destinations were clarified, legitimized and disclosed to the respondents utilizing the introductory letter going with the survey, in order to save the significance of the study. This was likewise done to persuade respondents regarding the significance of research to enable them to give explicit answers.

In building up the questions in the study, we additionally tried their pertinence. This was to guarantee that the inquiries did not contain superfluous aspects. In doing this, we originally checked whether the inquiries could be conducted with the study tools chosen for the study. In order to avoid circumstances where a few inquiries did not have answers, the names were checked effectively to maintain a strategic distance from the entanglements related to the wording of the inquiries.

The data collection technique comprised conveying surveys to the schools taking an interest in the study. This technique was picked in connection to different strategies, for example, talking with students, due to various variables basic to the acknowledgment of the investigation. The utilization of polls contrasted with different types of information gathering isn't extravagant to execute, respondents were guaranteed of confidentiality and questions answered accordingly, lastly, this strategy for information gathering spares the researcher time and money.

Respondents in this study were randomly selected from the participating universities. Instructors were considered at various degrees of integrating technology in learning process. Accordingly, a 5-point Likert scale was utilized due to the fear that instructors may not effectively separate the various degrees of the scale if a bigger scale was utilized. The
inquiries were straightforward for all educators. The survey was additionally intended to harness all conceivable data on elements influencing the acknowledgment and reconciliation of Web 2.0 advancements, just as to gather data on the subjective characteristics of instructors.

Reliability is the assessment of the degree of consistency between multiple measures of a variable. It indicates how the activities of a research, for example, information gathering can be rehashed and that comparative outcomes are gotten and that the deliberate credits don't appear to have changed in the interim between estimations, regardless of whether the test is managed by various individuals utilizing the equivalent or elective types of testing. A measure is regarded solid if a person's test score is indistinguishable when given more than once in a comparable test and in comparable conditions. A solid instrument or test must meet two conditions; it must quantify one measurement and have a little irregular error.

In this study, the Cronbach alpha coefficient, which is the most well-known size of unwavering quality measure, was utilized to quantify the dependability of the survey. This test was picked from among different tests in view of its protection from comparable investigations, Venkatesh et al (2003). The acknowledged lower limit for Cronbach's alpha is 0.7, Davis (1989). In the event that the worth acquired in one test is under 0.7, the test is regularly viewed as questionable.

The proportion of dependability was first performed by examining every substantial reaction from the pilot data of 5 instructors from each participating university. The study involved estimating the inward intelligence as indicated by the relationship between the components. The inward consistency technique for setting up unwavering quality comprises basically of deciding how respondents react to all things or to a gathering of things in the survey. The dependability evaluations created by this technique are referred to as the inner consistency coefficient. In the pilot test, the outcome was as appeared in Table 1 below.
3.6 Reliability

Table 3: Reliability Test of Pilot test items in Questionnaire

<table>
<thead>
<tr>
<th>Cronbach’s Alpha</th>
<th>Cronbach’s Alpha Based on Standardized Items</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.855</td>
<td>.870</td>
<td>38</td>
</tr>
</tbody>
</table>

3.7 Data analysis

All the raw data collected from the field were converted into computer-readable format by first being entered in excel, then imported into SPSS. Descriptive statistics was applied to ensure the measurement properties were construct valid and reliable. The data were subjected to normality tests before analysis. Those which exhibited a normal distribution were subjected to parametric tests while those which did not were subjected to nonparametric test. Treatment effects were evaluated using descriptive statistics, in a package of statistics SPSS v. 17.0 to a confidence level of $\alpha=0.05$.

3.8 Ethical considerations

Ethical principles were taken into consideration before the study was carried out, and appropriate actions relating to the considerations were taken. Ethical considerations used in the study included respect for anonymity and confidentiality, informed consent, beneficence, anonymity and confidentiality, and respect for privacy.

3.9 Chapter Summary

This chapter has presented details about the research methodology by elaborating on the research design, the population and sampling design, the methods applied in collecting data, and finally the methods used in analyzing data.
CHAPTER 4: MODEL

4.1 Introduction

This chapter presents detailed information about the model, which was the primary objective of the study. It elaborates on the framework applied by explaining its adoption and provides details about the model and testing for its performance.

4.2 Theoretical Models On Technology Acceptance

TAM and UTAUT can be effectively connected utilizing quantifiable factors for comprehension and deciding components of reception. TAM does not completely address the issues of this study because of the way that it is not touchy to assorted use systems. Lee et al. (2003) query the study technique utilized in TAM whereby a few studies have their actions dependent on self-revealed use and clients who have hardly worked with the framework. UTAUT takes a shot at these matters with the four factors that are effort expectancy, social impact, encouraging condition and performance expectancy. Moreover, that is the reason UTAUT has been deliberately picked as the theoretical system for this research. This exploration leaves room for further study for more approval of UTAUT, Straub (2009).

4.2.1 Diffusion of Innovation

The process via which an innovation is communicated through a particular channel over time among social system members is referred to as diffusion. Innovation concerns an idea that is accepted as new by individuals (Al-Adwan, Al-Adwan & Smedley, 2013). The dissemination of advancement hypothesis contends that there are five known factors that impact innovation use. The five factors influence 49% to 87% of the dissimilarity in the acknowledgment of new mechanical items (Lai, 2017). These components contain the relative bit of leeway which concerns the leaders. In this system, trend-setters are individuals who are keen on new thoughts and would consistently need to attempt the development as the main thing (Arif and Mahmood, 2014).

The next group of people are early adopters who can be described as assessment pioneers. Early adopters like authority obligations and accept open doors of progress. They are as of now outfitted with the necessity to change and can serenely grasp new thoughts (Buabeng-
Andoh, 2012). Early adopters can be attracted to evaluate new items by exhibiting manuals and data slips in training (Buchanan, Sainter & Saunders, 2013). Data cannot really be induced to the group.

Early majority group comes after the early adopters. They are probably going to request some proof of the development working before they grasp it. Signs of achievement and enough proof of how powerful the technology is, are basics in influencing the early majority group (Buchanan, Sainter & Saunders, 2013). The late majority are people who are careful of progress and possibly acknowledge change when it has been attempted by the early adopters (Alharbi, 2014). Persuading the late adopters includes giving data about other individuals who have attempted and embraced the technology effectively (Arif & Mahmood, 2014). Ultimately, the laggards are individuals who are kept down by custom and are by one way or another out-dated. Laggards are skeptical about change and it is so hard to persuade them (Al-Adwan, Al-Adwan & Smedley, 2013). Convincing laggards to embrace innovation involves various methods such as fear appeals, statistics, piling presasure from people in other adopter groups.

Awareness of the need for an innovation, decision to adopt the innovation, continued use of the innovation, and original use of the innovation to evaluate it, is part of the stages via which a person adopts an innovation and diffusion gets accomplished (Arif & Mahmood, 2014). Five primary elements impact the reception of development and a model is relative advantage. Recognized as an adopter category, a relative bit of leeway includes to what extent an advancement is utilized as a superior thought than the thought it replaces (Alharbi, 2014). Utilizing Web 2.0 innovation in LMS ought to be taken as posing a relatively preferred position.

Compatibility is an alternate factor, which effects the acknowledgment of advancement. The development ought to be stable with the encounters, values, and the requirements of the probable adopters. Another factor is intricacy that involves how hard the advancement is to be utilized or gotten (knowledge). Variability is a factor depicted as the degree to which new thoughts can be surveyed before they are adopted (Buabeng-Andoh, 2012). Ultimately, observability as a factor concerns how much the advancement offers unmistakable results. Web 2.0 innovation utilizations brings to the table similarity, trialability, and recognizability highlights.
4.2.2 Technology Readiness Model

The technology preparation model explains the tendency for people to accept and use new tools to achieve goals at work and at home. Cochrane (2014) bases the individual technological disposition score together with the technological preparation to classify technology users into five technological preparation groups. Consumers consist of groups that are explorers, skeptics, pioneers and paranoids. The research is similar to Calisir, Gumussoy, Bayraktaroglu and Karaali (2014) which identifies an adoption curve of innovators, late majority, early majority and laggards that is S-shaped. The critical point of technological preparation or dissemination of innovation is the focus of the market and defines the achievement of the organization’s application (Buchanan et al., 2013). The study is applied in understanding the influences of the adoption of Web 2.0 technology in LMS in the universities of Kenya (Cochrane, 2014).

4.2.3 Task-technology Fit Model

The shape of the adjustment of task technology focuses on the impact for an individual that includes higher efficiency, higher quality and effectiveness (perceived usefulness). Den Exter, Rowe, Boyd and Lloyd (2012) anticipate that the desirable fit between the task and the science is to enhance the chance of exploitation and additionally extend the influence of overall performance because the technological know-how meets the desires of the venture and the wishes of users’ greater intent (Cochrane 2014). The task-technology fit model is good for studying the use of the technology, frequently evaluating new technologies and getting feedback (Buchanan, Sainter and Saunders, 2013). The structure is appropriate for evaluating the uses of technology that are already in use in the market.

