UNIVERSITY OF NAIROBI

SCHOOL OF COMPUTING AND INFORMATICS

A MODEL FOR THE IMPLEMENTATION OF ONLINE LEARNING IN KENYAN PUBLIC UNIVERSITIES DURING THE COVID-19 PANDEMIC

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DECLARATION

Student Declaration

I Joseph Odanga Ambayo, whose student registration number is P54/34414/2019, hereby declare that this MSc. Project entitled "A Model for the Implementation of Online Learning in Kenyan Pubic Universities" to the best of my knowledge and belief, it is my original work and has not been submitted for examination in this university or other universities for an award of any other degree. Use of other authors work has been acknowledged at the point of their use and a list of references included at the last pages.

Signature: ……   ………………… Date: …24th August 2021…………

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Supervisor's Declaration

This research has been submitted for review with my approval as a university supervisor.

Signature: ……………………………. Date: ……August 27, 2021…….

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SCHOOL OF COMPUTING & INFORMATICS

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DEDICATION

This project report is dedicated to my dear wife Purity, my daughter Shannah, my parents and siblings for their support, patience and understanding while I was pursuing this worthy course.

ACKNOWLEDGEMENT

ABSTRACT

The advancement of information technology in the twenty-first century has profoundly changed educational systems across the world. With the restrictions on gathering and movement imposed by Government during the covid-19 pandemic Public Universities in Kenya are in need to fulfil their mandate which is providing education. The abrupt massive transition from traditional learning to an online learning various implementation challenges that that have made them not realize full potential of online learning. Stakeholders are left dissatisfied when online learning initiatives fail to meet their expectations. The objective of this study is to establish a model that will be used to implement online learning in Kenyan Public Universities. A quantitative study was be conducted using a descriptive research approach. Using online surveys, this study concluded that Frequency of Use, Availability of Policies, Procedures and Documentation, Awareness of Policies and Documentation, Extent of use of skills on online learning technology and Routinization contribute significantly to implementation success of online learning technology.

Keywords: Online learning, Implementation Success, Routinization, Extent of use of Skills, covid-19

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LIST OF ACRONYMS AND ABBREVIATIONS

Covid-**19** – Coronavirus Disease 2019

WHO – Word Health Organization

UoN – University Of Nairobi

JKUAT- Jomo Kenyatta University of Agriculture and Technology

KENET - Kenya Education Network Trust

PHEIC- Public Health Emergency of International Concern

UNESCO- United Nations Educational, Scientific and Cultural Organization

MOOC- massive open online course

IT – information technology

IS – Information Systems

ICT – Information Communication Technology

KNBS- Kenya National Bureau of Statistics

ANOVA - Analysis of Variance

CHAPTER ONE

1. INTRODUCTION

1.1. BACKGROUND

The advancement of information technology in the twenty-first century has profoundly changed educational systems globally. Higher education institutions have become more receptive to the internet use in learning. In response to technological, sociological, and economic changes, the number of online courses offered by colleges and universities has expanded significantly during the over the last decade. (Ozerbas & Erdogan, 2016). Technology offers innovative and alternative avenues for learners to demonstrate increased achievement and engagement. As education becomes increasingly digital, as digitalization has become a transformation, and as new technologies converge into emerging educational standards, education in combination with information communication technology have created new learning environment where students are responsible for their own learning, where time and flexibility play a major role (Suárez & Najar, 2014).

Online learning is a tool that can help educational activities become more creative, and adaptive. Learning interactions in synchronous or asynchronous situations using gadgets such as mobile phones, tablets, and computers with internet connection are referred to as online learning. Students can study and interact instructors from anywhere (Singh & Thurman, 2019). In synchronous learning setup, there is instant engagement and feedback between educators. In asynchronous learning setup learning content is provided through different learning systems and platforms and not in the form of live classes. Asynchronous learning does not allow for immediate feedback or reaction during learning (Dhawan, 2020).

Technology is an excellent medium for imparting knowledge, and an important aspect of online learning. Students and instructors communicate using a variety of methods, the majority of which incorporate internet communication. Technology helps students and teachers learn more effectively by delivering content, improving the learning environment, and improving student-teacher interactions (Singh & Thurman, 2019).

The last two decades there has seen a rise in the demand for university courses in Kenya as a result of the increase in admissions, and thus an increase in the number of public universities and constituent colleges (Nyerere, Gravenir, & Mse, 2012). Kenyan higher education institutions have not expanded facilities at the same rate to match this demand hence further widening the educational access gap. Some universities have adopted online learning to bridge this gap in a bid to improve learning flexibility especially for the employed learners (Nyerere, 2016). Online learning in blended with face to face learning has been a choice for most public universities in Kenya. At the University of Nairobi (UoN) for example, online learning was initiated in 2004 with a platform called Wedusoft. Kenyatta University began online learning in 2005 and used Moodle as a platform. Jomo Kenyatta University of Agriculture and Technology (JKUAT) initiated online learning programs in 2006 with Moodle as a platform of choice. At Moi University online earning started in 2007 with MUSOMI as a platform of choice (Tarus & Gichoya, 2015).

1.1.1. CORONAVIRUS PANDEMIC AND EDUCATION

On 30th January 2020 the coronavirus disease 2019 (COVID-19) outbreak, was declared by The World Health Organization (WHO) as a Public Health Emergency of International Concern (PHEIC) (World Health Organization, 2020).

The outbreak of COVID-19 was announced a pandemic by WHO on 12th March 2020 (World Health Organization, 2020). As of mid-April 2020, 1.5 billion pupils and students were affected by school closures in 195 countries (UNESCO, 2020).

In response to disruption to learning caused by Covid-19, many Universities worldwide implemented large-scale online learning programmes. In China, universities made massive migration to online education as early as March 2020. (Bao, 2020).

On 26th March 2020 at Erasmus University Rotterdam their first online PhD defense was conducted by Erasmus School of Economics. (Erasmus University Rotterdam, 2020).

In June 2020, The National Council for Higher Education released guidelines for online learning in Uganda to reduce the risks of COVID-19 infections. Makerere University was able to resume learning online with undergraduate medicine and nursing students (Olum, et al., 2020).

1.1.2. LEARNING IN KENYA DURING CORONAVIRUS PANDEMIC

First case of Covid-19 in Kenya was announced on 12th March 2020 (Ministry of Health, 2020). The Government of Kenya then proceeded to close all learning institutions including institutions of higher learning, on 15th March 2020. The Disruption to learning affected 15 million learners, 562,521 being in tertiary institutions (UNESCO, 2020b).

To ensure continuity some public universities resumed learning activities online as the lockdown went on for several months. The University of Nairobi (UoN) was among the first public Universities to resume learning and administered examinations online (University of Nairobi, 2020a). All this happened from May to September 2020. On 8th May 2020 UoN Senate announced plans to undertake the University's first virtual graduation on 25th September 2020. UoN adopted

Google Classroom, Moodle, Google Meet and Zoom, Microsoft Teams as online learning tools (University of Nairobi, 2020b).

On 18th May 2020 Dedan Kimathi University of Technology (DeKUT) announce to students that learning would resume online from May to August 2020. DeKUT adopted the use of BigBlueButton, WebinarJam, Zoom and Moodle as online learning tools (Dedan Kimathi University of Technology, 2020).

Kaimosi Friends University College (KAFUCO) on 31st August 2020 announced guidelines for online registration and orientation for their September 2020 intake (Khaimosi Friends University College, 2020a). KAFUCO adopted the use of Moodle, Zoom and BigBlueButton as online learning tools.

Jaramogi Oginga Odinga University of Science and Technology (JOOUST) in August 2020 conducted learning and examinations online for its students. JOOUST adopted the use of Zoom, Moodle and BigBlueButton as online learning tools (Jaramogi Oginga Odinga University of Science and Technology, 2020).

Telecommunication companies Telkom Kenya, Safaricom and Kenya Education Network Trust (KENET) partnered with learning institutions to facilitate online learning through provision of affordable internet access to students and their teachers. KENET in collaboration with Kenya higher education institutions offered sponsored Telkom Kenya 4G SIM cards with 30GB bundles per month for a limited period (KENET, 2020a). KENET also offered discounted bundle that enabled subscribers get pre-paid bundles at subsidies rates (KENET, 2020b). The University of

Nairobi partnered with Telkom Kenya to offer free data bundles to students to encourage online learning particiation (University of Nairobi, 2020d).

Public universities in Kenya have a mandate to provide education in the midst of the Covid-19 shutdowns. However, since the public Universities started transitioning to online learning setups following the Covid-19 pandemic, they have experienced various challenges in implementing online learning that that have made them not realize full potential of online learning. Stakeholders are left dissatisfied when online learning initiatives fail to meet their expectations (Kibuku, Ochieng, & Wausi, 2020).

