

The Integration of Information and Communication Technology Facilities on Students` Learning and Training in Sierra Leone: A Case Study: Eastern Technical University (ETU-SL)

Ahmed Tejan Jalloh

Lecturer in the Department of Information and Communication Technology (ICT)
Faculty of Engineering and Innovation
Eastern Technical University
Kenema City – Sierra Leone

Abstract

The study investigated the integration of ICT resources on students` learning by taking Eastern Technical University (ETU-SL) as a case study. It sought to establish the relationship between ICT and students` learning particularly looking at the availability, accessibility and user-ability of the ICT (facilities) resources in Eastern Technical University. The study was prompted due to the persistent report that students in Eastern Technical University are getting difficulties in their studies due to limited access and use of ICT resources. It was conducted through cross-sectional survey design; data was collected during the month of December 2018 using questionnaires, interview techniques from a sample of 120 respondents out of a parent population of 1007. In verifying the hypotheses, the researcher used Pearson correlation analysis method to find out whether students` learning was linearly correlated with ICT. The study established that the availability of ICT resources in the Eastern Technical University (ETU-SL) is very inadequate for the students to use. Because of the limited number of functional computers and the computer laboratory, accessibility is time tabled. The research found out that training was limited to certain courses e.g.: introduction to basic concepts of information technology, some application programs notably MS office suits and internet. Contextual training of students on how to use ICT in learning was not in practice. The research concludes that availability, accessibility and user-ability of ICT resources significantly affect students learning in Eastern Technical University (ETU-SL) . Based on the above, the research recommends that there is need for the institution to invest more in computers and related technology. Access to ICT tools should not be limited only in labs and library but expanded through establishment of ICT resource Centre. ICT training should not be limited to MS Office suites but rather aim at training students with the contextual skills to use ICT for their learning.

Keywords ETU-SL, MTHE ICT and Integration

1. Introduction

It is acknowledged that Information and Communication Technologies (ICTs) are revolutionizing the teaching, training and learning process in universities. Museveni (2006) observed that ICT is no longer a matter of choice it is a necessity in today`s world which is driven by technology and knowledge. Many Universities have seen the importance of integrating Information and Communication Technologies (ICTs) in their teaching process as reported by UNDP (2001) that: Across a range of educational applications, ICT is being harnessed to improve the efficiency, accessibility and quality of the learning process in developing countries. According to a report on ICT Education Needs by ICT Consultants (2005), Information and communication technology (ICT) education is relatively new in Sierra Leone Universities. Moreover, it is confirmed that a secretariat has just been established at state house looking into the thorough integration of ICT in every aspect for the development of the country that will be tasked to making sure every institution is connected and provided with ICT facilities for proper and appropriate integration. The ministry of technical and higher education is working relentlessly for this venture to be a success.

1.2 Statement of the Problem

Students` learning remains central in any academic achievement debate. ICTs provide a window of opportunity for educational institutions and other organizations to harness and use technology to complement and support the teaching and learning process. However, despite the enormous advocacy of ICT aided teaching and learning, investment and donation of ICT equipment to Eastern Technical University (ETU-SL) . The institution still

faces the challenges of how to transform students learning process to provide students with the skills to function effectively in this dynamic, information rich, and continuously changing environment. The cause of concern is that unless this problem is addressed, integrating ICT in the institution is going to be put to waste and improvement in the quality of teaching and learning is going to be sluggish. This may make the institution fail to achieve its mission and to produce graduates who are ready for the world of work which is increasingly reliant on ICT aided generation and dissemination of knowledge. In view of this discrepancy, there is need for me to examine the particular integration and making the availability, accessibility and user-ability of ICT resources on students learning and training in Eastern Technical University.

1.3 Aim of the Study

The aim of the study is to investigate the perceived integration of the availability, accessibility and user-ability of ICT resources on student's learning and training in Eastern Technical University using cross-sectional survey design with a view to provide relevant recommendations.

1.4. Objectives of the study

- To investigate the availability of ICT tools for use in enhancing teaching, lecturing and learning.
- To investigate the students' attitudes towards the use of ICT resources in teaching and learning.
- To investigate the accessibility of ICT resources to student's learning in Eastern Technical University (ETU-SL)
- To investigate the user-ability of ICT resources on student's learning in the Eastern Technical University (ETU-SL).