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

UTAUT tries to portray the users’ readiness to utilize a data framework and the utilization behavior. UTAUT portrays that performance expectancy, social impact, effort expectancy and facilitating conditions are four crucial developments (Attuquayefio & Addo, 2014). The four concepts are the organized coordinate determinants of the reason for use and behavior among the clients of the data framework. The hypothesis states that age, sex, voluntariness and experience control the effects of the four primary developments on utilization behavior and purposeful (Paul, 2017). UTAUT was built up by combining and checking on the developments of eight models that prior research had utilized to clarify the
behavior of data utilization. UTAUT brings together angles of the hypothesis of reasoned action, the motivational model and the theory of planned behavior, plus technology acceptance model, among others.

Effort expectancy, social influence and performance expectancy agreeing to the UTAUT were theorized and found to impact the purposefulness of behavior when employing an innovation. Behavioral intention and enabling conditions characterize the use of innovation (Paul, 2017). Different bunches of the four UTAUT arbitrators were theorize and found to moderate different UTAUT relationships. UTAUT can clarify a variation of 77% in behavioral intention to use technology including 52% variance in technology use (Attuquayefio and Addo, 2014). UTAUT2 incorporates new constructs such as price value, habit and hedonic motivation thus focuses on new theoretical mechanisms within a consumer context (Paul, 2017).

The selection of Web 2.0 instruments in learning is related with a chance like several modern innovations. The influence of peers on the utilization of technology may be a measure within the appropriation of Web 2.0 (Cochrane, 2014). Students and instructors who feel that their classmates expect them to acknowledge web applications will uncover tall scores in arranging to utilize the framework (Cheung & Vogel, 2013). The intention to use the framework happens in this environment, indeed when those individuals do not personally feel positive about the system (Buabeng-Andoh, 2012). All these bolster the hypothesis of contemplated activity that recommends that the demeanor and subjective standard are imperative influencers of deliberate behavior.

4.2.5 Technology Acceptance Model

The advancement of the acknowledgment of innovation came from the contemplated activity hypothesis. The TAM deals specifically with the estimation of the worthiness of an innovative item (Persico, Manca and Pozzi, 2014). The intent of this is to decide the adequacy of an innovation item and discover the vital changes to make which enhance the adequacy of the item to the client (Lai, 2017). The TAM contends that the worthiness of the data framework is driven by two fundamental variables that are seen utility and seen ease of utilization (Holden & Karsh, 2010).
It is basic to know the variables that drive the appropriation of web applications in common and afterward inside the instruction segment. Data on what drives clients to utilize the internet application can permit experts to improve their best execution within the establishment of innovation furthermore preparing to move forward the immediate and long-term acknowledgment of innovation (Persico, Manca & Pozzi, 2014). The implementation of a web application requires an understanding by the faculty and endorsement of the pedagogical use of web 2.0 technology (Huang, Hood & Yoo, 2013). The demeanor figure is taken by the four concepts of seen ease of utilization, recognition of utility, perceived pedagogical and perceived risk (Lwoga, 2012). Peer impact implies the individual norm. The appropriation of web applications in learning is additionally influenced by information and individual encounter.

4.2.6 Perceived usefulness factor in Technology Acceptance Model

The degree to which an individual considers that employing a framework will improve their performance is called perceived usefulness (Manca & Ranieri, 2013). Ease of use, on the other hand, is the degree to which an individual accepts that the use of the framework will be simple. Seen ease of utilization and seen utility can be treated in an unexpected way, as recommended by a few figure analyzes (Marangunić & Granić, 2015). As the contemplated activity hypothesis illustrates, TAM hypothesizes that the utilization of a data framework is impacted by behavioral purposefulness (Stop, Nam & Cha, 2012). The purposefulness of behavior is decided by the state of mind of the individual towards the use of the framework conjointly by his recognition of the convenience of the framework.

Lai, Wang and Lei (2012) pointed out that an individual's attitude was one of the components that impacted the utilization of the framework, among other key variables. The attitude as a calculate in TAM is based on the impact it can create during the individual's execution (Marangunić & Granić, 2015). In other words, indeed on the off chance that a student does not embrace the Net 2.0 application, the likelihood of utilizing the Internet 2.0 application is big in the event that he accepts that the application will enable his learning encounter (Manca et al. Ranieri, 2013). The TAM moreover expects a coordinate relationship between perceived utility and the user's ease of perception. A client will select a framework or application that is less demanding to utilize with two frameworks that offer comparable usefulness.
In addition, Iqbal and Qureshi (2012) pointed out that the perceived ease of use too impacts the demeanor of the person through two fundamental instruments. These components are individual viability and instrumentality. To Lwoga (2012), self-efficacy explains the fact that the simpler it is to utilize a framework, the more prominent the user's sense of adequacy. Easy-to-use mechanical devices will allow the client the feeling of being able to control what they are doing (Huang, Hood & Yoo, 2013).

### 4.3 Instrument Development

An integrated model with modified constructs from UTAUT, TAM, and TAM2 were utilized to help formulate hypotheses. The other part of this segment will clarify the constructs of the study model and some of the hypotheses that define the associations between them.

#### 4.3.1 Saving on Time

Time-saving is defined as the act of reducing the amount of time needed to perform a task or an activity. It is essential to adopt Web 2.0 tools in LMS, which will save on time when a student is in need of certain learning resources or a solution to a given problem (Conole & Alevizou, 2010). Saving on time is an essential construct in this study since it intends to elaborate how the flexibility of Web 2.0 tools in LMS assists students in saving time during the processes of learning and sharing ideas, and become more productive through minimal time wastage. Learning management system and Web 2.0 should be able to assist the students to appropriately manage their time in learning activities, and be able to achieve the following factors less stress, less rework, and less effort.

**H1**: There is a positive impact on saving on time to the attitude of using and acceptance of Web 2.0 use in universities.

#### 4.3.2 Perceived Usefulness (PU)

Perceived usefulness talks about the belief of a client that innovation will progress their work better (Venkztesh, Croteau & Rabah, 2014). Seen value is a viewpoint that contacts innovation acknowledgment and the factors was viable crosswise over societies. The study takes a similar conclusion that apparent helpfulness of Web 2.0 tools should unquestionably co-shift with the gathering of these instruments in learning and educating (Venkztesh, Croteau & Rabah, 2014). Perceived usefulness is a vital speculation in this study as it looks
at the reach out to which intuitive innovation stages in web 2.0 can improve utilization of Web 2.0, with the help of these factors, Interaction, Enjoyment, and Compatibility. Web 2.0 should affect a positive encounter by demonstrating to be useful in the learning the board framework in the Universities in Nairobi to improve online innovation cooperations among students and lecturers.

**H2:** There is a positive connection between perceived usefulness and attitude towards Web 2.0 tools in Universities.

### 4.3.3 Ease of Use

Usability defines the elegance with which a website or a given application is designed for the end users (Pilgrim, 2008). The iterative design of Web 2.0 has to be able to increase user experience by achieving quantified objectives effectively, efficiently and improve satisfaction in its use (Conole & Alevizou, 2010). Perceived ease of use is important in this research since it examines to what extent a web 2.0 user believes that its adoption in LMS might be effort free. The use of web 2.0 in LMS should be effortless for the students and tutors to have a smooth interaction with the technology, and these factors relate to its ease of use which includes reduced training time and cost, increased user adoption.

**H3:** There is an affirmative relationship between the ease of use and the attitude towards Web 2.0 tools in Universities.

### 4.3.4 Social Influence

The social influence concerns an interpersonal covenant that bores individuals within a specific environment (Sadaf, Newby & Ertmer, 2016). Various external influences exist that could impact the acceptance of technology. Social influence ought to relate positively with the behavior intention to use Web 2.0 technology in LMS, and its integration can be highly influenced by students through social factors (Sadaf, Newby & Ertmer, 2016). Social information embedded in a digital social network might influence peoples’ attitudes, thoughts and online behaviors, which are influenced by conformity and peer pressure. This is essential in the study as it influences the users’ perception of web 2.0 from the social networks. Social impact is vital in the adoption of web 2.0 in universities in Nairobi as it changes the attitudes of users. Therefore:

**H4:** Social influence has a positive impact with the attitude to use Web 2.0 applications in LMS.
4.3.5 Effectiveness and Efficiency

Before the full adoption of Web 2.0, it is essential to comprehend what its application in LMS is trying to achieve, and work towards its implementation and adoption. Achieving the primary goal would make Web 2.0 effective, and this gives it more room for adoption (Conole & Alevizou, 2010). Effectiveness and efficiency is important in this study since it ensures that the adoption of web 2.0 in LMS will cover all the requirements to make it effective in universities in Nairobi, and perform as expected. Effectiveness and efficiency are relatable in learning management systems as learning activities will be improved and made easier through the adoption of web 2.0 applications in LMS, with productivity being the main factor here.