1.2. RESEARCH PROBLEM STATEMENT

Despite the number of Kenyan universities that have made efforts to adopt online learning little gains has been recorded in its implementation. A majority of Kenyan universities have lagged behind in full utilization of online learning (Tarus & Gichoya, 2015). The majority of online learning efforts in underdeveloped nations fail to deliver on their promises, either partially or completely (Nyerere, 2016).

Most learners are dissatisfied with the delivery of online learning and teachers are unmotivated in carrying out their online learning responsibilities. As a result of these drawbacks, the implementation of online learning in Kenyan Universities have been hampered (Nyerere, Gravenir, & Mse, 2012).

1.3. RESEARCH OBJECTIVE
1.3.1. MAIN OBJECTIVE

To establish a model that will be used to implement online learning in Kenyan Public Universities.

The following are the specific objectives:

i. To investigate the effects of frequency of use on routinization of online learning in Kenyan Public Universities

ii. To investigate the effects of extent of use of skills on routinization of online learning in Kenyan Public Universities

iii. To investigate the effects of awareness of policies, procedures and documentation on routinization of online learning in Kenyan Public Universities

iv. To investigate the effects of availability of policies, procedures and documentation on the routinization of online learning in Kenyan Public Universities

v. To investigate the effects of maintenance on routinization of online learning in Kenyan Public Universities

vi. To investigate the effects of routinization on implementation success of online learning in Kenyan Public Universities.

vii. To propose an online learning implementation model to be used by Kenyan Public Universities during the covid-19 pandemic.

1.4. RESEARCH QUESTION

i. How does routinization affect the implementation outcome of online learning technology in Kenyan Public Universities?

ii. Does frequency of use affect routinization of online learning in Kenyan Public Universities?

iii. Does of extent of use of skills affect routinization of online learning in Kenyan Public Universities?

iv. Does awareness of policies, procedures and documentation affect routinization of online learning in Kenyan Public Universities?

v. Does availability of policies, procedures and documentation affect the routinization of online learning in Kenyan Public Universities?

vi. Does maintenance affect routinization of online learning in Kenyan Public Universities

vii. Does routinization affect implementation success of online learning in Kenyan Public Universities?

1.5. RESEARCH SIGNIFICANCE

This research gives perspective to those tasked with implementation of online learning programs in Kenyan Public Universities on how organizational policies, information systems usage tendencies, user skills and technological context affect organization learners' ability and desire to incorporate usage of online learning technology into learning routines. With this knowledge, Kenyan Public Universities can develop around tools that are more user centered to fit the unique requirements of their individual students and teaching staff especially when faced by crises.

CHAPTER TWO

2. LITERATURE REVIEW

2.1. INFORMATION SYSTEM IMPLEMENTATION

Implementation is the transitional period during which targeted members of an organization become increasingly skilled, consistent and dedicated in the usage of an innovation. (Klein & Sorra, 1996).

2.2. ONLINE LEARNING IN HIGHER EDUCATION

Online learning is an educational process that takes place over the web. It is a type of distance education that facilitates students to access education from remote locations (Kim, 2020).

Many universities combine traditional classroom learning with online learning. Other universities use online learning as a complete learning method for learning such as a distance education. (Watjatrakul, 2016).

2.3. BENEFITS OF ONLINE LEARNING DURING THE COVID-19 PANDEMIC

The effectiveness of online learning, its use in career advancement, its affordability in managing the increasing cost of higher education, and the possibility of providing quality education to anyone with internet access are just a few of the advantages of online learning. Some of the advantageous online learning outcomes include increased learning measured by tests, student engagement with quality resources, enhanced perceptions of learning, a stronger sense of unity among leaners, and a reduction in dropout or failure rates (Nguyen, 2015).

Because online learning does not require students to be in the same physical area, it has the potential to boost participation rates. Adult students with full-time or part-time jobs may benefit

from online learning since it saves travel and other expenditures associated with attending in-person classes (Bowers & Kumar, 2015).

There are a plethora of online resources available, all of which are necessary for a productive and efficient learning environment. Educators contact their students in time of crisis such as pandemics and disasters by combining audio, video, and text to make their lectures personable (Dhawan, 2020).

Due to suspension of face-to-face educational activities in response to the Covid-19 outbreak, learners were acutely aware of the distinction between online learning and their other modes of operation (Rapanta, Botturi, Goodyear, Guàrdia, & Koole, 2020).

2.4.   THEORETICAL FRAMEWORK

2.4.1.   DIFFUSION OF INNOVATION THEORY

The Diffusion of Innovation Theory by Rogers (1983) attempts to expound why and new innovations spread among intended users. The theory implies that complexity, observability, compatibility, relative advantage, and trialability predict adoption of innovation (Rogers E. , 1983). Rogers (1983) posed that an innovation is an idea that the adopting organization perceives as novel.

Diffusion of Innovation Theory analyzed the impact of a combination of social, technical and economic forces on the diffusion process. It was borrowed from communication to describe how an idea or product develops traction and spreads through a population or social system over time. In the end the outcome of this is the adoption of a new idea, product or behavior. The key to

adoption is that the person must perceive the idea, behavior, or product as new or innovative making diffusion possible (LaMorte, 2019).

In a social system adoption does not occur simultaneously. It is a process in which some people are more inclined than others to accept an invention. People who are early adopters of an idea have different traits than those who are late adopters. When pushing an invention to a target population, it is critical to identify the traits of that demographic that will aid or impede adoption (LaMorte, 2019).

Different techniques are utilized to persuade different adopter categories while promoting an invention. People who desire to be the first to try an idea are known as *Innovators*. They are bold and inquisitive about innovations, and they are frequently the first to create fresh ideas. Least effort needs to be employed to convince this population (LaMorte, 2019).

People who represent opinion leaders are known as *Early Adopters*. This group prefers taking on the lead and are open to new things. They are cognizant of the need for change and receptive to new ideas Implementation how-to guides are one example of a strategy to appeal to this group. They do not require proof to change their opinions (LaMorte, 2019).

The *Early Majority* usually need proof that an innovation works before they are willing to adopt Proof of the innovation's usefulness and proof of its successes are two ways of appealing to this group (LaMorte, 2019).

The *Late Majority* is wary of change and will only accept a new technology once the majority has tried it. Information on how many other people have tried and embraced the idea is one method to appeal to this group (LaMorte, 2019).

Laggards are traditionalists who are exceedingly conservative. To appeal to this population, fear appeals, facts and figures, and lobbying from other adopter groups are all employed. (LaMorte, 2019).
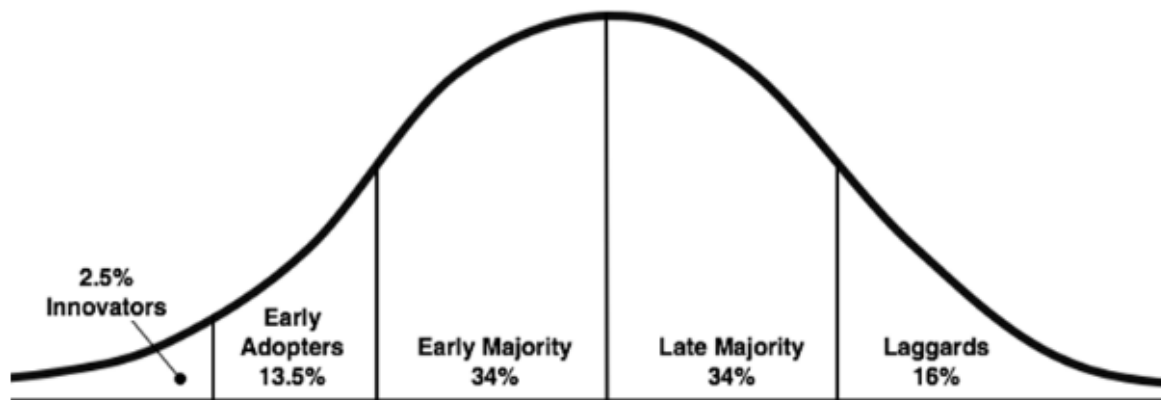
Figure 1: Diffusion of Innovation Theory. Source: Boston University School of Public Health

Adoption is driven by five key elements, and each factor is present in the adopter categories in varying degrees. First, *Relative Advantage*, which refers to the extent a new concept, program, or product is thought to be superior to the one it replaces. The second element is *Compatibility*, which is described as how well the innovation matches with the potential adopters' experiences, beliefs, and requirements. The third element is *Complexity*, which is defined as how difficulty of understanding and implementing an innovation. The element factor is *Triability*, which refers to the ability to test an innovation prior to deciding on to accepting it. Finally *Observability* refers to how well an invention produces tangible outcomes (LaMorte, 2019).

