

Role of Information and Communications Technologies in Teaching and Learning in Tertiary Institutions in Nairobi, Kenya

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Abstract: Information and communications technologies (ICTs) have the potential to widen access to educational resources. They can also improve quality of teaching and learning and build a well-established knowledge society. The study explored how ICTs support teaching and learning processes, how lecturers and students make use of the Moodle platform developed for teaching and learning, the factors that affect the effective use of ICTs on teaching and learning, and how effective use of ICTs can be improved in order to enhance teaching and learning in the institution. The study was carried out in a private tertiary institution in Langata, Nairobi County, Kenya. It adopted a qualitative paradigm and used case study in the design. It was anchored on the Constructivism Learning Theory. The study purposively sampled 10 students and 4 staff members. Interview guide and focus group discussion guide were used for data collection. The interviews were transcribed, coded, categorised into themes, interrelated, and interpreted. The study revealed that ICTs enable lecturers and students to access educational resources easily, make teaching and learning interesting and motivating, also promote easy diffusion of information and knowledge. Furthermore, despite the relevance of the Moodle platform developed for teaching and learning in the institution, the platform is rarely used due to technophobic attitude among the lecturers, and the dysfunctional nature of the Moodle platform. To overcome this challenge, the study recommended need for full administrative and technical support so as to enhance quality teaching and learning by the use of ICTs.

Keywords: Role, ICTs, teaching & learning, tertiary institutions, case study, Kenya.

INTRODUCTION

Education is a critical tool for the transformation of the individual and the society. Therefore, the place of information and communications technologies (ICTs) in enhancing teaching and learning in tertiary institutions cannot be downplayed. The 21st century world has become a global village and every nation is injecting novel ideas in the education sector in order to improve the economy. This innovation accrues as a result of the quality of knowledge that the society has delved into in order to come up with a sustainable future in terms of the economy [1]. The need for the acquisition of sustainable knowledge and skills in order to overcome business, political, scientific, technological, health and environmental challenges in the society cannot be over-emphasised.

Tertiary institutions need to focus on relevant skills and knowledge that meet the demands of the 21st century and also prepare students for the acquisition of these skills. One of the basic requirements for education in the future is to prepare learners for participation in a networked, information society in which knowledge

will be the most critical resource for social and economic development. The fast development of technology has led to a widespread use of ICTs in teaching and learning. With regard to this therefore, there is a clarion call for a more qualitative approach to education by the use of ICTs.

Following Punie and Cabrera [2], widespread use of ICTs in the knowledge society generates a need for new digital skills and competences for employment, education and training, self-development, and participation in society. ICTs are really enablers for both innovation and education without which a knowledge society cannot be realised, supported or further developed. This is because the world is in the knowledge society where growth, development and innovation are driven by optimal use of information and information products [3].

Different scholars have come up with varied definitions of ICTs and these definitions are valid in their own dimension. Nevertheless, the United Nations Development Programme (UNDP) [4] defined ICTs as basically information-handling tools- a varied set of

goods, applications and services that are used to produce, store, process, distribute and exchange information. In support of this definition, Tinio [5] opined that ICTs are diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information. He added that these technologies include computers, the Internet, broadcasting technologies; radio and television, and telephony. Furthermore, he expressed that when we talk of ICTs, we refer not only to the latest computer and Internet-based technologies, but also to simple audio visual aids such as the transparency and slides, tape and cassette recorders and radio; video cassettes and television; and film. These older and more familiar technologies are referred to under the collective heading of analogue media while the newer computer and Internet based technologies are called the digital media.

However, for the purpose of this study, ICTs are those new technologies that are employed in education in order to enhance teaching and learning process. Such new educational technologies include presentation software, e-mail, world-wide-web, multi-media, video-conferencing, Moodle and social media, just to mention a few. Valtonen *et al.*, [6], in their study on facing challenges with new teachers' use of ICT in teaching and learning in Finland revealed that in Finnish schools, the use of new technologies motivate both teachers and learners, make teaching and learning interesting and enhance academic performance. In buttressing Valtonen *et al.*'s [6] assertion, Macharia and Pelser [7] looking at key factors that influence the diffusion and infusion of information and communication technologies in Kenyan higher education agreed with other previous studies and stated that ICTs provide the impetus for change from the traditional concepts of teaching and learning, as well as prime motivation behind the change in scholarly and professional activities.

