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Evaluation of Information Communication Technology Competencies for Learning amongst Undergraduate Students' in Kenyan Public Universities

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ABSTRACT
Public universities have invested in Information Communication Technology (ICT) to equip students with the digital skills to enable them to easily access information and support them in the learning process. As such, universities have introduced an ICT introductory course to equip them with the necessary skills to fit in the ICT environment of learning. Unfortunately, there is a huge gap on the expected and actual use of ICTs in learning. Therefore, it is necessary to establish the student's competency levels in ICT, their ability to use ICT in teaching and learning and explore the challenges they face in the use of ICTs. The study adopted a descriptive survey design. It targeted third year undergraduate students who have been in the university long enough to have interacted with ICTs frequently. The study used a questionnaire that had both open and close ended questions. A sample size of 55 students undertaking a Bachelor's Degree in Education in a population of 218 students was identified. The findings indicated that although students undertook a course in Introduction to Computer Applications and appreciated its use in learning, they were not competent enough to make good use of ICTs. The study indicated that students faced challenges such as high internet costs, unreliable internet connectivity, limited technical knowledge and lack of computers among others. The study recommends that universities can partner with internet service providers to enable students to access internet services and acquire personal computers at affordable rates.

Keywords: *Competency, Digital Skills, Access Information, Blended Learning, Students, use, Learning Management System.*

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INTRODUCTION

The use of ICT in learning today is a necessity. Many countries have adopted the use of ICT to equip students with globally competitive skills to fit in the global job markets [1]. Accordingly, Veeraragoo [2] opined that young people are expected to have the mandatory 21st-century competencies; critical thinking, problem-solving, collaboration, creativity and communication. Consequently, universities must support students to make use of ICTs so as to acquire the necessary ICT skills, knowledge to navigate varied ICT platforms and reliable infrastructure [3]. Therefore, all students are expected to adopt the use of technology in their daily learning as they depend on those technologies to access information, access learning materials and, communicate with university management and amongst themselves.

The provision of ICT infrastructure and its availability to the students is one way of ensuring that they become competent in the use of ICTs. Universities have taken the initiative to offer students courses that are tailored to adopt ICT in their daily lives. This has been accelerated by the shift of institutions to adopt a blended form of learning where students are able to practice the use of technology in their daily learning process. However, despite the quantity and quality of technology available in the universities, student's competencies in ICTs are paramount to their success, [4]. Therefore students ought to be competent in handling ICT devices such as computers, be able to navigate through web pages, use printers and connect computer peripherals to transfer information from other ICT tools to computers as well as scanning documents into computers. Additionally, they should be use varied operating systems and manage files and folders. Further, it is important to be competent in the use of application programmes such as word processing, spreadsheets, presentation software, and navigate through databases, [1]. Lastly, they need competency in internet access and use to be able to connect and surf the internet, send and receive e-mail messages with and without attachments, upload, download and save documents and observe legal and ethical use of internet resources and digital information, [5].

The use of ICTs can be quite challenging a time. Though this is not expected to affect students who have gone through a course on the use of ICTs, research has indicated that students are likely to experience conditions which would deter them from achieving their set expectations, [6]. The challenges include limited accessibility to and, lack of personal computers, poor network connection, limited technical support for students, lack of effective training and limited time to practice the use of ICTs for proficiency.

Kenyan universities have adopted the use of Information Communication Technology (ICT) in teaching in one way or another. The effects of COVID-19 led some universities to shift from face to face learning to purely on line teaching. The abrupt change in the teaching methodology led universities to invest heavily in acquisition of ICTs for the new pedagogical approaches, training of lecturers and students in using new technologies and developing teaching materials to fit in the Learning Management System (LMS). This changed the mode of teaching learning from face to face interaction to on line or virtual learning. The decline in the effects of COVID-19 and the opening up of universities has shifted teaching and learning from a purely virtual mode to a blended or hybrid mode where both face to face learning and on line learning are adopted. Therefore there is limited face to face learning as well as some on line teaching learning process undertaken to deliver content of each and every course. This blended mode of learning require the use of ICTs and especially the students to enable them to access information from institutions, access the relevant on line content necessary for teaching learning process and communicate and interact with each other.