2.4.2. EXPECTATION-CONFIRMATION MODEL

Expectation confirmation model (ECM) by Bhattacherjee (2001) is based on the Expectation-Confirmation Theory (ECT), to better comprehend users' continued motivation to use information systems *(Oliver, 1980)*. Expectations, perceived performance, and belief disconfirmation are all used in ECT to explain post-purchase or post-adoption satisfaction. Post-adoption satisfaction is mediated through disconfirmation between expectations and perceived performance. Post-adoption satisfaction will occur if a an innovation outperforms expectations (positive disconfirmation) *(Oliver, 1980)*.
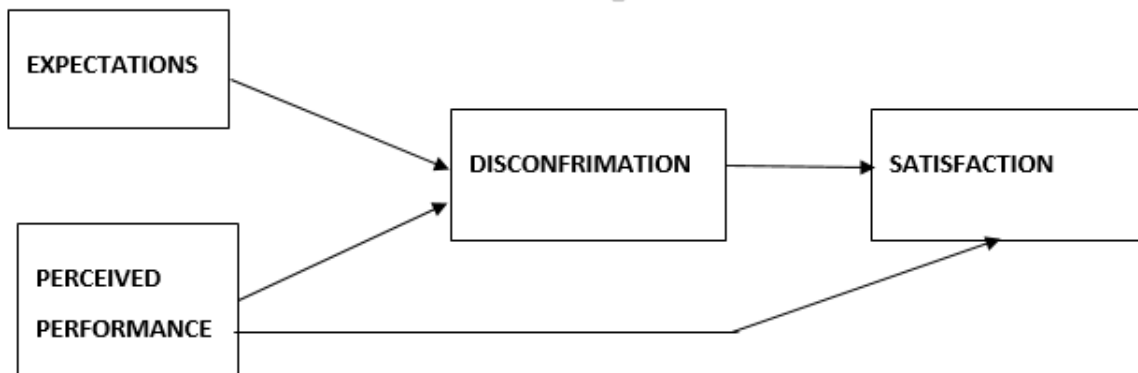
Figure 2: Expectation-Confirmation Theory

Expectation-Confirmation Model instead of looking at both pre- and post-consumption factors, the model simply looks at post-acceptance variables. When using a product customers compare perceived performance to their initial expectations to see how closely their expectations are met. Users create a post-acceptance expectation (perceived usefulness) based on their usage experience and confirmation level. Satisfaction is determined by their amount of confirmation

and post-acceptance expectation. Finally, satisfied users would like to develop a continuance intention *(Bhattacherjee, 2001)*.
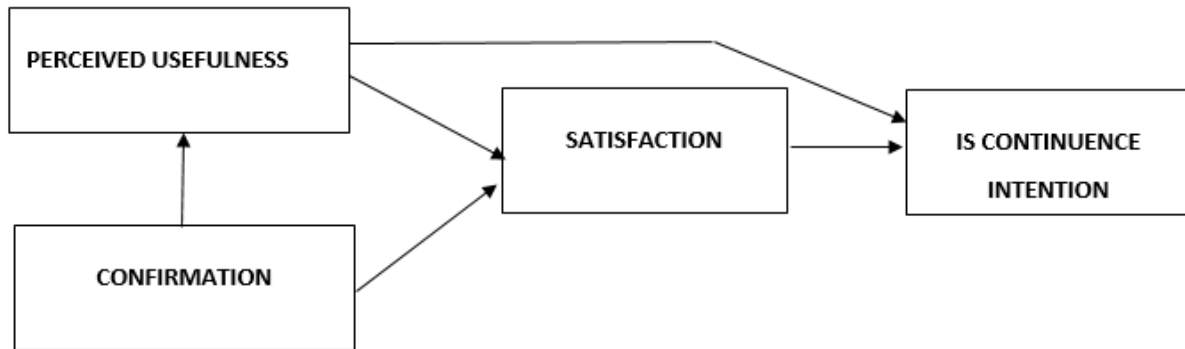
Figure 3: Expectation-confirmation model

Perceived usefulness is a cognitive belief, while attitude and satisfaction both reflect user affect (pre- and post-acceptance respectively). The information system's interactions with users lay the groundwork for post-acceptance satisfaction. The interactions between the information system and its users provide the foundation for post-acceptance satisfaction (Bhattacherjee, 2001). According to Bhattacherjee (2001) the intention by users to continue using an information system is influenced by its usefulness after acceptance. User satisfaction from prior experience in usage of an information system has stronger effect on the user's intention to exploit a systems. User satisfaction is largely decided by users' confirmation of expectations from previous use, and complimented by perceived usefulness (Bhattacherjee, 2001).

2.4.3. A MODEL OF THE IMPLEMENTATION PROCESS BY KWON AND ZMUD

Introduced by Zmud and Kwon (1987) model of IT implementation process looks at IT implementation from a diffusion of innovation perspective. Thus IT implementation is an organizational endeavor to promote information technology usage to its user population. (Cooper & Zmud, 1990).

The six stages of the model are presented below.

Initiation

Organizational opportunities, weaknesses and potential solutions are examined. The need to change emerge from either technological innovation, organizational requirement, or both. An IT solution in the organization are determined to be compatible. (Cooper & Zmud, 1990).

Adoption

Negotiations ensue in order to get organizational support for the IT application's implementation. (Cooper & Zmud, 1990).

Adaptation

Here, the IT application is developed and maintained. Organizational procedures are drafted. The Information system and new procedures are both taught to the organization's members. The IT application is now ready for use in the organization (Cooper & Zmud, 1990).

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Members of the organization are convinced to utilize IT applications. The IT application is implemented in the company. (Cooper & Zmud, 1990).

Routinization

At this point, the use of the IT application is encouraged as a habit. The IT application is no longer considered odd, and the organization's governance systems have been modified to support it (Cooper & Zmud, 1990).

Infusion

At this stage, increased gains are derived from using the IT application (Cooper & Zmud, 1990).

CONTEXTUAL FACTORS

Five important factors influencing each of these stages were identified by Kwon and Zmud (1987).These factors relate to user characteristics, organizational characteristics, technology being adopted task characteristics and organizational environment characteristics. The correlation of these factors was shown to be important, such as the compatibility and economic advantage of the technology with organization and task characteristics. (Cooper & Zmud, 1990).

2.5. CONCEPTUAL FRAMEWORK

A conceptual framework depicts what is anticipated as discovery from the results of a study. It identifies the factors that are important to a study and shows how they could be related (Swaen, 2015).

2.5.1. Model of Information System Implementation

The model's foundation is the Kwon and Zmud (1987) model, which allows for a complete evaluation of the information system implementation process. To be successful, any implementation must be approved by the intended users. This study's intent is to explore the implementation beyond adoption and acceptance processes to the point when routine use of the innovation occurs in an organization. This research will only look at the *Routinization* process.

Justification for the Information System Implementation Model by Kwon and Zmud (1987)

Firstly, the model incorporates diffusion of innovation. Diffusion happens in phases that begins with education of users on the technology and users adapting to it. It ends successfully after all gains are enjoyed and organization effectiveness enhanced (Rogers E. , 1983). Kwon and Zmud's (1987) introduced six stages, each with activities to support this perspective. (Cooper & Zmud, 1990).

Secondly, the model is anchored on Lewins's (1952) Change model which recognizes system implementation as a change process. For explaining the organizational change associated with introducing new technology, a model that reflects the change process is ideal.