H5: There is a constructive relationship between effectiveness and efficiency, and the attitude in using Web 2.0 applications in LMS.

4.3.6 Affordability

Affordability defines the inexpensiveness of a new technology and it is extremely important since it is linked to its sustainability. Affordability of Web 2.0 tools might be a problem in the acceptance of web 2.0 (Olaniran, 2009). It is pointless to adopt a new expensive technology that may not be sustained by the buyer. Affordability is important in this study since there has to be a financial plan of the expenditure on the adoption of Web 2.0 in LMS, some of the factors related to affordability are product pricing and price regulation.

H6: There is a negative relationship between affordability and the attitude towards the usage and implementation of Web 2.0 applications in LMS.

4.3.7 Enabling Conditions

Web 2.0 technology is unusable without internet facilities, policies and LMS software. Users must have access to computing devices with access to internet to exploit Web 2.0 in some of their undertakings (Allen, 2017). The use of web 2.0 has been successfully implemented in various higher learning institutions. This has been achieved through the enabling conditions that make web 2.0 function effectively in learning management systems (den Exter, Rowe, Boyd & Lloyd, 2012). The availability of skills and infrastructure is described by the capability framework of using Web 2.0 in LMS. Incentives relevant in motivating both learners and lecturers or tutors to use web 2.0, availability of funds for purchasing and installing LMS software, strong and reliable internet connection to facilitae
the operation of LMS with Web 2.0, and the existence of a clear learning management system are some of the enabling conditions for web 2.0 adoption, with some of its factors including motivation, environment, and teacher-student relationship. Thus:

**H7:** There is positive relationship between Web 2.0 enabling conditions and the attitude towards the usage and acceptance of Web 2.0 tools in LMS.

### 4.4 Conceptual Framework for Web 2.0 Acceptance in LMS

**Independent Variables**

- **Perceived Usefulness**
  - (Interaction, Enjoyment, Compatibility)
  - $H_1(\cdot)$

- **Ease of Use**
  - (Reduced training time and cost, increased user adoption, ensure expected Web 2.0 benefits)
  - $H_2(\cdot)$

- **Effectiveness and Efficiency**
  - (Productivity)
  - $H_3(\cdot)$

- **Affordability**
  - (Product pricing, Price regulation)
  - $H_4(\cdot)$

**Saving on Time**

- (Less stress, Less rework, Less effort)
  - $H_5(\cdot)$

**Social Influence**

- (Conformity, Peer pressure)
  - $H_6(\cdot)$

**Enabling Condition**

- (Motivation, Environment, Teacher-Student relationship)
  - $H_7(\cdot)$

**Dependent**

- **Improve Interaction In Collaborative Learning**
  - (Facilitors+ Students)
CHAPTER 5: RESULTS AND FINDINGS

5.1 Introduction

This section shows the research and results of the study. Information analysis was performed utilizing SPSS programming, version 17.0. Expressive measurements were utilized to dissect the information when certain frequencies were utilized, while others were examined using numerous reactions on the Likert scale to acquire a connection.

5.2 Reliability Test of Pilot test items in Questionnaire

Alpha scores are presented in Table 4.2 below. Scores were gotten when all components of the survey were submitted to the Cronbach alpha test to confirm interior consistency dependent on the connection between the components. Cronbach's Alpha which is a measure of internal consistency has a required reliability of 0.70 (Bonett & Wright, 2015). The components of the survey got the suggested alpha score more significant than 0.7. The results of the steady quality research in Table 4.1 demonstrate that the alpha coefficient of 0.770 is viewed as an excellent score. In light of these discoveries, it was discovered that the poll was a solid estimation device for understanding the adoption of Web 2.0 in learning the executives frameworks in Universities in Nairobi.

Table 4: Reliability Test of Pilot test items in Questionnaire

<table>
<thead>
<tr>
<th>Cronbach's Alpha</th>
<th>Cronbach's Alpha Based on Standardized Items</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.770</td>
<td>.785</td>
<td>27</td>
</tr>
</tbody>
</table>

5.3 Cross tabulation of Age and Level of education

Majority of respondents with the highest level of education were those within the age group of 18-30. Whereas 9% of this age group had at least finished college, an overwhelming 91% finished high school. The least level of education was recorded in the age bracket 51-60 years. Only 0.3% of the respondents in the age bracket 51-60 had attained any form of education. Generally, 86.6% of the respondents had finished high school while 13.4% had attained college education.
# Table 5: Cross tabulation of Age and Level of education

<table>
<thead>
<tr>
<th>Age group</th>
<th>Count</th>
<th>Finished College</th>
<th>Finished High School</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-30 Years</td>
<td>34</td>
<td>340</td>
<td>374</td>
<td></td>
</tr>
<tr>
<td>% within Age Group</td>
<td>9%</td>
<td>91%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>% of Total</td>
<td>8.6%</td>
<td>85.6%</td>
<td>94.2%</td>
<td></td>
</tr>
<tr>
<td>31-40 Years</td>
<td>15</td>
<td>3</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>% within Age Group</td>
<td>83.3%</td>
<td>16.7%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>% of Total</td>
<td>3.8%</td>
<td>0.8%</td>
<td>4.6%</td>
<td></td>
</tr>
<tr>
<td>41-50 Years</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>% within Age Group</td>
<td>100%</td>
<td>0%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>% of Total</td>
<td>0.8%</td>
<td>0%</td>
<td>0.8%</td>
<td></td>
</tr>
<tr>
<td>51-60 Years</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>% within Age Group</td>
<td>100%</td>
<td>0%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>% of Total</td>
<td>0.3%</td>
<td>0%</td>
<td>0.3%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>343</td>
<td>396</td>
<td></td>
</tr>
<tr>
<td>% within Age Group</td>
<td>13.4%</td>
<td>86.6%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>% of Total</td>
<td>13.4%</td>
<td>86.6%</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>
5.4 Gender of the respondents

A total of 396 respondents were interviewed for this study. When it comes to gender, women were higher than men. 56% of the respondents were women and the remaining 44% were men. Most respondents were between the ages of 18 and 30, as shown in Figure 2 below.

![Graph of gender and age brackets](image)

Figure 3: Graph of gender and age brackets

5.5 Summary of the responses for constructs measuring statements

An analysis of estimated study reactions for every development was compared on a statement by statement basis. The Likert scale in the survey included five levels going from strongly disagree to strongly agree. The responses of strongly disagree and disagree were summarized and presented as disagree. The responses for agree and strongly agree were summarized and presented as agree. The neutral response was left unchanged as neutral. The Table 4 shows the output summary of the combined responses to come up with Disagree, Neutral and Agree.

Table 6: The output summary of the combined responses

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td>Neutral</td>
<td>Agree</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.6 Respondents perception whether the use of Web 2.0 tools in LMS saves on time

Time saving ability of the tool was designed to capture the data that indicates the respondents’ perception whether the use of Web 2.0 tools in LMS saves on time. On whether using Web 2.0 tools in LMS is flexible and saves on time 38.6% disagreed, 52.3% were neutral while 9.1% agreed. On whether using Web 2.0 tools in LMS wastes a lot of time in my learning activities 41.4% disagreed, 28.3% were neutral while 30.3% agreed. Additionally, 39.1%, 53.5% and 7.4% disagreed, were neutral and agreed respectively on question that Using Web 2.0 tools in LMS is a good idea for time saving as shown in Table 5.

Table 7: The responses level associated with whether the use of Web 2.0 tools in LMS saves on time

<table>
<thead>
<tr>
<th>Saving Time (ST)</th>
<th>Statements</th>
<th>Disagree %</th>
<th>Neutral %</th>
<th>Agree %</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST</td>
<td>Statements</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ST1</td>
<td>Using Web 2.0 tools in LMS is flexible and saves on time</td>
<td>38.6</td>
<td>52.3</td>
<td>9.1</td>
<td>100</td>
</tr>
<tr>
<td>ST2</td>
<td>Using Web 2.0 tools in LMS will waste a lot of time in my learning activities</td>
<td>41.4</td>
<td>28.3</td>
<td>30.3</td>
<td>100</td>
</tr>
<tr>
<td>ST3</td>
<td>Using Web 2.0 tools in LMS is a good idea for time saving.</td>
<td>39.1</td>
<td>53.5</td>
<td>7.4</td>
<td>100</td>
</tr>
<tr>
<td>ST4</td>
<td>I hesitate to use a Web 2.0 tools in LMS because it might look stupid and be wasting my time</td>
<td>31.6</td>
<td>44.0</td>
<td>24.4</td>
<td>100</td>
</tr>
</tbody>
</table>

5.7 Respondents perception on Perceived Usefulness

Perceived usefulness was designed to capture data that indicates the level of usefulness that the respondents have when using Web 2.0 technologies and how these levels will influence the acceptance and use of the technology. Whereas 54.2% of the respondents believed that Web 2.0 tools in LMS make it possible to work more productively, 37.5% were neutral while 8.3% agreed. 47.3% and 47.1% of the respondents also disagreed and were neutral.
respectively on usefulness of Web 2.0 tools in LMS in learning work. Moreover, an overwhelming majority of 50.8% also believed that Using Web 2.0 tools in LMS will not have any positive impact on their learning experience.