1.5. Significance of the study

- ICTs have the potential to play a powerful role in enhancing teaching or lecturing and learning in the institution and preparing students to acquire skills, knowledge and competencies to enable them compete in the emerging global knowledge economy.
- Data and information obtained in this study would hopefully be used to provide various education stakeholders with information that ICT integration would be of great help. The findings could also help the Ministry of Technical and Higher Education (MTHE) in formulation of policies and strategies that can be used to enhance the academic standards in the Eastern Technical University (ETU-SL).
- The study can also help other researchers and educational administrators in strengthening the educational theories behind ICT use in University. The research result of the study may be useful to future researchers with interest in examining further the effects of integrating ICT on students' learning.
- This will lead to the generation of new ideas for the better implementation of ICT into learning process. The study would be of great importance to the policy makers and University administrators of Eastern Technical University helping them to appreciate the usefulness of ICT in learning so as to come up with policies that promote ICT in learning and training of students.

1.6. The study site (Eastern Technical University (ETU-SL), Combema Road, Kenema).

Eastern Technical University is a higher tertiary institution in the Eastern part of Sierra Leone, established purposely to train high school graduate to become professional teachers, among the programs offered are Teachers Certificate (TC), Higher Teachers Certificate both primary and secondary (HTC), Ordinary Diploma (OD) and Higher Diploma (HD). The institution offers as well as degree programs. Most of the instructors or lecturers are Double master holders in various disciplines and a professor as the principal of the institution. The institution has a school of distance education wherein they train teachers who have been in the service but have not acquired any documents for them to be approved, so this school or sector in the institution provides tutoring services to them and awards certificates like Teachers certificate and other ordinary diplomas.

1.7. Scope of the study

The study on the integration of ICT into the training and learning was carried out at Eastern Technical University, Kenema in the Eastern part of Sierra Leone, West Africa. The study specifically sought to determine the integration and focusing on the availability, accessibility and user-ability of ICT resources on Students' learning in the university.

1.8. Limitations of the study

The use of ICT in teaching and learning is considered to be very crucial and therefore little time for the respondents to respond to the questionnaire would make the findings absolutely difficult. The students may give responses that seem not to portray the actual phenomena in the study. The integration of ICTs in the teaching

and learning process will be affected by administration attitude and management and support as well as the infrastructure.

1.9. Basic Assumptions of the study

- The study will be based on the following assumptions:
- The information that will be given by the respondents will be truth and free from bias.
- That there could be a positive impact if ICT is integrated appropriately in the teaching or lecturing, training and learning process of the institution.
- The information that will be given by the respondents will be treated as confidential.