What do ICTs have for us as educators? How do ICTs and knowledge come in to change things in the society? Does the use of ICTs in education bridge the environmental gap in knowledge; that is, put learning in the hands of the user and makes the teacher and the student to be co-learners through expanding educational opportunities? The purpose of this study therefore was to explore how the usage of new technologies; presentation software, Moodle platform, e-mail, world-wide-web, multi-media, videoconferencing, social media, just to mention a few, enhances teaching and learning in a private tertiary institution in Nairobi, County, Kenya

Statement of the Problem

The growth of knowledge societies has placed increasing emphasis on the use of ICTs. However, it is still dominated by the focus on dissemination of information. In our knowledge society today, it is necessary to help students to become knowledgeable as

well as productive members of society, working and participating with others in different groups and communities. Therefore, creating an aligned 21st century teaching and learning that prepares students to triumph in the global skills race is the central economic competitiveness issue for the next decade [1].

ICTs are increasingly being used in schools and educational institutions [8]. These electronic tools allow learning, problem solving and higher order collaborative thinking to take place [9]. Despite the fact that the "past ten years has seen an unprecedented explosion of innovation in ICT" [3], some of our tertiary institutions still lag behind with regard to the effective use of these new technologies in enhancing teaching and learning.

Some related literatures reviewed have confirmed the vital role that ICTs play in the education sector [6, 7]. They approached this using either the quantitative paradigm or mixed methods paradigm. This study therefore contributed by adopting a qualitative paradigm and used case study in the design. Additionally, there was a Moodle platform in the institution which was not very much used. It is against this backdrop that this study used a bounded case to explore the role the use of ICTs plays on teaching and learning in this particular institution and the challenges involved.

Research Questions

The study was guided by following questions:

- How do ICTs support teaching and learning processes in the College?
- How do lecturers and students make use of the Moodle platform developed for teaching and learning in the College?
- What are the factors affecting effective use of ICTs on teaching and learning in the College?
- How can effective use of ICTs be improved in order to enhance teaching and learning in the College?

Significance of the Study

The findings will be an eye-opener to the Ministry of Education, Commission for University Education, the Board of Governors and the Management Board of this institution. This is on the need for teaching and learning that is geared towards constructive learning. That is, problem solving that meets the needs of the 21st century society and the future generation. For lecturers and students, the study will provide a tool for developing their potentials fully and contribute to the positive transformation of the society.

Finally, the society and the future generations will benefit from the sensitivity that these students will apply with regard to contributing towards the

transformation of the society as a result of the acquired sustainable knowledge, skills, values and positive attitudes that meet the 21st century society. The study will complement existing studies, and also contribute positively to theory and field of study.

Scope and Delimitations of the Study

This study therefore explored the use of new technologies in teaching and learning for an enhanced academic performance in a tertiary institution in Nairobi County, Kenya. Its scope was the support teaching and learning gets as a result of the use of ICTs. It also focused on the factors responsible for the effective use of ICTs in the teaching and learning process. It delimited itself to only lecturers and students in the department of education in this institution.

Theoretical Framework of the Study

The study hinged on the constructivism learning theory. Constructivism learning theory has its foundation in Piaget's works on cognitive and developmental and in Bruner's and Vygotsky's interactional and cultural perspectives [10]. Constructivism learning theory is a philosophy which enhances students' logical and conceptual growth. The underlying concept within the constructivism learning theory is the role which experiences or connections with the adjoining atmosphere play in students' education. Constructivism learning theory assumes that the knowledge we acquire about the world is not just a photocopy of the outside world that was put into our heads by some instructional process. Rather, knowledge is actively constructed by the individual, as part of a process of meaning-making, in socially, culturally, historically and politically situated contexts [11].

In a constructivism learning environment, students construct their own knowledge and apply it to new tasks, contexts and situation, integrating the new knowledge into their already existing knowledge structures. Constructivism approaches to learning stress the importance of authentic, challenging projects that include students, teachers and experts in the learning community. Their goal is to create learning communities that are more closely related to the collaborative practice of the real world. In an authentic environment, learners assume the responsibilities of their own learning, they have to develop metacognitive skills to monitor and direct their own learning and performance. When people work collaboratively in an authentic activity, they bring their own framework and perspectives to the activity. But they can see a problem from different perspectives, and are able to negotiate and generate meanings and solution through shared understanding.