**Table 8: The responses level associated with Perceived Usefulness**

<table>
<thead>
<tr>
<th>Perceived Usefulness (PU)</th>
<th>Statistics of Agree and disagree with statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>PU 1</td>
<td>Disagree %</td>
</tr>
<tr>
<td>Web 2.0 tools in LMS make it possible to work more productively</td>
<td>54.2%</td>
</tr>
<tr>
<td>I find Web 2.0 tools in LMS a useful tool in my learning work</td>
<td>47.3%</td>
</tr>
<tr>
<td>Using Web 2.0 tools in LMS will increase my productivity in learning</td>
<td>38.4%</td>
</tr>
<tr>
<td>Using Web 2.0 tools in LMS will improve my learning</td>
<td>50.8%</td>
</tr>
</tbody>
</table>

**5.8 Respondents perception on Ease of Use**

The ease of use was designed to capture data and generate statistics on peer influence in an attempt to establish its role in the acceptance of Web 2.0 technologies in public and private universities in Nairobi, as shown in Table 7 below. The respondents were asked if their interactions with Web 2.0 tools in LMS was clear and understandable. 41.4% disagreed, 52.8% were neutral while 5.8% agreed. Respondents were also asked if learning to operate Web 2.0 tools in LMS was easy. 38.9% disagreed, 54.8% were neutral while 6.3% agreed. On if it would be easy for the respondents to become skillful at using Web 2.0 tools in LMS, 36.9% disagreed, 58.3% were neutral while 4.8% agreed. 40.4%, 37.6% and 22% also disagreed, remained neutral or agreed respectively that they could easily use Web 2.0 technologies on their own.
Table 9: The responses level associated with Ease of Use

<table>
<thead>
<tr>
<th>Ease of Use (EU)</th>
<th>Statements</th>
<th>Disagree %</th>
<th>Neutral %</th>
<th>Agree %</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU 1</td>
<td>My interaction with Web 2.0 tools in LMS will be clear and understandable.</td>
<td>41.4</td>
<td>52.8</td>
<td>5.8</td>
<td>100</td>
</tr>
<tr>
<td>EU 2</td>
<td>Learning to operate Web 2.0 tools in LMS will be easy for me.</td>
<td>38.9</td>
<td>54.8</td>
<td>6.3</td>
<td>100</td>
</tr>
<tr>
<td>EU 3</td>
<td>It will be easy for me to become skillful at using Web 2.0 tools in LMS.</td>
<td>36.9</td>
<td>58.3</td>
<td>4.8</td>
<td>100</td>
</tr>
<tr>
<td>EU 4</td>
<td>I could easily use Web 2.0 technologies on my own.</td>
<td>40.4</td>
<td>37.6</td>
<td>22</td>
<td>100</td>
</tr>
</tbody>
</table>

5.9 Respondents perception on Social Influence

The social influence was designed to capture data and generate statistics on peer influence in an attempt to establish its role in the acceptance of Web 2.0 technologies in public and private universities in Nairobi. To establish this, the respondents were presented with three statements for them to indicate their level of agreement with the statements. The Table 8 clearly shows the response analysis of the results. The respondents were first asked if friends who influence their behavior would think that they should use Web 2.0 technologies in the classroom. In response to this statement, 42.2% disagreed, 48% were neutral while 9.8% agreed. Secondly the respondents were asked to respond to whether people who are important to the would think that they should use Web 2.0 tools in LMS for their learning activities. 42.4% disagreed, 52.8% were neutral while 4.8% agreed. Respondents were also asked if the senior management of their university have supported the adoption and use of Web 2.0 tools in learning management system. 34.6% disagreed, 51.5% were neutral while 13.9% agreed.
Table 10: The responses level associated with Social Influence

<table>
<thead>
<tr>
<th>Social Influence (SI)</th>
<th>Statements</th>
<th>Disagree %</th>
<th>Neutral %</th>
<th>Agree %</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SI1</td>
<td>Friends who influence my behavior would think that I should use Web 2.0 technologies in the classroom.</td>
<td>42.2%</td>
<td>48%</td>
<td>9.8%</td>
<td>100%</td>
</tr>
<tr>
<td>SI2</td>
<td>People who are important to me think that I should use Web 2.0 tools in LMS for my learning activities</td>
<td>42.4%</td>
<td>52.8%</td>
<td>4.8%</td>
<td>100%</td>
</tr>
<tr>
<td>SI3</td>
<td>The senior management of my university has supported the adoption and use of Web 2.0 tools in learning management system.</td>
<td>34.6%</td>
<td>51.5%</td>
<td>13.9%</td>
<td>100%</td>
</tr>
</tbody>
</table>

5.10 Respondents perception on Effectiveness and Efficiency

Table 11: The responses level associated with Effectiveness and Efficiency

<table>
<thead>
<tr>
<th>Effectiveness and Efficiency (EE)</th>
<th>Statements</th>
<th>Disagree %</th>
<th>Neutral %</th>
<th>Agree %</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EE1</td>
<td>Using Web 2.0 tools in LMS will improve student’s grades.</td>
<td>44%</td>
<td>47.2%</td>
<td>8.8%</td>
<td>100%</td>
</tr>
<tr>
<td>EE2</td>
<td>I believe that I could communicate to others the consequences of using Web 2.0 in LMS in the classroom</td>
<td>42.2%</td>
<td>50%</td>
<td>7.8%</td>
<td>100%</td>
</tr>
<tr>
<td>EE3</td>
<td>I look forward to using Web 2.0 tools in LMS to enhance the effectiveness of my learning career in the future.</td>
<td>35%</td>
<td>46.3%</td>
<td>18.7%</td>
<td>100%</td>
</tr>
<tr>
<td>EE4</td>
<td>Web 2.0 tools in LMS make learning more interesting and increases efficiency.</td>
<td>40.2%</td>
<td>48%</td>
<td>11.8%</td>
<td>100%</td>
</tr>
<tr>
<td>EE5</td>
<td>I can easily interact with my friends and tutors through social networks when using Web 2.0 tools in LMS.</td>
<td>39%</td>
<td>53%</td>
<td>8%</td>
<td>100%</td>
</tr>
</tbody>
</table>

The Effectiveness and Efficiency was designed to capture data and generate statistics to establish its role in the acceptance of Web 2.0 technologies in the public and private universities in Nairobi as shown in Table 9 below. The respondents were asked if using
Web 2.0 tools in LMS will improve student’s grades. 44% disagreed, 47.2% were neutral and 8.8% agreed. Secondly respondents were asked if they believed that they could communicate to others the consequences of using Web 2.0 in LMS in the classroom, 42.2% agreed, 50% were neutral while 7.8% agreed. Thirdly, respondents were asked if using Web 2.0 tools in LMS made learning more interesting and increased efficiency. 40.2% disagreed, 48% were neutral while 11.8% agreed. Respondents were also asked if they could easily interact with friends and tutors through social networks when using Web 2.0 tools in LMS. 39% disagreed, 53% were neutral while 8 agreed.

5.11 Respondents perception on Affordability

The affordability was designed to capture data and generate statistics to establish its role in the acceptance of Web 2.0 technologies in Nairobi public and private universities as shown in Table 10 below. The respondents were asked if Interacting with Web 2.0 tools in LMS required a lot of attention. 35.4% said no, 56.6% were neutral while 8% agreed. On whether respondents had the resources necessary to use Web 2.0 tools in LMS for their learning process, 35.1% disagreed, 53.8% were neutral will 11.1% said yes. On if the respondents would avoid taking a teaching or learning career if they knew it involved working with Web 2.0 tools in LMS, 34.3% disagreed, and 43.4% were neutral while 22.3% said yes.