Figure 4 presents the proposed model of Information System implementation.
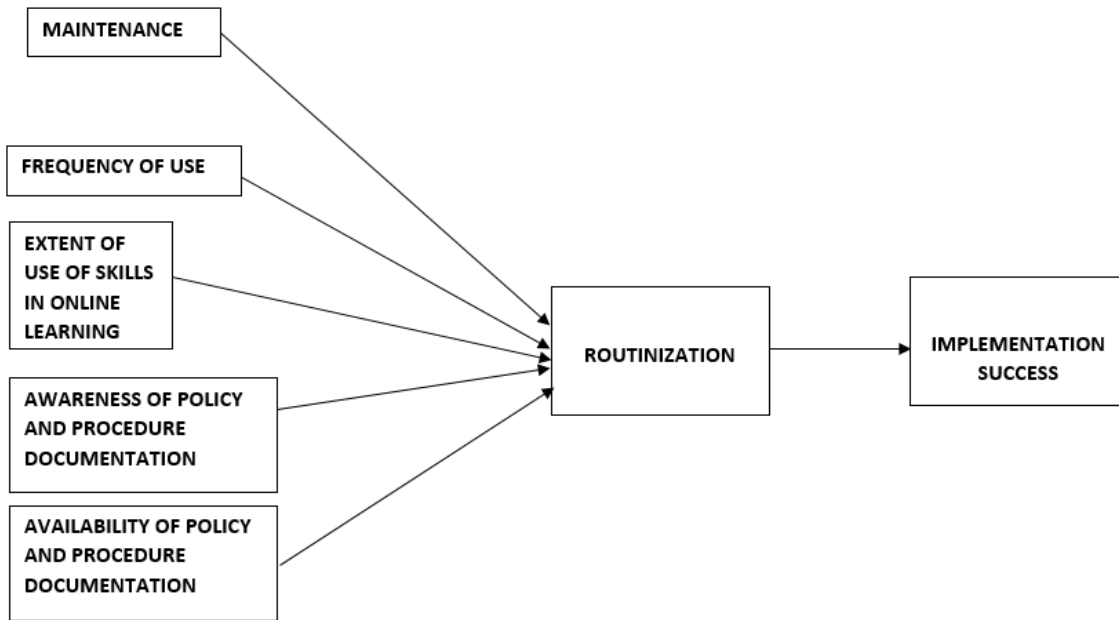
Figure 4: The Proposed Model of Information System Implementation

The Mediating Role of Routinization

During the *Routinization*, usage of the information system is encouraged as a normal activity.

The governance structures in an organization are adjusted to accommodate for the new

information system. The information system is no longer unusual (Cooper & Zmud, 1990).

Routinization refers to the integration of an information system into daily activities through

regular and standardized use of the system. Routinization entails making the most of the system.

As a result, there is a link between *frequency of usage* and routinization. Users who utilize an

information system frequently get acclimated to it and see it as an unusual activity. (Saga, Zmud,

IFIP, Technical Committee 8 on Information Systems, & Levine, 1994). An increased usage of

an information system enables the opportunity for an information system be routinized

(Sundaram, Schwarz, Jones, & Chin, 2007).

According to Cooper and Zmud (1990), the anchoring of behaviors in an organization is very

relevant than their initial use. Initially, users get a basic grasp of on usage of the system then

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proceed to the routinization stage after gaining more experience. Routinization will be the result of *exploitation or expertise*, a learning process that can influence individual performance outcomes. The routine execution of knowledge is referred to as exploitation or expertise. Exploitation or expertise is the regular execution of knowledge which is enhancement of existing skills by applying what has already been learned by adaption (Burton-Jones & Straub, 2006). *Documentation* is another significant variable at this stage. This entails capturing and finalizing detailed system requirements, such as end-user and information systems personnel's usage manuals, authority structures, and processes and policies for the new system's use in the organization (O'Brien, 2008). Universities' efforts to routinize online learning are motivated by eagerness to match their actions with both local and global norms and policies in order to comply laws associated with Covid-19 pandemic and keep the academic calendar on track (Adedoyin & Soykan, 2020).

Maintenance is the next variable. This entails keeping track of, reviewing, and adjusting operational information systems in order to make the necessary improvements (Johny & Bhasi, 2015).

Most firms' information systems often incorporate industry standards through reference models offered to adopting organizations. The vendor-promised benefits of these information systems, on the other hand, are equally available to competing players in the same industry who also adopt the information system, resulting in *strategic convergence* (Porter, 1985). As other Universities deploy the same online learning technology, the competitive advantages derived from one university's strategic decision to implement it erode. Routinization of these systems consequently offers little in the way of comparative advantage. The competitive advantages produced from one University's strategic decision to implement online learning technology

depreciates as other universities effect the same online learning technology in their learning activities. Minimal comparative advantage is results from routinization of these systems. As a result, the distinctive competitive advantages of deploying information systems can only emanate from benefits that go beyond what the system's designers had in mind (Dutton & Thomas, 1984). Users attain a greater degree of utilization when they move beyond routinized usage, which may allow them to fully exploit the potential of an online learning tool, resulting in more favorable implementation success (Cooper & Zmud, 1990).

By broadening the knowledgebase, competences, and IT resources, improved routinization leads to increased organizational agility. Increased routinization of information systems, from a knowledge-based perspective, increases knowledge "reach" in an organization by allowing for large-scale integration of diverse information sources within the organization as well as integration with databases outside the organization. Routine usage of information systems improves knowledge "richness" by encouraging users to use information that is of higher quality, real-time, and more configurable on a regular basis. (Sambamurthy, Bharadwaj, & Grover, 2003).

An increase in information system routinization improves businesses' sensing capability from a capabilities standpoint. This refers to the ability to quickly sense and interpret large amounts of data in the environment. Greater agility in more turbulent situations is the result of increased sensing capabilities (Haeckel & Nolan, 1993).

An increase in routinization of information systems, from a resource-based perspective, allows processes inside an organization to be widely and routinely reconfigured for other resources while minimizing the cost and duration of switching such resources. As a result, resource flexibility improves, increasing organizational agility (Sanchez & Mahoney, 1996).

Individual use yields organizational benefits, therefore extended use, integrative use, and emergent use are valid measures of implementation success. Individuals who use more of an information system's features to support their learning activities are said to be using it extensively. The use of an information system to improve links between various tasks is referred to as integrative utilization. Emergent use, or the use of an information system to execute tasks that were not previously recognized as compatible with information systems support (Cooper & Zmud, 1990).

Implementation Success is emerges from the users' experience with the information system as well as the accompanying training that enable a person to fully exploit an information system to its full potential. This type of learning is known as exploration, which is the search for novel of executing tasks with an information system (Burton-Jones & Straub, 2006).

Successful information system installation can result in cost savings, greater service quality, more effective decision-making, transparency, increased efficiency, improved information availability, and other technological benefits. Cost and time can be used to assess the success of an implementation (Johny & Bhasi, 2015).

2.6. RESEARCH GAP

There is enough literature on online learning that recommend further research. According to Daghan & Akknyulu (2016), it should not be ignored that certain variables used in online learning research can evolve. Therefore, it is necessary to take measurements periodically and if possible, to conduct longitudinal studies. Future study should focus on doing a thorough examination of the online learning methods that should be used, such as online instructing practices. (Demuyakor, 2020).

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1. RESEARCH DESIGN

A quantitative study was be conducted using a descriptive research approach.

A research design is a systematic technique used by a scientist to conduct a study and it is the overall synchronization of components and data leading to a credible outcome. To achieve authentic and correct results, research design should follow a strategic approach that is compatible with the nature of study chosen (USC Libraries, 2021).

3.2. POPULATION AND SAMPLE

The population consisted of students pursuing Bachelor's and Master's degrees in Kenyan public universities. There were 412,845 students enrolled in 33 Kenyan public institutions for the 2019/2020 academic year (Kenya National Bureau of Statistics, 2020).

University of Nairobi, Jomo Kenyatta University of Agriculture and Kenyatta University were selected for this reaseach through purposive sampling. The student population in the Universities were as follows: University of Nairobi, Jomo Kenyatta University, 58,319 and Kenyatta University 34,170 (Kenya National Bureau of Statistics, 2020).

The students in the three Universities were then selected through random sampling.

3.2.1. SAMPLING TECHNIQUE

In any statistical situation, such as a scientific research, sample size is a count of individual samples or observations. The sample size is crucial for obtaining accurate, statistically significant data and successfully conducting a study (Zamboni, 2018).

A sample size that is too small may have unreasonable number of respondents who are anomalies and outliers resulting in skewed outcomes and that do not accurately represent the whole population (Kenya National Bureau of Statistics, 2020).

A sample that is too big makes the study become complex, expensive and time-consuming to run. Although the results are more accurate, there are no cost-benefits realized. (Kenya National Bureau of Statistics, 2020).

The Yamane (1967) formula was used to determine the same size.

$$n \; = \; \frac{N}{1 \; + \; N(e)^2}$$

Where:

N is sample size

N is population size

e is Level of precision or Sampling of error

The population was 154,852 and the sampling of error was 5%. The computation yielded a

sample size of 398.96 which was approximated to **399**.

In each of the three universities, the sample size was distributed proportionately.

Each university's sample size is listed in the table below.

University	Population	Sample size
University of Nairobi	62,363	161
Kenyatta University	58,319	150
Jomo Kenyatta University of Agriculture and Technology	34,170	88
Totals	**154,852**	**399**

Table 1: Sample Size distribution

3.3. DATA COLLECTION METHODS
3.3.1.   Research Instruments

Data was collected from respondents filling out an online questionnaire. The questions on the

questionnaire consist of scales and selection questions.