The use of ICTs requires skills to navigate through the system to access materials necessary for learning. Thus, the efficacy of on line learning is purely dependent on the competency of the users of ICTs in the instructional process. Intrinsically, competency can be described as the ability and knowledge to carry out prescribed tasks to the required expectations. Thus ICT competency is the aptitude of skills and knowledge to effectively use ICTs to access and disseminate information in different formats, [7]. As such, students ought to have the requisite skills, knowledge and the right attitude to competently utilize ICTs in the teaching learning process. The students competency in relation to this study will be based on the students ability, confidence and comfort to use ICTs to access learning materials. As such, there is need to evaluate students ICT competency so as to determine the significance of the training, their ability to effectively use ICTs in learning and the challenges they experience in the use of ICT for learning. Therefore, this study set out to establish the students competencies in the use of ICTs and explore the challenges they experience in the use of ICTs for learning.

METHODOLOGY

The study adopted a Descriptive Survey Design to establish the undergraduate students ICT competency levels and the challenges they faced in the use of the ICTs in learning. The design was appropriate as the researcher is able to describe the situation as it is as per the students responses which can be easily summarized and inferences made from the sample responses, [8].

The study targeted undergraduate students in the third year of study. These are students who have been in the university long enough to have interacted with ICTs frequently. Also the group is expected to have undertaken the mandatory course of Introduction to Computer Applications. The study population was 218 third year BEd undergraduate students. The sample size of 25% of the study population was deemed adequate. Thus, stratified sampling was adopted where students were grouped into two groups; Bed Arts and Bed Science. Simple random sampling was applied to identify sample size relative to each category. As such, a sample size of 55 respondents was targeted whereby 44 responded.

The researcher used one instrument, a questionnaire that had three sections on; Training, Competency and challenges to students. The questionnaire had both open and close ended questions. The reliability of the instrument was calculated using the Cronbach alpha formula.

RESULTS

Questionnaire response rate

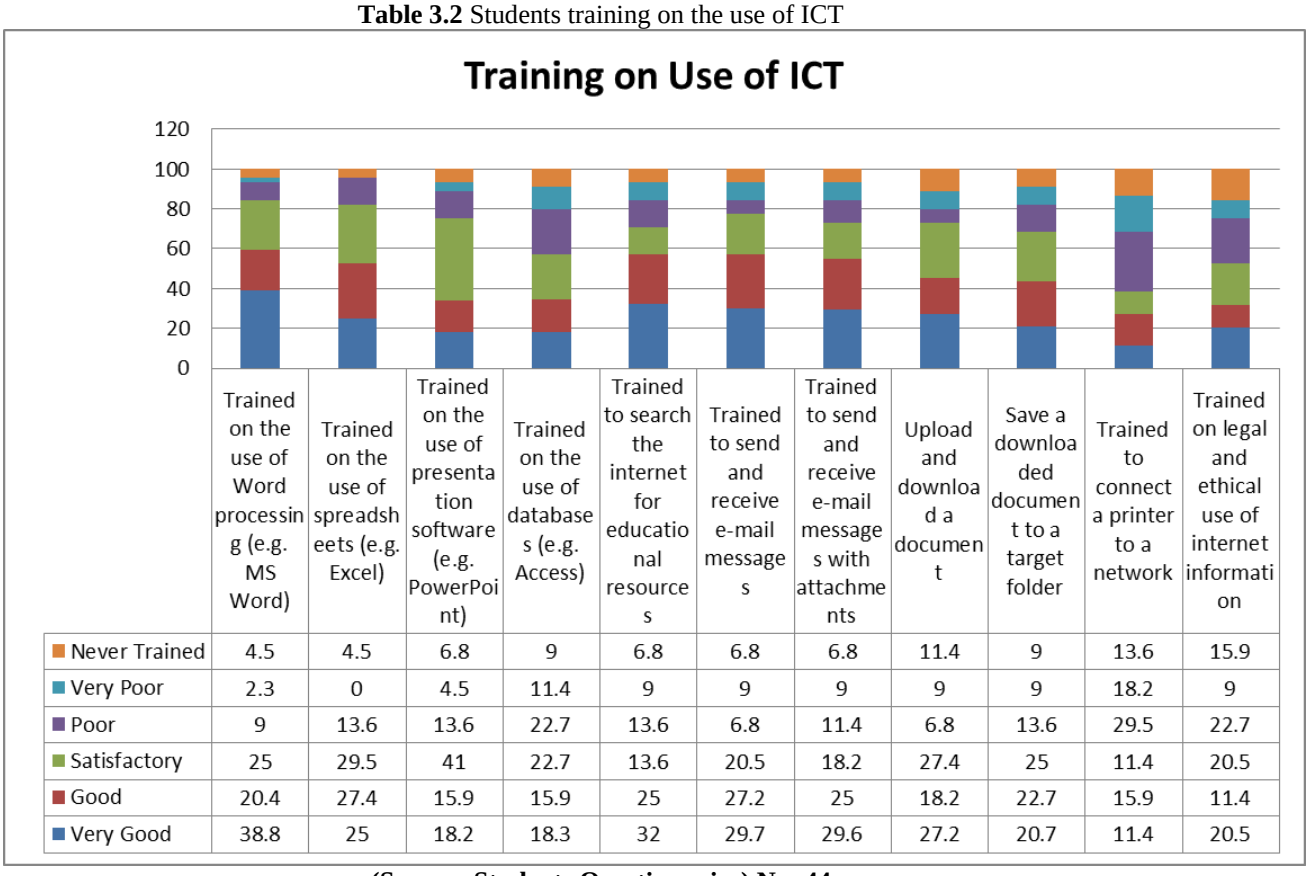
The questionnaires response rate from BEd Science students had a return rate of 70% and the BEd Arts students had 92%. Cumulatively, a return rate of 80% was realized which was statistically good enough for data analysis.