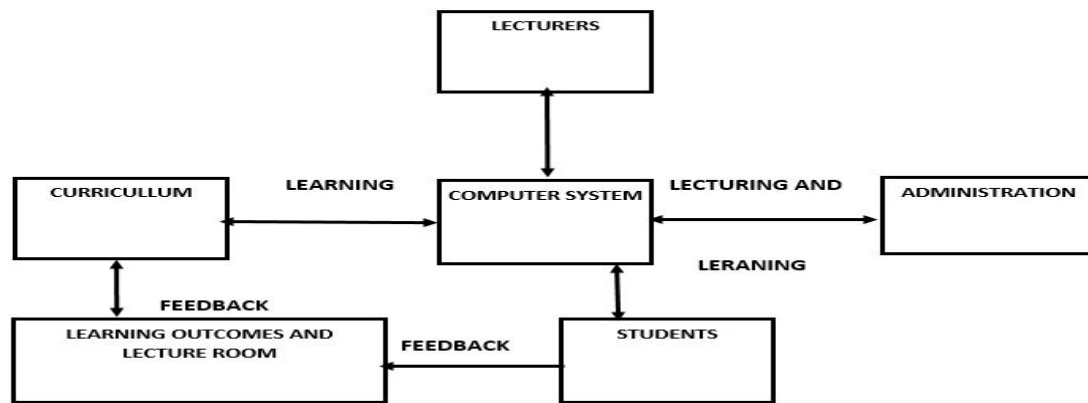
2.0 Literature Review

Integrating ICT into teaching and learning is not a new concept. It may be as old as other technologies such as radios or televisions. However, with the rapid development of emerging technologies, such as web technology, ICT integration has increasingly attracted the attention of educators. Technology should be used not because it is available or it has been shown effective in some cases. It should be used to enable the process and enhance learning because inappropriate use of technology can lead to negative effects Russel, (1999). Integration has a sense of completeness or wholeness (Earle, 2002), by which all essential elements of a system are seamlessly combined together to make a whole. In education, simply handing out to students a collection of websites or CD-ROM programs, taking your students to the computer lab once a week or using an electronic worksheet is not necessarily an ICT integration. In a properly prepared ICT integrated lesson, ICT and other crucial educational components such as content and pedagogy are molded into one entity. As a result, the objective of the lesson may be achieved, but if the ingredients are taken away from the ICT integrated lesson, the quality of the lesson would be somehow be diminished William, (2003). Instead, technology is integrated when it is used in a seamless manner to support and extend curriculum objectives and to engage students in a meaningful learning. It is not something one does separately; it is part of the daily activities taking place in the classroom and campus. Based on the above, within the education sector in Sierra Leone, ICT is defined as the seamless incorporation of technology to support and enhance students' engagement in meaningful learning and for attainment of curriculum objectives. ICT integration is more of a process rather than a product. The computer should be fitted into the curriculum not the curriculum into the computer Earle, (2002). Therefore, effective ICT integration should focus on pedagogy design by justifying how the technology is used. Effective ICT integration into learning process has the potential to engage learners. Additionally, ICT can support various types of interactions in the learning environment: learner – content, learner- learner, learner-teacher and learner-interface. These types of interactions make the learning process more interactive and learners more active and engaged Wong et al, (2006). The term Information Communication Technology (ICT) has had a long history in its evolution process. According to Pelgrum and Law (2003), towards the end of 1980's, the term 'computers' was replaced by ICT (Information Communication Technology). This signified as shift of focus from computing technology to the computers and enhance capability to store and retrieve information. This was followed by the introduction of the term 'ICT' around 1992, when e-mail started to become available to the general public. The concept of Information Communication Technology consists of three words. The term 'Information' refers to any communication or representation of knowledge such as facts, data or opinion in any medium. 'Communication' is an integral part of human existence. It refers to the process of transferring information from a sender to a receiver with the use of a medium in which the Communication Information is understood by both. 'Technology' is the practical form of scientific knowledge or the science of application of knowledge. Therefore, Information Communication Technology (ICTs) are commonly defined in education as 'a diverse set of technological tools and resources used to communicate, create, disseminate, store and manage information' Blurton, (2000). These technologies include computers, the internet, and broadcasting Technologies (Radio and Television), and (Mobile) telephony. Basically ICT is a tool. It can be hardware (such as Computers, Digital cameras), software (such excel, discussion forum) or both.

2.1 Conceptual Frame work

The World Bank (2003 citing Rodriguez & Wilson, 2000) opines that ICT is the set of activities which facilitate by electronic means the processing, transmission and display of information. According to United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP, 2001) ICTs refer to technologies that people use to share, distribute, and gather information and to communicate, through computers and computer networks. In this study ICT is viewed as set of tools that can be used to process, avail and access, information and communication services or products. The services and products may include hardware and software; Internet, telephones/mobile phones, telefax, type writer, calculators, radios, televisions, hydraulic machines used in industries among others. Bakkabulindi (2002; 2000) observes that ICTs are of two major types namely; ICTs for converting or processing data into information such as adding machines, calculators, typewriters and

computers; and ICTs for communication of data and or information from one place to another: These include telegraph, telephone, telefax and computer networks. These gadgets offer the possibility for an interactive approach. Interaction refers to the relation between the user and these gadgets. In this study, ICT further refers to the availability, accessibility and user-ability of these gadgets. Availability implies the presence of these ICT resources, accessibility means the degree to which these ICT resources are easily accessible by as many people as possible. User-ability refers to the capability of the students and teachers to use these resources to achieve specified goals. Learning refers to concerted activity that increases the capacity and willingness of students to acquire and productively apply new knowledge and skills, to grow, mature and to adapt successfully to changes and challenges (Warschaure, 1996). Such learning empowers students to make wise choices, solve problems and break new grounds. Learning certainly includes academic studies and occupational training through high school and beyond. In this study, learning will refer to the process whereby learners acquire and master knowledge and skills imparted in them by the instructor and through interaction with technological tools in relation to their academic performance, work place preparedness and application of the acquired skills and knowledge.