Table 12: The responses level associated with Affordability

<table>
<thead>
<tr>
<th>Affordability (A)</th>
<th>Statements</th>
<th>Disagree %</th>
<th>Neutral %</th>
<th>Agree %</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Interacting with Web 2.0 tools in LMS requires a lot of attention.</td>
<td>35.4%</td>
<td>56.6%</td>
<td>8%</td>
<td>100%</td>
</tr>
<tr>
<td>A2</td>
<td>I have the resources necessary to use Web 2.0 tools in LMS for my learning process.</td>
<td>35.1%</td>
<td>53.8%</td>
<td>11.1%</td>
<td>100%</td>
</tr>
<tr>
<td>A3</td>
<td>I would avoid taking a teaching or learning career if I knew it involved working with Web 2.0 tools in LMS.</td>
<td>34.3%</td>
<td>43.4%</td>
<td>22.3%</td>
<td>100%</td>
</tr>
</tbody>
</table>

5.12 Respondents perception on Enabling Conditions

Enabling condition was designed to generate statistics on how the availability of internet connections to public and private universities in Kenya influences the acceptance of Web
2.0 technologies. The respondents were therefore presented with four statements to indicate their level of agreement to the statements. The Table 11 clearly displays the response analysis of the results. Respondents were asked if Web 2.0 technologies in LMS were compatible with the computer they were already using in the classroom. 31.3% disagreed, 60.1% were neutral and 8.6% agreed. On whether the respondents could use Web 2.0 technologies in LMS using any computer connected to the internet, 33.6% disagreed, 54.3% were neutral while 12.1% agreed. On if the respondents thought that using Web 2.0 tools in LMS would be easy to integrate in their lecture hall environment, 37.4% disagreed, and 31.8% were neutral while 30.8% agreed. Additionally, 33.3%, 60% and 6.7% of the respondents disagreed, were neutral or agreed respectively that they had the knowledge necessary to use Web 2.0 tools in LMS.

Table 13: The responses level associated with Enabling Conditions

<table>
<thead>
<tr>
<th>Enabling Conditions (AC)</th>
<th>Statistics of Agree and disagree with statement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Disagree %</td>
</tr>
<tr>
<td>AC1 Web 2.0 technologies in LMS are compatible with the computer I already use in the classroom.</td>
<td>31.3%</td>
</tr>
<tr>
<td>AC2 I can use Web 2.0 technologies in LMS using any computer connected to the internet.</td>
<td>33.6%</td>
</tr>
<tr>
<td>AC3 I think that using Web 2.0 tools in LMS will be easy to integrate in my lecture hall environment.</td>
<td>37.4%</td>
</tr>
<tr>
<td>AC4 I have the knowledge necessary to use Web 2.0 tools in LMS.</td>
<td>33.3%</td>
</tr>
</tbody>
</table>

5.13 Respondents’ perception on Use of LMS (Efficacy)

The use of LMS was designed to generate statistics on how the efficacy in terms of the use of LMS influenced the acceptance of Web 2.0 technologies. The respondents were presented with four statements to indicate their level of agreement to the statements. The Table 12 clearly displays the response analysis of the results. Respondents were asked if they could easily interact with my friends and tutors through social networks when using
Web 2.0 tolls in LMS. Regarding this question 38.7% agreed, 53% were neutral while 8.3% agreed that they could easily interact with their friends and tutors through social networks when using Web 2.0 tolls in LMS. The second question was whether the Web 2.0 tools in LMS made learning more interesting and increased efficiency where 40.2%, 48% and 11.8% disagreed, were neutral and agreed respectively. The third question that the respondents were asked was if they had the resources necessary to use Web 2.0 tools in LMS for their learning process. 35.1% of the respondent’s disagreed, 53.8% were neutral while 11.1% agreed. On the respondents’ perception on whether using Web 2.0 tools in LMS would be easy to integrate in their lecture hall environment, 37.4% disagreed, 31.8% were neutral while 30.8% agreed.

Table 14: The responses level associated with the Use of LMS (Efficacy)

<table>
<thead>
<tr>
<th>Use of LMS (Efficacy)</th>
<th>Statistics of Agree and disagree with statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>EF1</td>
<td>Statements</td>
</tr>
<tr>
<td>EF1</td>
<td>I can easily interact with my friends and tutors through social networks when using web 2.0 tolls in LMS.</td>
</tr>
<tr>
<td>EF2</td>
<td>Web 2.0 tools in LMS make learning more interesting and increases efficiency.</td>
</tr>
<tr>
<td>EF3</td>
<td>I have the resources necessary to use Web 2.0 tools in LMS for my learning process.</td>
</tr>
<tr>
<td>EF4</td>
<td>I think that using Web 2.0 tools in LMS will be easy to integrate in my lecture hall environment.</td>
</tr>
</tbody>
</table>
5.14 Correlation between age and whether Using Web 2.0 tools in LMS is flexible and saves on time when carrying out my learning activities

A correlation has been made to determine the relationship between age and whether the use of Web 2.0 tools in LMS is flexible and saves time when performing learning activities. The results showed that there was a weak negative correlation with \( r = -0.1068 \).

![Figure 4: Correlation between age and whether applying Web 2.0 tools in LMS is flexible and saves on time when carrying out my learning activities](image)

5.15 Regression between age and Perceived Usefulness of Using Web 2.0 tools in LMS

A linear regression was calculated to predict the respondents’ perception on the usefulness of Using Web 2.0 tools in LMS based on their age. Preliminary analysis was performed to ensure there was no violation of the assumption of normality, linearity and multicollinearity. A significant regression equation was found (\( F (1, 394) = 4.826, \ p = 0.029 \) with an \( R^2 \) of 0.012.)
Table 15: Regression between age and Perceived Usefulness of Using Web 2.0 tools in LMS

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>5.213</td>
<td>1</td>
<td>5.213</td>
<td>4.826</td>
<td>0.029***</td>
</tr>
<tr>
<td>Residual</td>
<td>425.542</td>
<td>394</td>
<td>1.080</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.16 Regression between age and Ease of Use of Using Web 2.0 tools in LMS

A linear regression was calculated to predict the respondents’ perception on the ease of use of Using Web 2.0 tools in LMS based on their age. Preliminary analysis was performed to ensure there was no violation of the assumption of normality, linearity and multicolinearity. The results demonstrated that there was no significant association. A regression equation of (F (1, 394) =0.071, p=0.00479 with an R² of 0.0002.

Table 16: Regression between age and Ease of Use of Using Web 2.0 tools in LMS

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>0.048</td>
<td>1</td>
<td>0.048</td>
<td>0.071</td>
<td>0.00479</td>
</tr>
<tr>
<td>Residual</td>
<td>264.889</td>
<td>394</td>
<td>0.672</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.17 Regression between age and Social influence of Using Web 2.0 tools in LMS

A linear regression was calculated to predict the respondents’ perception on the social influence of Using Web 2.0 tools in LMS based on their age. Preliminary analysis was performed to ensure there was no violation of the assumption of normality, linearity and multicolinearity. The results demonstrated that there was no significant association. A regression equation of (F (1, 394) =0.003, p=0.954 with an R² of 0.0003.

Table 17: Regression between age and Social influence of Using Web 2.0 tools in LMS

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>0.003</td>
<td>1</td>
<td>0.003</td>
<td>0.003</td>
<td>0.954</td>
</tr>
</tbody>
</table>
5.18 Regression between age and Effectiveness and Efficiency of Using Web 2.0 tools in LMS

A linear regression was calculated to predict respondents' insight of the effectiveness of Web 2.0 tools in LMS by age. Preliminary analyzes were conducted to ascertain that there was no ruining of the assumption of normality, linearity and multicollinearity. The results showed that there was no significant association. A regression equation of \((F(1, 394) = 0.417, p = 0.497)\) with an \(R^2\) of 0.001.

Table 18: Regression between age and Effectiveness and Efficiency of Using Web 2.0 tools in LMS

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>0.417</td>
<td>1</td>
<td>0.417</td>
<td>0.462</td>
<td>0.497</td>
</tr>
<tr>
<td>Residual</td>
<td>355.765</td>
<td>394</td>
<td>0.903</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.19 Regression between age and Affordability of Using Web 2.0 tools in LMS

A linear regression was calculated to predict the respondents’ perception of the affordability of using Web 2.0 tools in LMS, based on their age. Preliminary analysis was performed to ensure there was no violation of the assumption of normality, linearity and multicolinearity. The results demonstrated that there was no significant association. A regression equation of \((F(1, 394) = 0.075, p=0.784)\) with an \(R^2\) of 0.0005.

Table 19: Regression between age and Affordability of Using Web 2.0 tools in LMS

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>0.57</td>
<td>1</td>
<td>0.057</td>
<td>0.075</td>
<td>0.784</td>
</tr>
<tr>
<td>Residual</td>
<td>301.829</td>
<td>394</td>
<td>0.766</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.20 **Regression between age and Enabling Conditions of Using Web 2.0 tools in LMS**

A linear regression was calculated to predict the respondents’ perception on the enabling conditions of using Web 2.0 tools in LMS based on their age. Preliminary analyses were performed to ensure there were no violations of the assumption of normality, linearity and multicollinearity. A significant regression equation was found (F (1, 394) =5.265, p=0.022 with an R$^2$ of 0.013.

