AN ASSESSMENT OF INFORMATION TECHNOLOGY ADOPTION AND PERFORMANCE OF EMPLOYEES IN PUBLIC UNIVERSITIES IN KENYA: A CASE STUDY OF KENYATTA UNIVERSITY, KIAMBU COUNTY

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ABSTRACT

It is evident that a number of nations have shown that the revolution brought by ICT in terms of its skill-basis has raised demand for highly trained people in comparison to those with lower levels of education. The main purpose of the study was to establish how ICT information access affects employees' performance in Public Universities in Kenya. The study was based on systems theory and Technology Acceptance Model (TAM) theory. The study adopted a survey research design because data was collected from respondents at a particular time. 230 of the study population was selected using simple random sampling method, taking care that the sample is fairly representative of the study population. The main tool that was employed for data collection was the questionnaires. The piloting of data collection instruments was undertaken in Multi Media University and Jomo Kenyatta University of Agriculture & Technology. Following piloting, the validity and reliability of the tools of data collection was ascertained. The study employed the Split-Half technique in testing reliability. The data was coded and fed into the computer for analysis using Statistical Package for Social Sciences (SPSS) version 26. In the analysis phase, descriptive statistical methods including frequency counts, percentages, tables and graphs to depict distribution and pie charts was employed. The objective of the study was the influence of ICT on information access. Based on this objective the study concluded that most of the staffs at KU use word of mouth, face to face, telephone or email to communicate. Also, the institution's website is not equipped to support worker's communication. There is an organization email communication but it is not well utilized. The objective recommended that the institution should equip its website, support workers communication and should have an organization email that should be used in communication.

Keywords: *Information Technology Adoption, ICT information access and Universities in Kenya*

INTRODUCTION

Countries with strong ICT service sectors are at an advantage over those countries where the ICT sector as a whole is weak. Gilmore et al., (2015) asserts that investments in information and communications technology have helped to "contribute to capital-deepening" by increasing the amount of capital input per worker in addition to enhancing labor productivity. In the majority of

developed countries, the widespread use of information and communications technologies (ICTs) throughout the value chain has contributed to improved performance in firms. In particular, it has enabled firms to increase their efficiency in combining capital and labor, which has led to improved performance. In some developed countries, such as Finland and the United States, the contribution of technological innovation and high volumes of demand generated by an information and communications technology (ICT) productive sector played a significant role in achieving a positive impact on the economies of those countries (Szirmai & Verspagen, 2015).

African nations who have developed robust ICT service industries have a distinct edge over those that do not. According to Gilmore et al. (2015), investments in information and communications technology (ICT) have the potential to increase worker productivity and deepen capital. Regarding the adoption and effect of ICT, the environment of African nations, however, brings its own distinct obstacles and possibilities.

The broad usage of ICTs throughout the whole value chain has enhanced business performance in many industrialized nations. Businesses have been able to improve performance by combining labor and capital more effectively by incorporating ICTs into their operations. This has been seen in nations like Finland and the United States, where the technical advancements and strong demand in the ICT industry have had a favorable influence on their economy (Szirmai & Verspagen, 2015). According to Chege et al., (2020) the expansion of Kenya's information and communications technology business has exceeded the growth of every other sector, increasing by 23 percent annually over the course of the preceding decade. This information comes from the author's own research. The advancement of information and communication technology (ICT) throughout the course of the last two decades has been an important contributor to the growth of East Africa's economy. In East Africa in the year 2000, there were around 250,000 persons who were connected to the internet (which includes Kenya, Uganda, and Tanzania). At the end of 2014, there were more than 29 million people in this region who used the internet. Kenya has been awarded the nickname "Silicon Savannah" owing to the fact that it is continuously on the front edge of technological innovation (Irungu et al., 2015).

It is important to remember that Kenya released her Digital Economy Blueprint in the year 2019. The strategy acknowledged that new services and technologies are on the horizon to appear with each passing year, and that digital technologies have become the cornerstone of our everyday activities, to which governments, organizations, and people must adapt. The fifth pillar of the plan is very significant since it calls for "the creation of a digitally trained workforce that is founded on strong ethical practices and socio-cultural values." This provision is one of the most crucial aspects of the blueprint (Knickrehm et al., n.d.). The digital skills have been broken into basic, intermediate and advanced. Given the requirement of the 5th pillar of the Digital Economy Blueprint, it becomes necessary to periodically assess the level of ICT skills in the universities. Szirmai & Verspagen, (2015) reported that a survey was conducted in the Eastern Africa Region in the use of information communication technologies among universities. Kenyan universities were ranked top, however it is significant to point out that the universities ranked highly were the private ones.