Source: Adapted from Spiro et al., 1992
Figure 1. Conceptual Framework

2.2. Availability of ICT resources and Student’s learning

For teachers and their students, the availability of modern computers, peripherals, networking and resources within an increasingly diverse range of technologies is an essential part of learning and teaching in the 21st century. ICT constitutes an input in the student learning process that should help produce better learning output. The availability of ICT resources can enhance learning by making education less dependent on differing teaching or lecturing quality and by making education available at home throughout the day (Mbwesa, 2002). Bonnet (1997) argues that the use of ICT can positively transmit knowledge to students. Furthermore, the availability and use of ICT can help students exploit enormous possibilities for acquiring information for schooling purposes and can increase learning through communication (Riel, 1998). According to the Swedish National Agency for School Improvement (2008), ICT provide a Positive impact on learning and student performance when it becomes an integrated element in the classroom or lecture room and teaching. Bonnet (1997) argues that the availability of visual digital Technology (such as animation, simulation and moving images) involves students and reinforces Conceptual understanding. ICT integration also encourages development from a lecturer -focused or Teacher-led model to a more student-focused model in which students work together, make their own decisions and take an active role in learning (Swedish National Association for School Improvement, 2008). Davis (2000) asserts that increased availability of ICT is especially useful for students who suffer from learning disabilities since ICT use allows teachers or lecturers to prepare suitable tasks for individual needs and each individual more effectively. However, authors like Cox (1999) believe that allowing certain students to use computers distracts them from focusing on the task at hand. Central to the argument of availability are the issues of whether or not the teachers or lecturers and students have ample and convenient access to computers and their accessories let alone the software that is necessitated in the context of their day-to-day research, collaboration, teaching and student evaluation (Fabry, et al., 1997). Furthermore, students and lecturers should have confidence in these facilities, which is in turn reliant on the facilities’ reliability or degree to which the tutors and students are sure that they will have access to them at all expected times and utilise them predictably to the betterment of their academic work, an issue on which consensus is enormous as is clear from ICT in education scholars like Russell (1997), Ross (1997), Guha (2000), Mumtaz (2000) and Pelgrum (2001). The lesson here is that computers are but a subset of the information communication technology facilities necessitated in universities and that even then, they have to be furnished

with quality accessories, installed with appropriate software and linked to necessary networks to allow access to rich resources beyond the university rather than serve as a resource for minor typesetting and other word processing activities. Whilst the above studies attempted generally to explain how the availability of ICT affects learning, it does not look at how particular ICT tools clearly affects students learning.

2.3 Accessibility of ICT Resources and Students Learning

Effective integration of ICT in any institution would call for a whole institution to be networked to ensure access to multimedia and learning- rich resources via the polytechnic's Intranet and the Internet wherever students and tutors are, in or out of campus. The computer labs and classroom computers need to be sufficient in number to allow ready access by students and staff in most subjects across the campus. A wide range of peripheral and remote working devices, including video-conferencing is to be provided and integrated into the curriculum. Large and small group presentation facilities are readily available (school net Africa, 2004). Despite the above desired situation, most Institutions in Africa face barriers to effective integration of ICT in the teaching and learning process; limited infrastructure in terms of satisfactory physical conditions of laboratories and the subsequent accessibility of the resources (ICT) to the learners (Singh, 1993). Many commercial and academic developers of educational multimedia have focused primarily on information access and presentation (Singh, 1993). However, it is easy to see that multimedia has tremendous potential to enhance the vividness with which information can be presented and ease with which it can be accessed, the main barriers to learning are not generally that appropriate information is difficult to access or badly presented. The problem has more to do with that information (Shank & Kass, 1996). Accessibility and use of ICT allows students to investigate more thoroughly the real world (Reginald Grégoire inc., Bracewell & Laferrière, 1996; Riel, 1998). They can more readily access information sources outside the classroom and can use tools to analyze and interpret such information. Information may be accessed through online systems or through data logging systems (Riel, 1998). The technologies allow them to receive feedback, refine their understanding, build new knowledge and transfer from school to non-school settings (Committee on Developments in the Science of Learning, 2000). In the past this has been difficult to provide in universities or Universities due to logistical constraints and the amount of material to be covered all of which can now be addressed with ICT. What can be learned is broadened and deepened (Réginald Grégoire inc. et al., 1996). Barriers, associated with ICT integration that fall within the physical realm are beyond the direct control of the teacher (Loveless, 1996). These barriers centers around accessibility and infrastructure and include decisions about purchasing, locations of wiring drops, and decisions regarding the placement of computers in centralized labs and placement of computer pods in lecture rooms. Placing computers in centralized labs may provide students with equitable and efficient exposure to technology but severely limit the technology's accessibility for classroom instruction (Loveless, 1996). In addition, physical limitations of the lecture room including size and location of desks, often limit choices of room arrangement and do not provide the space that is necessary to add pods of computers to be used as technology centers. The research agrees with the developers of Makerere University ICT policy 2002, that overall, governments and training institutions seem to recognize the importance of introducing ICT in education, training and learning process. Much as students and staff need training on a continuous basis with modern requisite skills to fully exploit the ICT environment in their different functions (Makerere University ICT Policy, 2002), awareness skills only may not be sufficient enough but rather continuous accessibility to ICT resources would do much better. Continuous access to computers helps lecturers feel more secured in their ICT use during lessons and gives them the courage to experiment more and thus helps them integrate ICT into lessons effectively. Many studies also indicate that the impact on learning will increase over time as lecturers and students become more experienced in continued practice on using computers (Swedish National Association for School Improvement, 2008). Dewey (1989) argues that information that is accessed but never put to use during that process, may be difficult to retrieve and use when need arises in the real world. Equal attention must be paid to ensuring that the technology is actually being used by the target learners and in ways that truly serve their needs (Salomon, 1994). Whereas the above studies looked at the accessibility of ICT resources in institutions of learning, key information in regards to access points like library, laboratory, and halls of residence were not explored and the frequency of access by the students and staff was never looked at.