Constructivism and new technologies in education are working hand-in-hand in this 21st century knowledge society for a better understanding of the school curriculum. The internet for example which is a

breakthrough in educational technology has built an endless amount of possibilities for teaching and learning. Students now proudly access information easily from the internet through various learning management systems (LMS). This aids in enhancing their knowledge horizon and academic performance.

METHODOLOGY

The study adopted a qualitative paradigm and specifically made use of case study design. The justification for this design was the need for conducting an in-depth study to produce a conclusive finding on the impact and challenges of using ICTs on teaching and learning in a private tertiary institution in Langata, Nairobi County, Kenya. Case study helped to develop an in-depth analysis of the phenomenon [12-15].

The study purposively sampled 14 participants. Homogeneous sampling technique was used to sample 10 students, and criterion sampling technique was used to sample 4 staff members. Interview guide and focus group discussion guide were used for data collection. The reasons for these instruments were to have in-depth data collection involving multiple sources of information so as to ensure that data collected were credible, rich, robust, comprehensive and well developed.

With regard to ethical considerations, the Institution's gate keepers granted permission for data collection. Participants also gave their informed consent. The researchers assured them of confidentiality; also that the data would be solely for academic purpose as stipulated in the purpose of the study. The researchers had a face-to-face interview with the participants. The questions in the interview guide were put in a neutral manner, and the researchers were able to listen attentively to the participants' responses and asked follow-up questions and probes based on the responses. The researchers also keenly observed some lectures in the lecture halls focusing more on the interaction between the lecturers and the students and the learning management systems they were using in the lecture halls.

On data analysis, the data collected were transcribed. Codes from the transcriptions were developed into categories and themes were identified from the categories based on the research questions of the study; then interrelated. The findings were presented in narrative form.

The trustworthiness of the study was ascertained focusing on credibility, transferability, dependability and confirmability [16]. Trustworthiness was established through triangulation; that is, using multiple sources for data collection, through prolonged engagement with the data during analysis, through peer scrutiny and through member checking.

Findings

Role of ICTs in Teaching and Learning Processes in the College

Many of the participants of the study expressed that ICTs enhance learning in the College through fast and speedy sharing of information. They emphasised that the use of teaching facilities such as projectors, laptops and software such as PowerPoint is common place in the institution. They see the internet for example as a very vital tool in teaching and learning in the College. A staff member expressed that:

Through the use of the internet, lecturers and students are able to access a lot of up to date information, most of which is not even available in textbooks in the library. The Wi-Fi spots installed all over the compound are facilitating access to the internet free of charge and therefore enabling anyone with laptop, tablet, smart mobile phone or such kind of gadgets to access the e-resources. (Staff 1, Interview, June 5, 2017)

In support of this assertion, a student records:

ICTs support teaching and learning by providing a wide scope or platform of getting information in different websites. Hence, the students are able to learn from their lecturers and also get the extra information from the ICT sites. This motivates learners in their educational pursuit. (Student 10, FGD, June 12, 2017)

Generally, the study found that ICTs enable lecturers and students to access educational resources easily. They also make teaching and learning interesting and motivating. More so, they promote easy diffusion of information and knowledge.

Use of Moodle Platform in the College

The College has an e-learning Moodle in place that is embedded in the College's website. In this Moodle platform, lecturers are able to easily create and manage a course in entirety. That is, organise course activities on weekly basis, upload reading materials, create and manage assignments, create and manage discussion fora, chats, mark and provide feedback for assignments and grade assignments. One of the participants agreed with this and expressed that:

In the College, the Moodle platform is used by lecturers to upload learning materials; course outlines, notes, PowerPoint, assignments, and videos. It is used as a platform for posting discussion on units covered. It is also used for forum (chatting) discussions. Students also post their assignments on the Moodle platform. (Staff 2, Interview, June 5, 2017)

The Moodle platform allows lecturers and students to learn anywhere, anytime and anyhow and interact freely educationally. It has bridged the gap of restricting learners and lecturers to the walls of the

classroom. It is very beneficial for teaching and learning as a student reiterated:

Students and lecturers make use of the Moodle platform developed for teaching and learning. Most of the students prefer the Moodle platform in the sense that it helps the students to read the lessons even if they are not able to print the work. (Student 1, Interview, June 9, 2017)

Despite the relevance of the Moodle platform in teaching and learning especially in the area of virtual classroom as was expressed by most of the participants, a staff participant had a candid concern. He expressed that: "this platform is rarely used in the College due to technophobia among the lecturers and the dysfunctional nature of the Moodle platform" (Staff 4, Interview, June 7, 2017).