Statement of the Problem

There is evidence coming from a number of different nations that shows the revolution brought on by ICT is skill-based and raised demand for highly trained people in comparison to those with lower levels of education. For instance, Jorgenson and Stiroh (2000) note that highly trained people are likely to be complimentary to ICT, but individuals with low levels of competence are likely to be replaceable by ICT. Organizations that wish to increase their productivity and efficiency need

to stay up with the changing trend and figure out how to deal with the effect of globalization as well as advancements in ICT.

Additionally, in a world that is always changing, continuing education is essential in order to stay up with the advancement of technology and the latest discoveries in this field. The little information technology programs that are quite rudimentary. These programs do not produce competent academics, and they do not meet the demands of the market. The teaching of computer courses often falls on faculty members from other engineering departments, despite the fact that universities make little attempt to recruit highly competent teachers or researchers in computer science fields. There are even students who graduate from different university with a bachelor's degree in information technology and acquire employment teaching in the same faculties from where they graduated. The poor results are a direct reflection of the inadequate IT training that has been provided, which has a significant impact on universities efforts to become a more computerized society.

The depressing state of universities IT market is another factor that contributes to the country's technical backwardness. Because university managers are uninformed or partially informed of the significance of computerizing their systems and the extent to which doing so may boost their productivity, these individuals do not seem to be interested in the purchase of IT goods or services. And because there are not enough well-established technology providers, companies who decide to computerize their operations almost certainly look for suppliers located in other countries. When we do not use technology for higher productivity, it has an effect on the economy as a whole and provides a very limited response to the need for IT on a local level (Awino, 2011).

It is in recognition of this underachievement in the use of modern information communication technology that possibly necessitated the development and adoption of the Digital Economy Blueprint (GoK, 2019) and the study by the Ministry of Education, Kenya (Gathumbi, 2013) which led to making it mandatory for employers in educational institutions to introduce training on the use of information technology. This underachievement in the use of modern information communication technology was recognized by the Government of Kenya (GoK). Gathumbi, (2013) and other researchers have shown that there is a favorable correlation between the use of cutting-edge technology and the production of vast amounts of data, the transfer of knowledge, and the effective flow of information and communication.

It has been pointed out in a succinct manner that the old way of administration looks to be quite different from what administrators in current digital age need in order to ensure efficient administration in schools. According to Gray & DiLoreto, (2016) as well, the utilization of ICT is much lower in educational administration compared to classroom settings. Because of this, the researcher intends to do an analysis on the degree to which public universities in Kenya have adopted and benefited from information and communication technology.

Objectives

To establish how ICT information access affects employees' performance in Public Universities in Kenya.

Significance of the Study

The study is important in many ways. Firstly, given the documented evidence of the contribution of the digital revolution to the immense growth of the industrialized countries, there is certainly need to find out if our organizations are utilizing the new technology to foster development. The research might also assist students in gaining a better understanding of the significance of information technology as well as the need of incorporating information technology into the system in order to guarantee both effective service delivery and high levels of productivity.

Second, the sample organization that was selected for the research was deemed acceptable because it would be possible to determine how the use or non-usage of new technology impacted the transfer of knowledge as well as the collection of critical data for the governance of the institution. Furthermore, the study is significant in that it adds to existing literature and may guide people on the importance of new technology use in offices and lectures so as to adjust to the new trend in technology. The study might benefit public universities in Kenya, students and staffs in general as they might understand better the immense benefits as well as the minor difficulties that can be overcome in using the new technology.

Literature Review

For schools to be more productive, the way they run, teach, and help students learn must become more efficient and effective (Haselow et al., 2022). In today's digital world, the old ways of teaching, learning, and running schools are no longer good options. This includes both what goes on in the classroom and how schools are run. Because of this, governments and other people with a stake in education are under more pressure to invest more in technology in order to improve how well educational institutions work as a whole. Most schools still do most of their work and teaching by hand, which is mostly out of date. Because of this, governments and other people who have a stake in education are under more pressure to invest more in technology.