2.4 User-Ability of ICT Resources and Student's Learning

Teaching or lecturing is becoming one of the most challenging professions in our society where knowledge is expanding rapidly and much of it is available to students as well as teachers at the same time. Modern developments of innovative technologies have provided new possibilities to teaching professions, but at the same time have placed more demands on teachers and students to use these new technologies in the teaching and learning process (Jung, 2005). Owing to the above, there is widespread change across the world to infuse ICT into education. Recent research by British Education Communication and Technology Agency (BECTA)

has highlighted user-ability of ICT resources as one of the five key pillars of successful integration of ICT in schools or Universities and universities (National Council for Curriculum and Assessment UK, 2004). In developed countries, teachers are fully using ICT in all aspects of their professional life to improve their own learning and the learning of their students (Davis, 2000). They use ICT to assist students assess their own learning in completing specific personal projects. It is natural for teachers to collaborate with other colleagues in sharing experiences to solve problems. ICT becomes a stimulus for exciting new teaching and learning opportunities (UNESCO, 2002a). It is the skill and attitude of the students and lecturers that determines the effectiveness of technology integration into the curriculum (Bitner & Bitner, 2002). Once teachers and students developed skills, they could begin to find ways to integrate ICT into the teaching and learning process and demonstrate its use to others. If learning was the impetus that drove the use of technology in the school, teachers and students could be partners in the learning process, altering traditional paradigms of the teacher providing wisdom and the student absorbing knowledge. Motivation to endure the frustration and turmoil of the process of change needed to be intrinsic. Newhouse (2002) and Loveless (2002) notes that ICT if used positively enhances learning processes and outcomes. Findings assert that both the learning environment and curriculum pedagogy and content are central to the effective use of ICT. However, teachers and students need to be confident in their subject knowledge as well as in basic ICT literacy's so that they can effectively integrate ICT into teaching and learning programs. A large number of studies have found that students are often more engaged and motivated to learn when using relevant ICT to support specific intentional learning. What students generally do on the way to becoming computer literate is how to memorize the components of ICT and their functions. It is a mistake to believe that if students can memorize the hardware parts and software then they will understand and be able to use them. Learners do not acquire a repertoire of learning strategies for successfully accomplishing different kinds of learning tasks. Too often, they apply a memorization strategy and when that fails to work they lack alternative strategies to employ. This is especially problematic with ICT, for which memorization strategies simply do not work (Jonassen, 2000). The most pandemic, yet most insidious, cause for underachievement in ICT is lower expectations on the part of lecturers, which reduces expectations of students and the entire educational system. According to Laurillard (1994), there is a persistent discrepancy between the questions asked of evaluation studies in new technology, and the conclusions they come to. In a research into ICT and learning, Laurillard (1994) has repeatedly shown that the context of the use of ICT determines any effects that ICT may have on learning, and that it is extremely difficult to separate the uses that new technologies are put to from the context of their use. This is supported by Joy II and Garcia (2000), who suggest that it is not the sole effect of ICT on learning gains which should be studied, but the combination of ICT use with particular pedagogical practices in enhancing much improved students learning, a point which has been echoed elsewhere in Kennewell (2001). Students also learn more quickly, demonstrates greater retention, and are better motivated to learn when they more often use computers (Richmond, 1997). Richmond continues that since technology use is fully integrated into the larger learning system, it is very difficult to isolate the technology variable and determine whether any observed gains are due to technology use or to some other factor or combination of factors. Whilst these studies identifies the user-ability outcome and benefits, the relationship between the form of technology (ICT) and user skills and state of ICT resources in fostering learning were not fully explored.

3.0 Methodology

This chapter shows how the research was carried out. It discusses the research design, population, sampling strategies, data collection instruments, data quality control, research procedure and the data analysis techniques employed in the study.

3.1 Research Design

The study employed a cross-sectional research design. Cross-sectional design allowed me to study the population at one specific time and the difference between the individual groups within the population to be compared. It also provided for the examination of the co-relationship between ICT and students learning in the context of Eastern Technical University seeking the views of the students. The choice of this design was dependent on the nature of the study variables.