Factors affecting Effective use of ICTs on Teaching and Learning in the College

The study revealed the following as some of the factors that affect the effective use of ICTs on teaching and learning in the College: Low level of ICT skills from both lecturers and students alike, technophobia, and inadequacy and insufficiency of some ICTs facilities. Others were: lack of technical support, low internet speed, high cost in acquiring ICTs facilities. Also, non-innovative nature of some lecturers was another factor that affects the effective use of ICTs in the College.

It is very striking to find that in an institution of higher learning of such nature, there are no enough technical support to keep the ICTs for teaching and learning moving forward. One of the staff members exclaimed:

For ICT to be taken seriously as a learning tool, we need to empower on ICT staff. We currently have one ICT staff with such diverse duties such as; teaching, user support network management, maintenance of computer labs, computer lab administration. All these are just too much for one person. (Staff 3, Interview, June 7, 2017)

In supporting this statement from a staff member, one of the students said that: "In ICT laboratory, there is a shortage of expert people who are available for assisting the students" (Student 8, FGD, June 12, 2017). In general, the study revealed that this leads to inefficiency in that sector and the frequent breakdown of the ICTs facilities because the number of people making use of them is not comparable to the technical support these facilities receive.

Improvement in the use of ICTs in the College

The participants applauded the benefits of ICTs in teaching and learning and mentioned some of the ways of improving the effective use of ICTs in the

College. Some of the ways the study disclosed were: organisation of e-learning Moodle workshop for lecturers and students, provision of sufficient and adequate ICTs facilities, administrative support, integration of ICT within all curricula, and employment of more trained ICT personnel.

The study found that there is need for a leader in the Management Team of the College who has a deep passion and enthusiasm for ICT to push ICT agenda at the management level. Also, to influence decision making process which will help to boost teaching and learning. Most of the participants called for the need of installing projectors, interactive white boards, computers with full internet connections in each lecture hall. This according to them will help them more in their teaching and learning. This concurs with the theory of Constructivism the study anchored on which expressed that in a constructivism learning environment, students construct their own knowledge and apply it to new tasks, contexts and situation, integrating the new knowledge into their already existing knowledge structures.

DISCUSSION OF THE FINDINGS

Investment in ICTs for teaching and learning is always a big boost for the education sector because of its motivating factor and the diffusion of knowledge that accrue from these educational resources. It is worth to mention that part of the drive towards greater use of ICTs in colleges is to modernize education and help students acquire sustainable knowledge and skills that meet the demands of the 21st century.

The study found that ICTs enable lecturers and students to access educational resources easily, make teaching and learning interesting and motivating, also promote easy diffusion of information and knowledge. This finding agrees with the study of Reddi [4] who looked at the role of ICTs in education and development and identified some of the strengths of the ICTs. He noted that ICTs help learners to learn as individuals; that is, individualization of learning, interact freely with the medium of instruction and the content.

Furthermore, ICTs, especially the computer and Internet based can be useful in drill and practice; to help diagnose and solve problems, for accessing information and knowledge about various related themes of the course. In support of this, Kairo, Nyagah and Ngumbi [9] in their study on the use of ICT resources in improving teaching and learning in public primary schools in Gatanga sub County, Kenya concluded that with ICT, teacher and learners are able to research widely and get current information. In addition, the learners are able to share knowledge, have better mastery of the content and can learn at their own pace.

Many institutions of higher learning are now encouraged to develop learning platforms that allow their learners to learn effectively from the comfort of their homes. The Moodle platform for example is a virtual learning environment that helps the learners and their lecturers to interact freely and share knowledge. Despite the relevance of the Moodle platform in teaching and learning especially in the area of virtual classroom, this platform is rarely used in the College due to technophobia among the lecturers and the dysfunctional of the Moodle platform.