Students training on the use of ICT

The table below indicates that more than 60% of the students are satisfied with the training that they did in the use of ICTs for learning apart from training in the use of database where 43.1% of the students indicated the training as poor, very poor or never trained. Additionally, 60% of the students indicated that the training they

did to enable them to connect a printer to a network was unsatisfactory. This has been summarized in Table 3.2 below

Table 3.2 Students training on the use of ICT



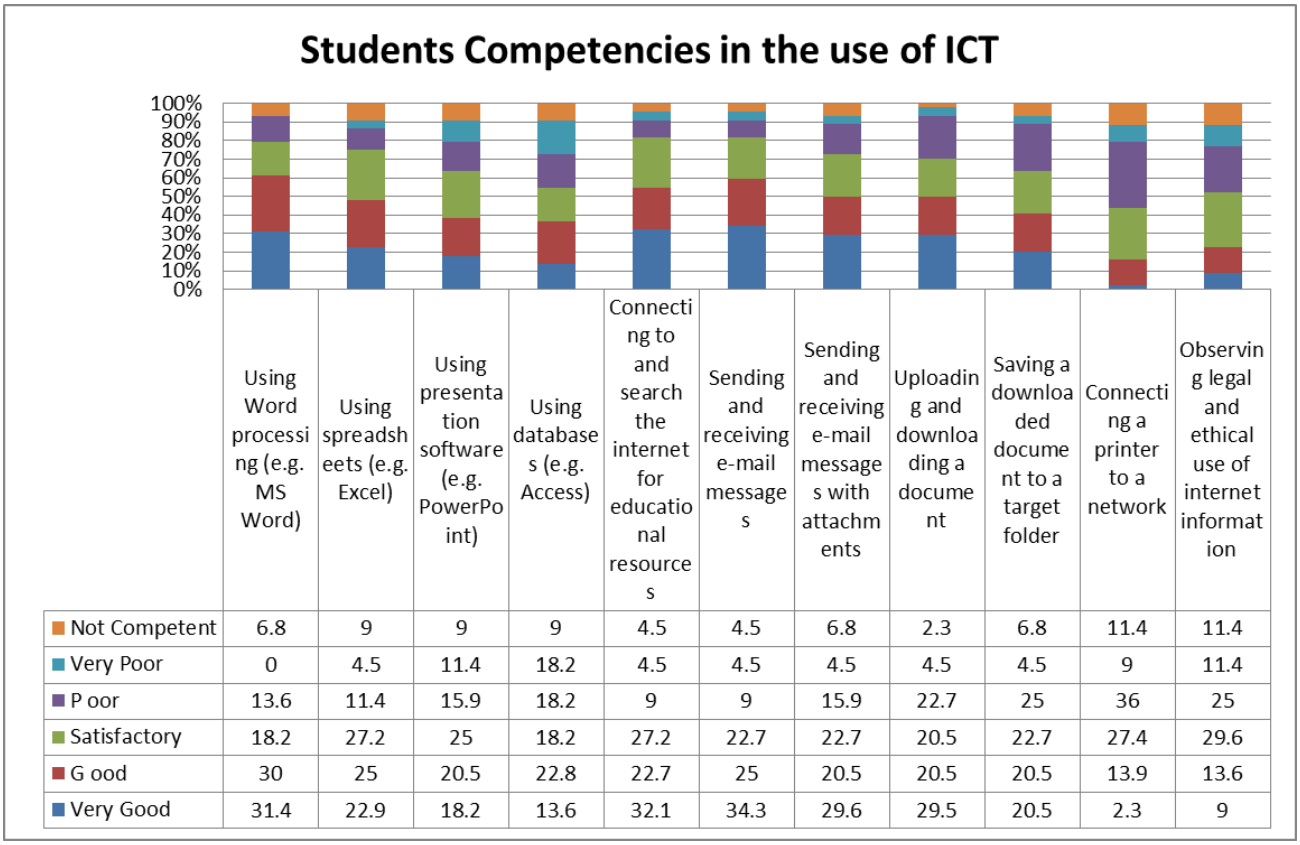
	Trained on the use of Word processing (e.g. MS Word)	Trained on the use of spreadsheets (e.g. Excel)	Trained on the use of presentation software (e.g. PowerPoint)	Trained on the use of databases (e.g. Access)	Trained to search the internet for educational resources	Trained to send and receive e-mail messages	Trained to send and receive e-mail messages with attachments	Upload and download a document	Save a downloaded document to a target folder	Trained to connect a printer to a network	Trained on legal and ethical use of internet information
Never Trained	4.5	4.5	6.8	9	6.8	6.8	6.8	11.4	9	13.6	15.9
Very Poor	2.3	0	4.5	11.4	9	9	9	9	9	18.2	9
Poor	9	13.6	13.6	22.7	13.6	6.8	11.4	6.8	13.6	29.5	22.7
Satisfactory	25	29.5	41	22.7	13.6	20.5	18.2	27.4	25	11.4	20.5
Good	20.4	27.4	15.9	15.9	25	27.2	25	18.2	22.7	15.9	11.4
Very Good	38.8	25	18.2	18.3	32	29.7	29.6	27.2	20.7	11.4	20.5

(Source: Students Questionnaire) N = 44

Students Competencies in the use of ICT

Training students to acquire a skill is effective if only a learner can put the skill learnt into practice. Therefore, it was necessary to establish if the students were competent in the areas that they were trained in. As such, from the table below, it is very clear that quite a significant number of students are not competent in almost half on the areas that they were trained in. It is notable that 56.4% of the students are not able to connect a printer to a network, 47.8% are not able to observe legal and ethical use of internet while 45.8% cannot use database. Also, 36.3% of the students are not competent in the use of presentation software. Table 3.3 below indicates the students competencies.