3.2 Population

The study was carried out among undergraduate students of Eastern Technical University to find out or investigate the integration of ICT on their learning. The University has a total number student enrollment of about 1007. The University exercised the highest number of intake this academic year (2018/2019). The students were considered the true representative of the population and they came from the different faculties within the University. Lecturers and administrators also formed part of the study because of their roles in the teaching and learning process in the University.

3.3 Sample Selection

The study was conducted in Eastern Technical University (ETU-SL) . A sample of 120 respondents was targeted with the categories of the respondents that took part in the study.

Table1: Sample selection and categories of respondent involved.

Categories	Number	Sample	Percentage
Students	1007	120	100%

The students were considered the true representative population since they were the target of this investigation.

3.4 Sampling Strategies

Since the study population was big, sampling was used to come up with a small size which was a representative of the study population. The study employed stratified, purposeful and convenient sampling strategies. Stratified sampling was used to identify the stratum in the population. I identified students, lecturers and administrators as the relevant stratum and their actual representation in the population. Sufficient number of subject from each stratum was then selected. Stratified sampling ensured equal representation in an event where one or more strata in the population had a low incidence relative to the other strata. Purposeful sampling was used to acquire the appropriate number of student's representative in the study. The students represented the widest variety of perspective on integration of ICT on the learning and training of Eastern Technical University (ETU-SL) . Convenient sampling was used to identify the lecturers and administrators that formed part of the study. This was because the lecturers and administrators were relatively few in number and most times available.

3.5 Data collection Method

Secondary data was collected by the method of analysis of documents. Such documents included Official records, newspaper accounts, reports, as well as the published data used in the review of outstanding literature. Primary data on the other hand was got directly from the field and collected through observation, self-administered questionnaires, and interviews.

3.5.1 Questionnaire

Questionnaires were designed (Appendices A) such that each question was related to a given research question and the topic. Both closed and open ended questions were used. Open ended questions were to help supplement the information given in the closed ended questions and helped in obtaining more complete data. The questionnaires are preferred because it gives clear and specific responses and enable the respondent to express themselves freely especially lecturers who may not have enough time to attend to personal interview.

3.5.2 Interview Guide

Interview guide was used to collect primary data. Semi-structured face-to-face interview guide were set up with sets of outlined questions about issues to be explored. The outlined questions were meant to guide and make sure that all the relevant topics are covered. Interview guides permitted me to probe and guide the respondents for detailed information and help keep interaction focused. Interviews were suitable for administrators since they had limited time to respond to questionnaires and verbal interaction with them helped in detecting biased answers.

3.5.3 Observation guide

Observation of participants in the context of a natural scene was made. Observation provided Knowledge of the context in which events occurred, and enabled me to see things that participants themselves were not aware of.

3.7 Procedure for Data collection

The researcher acquired a permission from the administration of Eastern Technical University (ETU-SL) . The research sought appointments from the Deans, heads of departments from Eastern Technical University for interviews. Respondents filled the questionnaires while observation conducted. The objectives and purpose of the study was explained to the respondents. A Research assistant was employed to help in the data collection.

3.8 Data collection techniques

The questionnaires were administered to the students during classes and at their free time by the help of the research assistant. Those students who could fill them there and then were welcomed but those who opted for more time were granted a one and half week period to return the filled questionnaires to the research assistant. This technique enabled me to approach many respondents more easily. Interview schedules were set up with administrators who made appointment dates of convenience for the interviews. Guideline questions (Appendix

C) guided the interview process and made sure that all the relevant questions were covered. Through the face to face exchange of words in personal interviews with the deans of faculties, and heads of departments, and the researcher was able to get what was not mentioned by the students. The researcher carried out observation of the institution visiting the five faculties and library monitoring students’ reaction to technology. With the guide of a check list, and could be ticked as well as write down key features of the observation.

3.9 Data Analysis

Data collected was mainly presented by the use of quantitative methods. Data from the open ended questions and interviews were analyzed by indicating the magnitude of responses. Expressions like the bigger number, the least number, to a large extent and to a small extent. Most respondents’ comments and the majority of respondents were applied. In some cases respondents’ comments were directly quoted. The responses from the structured questions were computed into frequency counts, percentages and charts. It was summarized and tabulated for easy presentation, assessment, analysis and interpretation. Data from the open ended questions enriched output from the closed ended questions and information from the documentary sources and interviews helped to bring out concrete evidence in the data analyzed. Hypotheses were then tested with the use of Pearson Correlation techniques.