First, it takes less time to finish an online survey project than it does to do traditional research (SamartSurvey, 2021). When more thorough analysis is required, the data is instantaneously available and may be readily imported into specialist statistical tools or spreadsheets (Sutherland, 2019).

Secondly, the use of online surveys lowers the cost of research. Questionnaire printing and mailing are no longer required (Sutherland, 2019).

Finally, because participants enter their responses directly into a system with online surveys, the margin of error is substantially lowered, making them more accurate (SamartSurvey, 2021).

3.3.2. Instrument Reliability

The internal consistency of the data gathered was measured using the Cronbach alpha test, which was used to determine instrument validity. Cronbach's coefficient of reliability (or consistency) is a measure of how closely a collection of items is connected to one another (Statics How To, 2021).

3.3.3. Data collection Procedures

The recruiting of subjects and the gathering of information necessary for study is referred to as data collection. (Katari, 2004).

The researcher obtained a letter of introduction from the School of Computing and Informatics, UoN and presented to the institutions where data was collected. To get the required data, the researcher employed questionnaires. Questionnaires were delivered to the respondents via email after a brief introduction by the researcher.

Variable	Measure	Source
Frequency of use	Frequency at which technology is used	Saga et al. (1994) (Sundaram, Schwarz, Jones, & Chin, 2007).
Extent of use of skills	• Extent of use of skills on online learning	Cooper and Zmud (1990) Burton-Jones & Straub (2006)
Awareness of Policies and procedures	• Awareness	O'Brien (2008) Adedoyin & Soykan (2020)
Availability of Policies and procedures	• Availability	O'Brien (2008) Adedoyin & Soykan (2020)
Maintenance	• Awareness • Frequency	Johny & Bhasi (2015)
Routinization	• Extent to which usage has become normal	Cooper and Zmud (1990)
Implementation Success	• Extent to which users Explore IS capabilities	Cooper and Zmud (1990) Burton-Jones & Straub (2006)

Table 2: Operationalization of Questionnaire

3.4.DATA ANALYSIS METHODS AND PRESENTATION

The researcher assessed the instruments to ensure completeness. The data received

was organized into categories of information that answered the researcher's questions.

Tables, percentages, mean, mode, and probabilities were used to present quantitative data.

Stratified Package for Social Science (SPSS) computer application was applied in data analysis.

Research data was analyzed using correlation and simple regression models.

3.5.ETHICAL CONSIDERATIONS

The study used suitable research techniques and recognized all sources of information. The respondents' consent was requested and provided before the questionnaires were administered. The study was free and open to any interested participants. The goal of the study was explained to the study subjects. Assurances of confidentiality and anonymity made to the study subjects by the researcher. Procedures were put in place in all research materials to protect the confidentiality of the data and the identity of the participants. Personal data was only used for research purposes, and respondents' names were never shared with anyone else.

CHAPTER FOUR

4. DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1. INTRODUCTION

This chapter is a presentation of the study findings as well as an analysis of the data obtained, all in relation to the research objectives.

The data was analyzed using the Statistical Package for Social Sciences (SPSS) and given under various headings grouped together according to the study's research objectives for descriptive and inferential statistics in narrative, graphical, and tabular form.

4.2. TEST FOR RELIABILITY

Cronbach's alpha was used to perform the reliability test. 12 responses were selected and analyzed using SPSS. A value of 0.94 was achieved which is above the 0.7 minimum value.

Cronbach's Apha	No of Items
0.940	17

Table 3: Reliability Statistics

4.3. RESPONSE RATE

Of the 400 respondents surveyed by the researcher 319 filled and returned questionnaires representing 79.75%.

128 questionnaires (representing 40.1 %) were administered to students at the University of Nairobi Another batch of 121 (37.9%) administered to students at Kenyatta University and the remaining 70 (21.9 %) were filled by students at JKUAT.

The frequency of response for each university investigated is listed below.

		Frequency	Percent%	Valid Percent%	Cumulative Percent%
Valid	UoN	128	40.1	40.1	40.1
	KU	121	37.9	37.9	78.1
	JKUAT	70	21.9	21.9	100.0
	Total	319	100.0	100.0	

Table 4: No of Respondents

206(64.6%) of those surveyed were male and 113(35.4%) were female.

		Frequency	Percent%	Valid Percent%	Cumulative Percent%
Valid	Male	206	64.6	64.6	64.6
	Female	113	35.4	35.4	100.0
	Total	319	100.0	100.0	

Table 5: Gender distribution

244 (76.5%) respondents were Undergraduates and 75 (23.5%) were post-graduate students

		Frequency	Percent%	Valid Percent%	Cumulative Percent%
Valid	Undergraduate	244	76.5	76.5	76.5
	Post-graduate	75	23.5	23.5	100.0
	Total	319	100.0	100.0	

Table 6: Distribution based on level of study

4.4. DESCRIPTIVE ANALYSIS: ANALYSIS OF RESPONSES FOR CONSTRUCTS

Respondents evaluated particular components of the dependent variable and each independent

variable in the questionnaire on a Likert scale with five options ranging from 1 to 5.

4.4.1. FREQUENCY OF USE

	N	Minimum value	Maximum value	Mean	Sandard Deviation
You see the use of online learning technology as a normal activity at your University	319	1	5	3.34	1.265
How frequently do you conduct your learning activities using the online learning technology provided by the University?	319	1	5	3.82	1.091
Valid N (listwise)	319				
Average Mean				3.58	

Table 7: Statistics on Frequency of Use

The respondents generally agreed (Mean 3.58) on various aspects that Frequency of use.

4.4.2. EXTENT OF USE OF SKILLS IN ONLINE LEARNING

	N	Minimum	Maximum	Mean	Std. Deviation
How familiar are you with online learning technology provided by the University?	319	1	5	3.93	1.001
You are confident in using online learning technology provided by the University in your learning.	319	1	5	3.64	1.143
How frequently do you apply your knowledge and skills on the online learning technology provided by the University that you acquired through usage or training?	319	1	5	3.54	1.132
Valid N (listwise)	319				
Average Mean				3.69	

Table 8: Statistics on Extent of use of skills in online learning

The respondents generally agreed (Mean 3.69) on various aspects that Extent of use of Skills on online Learning.

4.4.3. AWARENESS OF POLICY AND PROCEDURE DOCUMENTATION

	N	Minimum	Maximum	Mean	Std. Deviation
Are you aware of the existence of policies by the University that guide of online learning	319	1	5	3.07	1.310
Are you aware of attempts by the University to introduce or revise policies used in the administering of online learning	319	1	5	2.58	1.477
Were the attempts to introduce or revise the policies triggered by the switch to online learning during the covid-19 pandemic?	317	1	5	3.95	.879
The policies governing online learning were communicated to you by the University	319	1	5	3.68	1.120
Valid N (listwise)	317				
Average Mean				3.32	

The respondents generally agreed (Mean 3.32) on various aspects of Awareness of Policies and Procedure documentation.

4.4.4. AVAILABILITY OF POLICY AND PROCEDURE DOCUMENTATION

	N	Minimum	Maximum	Mean	Std. Deviation
The policies governing online learning were made available to you by the University	319	1	5	3.51	1.223
The University has provided user manuals and other documentation that guide learners on the usage of online learning technology	319	1	5	3.60	1.201
Valid N (listwise)	319				
Average Mean				3.55	

The respondents generally agreed (Mean 3.55) on various aspects of Availability of Policies and Procedure documentation.

4.4.5. MAINTENANCE

	N	Minimum	Maximum	Mean	Std. Deviation
Are you aware of attempts to improve online learning technology provided by the Universities through maintenance	316	1	5	2.74	1.464
The University has occasionally communicated scheduled maintenance of online learning technology to learners	319	1	5	3.07	1.246
Does the University frequently make performance and desirable improvements on online learning technology?	319	1	5	3.18	1.248
Valid N (listwise)	316				
Average Mean				3	

The respondents generally neutral (Mean 3.32) on various aspects of Maintenance.

4.4.6. ROUTINIZATION

Descriptive Statistics

	N	Minimum	Maximum	Mean	Standard Deviation
Use of online learning technology has been incorporated into your learning schedule	319	1	5	4.07	.907
Use of online learning technology is a normal part of your life	319	1	5	3.58	1.058
Valid N (listwise)	319				
Average Mean				3.8	

The respondents generally agreed (Mean 3.8) on various aspects of Routinization.