Table 3.3 Students Competencies in the use of ICT



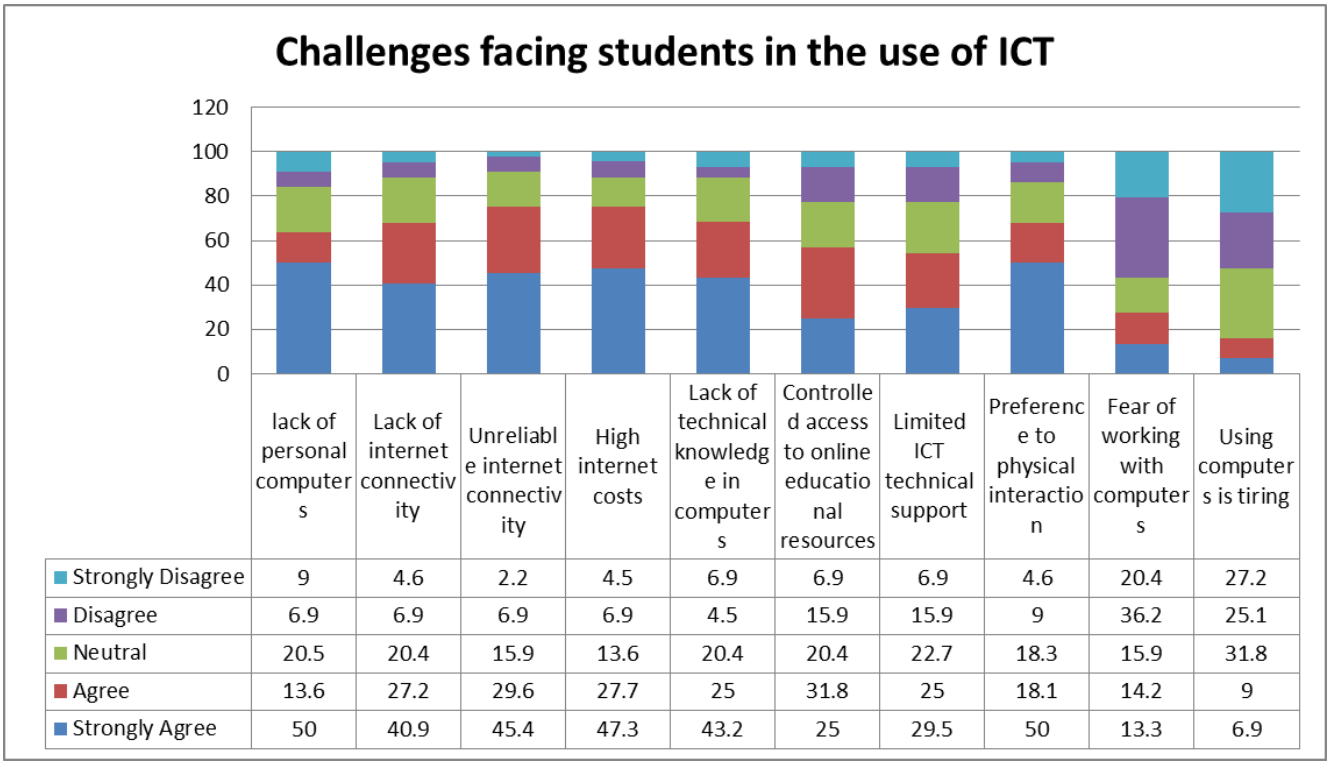
	Using Word processing (e.g. MS Word)	Using spreadsheets (e.g. Excel)	Using presentation software (e.g. PowerPoint)	Using databases (e.g. Access)	Connecting to and search the internet for educational resources	Sending and receiving e-mail messages	Sending and receiving e-mail messages with attachments	Uploading and downloading a document	Saving a downloaded document to a target folder	Connecting a printer to a network	Observing legal and ethical use of internet information
Not Competent	6.8	9	9	9	4.5	4.5	6.8	2.3	6.8	11.4	11.4
Very Poor	0	4.5	11.4	18.2	4.5	4.5	4.5	4.5	4.5	9	11.4
P oor	13.6	11.4	15.9	18.2	9	9	15.9	22.7	25	36	25
Satisfactory	18.2	27.2	25	18.2	27.2	22.7	22.7	20.5	22.7	27.4	29.6
G ood	30	25	20.5	22.8	22.7	25	20.5	20.5	20.5	13.9	13.6
Very Good	31.4	22.9	18.2	13.6	32.1	34.3	29.6	29.5	20.5	2.3	9