The role of the teacher in today's classrooms has also continued to get a lot of attention because of how important it is. This makes it seem like the teacher is in charge of what and how the students learn, which takes away from the role that the students play in the learning process. Affara & Lagu, (2021) noted that the teaching and learning skills needed for the twenty-first century call for a more efficient and effective way to teach and learn, one in which students take an active role in the learning process and teachers act as facilitators rather than lecturers or instructors. This way of teaching and learning in the classroom is called "flipped classroom."

The main reason for adding new technology to schools is to help students do better in school and improve the school as a whole (Mohammad et al., 2018). The use of information and communications technology (ICT) in the running, teaching, and learning of educational institutions is expected to make them more modern and help get rid of physical, geographical, and social barriers to education. Using information and communication technology could make education more efficient by making it take less time and cost less money to do different things. This could make education better as a whole.

According to the results of the study, the ways that information and communication technology (ICT) is used in schools now are different from the ways that it might be used in the future (Deen, 2015). This shows how important it is to have enough skills in information and communication technology (ICT) to make sure that ICT is used well in education and, as a result, to improve the performance of learning institutions as a whole. Integration of information and communications technology (ICT) into the educational system in a way that makes it work well is a complicated, multi-step process that involves not only technology but also the ability of educational institutions to change and the skills of people who use ICT. The goal of this process is to improve the way education works.

According to Neely (2015), the capacity of an organization may be broken down into its people, practices, technological capabilities, and infrastructure. These components, when put together, demonstrate how the company may generate value for its many stakeholders throughout its various business processes. ICT capacity, as defined by Newhouse (2013), is the capability of using one's knowledge and abilities about ICT to the completion of significant activities. According to the author, users of information and communications technologies (ICTs) need to have the skills,

infrastructure, and a supportive environment necessary to utilize ICTs successfully. To many academics, the term "ICT capability" refers to different things depending on the context of the educational setting.

ICT capability factors were broken down into three levels in the research conducted by Athuc, (2016). These levels are teacher, school, and system. The SITES 2006 research investigated the ways in which pedagogy and information and communication technology are used in schools all around the globe. The research further developed the criteria for ICT capability needed for effective ICT integration. The leadership, the vision, the policies, the infrastructure, the staff development, and the support were among these. Ng, et al. (2009) conducted research on the topic of capacity-building for the implementation of ICT in educational settings. The study came to the conclusion that in order to effectively reap the advantages of incorporating ICT into educational settings, the appropriate atmosphere must first be prepared in a methodical fashion. According to the researchers, in order to make it possible for information and communications technologies to be used in the administration of schools, the instruction of students, and the acquisition of knowledge, ICT capacity needs to be established. This involves the establishment of infrastructure, the upkeep of ICT equipment, and the training of staff.

According to Marcuse, (2020) conceptual framework on information and communication technology (ICT) usage and educational performance, they came to the conclusion that the relationship between ICT use and its impact on educational performance may be influenced by a variety of circumstances. At the micro level, these elements include the personal traits of instructors, pupils, and other staff members, as well as the curriculum and instructional procedures. Other influences include the environment in which the classroom is located. At the macro level, these elements consist of the environment of the school as well as aspects that are not related to the school. According to Dantan et al., (2019) ICT capacity encompasses a wide variety of elements, including but not limited to: hardware, software, connections, digital content, policies, training, knowledge and skills, support, values and attitudes, and a great many others. All of these elements contribute to the efficient and effective operation of schools.

Krug and Arntzen (2010) who studied "ecologies of learning" pushed for research on educational technology to take a more whole-person approach. This method would take into account how personal, instructional, and organizational factors affect how ICT is used and how well an institution does. In other words, it would look at how well an institution uses ICT and how well it does overall. Stark et al., (2019) observed that when analyzing an organization's information and communications technology (ICT) capabilities, it is important to take into account not only technical factors but also individual variables and institutional factors. Dantan et al., (2019) looked into how the availability of human resources affects the implementation of e-learning programs in public secondary schools in the Kitui District of Kenya. They came to the conclusion that there is a link between the characteristics of an institution, the skills of its human resources, and how ready it is to use e-learning. This article looks at studies that look at how teachers use information and communications technology (ICT). It focuses on the ICT skills of teachers and factors at the school level that affect how ICT is used to improve the performance of educational institutions.

Theoretical Literature Review

A theoretical framework places research in the field or subject area where it is being done and gives a study direction (Marangunić & Granić, 2014). The study was based on systems theory and Technology Acceptance Model (TAM) theory.