Table 20: Regression between age and Enabling Conditions of Using Web 2.0 tools in LMS

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>3.776</td>
<td>1</td>
<td>3.776</td>
<td>5.265</td>
<td>0.022****</td>
</tr>
<tr>
<td>Residual</td>
<td>282.578</td>
<td>394</td>
<td>0.717</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.21 **Regression between gender and Perceived Usefulness of Using Web 2.0 tools in LMS**

A linear regression was calculated to predict respondents' perception of the perceived utility of using Web 2.0 tools in LMS based on their gender. Fundamental breakdowns were directed to guarantee that there was no infringement of the presumption of ordinariness, linearity and multicollinearity. The outcomes demonstrated that there was no noteworthy affiliation. A relapse condition of (F (1.394) = 0.425, p = 0.515 with R2 of 0.01.

Table 21: Regression between gender and Perceived Usefulness of Using Web 2.0 tools in LMS

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>0.377</td>
<td>1</td>
<td>0.377</td>
<td>0.425</td>
<td>0.515</td>
</tr>
<tr>
<td>Residual</td>
<td>349.038</td>
<td>394</td>
<td>0.866</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.22 **Regression between gender and Affordability Using Web 2.0 tools in LMS**

A linear regression was calculated to predict the respondents’ perception on the Perceived Usefulness of Using Web 2.0 tools in LMS based on their gender. Preliminary analyses were performed to ensure there were no violations of the assumption of normality, linearity
and multicolinearity. The results demonstrated that there was no significant association. A regression equation of \( F(1, 394) = 1.142, p = 0.286 \) with an \( R^2 \) of 0.003.

Table 22: Regression between gender and Affordability Using Web 2.0 tools in LMS

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>0.873</td>
<td>1</td>
<td>0.873</td>
<td>1.142</td>
<td>0.286</td>
</tr>
<tr>
<td>Residual</td>
<td>301.886</td>
<td>394</td>
<td>0.764</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.23 Regression between age and Efficacy of Using Web 2.0 tools in LMS

A linear regression was calculated to predict the respondents’ perception on the Efficacy of Using Web 2.0 tools in LMS based on their age. Preliminary analyses were performed to ensure there were no violations of the assumption of normality, linearity and multicolinearity. The results demonstrated that there was no significant associations. A regression equation of \( F(1, 394) = 0.001, p = 0.981 \) with an \( R^2 \) of 0.002

Table 23: Regression between age and Use of LMS (Efficacy)

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>0.0001</td>
<td>1</td>
<td>0.0001</td>
<td>0.001</td>
<td>0.981</td>
</tr>
<tr>
<td>Residual</td>
<td>335.159</td>
<td>394</td>
<td>0.851</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.24 Study model analysis

Figure 5: Analysis of the structural model

Figure 4 above shows the analysis of the structural model. The model is used to study the predictive capabilities of the model and the relationship between constructs. The figure shows the relationship between the study variables and the standardized path coefficients, while indicating the levels of significance. The observed variance of 68% in the LMS is taken into account in the model. The path is significant if \( p < 0.01 \) and \( p < 0.05 \), if not insignificant. The analysis displays only three significant variables in the model, which include saving on Time, Ease of Use, and Effectiveness and Efficiency. The remaining four variables are insignificant to the model, thus they are dropped.

Table 24: Confirmatory factor analysis and multicollinearity test.

<table>
<thead>
<tr>
<th>Constructs</th>
<th>STime</th>
<th>P usef</th>
<th>Ease</th>
<th>EF</th>
<th>Afford</th>
<th>EC</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST1</td>
<td>0.133</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1.079</td>
</tr>
<tr>
<td>ST2</td>
<td>0.338</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1.302</td>
</tr>
</tbody>
</table>
The study factor loadings from Table 22 have a range of 0.377 to 0.033, which is below the required threshold value of 0.6.

Table 25: Model fit and quality indices using WarpPLS

<table>
<thead>
<tr>
<th>Measure</th>
<th>Value</th>
<th>Evaluation Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average path coefficient, (APC)</td>
<td>0.214</td>
<td>P&lt;0.001</td>
</tr>
<tr>
<td>Average R-squared, (ARS)</td>
<td>0.680</td>
<td>P&lt;0.001</td>
</tr>
<tr>
<td>Average adjusted R-squared, (AARS)</td>
<td>0.674</td>
<td>P&lt;0.001</td>
</tr>
<tr>
<td>Average block VIF, (AVIF)</td>
<td>1.431</td>
<td>acceptable if &lt;= 5, ideally &lt;= 3.3</td>
</tr>
<tr>
<td>Average full collinearity VIF, (AFVIF)</td>
<td>5.725</td>
<td>acceptable if &lt;= 5, ideally &lt;= 3.3</td>
</tr>
<tr>
<td>Tenenhaus GoF</td>
<td>0.427</td>
<td>small &gt;= 0.1, medium &gt;= 0.25, large &gt;= 0.36</td>
</tr>
<tr>
<td>Symposon's paradox ratio, (SPR)</td>
<td>0.714</td>
<td>acceptable if &gt;= 0.7, ideally = 1</td>
</tr>
</tbody>
</table>
R-squared contribution ratio (RSCR)=0.970, acceptable if >= 0.9, ideally = 1

Statistical suppression ratio (SSR)=1.000, acceptable if >= 0.7

The goodness-of-fit in the model is measured between the data collected and the model proposed, WarpPLS has various measures to describe the model of fit. The results from table 23 show that the statistical acceptable model fit according to D’Agostino (2017), therefore, the model is termed as fit to the data collected.
Table 26: Analysis of reliability.

<table>
<thead>
<tr>
<th></th>
<th>STime</th>
<th>Pusef</th>
<th>Sociali</th>
<th>Affor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Composite reliability</td>
<td>0.744</td>
<td>0.748</td>
<td>0.714</td>
<td>0.724</td>
</tr>
<tr>
<td>Cronbach's alpha</td>
<td>0.546</td>
<td>0.549</td>
<td>0.399</td>
<td>0.238</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>STime</th>
<th>Pusef</th>
<th>Sociali</th>
<th>Affor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dijkstra’s PLSc reliability</td>
<td>0.691</td>
<td>0.585</td>
<td>0.091</td>
<td>0.354</td>
</tr>
<tr>
<td>True composite reliability</td>
<td>0.744</td>
<td>0.748</td>
<td>0.714</td>
<td>0.724</td>
</tr>
<tr>
<td>Factor reliability</td>
<td>0.744</td>
<td>0.748</td>
<td>0.714</td>
<td>0.724</td>
</tr>
</tbody>
</table>

From table 24 above, reliability is assessed through the concept of internal consistency measure and the degree of homogeneity measure of a specific construct. This assessment determines if there would be similar results in same or different situations given that the timing is different (Davenport, Davison, Liou, & Love, 2015). Cronbach’s alpha and composite reliability are the models used to determine the acceptable reliability in this study. A value of 0.6 Cronbach’s alpha is the set threshold, from figure 24, the coefficients are above the set limit making the model have adequate reliability.
5.25 Hypothesis testing and discussion

**H1 Saving Time.** Time saving is an essential benefit related to adoption of Web 2.0 in LMS in universities in Nairobi. From the results collected and analyzed, a higher percentage of the respondents did not agree that Web 2.0 will save on time. This could negatively affect the adoption of Web 2.0 tools in LMS since the construct of time saving is not satisfied from the results. Web 2.0 tools can be considered to save time when little time is spent on acquiring resources or getting a solution to a problem (Conole & Alevizou, 2010). With the construct of time saving proving to be a problem, Web 2.0 tools can be ineffective, thus affecting the technology’s adoption. Time saving has a path coefficient of 0.07, which is positive implying that it is significant in the model. Time saving as one of the positive hypotheses will highly influence the adoption of Web 2.0, since it is considered to be an essential tool in time management.

**H2 Perceived Usefulness.** Most of the respondents decided that Web 2.0 tools will be beneficial in increasing their productivity. The level of usefulness of the technology will influence its acceptance and usage during adoption. For the technology to be well accepted in the system, it has to have a positive impact on the users’ learning experience, this should influence their attitude towards the adoption of the technology (Lai, Wang, & Lei, 2012). Positive attitude is generated from the individual’s better performance after realizing how useful the technology is to the learning practice. Perceived usefulness with a path coefficient of -0.03 is a negative indication of insignificance in Web 2.0 tools. With a perception that the technology is not useful, no one would warmly welcome the new technologies into their systems, this negatively impacts adoption of Web 2.0.