(Source: Students Questionnaire) N = 44

Challenges facing students in the use of ICT

Although students were trained and quite a number are competent on the use of ICT, their participation in on line activities have been limited by a number of challenges. Quite notable ones include; high internet costs and unreliable internet connectivity are the major challenges affecting students at 75%. Secondly, students are limited in the technical knowledge in the use of ICT at 68.2% while 68.1% prefer physical interaction. Thirdly, 68.1% indicated that lack of internet connectivity is quite a challenge and 63.6% felt challenged as they do not have personal computers to use. Other challenges were in the areas of controls of on line educational resources and limited ICT technical support within the university at 56.8% and 54.5% respectively. This has been illustrated as seen in Table 3.4 below

Table 3.4 Challenges facing students in the use of ICT



	lack of personal computers	Lack of internet connectivity	Unreliable internet connectivity	High internet costs	Lack of technical knowledge in computers	Controlled access to online educational resources	Limited ICT technical support	Preference to physical interaction	Fear of working with computers	Using computers is tiring
Strongly Disagree	9	4.6	2.2	4.5	6.9	6.9	6.9	4.6	20.4	27.2
Disagree	6.9	6.9	6.9	6.9	4.5	15.9	15.9	9	36.2	25.1
Neutral	20.5	20.4	15.9	13.6	20.4	20.4	22.7	18.3	15.9	31.8
Agree	13.6	27.2	29.6	27.7	25	31.8	25	18.1	14.2	9
Strongly Agree	50	40.9	45.4	47.3	43.2	25	29.5	50	13.3	6.9

(Source: Students Questionnaire) N = 44

From the tables above, there are indicators that students have been trained in the use of ICT for learning purposes. However, quite a number indicated that the training conducted was not adequate as students indicated that they were not competent enough in five out of the eleven areas (45%) that they were trained in. Further, the students are faced with a number of challenges that also need to be addressed if they are expected to make use of ICTs in their learning process.

DISCUSSIONS

The study intended to establish the university students competencies offered to enable them to use ICT so as to make use of on line learning materials. The study was also to explore the challenges students face in the use of ICTs in learning.

From the study, it was noted that some students were not trained in the use of ICTs although it is mandatory for all students to undertake an Introductory Computer Course in the university to enable them to take part in administrative duties such as course and unit registration, accessing university official communication as well as accessing their academic results. All these require students to be competent in ICTs to navigate through the system for their success. According to Masingila et al.,[9] every student need to acquire 21st-century skills to prepare them to fit in the ICT dominated society.

Also, the study established that a number of students felt that the training offered was poor and in some instances very poor. However, it is encouraging that students felt they were competent in a majority of areas they were trained in apart from connecting a printer to a network. These findings resonate well with literature that ICT competencies are as a result of continuous training and use. However, there is need to continuously train students if they have to be competent enough for maximum use of ICTs so as to assist them to access information, be at par with the rapid technological changes and manage to collaborate and positively contribute to the society [6].

The students highlighted some of the challenges they faced in the use of ICTs. Although some of them such as lack of knowledge, internet and need for technical support are as a result of training which can be handled by the universities, there are other challenges such as personal preferences and lack of personal computers. However, some challenges are beyond institutions such as unreliable internet, high internet tariffs and control of on line educational resources. These problems are as just as they are in all other institutions the world over. For instance, Ogbomo [10] noted that network tariffs and the high cost of computers affected the use of ICTs in Nigeria.

CONCLUSIONS

The findings of this study indicated that the training done was not adequate enough as indicated by the respondents. Secondly, although training was done and concluded, quite a number of students are not competent enough to navigate through the use of ICTs. Thirdly, the challenges experienced by students contribute highly to their use of ICTs for learning.

Thus, the study recommends that institutions ensure that training is more practical based to ensure that every learner is competent enough to use ICTs. Also institutions can partner with internet service providers to ensure students can access internet services at the most affordable rates. The same partnership may be extended to organizations that can sell computers to students at affordable rates.

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