The systems theory was developed so that we may have a better understanding of how the world functions and the factors that contribute to issues. Every system is made up of components that

interact with one another and are dependent on one another. According to systems theory, if there is a problem with one component in a system, we cannot simply repair that component by itself. Instead, we need to investigate the whole of the system in order to identify the potential source of the issue. When a system fails to function properly, it is usually due to a malfunction in one of the feedback channels. Participants get the opportunity to articulate the objectives of the program and instruct Ritter on how to identify issues in order to devise strategies for their resolution or enhancement (Cook, 2017).

According to Marangunić & Granić, (2014), a truly closed system does not exist in practice since each and every system requires some kind of input and output functions. The "open system" hypothesis served as the foundation for this investigation. According to systems theory, a program may have its whole or a portion of it relocated provided that the new environment satisfies the requirements of the program. System theorists argue that the most significant aspect of a system is that it can't exist if it's split up, and that altering one portion may have an effect on how the system functions as a whole (Demetriou et al., 2015). When attempting to enhance one component of a system, much relied on how that component interacts with the functionality of the other component of the same system. The research employed an open system as its foundation in order to demonstrate how the many independent factors that influence the usage of ICT in resource planning interact with one another and how these interactions may have an effect on the whole system.

The Technology Acceptance Model (TAM) and the Diffusion of Innovations Model (DOI) served as the foundation for this investigation. Ajzen and Fishbein's Theory of Reasoned Action (TRA) served as the foundation for Technology Acceptance Model (TAM). Davis first proposed this concept in 1986, according to Marceij et al., (2013b). Therefore, in the industry of information systems, technology, and services Lai, (2017) considered TAM to be one of the most well-known and commonly used models. It has been shown to be an effective method for predicting how people responded to newly developed technology. The objective of the TAM is to determine how well the information system was accepted and to identify design flaws before users have a significant amount of experience with the system. The TAM model is significant to this investigation because it demonstrates how a variety of factors influence the degree to which individuals are willing to adopt new technologies.

According to TAM, there are two aspects of new technologies that people consider, and both of these aspects have an indirect impact on the adoption of these technologies: how beneficial they are and how simple they are to use. The degree to which a user believes that using a certain piece of technology was beneficial to them in some manner is referred to as its perceived utility. In addition, the ease of use that a person believes a certain system had a measured by its perceived ease of use. It was discovered by Lai, (2017) as well as by Berry et al., (2019b) that the perceived usefulness of an item is directly proportional to how simple it is to use. In this particular investigation, TAM was put to use to investigate how ITI and performance are influenced by perceptions of how helpful and simple something is to use.

Methodology

Research Design

The study adopted a survey research design because data was collected from respondents at a particular time. The survey research design according to Amin (2005) was helpful to the researcher to attain systematic data from a sample. Here, the relationship to be determined is whether the use of new technology could be linked with the effectiveness of office management.

Sample Size

According to Tools4dev.org (https://tools4dev.org/resources/how-to-choose-a-sample-size/) a good maximum sample size is usually around 10% of the population, as long as this does not exceed 1000. In particular, Krejcie & Morgan, (1970) has developed a useful table for determining the needed size of a randomly chosen sample from a given finite population. According to this table a population of 550 requires a sample size of 226. The sample size of this study was 230.

Table 1: Table for determining sample size

Grade	Population	Sample
Senior Management		
Deputy Vice-Chancellors	4	-
Registrars	5	-
Deans	19	7
Associate Deans	2	1
Directors	37	15
Senior Deputy Registrars	5	2
Chairmen of Department	75	31
Middle Management		
Assistant Registrars	11	5
Senior Admin. Assistants	71	30
Administrative Staff		
Admin. Assistants	126	53
Secretaries	98	41
Data Clerks	107	45
Total	**560**	230

FINDINGS

Response Rate Analysis

The study response rate was 89.5% (206 respondents out of a sample of 230), meaning that 24 (10.5 %) of the sample did not participate in the study. Patten (2016) pointed out that a response rate of 60% or more is good in the field of research when filling out a questionnaire. On the other hand, the Pew Research Center (https://www.pewresearch.org) found that a response rate of 50% or higher on a questionnaire is very good, a response rate of 60% to 70% is good, and a response rate of 70% or higher is excellent. Based on what the research found, a response rate of 89.5 percent is enough and even great for the analysis.