4.4.7. IMPLEMENTATION SUCCESS

	N	Minimum	Maximum	Mean	Std. Deviation
You are using online learning technology provided by the University to its fullest potential to support your learning activities	319	1	5	3.56	1.153
Valid N (listwise)	319				
Average Mean				3.56	

The respondents generally agreed (Mean 3.56) on various aspects of Implementation Success.

4.5.   ANALYSIS OF CORRELATIONS

The extent of relationship between the independent and dependent variables was determined by Pearson correlation. Pearson correlation coefficients (commonly known as Pearson's *R*) range between -1 and +1. Positive correlation is indicated by a negative value, whereas negative correlation is indicated by a positive value (Statistics How To, n.d.).

A positive *r* value indicates that the two variables have a positive relationship, meaning that the greater the independent variable, the larger the dependent variable. The greater the independent variable, the smaller the dependent variable, whereas a negative *r* value implies a negative relaionship. A correlation value of 0 implies that the variables have no relationship at all. An *r* value <0.3 implies weak correlation, an *r* value >0.3<0.5 shows moderate correlation and an *r* value >0.5 indicates strong correlation. (Statistics How To, n.d.).

The results from table 9 below show six positive correlations on Routinization process. These are Policy Awareness (r=.242), Frequency of Use (r=.510), Extent of Use of Skill (r=.441), Policy Availability (r=.339), Maintenance (r=.258) and Implementation Success (r=.505).

The independent variables Policy Awareness and Maintenance have correlation coefficients of .242 and .258 to Routinization, meaning there is a weak positive relationship between the two independent variables and Routinization.

Independent variables Policy Availability and Extent of Use of Skills have correlation coefficients of .339 and .441. This means they have moderate correlation to Routinization.

The independent variable Frequency of Use a correlation coefficient of .510 to Routinization. This means Frequency of Use has a strong relationship with Routinization.

Routinization has a correlation coefficient of .505 to Implementation Success and indication of strong relationship. Increased Routinization has a positive influence on Implementation Success.

The correlation between Policy Awareness, Frequency of Use, Extent of Use of Skill, Policy

Availability, and Maintenance to Routinization are highly significant at .000 therefore have

severe Multicollinearity.

The Pearson correlation test findings are provided in table 9 below.

Correlations

		Policy Awareness	Frequency Of Use	Extent of Use of Skills	Policy Availability	Maintenance	Routinization	Implementation Success
Policy Awareness	Pearson Correlation	1	.401**	.531**	.644**	.502**	.242**	.379**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000
	N	319	319	319	319	319	319	319
Frequency Of Use	Pearson Correlation	.401**	1	.699**	.419**	.389**	.510**	.669**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000
	N	319	319	319	319	319	319	319
Extent of Use of Skills	Pearson Correlation	.531**	.699**	1	.457**	.433**	.441**	.620**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000
	N	319	319	319	319	319	319	319
Policy Availability	Pearson Correlation	.644**	.419**	.457**	1	.502**	.339**	.367**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000
	N	319	319	319	319	319	319	319
Maintenance	Pearson Correlation	.502**	.389**	.433**	.502**	1	.258**	.476**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000
	N	319	319	319	319	319	319	319
Routinization	Pearson Correlation	.242**	.510**	.441**	.339**	.258**	1	.505**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000
	N	319	319	319	319	319	319	319
Implementation Success	Pearson Correlation	.379**	.669**	.620**	.367**	.476**	.505**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	
	N	319	319	319	319	319	319	319

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

Table 9: Correlation Analysis

4.6. REGREATION ANALYSIS OF THE INDEPENDENT AND DEPENDENT VARIABLES

4.6.1. Analysis of independent variables

Linear relationship is measured by the coefficient of determination. R-squared (R^2) explains to what extent the variance of one variable explains the variance of the second variable. When a model's R^2 is 0.50, its inputs can explain about half of the observed variance. When R^2 is 0.0, understanding one term does not help in understanding the other. When R^2 is 1.0, the value of one term can be predicted by another term (Statistics How To, n.d.).

When the independent variables are added together, the R-square is 0.554, or 55.4 percent, indicating that they are significant influences on the dependent variable – Implementation Success. This, however, indicates that other factors (44.6%) have a role in implementation success. Table 10 below summarizes the findings.

Model Summary

Model	R	R^2	Adjusted R^2	Standard Error of the Estimate
1	.745[a]	.554	.546	.65490

a. Predictors: (Constant), Maintenance, Routinization, PolicyAwareness, FreuencyOfUse, PolicyAvailability, ExtentofUseofSkills

Table 10: Model summary for all independent variables

4.6.2. Analysis of variance(ANOVA) model

When determining whether or not the results of a survey or experiment are significant, an ANOVA test is used (Statistics How To, n.d.).

The ANOVA table 11 below presents the results. The coefficient of determination was significant, as evidenced by the Sig. column, which has a P value of 0.000 and is less than 0.05. As a result, the model is well-suited to predicting Implementation Success.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	166.487	6	27.748	64.697	.000[b]
	Residual	133.814	312	.429		
	Total	300.301	318			

a. Dependent Variable: ImplementationSuccess

b. Predictors: (Constant), Maintenance, Routinization, PolicyAwareness, FreuencyOfUse, PolicyAvailability, ExtentofUseofSkills

Table 11:ANOVA table showing significance – Sig

4.6.3. All independent variables' coefficients

The output in the coefficients table 12 below is used to determine which of the model's

independent variables contributed to the prediction of Implementation Success.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Standard Error	Beta	t	Sig.
1	(Constant)	.285	.200		1.421	.156
	PolicyAwareness	.001	.060	.001	.025	.980
	FreuencyOfUse	.347	.054	.361	6.415	.000
	ExtentofUseofSkills	.223	.060	.214	3.687	.000
	PolicyAvailability	-.053	.047	-.059	-1.123	.262
	Routinization	.202	.048	.189	4.205	.000
	Maintenance	.191	.040	.224	4.817	.000

a. Dependent Variable: ImplementationSuccess

Table 12: Coefficients

The P. value was used to compare the contribution of each independent variable in the research.

A P value <0.05 denotes the variable would be making a significant unique contribution to the

prediction of the dependent variable, where as a P greater than 0.05 denotes that the variable is

not making a significant contribution to the prediction of the dependent variable. The

contribution of each independent variable was as follows: PolicyAvailability made a strongest unique contribution and is statistically significant to the equation at **.262**. PolicyAwareness at **.980** does not make significant unique contribution to Implementation Success. FreuencyOfUse, ExtentofUseofSkills, Maintenance and Routinization contribution is statistically significant to the equation at **0.000**.

4.7. DISCUSSION OF FINDINGS

4.7.1. FREQUENCY OF USE

According to the descriptive statistics gathered, frequency of use contribute to routinization of online learning. The study also indicated that the average mean for Frequency of use was 3.58 indicating that respondents were generally agreed with the measured items. The data also revealed that all measured items under system use had a mean of more than 3, indicating that they were important in routinization of online learning.

These findings agreed with the research by Saga et al. (1994) that linked frequency of use to routinization. According to Saga et al. (1994), increased frequency of use leads to increased routinization. This was also in agreement with the study by Sundaram, Schwarz, Jones & Chin (2007) implied that increased usage of information systems birth the opportunities for routinzation.

4.7.2. EXTENT OF USE OF SKILLS

According to the descriptive statistics gathered, Extent of Use of Skills contribute to routinization of online learning. The study also indicated that the average mean for Extent of Use of Skills was 3.69 indicating that respondents were generally agreed with the measured items. The data also revealed that all measured items under system use had a mean of more than 3, indicating that they were important in routinization of online learning.

These findings from this study agreed with the study by Burton-Jones & Straub (2006) that found that routinization is a consequence of routine execution of knowledge.

4.7.3. AWARENESS OF POLICIES, PROCEDURES AND DOCUMENTATION

According to the descriptive statistics gathered Awareness of Policies, Procedures and Documentation contribute to routinization of online learning in Kenyan Public Universities. The study also indicated that the average mean for Awareness of Policies, Procedures and Documentation was 3.32 indicating that respondents were generally agreed with the measured items. The data also revealed that all measured items under system use had a mean of more than 3, indicating that they were important in routinization of online learning.

These findings agreed with the study by Adedoyin & Soykan (2020) that found that organizations' desire to align their policies and procedures to include to new adopted information systems contribute to routinization.

4.7.4. AVAILABILITY OF POLICIES, PROCEDURES AND DOCUMENTATION

According to the descriptive statistics gathered, Availability of Policies, Procedures and Documentation contribute to routinization of online learning in Kenyan Public Universities. The study also indicated that the average mean for Availability of Policies, Procedures and Documentation was 3.55 indicating that respondents were generally agreed with the measured items. The data also revealed that all measured items under system use had a mean of more than 3, indicating that they were important in routinization of online.