4.0 Presentation, Analysis and Interpretation of Results

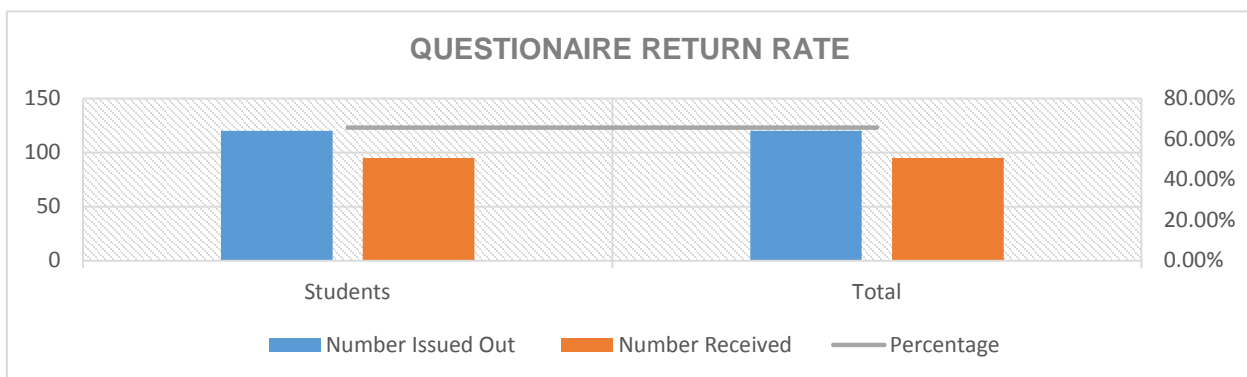
4.1 Introduction

This study aimed at looking into the integration of ICT facilities on students’ learning in Sierra Leon. Case study: Eastern Technical University (ETU-SL) ,Combema road Kenema. The focus was on three independent variables, namely: availability, accessibility and user-ability of ICT resources. In order to accomplish the above, three hypotheses were formulated and the results are presented in this chapter. The chapter is divided into three sections, namely: section one deals with the demographic characteristics of respondents. section two presents the descriptive statistics of the items relating to particular objectives and section three presents the study’s findings according to the hypotheses cited in chapter one. In the study, a total number of 120 students were sampled giving a total of 120 questionnaires that were distributed or administered. A total of 95 (65.7%) fully completed questionnaires were returned of which (34.3%) were not fully answered. This gave a response rate of 65.7% as illustrated in Table 4.1 below:

Table 4.1: Questionnaire return rate

Respondent Category	Number Issued Out	Number Received	Percentage
Students	120	95	65.7%
Total	120	95	65.7%

Figure 3. Depicting Questionnaire return rate



Information or response obtained was analyzed in terms of tables of frequencies, percentages and graphs. Responses from interviews and discussions with administrative staff were used to supplement responses from the closed ended questionnaires. The response rate was considered reasonable because at least more of the targeted respondents participated in the study. The views expressed in the report are therefore representative of the target population.

4.2 Demographic Characteristics

The demographic characteristic illustrates the distribution of respondents’ categories in relation to Age, Gender, Year of study, faculty and course that they offers as described in Table 4.2, and 4.3.

Table 4.2: Distribution of respondents according to Gender, Age and Year of study.

	Attributes	Category	Frequency	Percentage
	Gender	Male	60	63.2%
		Female	35	36.8%
Total		2	95	100.0%
	Age	18-27	58	61.1%
		28-37	35	36.8%
		38-47	2	2.1%
Total		4	95	100%
	Year Of Study	First Year	28	29.5%
		Second Year	24	25.3%
		Third Year	25	26.3%
		Final Year	18	18.9%
Total		4	95	100%
	Faculty/ School/Institute	Business and Management Studies	17	17.9%
		Education	46	48.4%
		Basic and Applied Sciences	18	18.9%
		Engineering	11	11.6%
		School Of Nursing		
		School of Distance Education	3	3.2%
Total		6	95	100%