4.5 Influence of ICT on Information Access

The study undertook a descriptive analysis on method of information access. The mean and standard deviations were calculated for the following questions: most of us use word of mouth/face to communication (M = 4.01, SD = 1.131215), there is an institution website where most of the workers communicate (M = 2.23, SD = 1.19106), the notice board is well designed to allow communication to be done (M = 2.23, SD = 1.200.29), there is an institution what's app group that is used for communication (M = 2.25, SD = 1.21246) the study also found out that for those who think the institution offers email communication where most communication is done (M = 2.19, SD = 1.16)

Table 2: Influence of ICT on Information Access

	N	Minimum	Maximum	Mean	Std. Deviation

Most of us use Word of mouth/face-to-face to communicate	206	1.00	5.00	4.0146	1.31215
The institution's website provides communication opportunity to workers	206	1.00	5.00	2.2330	1.19106
The notice board is well organized to allow communication	206	1.00	5.00	2.2379	1.20029
There are numerous WhatsApp groups that are used for communication	206	1.00	5.00	2.2573	1.21246
The institution offers corporate email service	206	1.00	5.00	2.1990	1.16627
Valid N (listwise)	206				

Source: Field Data 2023

According to the results of the study, the ways that information and communication technology (ICT) is used in schools now are different from the ways that it might be used in the future (Deen, 2015). This shows how important it is to have enough skills in information and communication technology (ICT) to make sure that ICT is used well in education and to improve the performance of learning institutions as a whole. Integration of information and communications technology (ICT) into the educational system in a way that makes it work well is a complicated, multi-step process that involves not only technology but also the ability of educational institutions to change and the skills of people who use ICT. The goal of this process is to improve the way education works. The above literature was in line with the study findings;

> *"The main reason for adding new technology to schools is to help students do better in school and improve the school as a whole. The use of information and communications technology (ICT) in the running, teaching, and learning of educational institutions is expected to make them more modern and help get rid of physical, geographical, and social barriers to education. Using information and communication technology could make education more efficient by making it take less time and cost less money to do different things. This could make education better as a whole.*
> *the teaching and learning skills needed for the twenty-first century call for a more efficient and effective way to teach and learn, one in which students take an active role in the learning process and teachers act as facilitators rather than lecturers or instructors.' So, education systems have put money into information and communication technology because they thought schools would use it and benefit from it sooner or later."*

Krug and Arntzen, (2010) who conducted research on "ecologies of learning", advocated for educational technology research to adopt a more holistic approach. This approach would take into consideration the ways in which personal, instructional, and organizational elements influence how information and communication technology (ICT) is utilized and how effectively an institution performs. In other words, it would look at how effectively an institution makes use of information and communication technology in addition to how well it works in general. The study conducted by Stark et al (2019) on organization's capabilities in the area of information and communications technology (ICT), pointed out that it is essential to take into consideration not just technological elements but also individual characteristics and institutional factors.

Conclusions

The objective of the study was the influence of ICT on information access. Based on this objective the study concluded that most of the staffs at KU use word of mouth, face to face, telephone or email to communicate. Also, the institution's website is not equipped to support worker's communication. There is an organization email communication but it is not well utilized.

Recommendations of the Study

First, the organization should make sure that its website has current features and functions. This includes changing the website's design to make sure it's easy to use and looks good, making it work better on mobile devices so more people can use it, and adding current information about the organization, its services, and any ongoing projects. By updating its website, the school can build a professional online presence that shows its beliefs and goals. This will bring in a bigger audience and make it easier for people to talk to each other.

Also, the suggestion stresses how important it is to help workers talk to each other. This can be done by giving workers tools and platforms that make it easy for them to work together and share information. For example, the school could use project management software, apps for team contact, or web systems to make it easier for people to talk to each other. Workers in different places can connect, share ideas, files, and work on projects together in real time thanks to these tools. By supporting these kinds of communication tools, the organization can improve teamwork, increase productivity, and make the workplace more united.

Along with improving how people talk to each other inside the company, the suggestion stresses the need for an organized email system. Setting up an organization-specific email for all business interactions makes sure that everything is consistent, professional, and easy to find. This email should be used for both internal communication among workers and outward contact with clients, partners, and other parties. By switching to an organization-wide email system, the school can make it easier for people to talk to each other, keep track of information better, and make all encounters more professional.

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