 These findings agreed with the study by Adedoyin & Soykan (2020) that found that organizations' desire to align their policies and procedures to include to new adopted information systems contribute to routinization.

4.7.5. MAINTENANCE

According to the descriptive statistics gathered, Maintenance contribute to routinization of online

learning in Kenyan Public Universities. The study also indicated that the average mean for

Maintenance was 3 indicating that respondents were generally neutral on the measured items.

The data also revealed that all measured items under system use had a mean of less than 3,

indicating that they were not important in routinization of online learning.

These findings were in disagreement with those the study by of John & Bhasi, (2015) that stated

maintenance is a contributing factor to routinization.

4.7.6. ROUTINIZATION

According to the descriptive statistics gathered, routinization contribute to implementation

success of online learning. The study also indicated that the average mean for Maintenance was 3

indicating that respondents were generally neutral on the measured items. The data also revealed

that some measured items under system use had a mean of less than 3, indicating that they were

not important in implementation success of online learning in Kenyan Public universities.

4.7.7. IMPLEMENTATION SUCCESS

The study also indicated that the average mean for implementation success was 3.56 indicating

that respondents were generally agreed with the measured items.

4.8.   THE PROPOSED MODEL

By removing PolicyAwareness from the equation, a regression analysis was performed to

determine whether this would result in be a significant increase in R^2 and a significant decrease

in the ANOVA Residual value.

Model Summary

Model	R	R^2	Adjusted R^2	Standard Error of the Estimate
1	.745[a]	.554	.546	.65490

a. Predictors: (Constant), Maintenance, Routinization, PolicyAwareness, FreuencyOfUse, PolicyAvailability, ExtentofUseofSkills

Table 13: Model Summary without PolicyAwareness variable

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	166.487	6	27.748	64.697	.000[b]
	Residual	133.814	312	.429		
	Total	300.301	318			

a. Dependent Variable: ImplementationSuccess

b. Predictors: (Constant), Maintenance, Routinization, PolicyAwareness, FreuencyOfUse, PolicyAvailability, ExtentofUseofSkills

Table 14: ANOVA table without PolicyAwareness variable

There being no change in R^2 and Residual value which remained at **.554** and **133.814**

respectively with the removal of PolicyAwareness variable, the model was adopted as it was in

the original state.
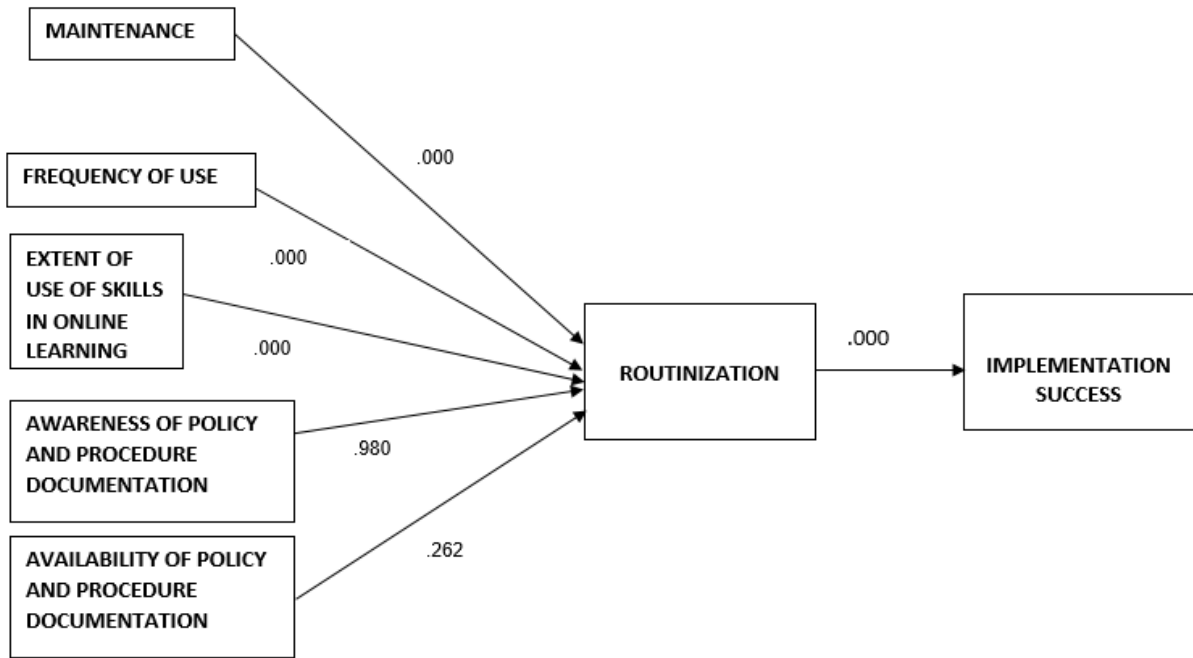
Below is the illustration of the proposed model.

Figure 5: The Proposed Model with values based on significance

CHAPTER FIVE

5.0. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter draws conclusions and gives recommendations based on the outcomes of the study to investigate the factors that contribute to Implementation success of online learning in Kenyan public Universities.

The study was conducted among undergraduate and post-graduate students in University of Nairobi, Kenyatta University and Jomo Kenyatta University of Agriculture and Technology. Purposive sampling was used to select the universities, the sample size distributed proportionately within the universities and students selected randomly. The data collected using online questionnaires was analyzed using correlation and simple regression models.

5.1. SUMMARY OF FINDINGS

The outcomes of this study were summarized according the problem statement stated in Chapter One.

Does Frequency of use affect Routinization of online learning?

The respondents of the study generally agreed on aspects Frequency of use. This was shown by the mean of 3.58 which is above average. In the correlation analysis, Frequency of Use had a correlation coefficient of .510 to Routinization. Meaning, Frequency of Use has a strong relationship with Routinization. Therefore, increased frequency of use of an information system results in increased Routinization. In the Analysis of Variance, Frequency of use had a P-value 0.00 which is < 0.05. This implied Frequency of use is a major factor in the study.

Does Extent of Use of Skills on online learning affect Routinization of online learning Implementation?

The respondents of the study generally agreed on aspects of Extent of Use of Skills on online learning. This was shown by the mean of 3.69 which is above average.In the correlation analysis, Extent of Use of Skills had a correlation coefficient of .441 denoting moderate correlation to

Routinization. In the Analysis of Variance, Extent of Use of Skills on online learning had a P-value of 0.00 which is below 0.05. This implied that Extent of Use of Skills on online learning was a significant factor in the study.

Does Availability of policies and procedures and documentation affect Routinization of online learning?

The respondents of the study generally agreed on aspects of Availability of policies and procedures and documentation. This was shown by the mean of 3.55 which was above average. In the correlation analysis, Availability of policies and procedures and documentation has a correlation coefficient of .339 denoting moderate correlation to Routinization. In the Analysis of Variance, Availability of policies and procedures and documentation had a P-value of 0.262 which is above 0.05. This implied that Extent of Use of Skills on online learning was a no significance in the study.

Does Awareness of policies and procedures and documentation affect Routinization of online learning?

The respondents of the study generally agreed on aspects of Awareness of policies and procedures and documentation. This was shown by the mean of 3.32 which was above average. In the correlation analysis, Awareness of policies and procedures and documentation has a correlation coefficient of .252 denoting weak positive relationship with routinization. Changes in Awareness of policies and procedures and documentation have low probability in changing routinization. In the Analysis of Variance, Awareness of policies and procedures and documentation had a P-value of 0.980 which is above 0.05. This implied that Extent of Use of Skills on online learning was a no significance in the study.

Does Maintenance affect Routinization of online learning?

The respondents of the study generally agreed on aspects of Maintenance**.** This was shown by the mean of 3.32 which was above average. In the correlation analysis, Maintenance has a correlation coefficient of .258 denoting weak positive relationship with routinization. Changes in Maintenance have low probability in changing routinization. In the Analysis of Variance, Maintenance had a P-value of 0.00 which is above 0.05. This implied that Maintenance on online learning was a significant factor in the study.

Does Routinization affect Implementation success of online learning?

The respondents of the study generally agreed on aspects of Awareness of policies and procedures and documentation. This was shown by the mean of 3.8 which was above average. In correlation analysis, Routinization had a correlation coefficient of .505 to Implementation Success and indication of strong relationship. Increased Routinization has a positive influence on Implementation Success.