From the angle of its relevance in teaching and learning, Wang [17] on his study on “A generic model for guiding the integration of ICT into teaching and learning,” expressed that the Moodle learning environment promotes trainee teachers’ collaborative learning, knowledge construction and social relationship building. It also agrees with the assertion of the students that the learning environment was easy to access and navigate; that they could conveniently download and upload resources. However, they met some technical problems occasionally.

With regard to the Moodle platform rarely used by the lecturers, the study found that it was because of lack of technical know-how on the part of the lecturers. This is in agreement with Odera [18] who in her study on the “Emerging issues in the implementation of computer technology into Kenyan secondary school classrooms” indicated that lack of technology savvy was the second highest obstacle to the integration of computers into teaching. She recommended that teachers need to be trained not only in the personal computing skills, but in the practical application of the skills in teaching and learning.

Low level of ICT skills from both lecturers and students alike, technophobia, inadequacy and insufficiency of some ICTs facilities, lack of technical support, low internet speed, high cost in acquiring ICTs facilities, and non-innovative nature of some lecturers were some of the factors that hinder effective implementation of ICTs in the College. This is actually one of the problems of most colleges in Africa with regard to effective implementation of ICTs in teaching and learning. Butcher [3] agreed with the findings by stating that the concept of digital inclusion is of vital importance in the education sector and certain factors that require consideration include; access to hardware and affordable/reliable internet connections, information literacy, extent of integration of ICT into the social fabric of everyday life, provision of technical and training support and access to compelling applications and content. He further opined that harnessing technologies for education purposes to create blended learning requires continued investment in supporting academics and teachers to create and sustain these new learning environments.

Finally, administrative support cannot be over-emphasised if actually we want a head way in the integration of ICTs in teaching and learning. According to the findings of the study, installing projectors, interactive white boards, and computers with full internet connections in each lecture hall would help improve on the effective use of ICTs in the college and this would equally enhance teaching and learning. These facilities need money and it is through the support of the school administration that these facilities could be available in the College for effective teaching and learning.

Butcher [3] confirmed this by expressing that investing in ICT for learning could be perceived as an additional cost and sustaining meaningful ICT utilization is a problem faced by many institutions, particularly those that rely on donor funding. Odera [18] on her part reported that administrative support is a major factor that determines the use of ICTs in teaching and learning; that the school leadership influences resources allocation, empowers staff and encourages teachers and students to use ICTs in teaching and learning in order to improve the quality of education.

CONCLUSION AND RECOMMENDATIONS

The impact of ICTs on teaching and learning in tertiary institutions here in Kenya cannot be overstressed. This is because ICTs improve and increase the quality, accessibility and cost-efficiency of the delivery of education. ICTs also play vital roles in strengthening accountability systems; e.g. performance of workers can be tracked and enhanced. They also enable information and knowledge to be diffused to the different fabrics of our social life adding value to the development of the society.

In this study, the researchers have been able to focus on how ICTs support teaching and learning processes in the sampled College, how lecturers and students make use of the Moodle platform for teaching and learning, the factors affecting effective use of ICTs, and the ways to improve effective use of ICTs in order to enhance teaching and learning. It has been noted that ICTs offer a lot of opportunities and benefits to the education sector, that the Moodle platform helps lecturers and learners to break the walls of the classroom and get optimal service delivery with regard to quality education. Despite this, there is resistance with regard to the effective implementation of ICTs in teaching and learning due to conservatism on the part of lecturers and lack of administrative and technical support. However, full administrative support, availability and receptive spirit of the lecturers have a lot to offer in the enhancement of the effective use of ICTs in the College.

Drawing from the findings, the researchers make the following recommendations:

- The administration of the College should fully support the ICT department especially in the area of fitting projectors, computers, and interactive boards in every lecture hall.
- The administration should employ more ICT personnel to offer more technical support to the ICT department.
- The administration should organise in-service training for all lecturers on the usage of the Moodle platform and other ICTs facilities for effective teaching and learning.
- Lecturers should be creative in their teaching pedagogy and make use of the learning environment developed for teaching and learning.
- Lecturers should encourage students to use the Moodle platform by posting educational resources to the platform.
- The ICT personnel should update the information on the Moodle platform on regular basis and maintain the ICTs facilities regularly.

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