**H3 Ease of Use.** For Web 2.0 tools to be accepted in LMS, using the technology should be easy and friendly to the users. However, with the outcomes, it was open that most of the respondents could not find it easy or difficult using the technology. This negatively influences the acceptance of Web 2.0 tools in LMS. The perception of not finding it easy to use the technology cannot fully support its adoption. Users mostly tend to chose technologies that are easy to use compared to those that give them hard time. According to Lwoga (2012), ease of use increases that sense of efficacy in an individual, making the user have control over their learning activities using Web 2.0 tools (Huang, Hood, & Yoo, 2013). The path coefficient of ease of use is 0.09 with a positive indication of the model’s
significance. Usability is a critical concern in every innovation, with the hypothesis being significant in the model, it will effectively encourage adoption of Web 2.0.

**H4 Social Influence.** Social influence determines how well other people can encourage a user to adopt Web 2.0 tools. From the study carried out, majority of the correspondents were neutral, which indicated that they were uncertain of whether to influence or not impact the use of Web 2.0 tools. The study’s objective can be effectively fulfilled with the fact that there is no full social influence support in its adoption. Social factors will highly determine a student’s behavior in the use of Web 2.0 tools (Sadaf, Newby & Ertmer, 2016). The influence is essential for the acceptance of Web 2.0 tools, which will effectively change the users’ attitudes. Social influence also had a path coefficient of -0.05, this makes it insignificant for the model, thus rejecting the hypothesis. Without social influence, the adoption of Web 2.0 can easily be rejected by the targeted population since there is no external influence driving them to adopt the technology.

**H5 the proposed Web 2.0 model in LMS in Universities in Nairobi is highly effective and efficient.** A linear regression was calculated to predict the respondents’ perception on the Effectiveness and Efficiency of Using Web 2.0 tools in LMS based on their age. Preliminary analyses were done to make sure there were no violations of the assumption of normality, linearity and multicolinearity. The results demonstrated that there was no significant association. A regression equation of (F (1, 394) =0.417, p=0.497 with an $R^2$ of 0.001. With the study’s primary goal achieved, adoption process can be successfully completed since Web 2.0 tools are proven to be effective and efficient (Conole & Alevizou, 2010). With a positive path coefficient of 0.06, the model is effective and efficient for use. This highly influences productivity and leads to an overall acceptance of the model in the adoption of Web 2.0.

**H6 Affordability.** The affordability rate of a new technology highly determines its success in adoption. Results indicated that most correspondents were neutral on the affordability of Web 2.0 in LMS. The technology has various requirements that one must fulfill to make good use of Web 2.0. Such requirements can be fulfilled through expenses such as having laptops, smartphones and internet connection. If the user finds it expensive to use Web 2.0 tools, this might raise a concern in its adoption due to the expensive requirements (Olaniran, 2009). Financial plan is essential before the full adoption of the technology, thus, making affordability a crucial construct in the study. With a negative significance level of 0.18,
affordability is not important in the model, thus supporting the hypothesis. Affordability
being null in the findings is a major set back of the hypothesis since it is one of the core
determinants of the successful adoption of Web 2.0.

**H7 there is no enabling condition to support adoption of Web 2.0 in LMS in
Universities in Nairobi.** In the proposition of a model to help reception of Web 2.0 in LMS
in Nairobi colleges, for example, computer gadgets with internet access (Allen, 2017), we
look at the empowering condition for the selection of Web 2.0 in LMS in Nairobi colleges.
A direct relapse was determined to anticipate the respondents' understanding on the
Enabling Conditions of Using Web 2.0 instruments in LMS dependent on their age. With
the hugeness level of - 0.08, the empowering condition isn't compelling in the model.
Fundamental investigation were done to guarantee there was no contamination of the theory
of typicality, linearity and multicolinearity. A noteworthy relapse condition was discovered
(F (1, 394) =5.265, p=0.022 with a R2 of 0.013. the p worth was factually noteworthy. This
infers that there is really an empowering condition to help appropriation of Web 2.0 in LMS
in Nairobi colleges. Accordingly, we dismiss the invalid speculation. With no enabling
condition, adopting Web 2.0 will be a great deal as no supportive measures will be in place
to ensure it functions appropriately.

**5.26 Chapter Summary**

This chapter provides detailed findings and results, which were retrieved from the data
collected and analysed. The findings are explained and also provided in table formats to
give a clear picture of the analysed data. The following chapter provides the discussion of
the findings and their relationship with the study objectives.
CHAPTER 6: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This section presents the discussion, conclusion, and recommendations of the study, on the need to establish factors that influence behavioral intention to use Web 2.0 technologies within public and private universities in Kenya. It also highlights the limitations of the study and the recommendation for further research and practice.

6.2 The Key Findings of the Study

6.2.1. The adoption rate of Web 2.0 Learning Management Systems in the four Universities

The study established that the adoption rate of web 2.0 in Learning Management Systems in Kenya is low. A linear regression was calculated to predict the respondents’ perception on the social influence of Using Web 2.0 tools in LMS based on their age. A regression equation of \( F (1, 394) = 0.003, p=0.954 \) with an \( R^2 \) of 0.0003, giving a \( p \) value that was not statistically different. This implied that the adoption rate of Web 2.0 in Learning Management Systems in Kenya is low. This was in agreement with the findings of other studies that have been done on the adoption rate of Web 2.0 in Learning Management Systems in Kenya. According to the findings by Elloumi, (2004), high cost of technology, poor decisions, competition, and the absence of a business strategy are some of barriers that affect the adoption of EMS in many universities in developing countries.

6.2.2. Barriers and challenges in adoption of Web 2.0 in Learning Management Systems in Universities in Nairobi.

It is true that the adoption of Web 2.0 in learning management systems in universities in Nairobi is still a new technology (Maina & Nzuiki, 2015). This being a new technology, the biggest obstacle could be the ease of use. A linear regression was calculated to predict respondents' perception of the ease of use of Web 2.0 tools in LMS by age.

A regression equation of \( F (1394) = 0.071, p = 0.00479 \) with \( R^2 \) equal to 0.0002. The \( p \) value was statistically different. This denoted that there are barriers and challenges which affect the adoption of web 2.0 in LMS in universities in Nairobi. This was supported by the finding by previous studies that have demonstrated the high cost of technology, poor decisions, competition, and the absence of a business strategy are some of barriers that
affect adoption of new innovation in many universities in developing countries (Elloumi, 2004, Andersson, 2008).

6.2.3. Enabling condition to support adoption of Web 2.0 in LMS in Universities in Nairobi

In proposing a model to support the adoption of Web 2.0 in learning management systems in universities in Nairobi, we examine the conditions for the adoption of Web 2.0 in learning management systems in universities in Nairobi. A linear regression was calculated to predict respondents' perception of the favorable conditions for using Web 2.0 tools in LMS based on their age. The p value was statistically significant. This implies that there is in fact a condition to support the adoption of Web 2.0 in LMS at universities in Nairobi. Therefore, we reject the null hypothesis. This finding is consistent with the study by Ngamau (2013) that, despite the difficulties associated with the adoption of Web 2.0 in the Learning Management System (LMS) in universities in Nairobi, the condition is sufficient. This has been demonstrated by the efforts of these institutions to support the adoption of Web 2.0 in LMS. Efforts include the construction of state-of-the-art facilities to facilitate the adoption of Web 2.0 in the training management system at universities in Nairobi.

6.2.4. Effectiveness and efficiency of the proposed Web 2.0 model in LMS in Universities in Nairobi

A linear regression was calculated to predict respondents' perception of the efficacy and efficiency of using Web 2.0 tools in LMS based on their age. The results indicated that there was no important association. A regression equation of \( F (1,394) = 0.417, p = 0.497 \) with an \( R^2 \) of 0.001 implied that the Web 2.0 model proposed in the LMS in universities in Nairobi was not as effective as was thought it is supposed to be, most of the respondents felt that the proposed Web 2.0 model in learning management systems in Universities in Nairobi is not effective neither is it efficient. This is not the case in other countries, for instance, in Canada, e-learning appeared to be more effective in distance education, where technology use is required that in face-to-face instructional settings (Abrami et al., 2006).

6.3 Discussion

The study came up with a model based on some variables from TAM and UTAUT, which examined the intention of adopting Web 2.0 in LMS in universities in Nairobi. The result
shows that out of seven variables, only three were significantly co-relating with improved interaction in collaborative learning. These variables include saving on time, ease of use, effectiveness and efficiency. The study’s implication is to make the tools available in the learning management systems, and to deploy them in a way that they are easy to use, in order to contribute to the process of teaching and learning. As it has been noted, affordability did not have a significant impact in contributing to improved interaction likely because a majority of the students were not in a position to afford the requirements of Web 2.0. Therefore, this variable can again be tested in the future after the adoption of Web 2.0 technology.