5.2. CONCLUSION

This research investigated factors contributing to Implementation success in Kenyan public Universities. Using the adapted Model of the Implementation Process by Zmud and Kwon, and by focusing on the Routinization process, the study identified these constructs as Online leaning Implementation success factors in Kenyan Public Universities: Maintenance, Frequency of Use, Extent of Use Skills on Online Learning, Availability of Policy and Procedure Documentation, Awareness of Policy and Procedure Documentation, and Routinization.

5.3. STUDY LIMITATIONS

The main limitation for this study was the distribution of sample size. With the research happening during covid-19 pandemic restrictions on movement and physical meetings it was difficult to extend the study to more public Universities that have implemented online learning. This would have generated more accurate results.

Another limitation is that there are limited studies done on online learning implementation success in Kenyan Public Universities with most studies focusing on adoption phase of online learning.

Despite these constraints, the study yielded helpful results which would help improve knowledge and understanding of online learning implementation aspects in Kenyan public universities.

5.4. SUGGESTION FOR FURTHER RESEARCH

With Successful online learning Implementation Online having only been realized in few Pubic Universities in Kenya, there are few studies done on this area with majority of research focusing on adoption.

Since the study was limited to public universities namely, UoN, Kenyatta University and JKUAT, the researcher recommends further studies to be done on privately owned Universities in Kenya.

Other variables that contribute to the online learning implementation success should be examined in more depth in future studies since this study only focused on Awareness of Policy and procedure documentation, Frequency of Use, Availability of Policy and procedure documentation, Extent of Use of skills in Online Learning, Maintenance and Routinization. The independent variables that were studied explained 55.4% of factors contributing to implementation Success. The researcher recommend further study to be conducted to determine 44.5% of Implementation Success. Furthermore, a study that compares implementation success in public universities and private universities can be explored to give detailed recommendation on provisions that need to be in place to ensure Universities in Kenya reap the benefits of Implementation Success.

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APPENDICES

APPENDIX 1: QUESTIONNAIRE

UNIVERSITY OF NAIROBI

SCHOOL OF COMPUTING AND INFORMATICS

A FRAMEWORK FOR IMPLEMENTATION OF ONLINE LEARNING IN KENYAN PUBLIC UNIVERSITIES DURING THE COVID-19 PANDEMIC

STUDENTS' QUESTIONNAIRE

INTRODUCTION

Dear respondent,

I am conducting a research on the implementation of online learning in Kenyan public universities during the Covid-19 pandemic. The goal is to establish factors that contribute to effective implementation of online learning. The research findings will be kept confidential and will be used for

academic purposes only. Please complete the following questionnaire with specific regard to the above enquiry, by placing a tick in the appropriate box

Regards,

Joseph Odanga

Msc. IT Management Student

University of Nairobi

SECTION I: GENERAL INFORMATION

1. What is your gender?   Male ☐   Female ☐

2. Which Kenyan Public University do you study at? _____

3. Level of Study? Undergraduate ☐   Post-graduate ☐   ☐

4. Year of Study? 1 ☐   2 ☐   3 ☐   4 ☐   5 ☐   6 ☐

SECTION II: FERQUENCY OF USE

1. You see the use of online learning technology as a normal activity at your University.

   Strongly Disagree ☐   Disagree ☐   Undecided ☐   Agree ☐ Strongly agree ☐

2. How frequently do you conduct your learning activities using the online learning technology provided by the University?

   Never   ☐

   Rarely   ☐

   Sometimes   ☐

   Often   ☐

   Always   ☐

SECTION III: EXTENT OF USE OF SKILLS IN ONLINE LEARNING

1. How familiar are you with online learning technology provided by the University?

   Not at all familiar ☐

   Slightly familiar ☐

   Somewhat familiar ☐

   Moderately familiar ☐

   Extremely familiar ☐

2. You are confident in using online learning technology provided by the University in your learning.

   Strongly Disagree ☐

   Disagree ☐

   Undecided ☐

   Agree ☐

   Strongly agree ☐

3. How frequently do you apply your knowledge and skills on the online leaning technology provided by the University that you acquired through usage or training?

   Never ☐

   Rarely ☐

   Sometimes ☐

   Often ☐

   Always ☐

SECTION IV: AWARENES AND AVAILABILITY OF POLICIES AND PROCEDURES

1. Are you aware of the existence of policies by the University that guide the use of online learning technology

   Not at all aware ☐

   Slightly aware ☐

   Somewhat aware ☐

   Moderately aware ☐

   Extremely aware ☐

2.
   a) Are you aware of attempts to introduce or revise of policies by the Universities on the administering of online learning

   Not at all aware ☐

   Slightly aware ☐

   Somewhat aware ☐

   Moderately aware ☐

   Extremely aware ☐

b) If you are Slightly aware, Somewhat aware, Moderately aware or Moderately aware in 2 a) above, were the attempts to introduce or revise the policies triggered by increase in online learning activity during the covid-19 pandemic?

Extremely unlikely ☐

Unlikely ☐

Neutral ☐

Likely ☐

☐

Extremely likely

3. The policies on administering online learning were communicated and made available to you by the University

Strongly Disagree ☐

Disagree ☐

Undecided ☐

Agree ☐

Strongly agree ☐

4. The University has provided user manuals and other documentation that guide on the usage of online learning technology

Strongly Disagree ☐

Disagree ☐

Undecided ☐

Agree ☐

Strongly agree ☐

SECTION V: MAITENANCE

1. Are you aware of attempts to improve online learning technology provided by the

   Universities through maintenance

   Not at all aware ☐

   Slightly aware ☐

   Somewhat aware ☐

   Moderately aware ☐
   ☐

   Extremely aware

2. The University has occasionally communicate scheduled maintenance of online learning

   technology to learners

   Strongly Disagree ☐

   Disagree ☐

   Undecided ☐

   Agree ☐

   Strongly agree ☐

3. Does the University frequently make performance and desirable improvements on online

   leaning technology?

   Never ☐

   Rarely ☐

Sometimes ☐

Often ☐

Always ☐

SECTION V: ROUTINIZATION

1. Use of online learning technology has been incorporated into your learning schedule

    Strongly Disagree ☐

    Disagree ☐

    Undecided ☐

    Agree ☐

    Strongly agree ☐

2. Use of online learning technology is a normal part of your life

    Strongly Disagree ☐

    Disagree ☐

    Undecided ☐

    Agree ☐

    Strongly agree ☐

SECTION VI: IMPLEMENTATION SUCCESS

You are using online learning technology provided by the University to its fullest potential to support your learning activities

Strongly Disagree ☐

Disagree ☐

Undecided ☐

Agree ☐

Strongly agree ☐

---------END-------------

UNIVERSITY OF NAIROBI
COLLEGE OF BIOLOGICAL AND PHYSICAL SCIENCES
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Our Ref: UON/CBPS/SCI/MSC/ITM/2018   02 June 2021

TO WHOM IT MAY CONCERN

Dear Sir/Madam

RE: AMBAYO JOSEPH ODANGA:REG.NO.P54/34414/2019

This is to confirm that the above named is a bona fide student of the University of Nairobi, School of Computing and Informatics.

He is pursuing M.Sc in Information Technology Management course and would like to collect data for his research project entitled: "A Framework for Implementation of Online Learning in Kenya Public Universities during the Covid-19 Pandemic" under the supervision of Prof. Robert O. Oboko

Any assistance accorded to him will be highly appreciated.
Yours faithfully

PROF. ROBERT O. OBOKO
DIRECTOR
SCHOOL OF COMPUTING & INFORMATICS

JOMO KENYATTA UNIVERSITY
OF
AGRICULTURE AND TECHNOLOGY

P. O. Box 62000 - 00200, City Square, Nairobi, Tel: +254-67- 5870001- 4, Email:dvc@aa.jkuat.ac.ke

OFFICE OF THE DEPUTY VICE CHANCELLOR (ACADEMIC AFFAIRS)

JKU/2/003/072

07ᵗʰ July 2021

Joseph Odanga Ambayo
University of Nairobi
NAIROBI

Dear Mr. Odanga

RE: APPROVAL TO COLLECT DATA FOR RESEARCH

This is in response to your letter requesting to collect data for your research.

On behalf of Jomo Kenyatta University of Agriculture and Technology, I wish to inform you that your request to collect data from students at Jomo Kenyatta University of Agriculture & Technology for your Masters degree course in Information Technology Management has been granted on condition that the research findings shall be used solely for academic purposes.

Your research topic is and should remain *"A Framework for Implementation of Online Learning in Kenya Public Universities during the Covid-19 Pandemic."*

I wish you all the best as you embark on your research.

Yours faithfully

PROF. ROBERT KINYUA, PhD.
DEPUTY VICE CHANCELLOR (ACADEMIC AFFAIRS)

RK/es

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