**UTAUT based Model**

- **Saving on Time**
  - (Less stress, less rework, less effort)

- **Ease of Use**
  - (Reduced training time and cost, increased user adoption, ensure expected Web 2.0 benefits)

- **Effectiveness and Efficiency**
  - (Productivity)

The final model entails extracted components related to UTAUT constructs, that would facilitate the adoption of Web 2.0, and are discussed below.

Saving on time is the first construct that is mainly related to improving interaction in collaborative learning between the students and their facilitators. There are a number of benefits associated with time saving in adopting Web 2.0. This includes less stress on group work, which is assisted through managing time by less rushing from various tasks. Less
Rework is a result of proper organization that can be facilitated by Web 2.0. Less effort is also a result of proper time management. This result is also supported by various researches done that acknowledge the advantage of time saving in the adoption of Web 2.0, as it reduces time in solving a problem (Conole & Alevizou, 2010).

Ease of use as a construct was also identified where adoption of Web 2.0 highly depended on the ease of use of the technology. This is supported by some three benefits associated with ease of use, which include reduced training time and cost, increased user adoption, and ensure expected Web 2.0 benefits. The more a technology can be easily used, the higher the possibility of it being adopted in the targeted environment. Users will be able to control their learning activities and encourage their friends to adopt Web 2.0 technology (Huang, Hood, & Yoo, 2013).

Effectiveness and efficiency as the third and final construct was found to be significant in the adoption of Web 2.0 in universities in Nairobi. The benefit of effectiveness and efficiency is related to productivity, with Web 2.0 being effective and efficient, the overall productivity of the students will significantly increase. Different researchers were able to prove that Web 2.0 was effective and efficient (Conole & Alevizou, 2010) in areas that it was applied.

**6.4 Conclusion**

Based on the results of this research, the study concluded that the adoption rate of Web 2.0 learning management systems in universities in Nairobi was very low. This could have been attributed to the limited experience of Web 2.0 with the higher number of students and staff from the higher educational institutions in the sample. Second, the study found that there were so many challenges affecting the adoption of Web 2.0 learning management systems in universities in Nairobi. Third, the study concluded that, despite the challenges of adopting the new technology, the predominant condition is sufficient. Finally, the study found that, despite the perceived usefulness of Web 2.0, the model is neither effective nor efficient within Kenya's higher educational institutions.
6.5 Recommendations and Future Directions

There are a few recommendations that would be effective in solving the main problem of the study. They are:

1. It would be better if there was integration of e-learning in the strategic plan of universities.

There is an urgent need for all higher education institutions to assimilate eLearning into their calculated plan in order to broaden their institutional strategies for e-learning (Collins & Halverson, 2010).

2. In order to be more skilled in using Web 2.0 technology, it is essential to have improved computer literacy and LMS training.

Computer literacy ought to be upgraded to improve the use of eLearning. Computer literacy training and the use of the Learning Management System should be promoted in universities, especially those with low adoption (Ko, S., & Rossen, 2017).

3. Improve the establishment of ICT infrastructure in higher educational institutions in the near future.

The IT infrastructure needs to be improved, including Internet access for efficient and reliable connections, increased usability of the LMS system, and provision of a dedicated and mirrored server for the e-learning system (Kpolovie & Lale, 2017).

4. The model can further be investigated in various studies.

The study also recommends further studies on the factors influencing the adoption of eLearning by students (King & Boyatt, 2015).
References


Shneiderman, B. (2010). *Designing the user interface: strategies for effective human-computer*


*World. Solution Tree Press.*
APPENDICES

APPENDIX 1: Questionnaire

Web 2.0 in Learning Management Systems in Universities in Nairobi

This study is done to evaluate students’ understanding towards Web 2.0 in Universities in Nairobi’ education system. Besides, the primary objective of this study is to identify how Web 2.0 will impact Universities in Nairobi. We also want to identify the students’ opinion concerning Web 2.0 in the universities.

Please answer the questions honestly. The data will be used in planning for adoption of Web 2.0 tools in LMS in Universities in Nairobi.

If you agree to take part in the study please sign down below. Your name will not be required in the questionnaire.

Signature ________________ Date ____________________

Gender
Male ☐ Female ☐
Age
18-20 ☐ 21-23 ☐ 23-25 ☐ 26 and above ☐

Education
I have finished Primary School? Yes ☐ No ☐
I have finished High School? Yes ☐ No ☐
I have finished College? Yes ☐ No ☐

Program: ____________________________________________

1. Saving on Time
   a) Using Web 2.0 tools in LMS is flexible and saves on time when carrying out my learning activities.

☐ Agree ☐ Strongly agree ☐ Disagree ☐ Neutral ☐ Strongly disagree
   b) Using Web 2.0 tools in LMS will waste a lot of time in my learning activities.

☐ Agree ☐ Strongly agree ☐ Disagree ☐ Neutral ☐ Strongly disagree
   c) Using Web 2.0 tools in LMS is a good idea for time saving.

☐ Agree ☐ Strongly agree ☐ Disagree ☐ Neutral ☐ Strongly disagree
d) I hesitate to use a Web 2.0 tools in LMS because I might look stupid and be wasting my time

2. Perceived Usefulness
   a) Web 2.0 tools in LMS make it possible to work more productively.

   b) I find Web 2.0 tools in LMS a useful tool in my learning work.

   c) Using Web 2.0 tools in LMS will increase my productivity in learning.

   d) Using Web 2.0 tools in LMS will improve my learning.

   e) The benefits of using Web 2.0 in LMS offsets the drawbacks of not using Web 2.0.

3. Ease of Use
   a) My interaction with Web 2.0 tools in LMS will be clear and understandable.

   b) Learning to operate Web 2.0 tools in LMS will be easy for me.

   c) It will be easy for me to become skillful at using Web 2.0 tools in LMS.

   d) I could easily use Web 2.0 technologies on my own.
4. Social Influence
   a) Friends who influence my behavior would think that I should use Web 2.0 technologies in the classroom.
      [ ] Agree  [ ] Strongly agree  [ ] Disagree  [ ] Neutral  [ ] Strongly disagree

   b) People who are important to me think that I should use Web 2.0 tools in LMS for my learning activities.
      [ ] Agree  [ ] Strongly agree  [ ] Disagree  [ ] Neutral  [ ] Strongly disagree

   c) The senior management of my university has supported the adoption and use of Web 2.0 tools in learning management system.
      [ ] Agree  [ ] Strongly agree  [ ] Disagree  [ ] Neutral  [ ] Strongly disagree

5. Effectiveness and Efficiency
   a) Using web 2.0 tools in LMS will improve student’s grades.
      [ ] Agree  [ ] Strongly agree  [ ] Disagree  [ ] Neutral  [ ] Strongly disagree

   b) I believe that I could communicate to others the consequences of using Web 2.0 in LMS in the classroom.
      [ ] Agree  [ ] Strongly agree  [ ] Disagree  [ ] Neutral  [ ] Strongly disagree

   c) I look forward to using Web 2.0 tools in LMS to enhance the effectiveness of my learning career in the future.
      [ ] Agree  [ ] Strongly agree  [ ] Disagree  [ ] Neutral  [ ] Strongly disagree

   d) Web 2.0 tools in LMS make learning more interesting and increases efficiency.
      [ ] Agree  [ ] Strongly agree  [ ] Disagree  [ ] Neutral  [ ] Strongly disagree

   e) I can easily interact with my friends and tutors through social networks when using Web 2.0 tools in LMS.
      [ ] Agree  [ ] Strongly agree  [ ] Disagree  [ ] Neutral  [ ] Strongly disagree

6. Affordability
   a) Interacting with Web 2.0 tools in LMS requires a lot of attention.
b) I have the resources necessary to use Web 2.0 tools in LMS for my learning process.

Agree  Strongly agree  Disagree  Neutral  Strongly disagree

7. Enabling Conditions
   a) Web 2.0 technologies in LMS are compatible with the computer I already use in the classroom.

Agree  Strongly agree  Disagree  Neutral  Strongly disagree

b) I can use Web 2.0 technologies in LMS using any computer connected to the internet.

Agree  Strongly agree  Disagree  Neutral  Strongly disagree

c) I think that using Web 2.0 tools in LMS will be easy to integrate in my lecture hall environment.

Agree  Strongly agree  Disagree  Neutral  Strongly disagree

8. Use of LMS
   a) I can easily interact with my friends and tutors through social networks when using web 2.0 tools in LMS.

Agree  Strongly agree  Disagree  Neutral  Strongly disagree

b) Web 2.0 tools in LMS make learning more interesting and increases efficiency.
c) I have the resources necessary to use Web 2.0 tools in LMS for my learning process.

d) I think that using Web 2.0 tools in LMS will be easy to integrate in my lecture hall environment.