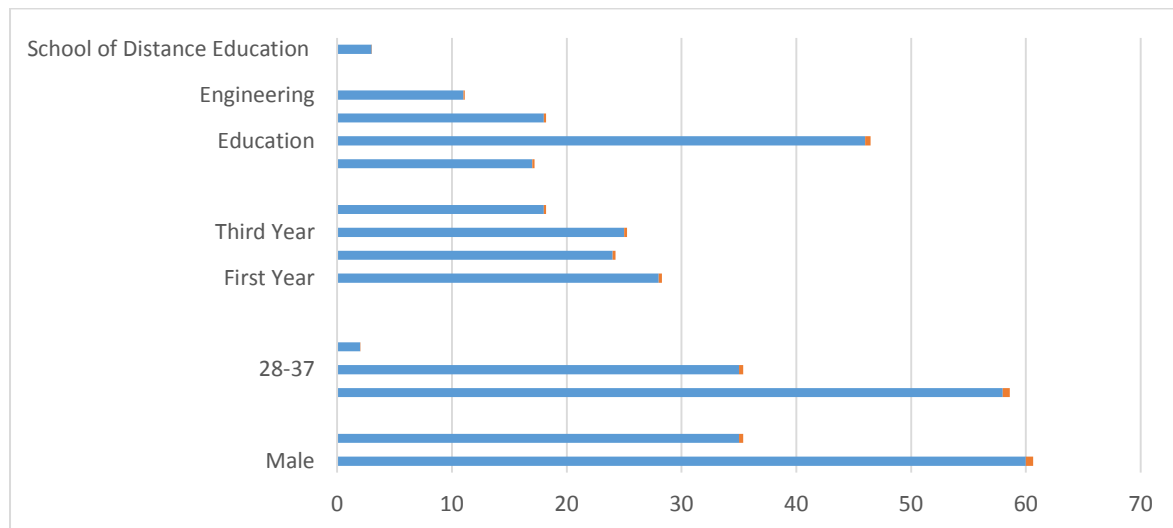


Figure 4.2 Distribution of respondents according to Gender, Age and Year of study

The findings in Table 4.2 shows that most of the respondents (60, 63.2%) were males while only (35, 36.8%) of them were females. This scenario is associated with the fact that, in the University where this study was conducted, female education is still low and this was clearly translating in their enrolment at university or tertiary level. This is further supported by the National Council of Higher Education (NCHE, 2005) which shows higher enrolment among male than female students in Sierra Leone’s public universities. From Table 4.2, it can also be noted that majority of the respondents (61.1%) were aged between 18-27 years, (36.8%) were between 28-37 years and (2.1%) were between 38-47 years respectively. This forms the bulk of students who enroll for weekend programs and they are mainly people of working classes. With regards to year of studies, a total of 28 (29.5%) respondents were in first year, total of 24 (25.3%) were in second year, a total of about 25(26.3%) were in third year and in final year of about 18(18.9%) respondents participated. This shows that the

majority of the respondents were either in the middle or final year of their studies - a stage which is crucial in the preparation for the employment world and also expected to have had sufficient exposure to ICTs at the University.

4.2. Section two: Description of respondents’ opinions in relation to the independent variable.

In this section, descriptions of respondents’ opinions per the items of the questionnaire relating to the objectives of the study are presented. Respondents were requested to react to the items by ticking (checking) the option that best described their opinions on a Likert scale ranging from Strongly Disagree to Strongly Agree or available, not sure and fairly available.

4.2.1. Respondents’ opinion on the availability of ICT resources.

Several items in the questionnaire were presented to the respondents to rate their availability and the findings are shown in Table 4.4:

Table 4.3: Distribution of respondents’ by opinion on the availability of ICT resources

As seen in Table 4.3, computers in classroom seems to be one of the major concerns in Eastern Technical

ICT RESOURCES	STATUS	FREQUENCY	PERCENTAGE
Computers/PC in Lecture Room	Not Sure	72	75.8%
	Fairly Available	10	10.5%
	Available	13	13.7%
Total	3	95	100%
Internet	Not Sure	67	70.5%
	Fairly Available	17	17.9%
	Available	11	11.6%
Total	3	95	100%
Projector	Not Sure	13	13.7%
	Fairly Available	57	60.0%
	Available	25	26.3%
Total	3	95	100%
Computer Laboratory	Not Sure	13	13.7%
	Fairly Available	55	57.9%
	Available	27	28.4%
Total	3	95	100%
Video Conferencing Equipment	Not Sure	69	72.6%
	Fairly Available	11	11.6%
	Available	15	15.8%
Total	3	95	100%
Software	Not Sure	19	20.0%
	Fairly Available	61	64.2%
	Available	15	15.8%
Total	3	95	100%
Television Set	Not Sure	36	37.9%
	Fairly Available	24	25.3%
	Available	35	36.8%
Total	3	95	100%

University (ETU-SL) . This is depicted by majority (75.8%) of respondents who asserted that they were not sure of the presence of Computers /PCs in the lecture room. About (10.5%) responded that PCs are fairly available in the class room, while (13.7%) of the respondents consented to the presence of ICT resources in classroom/lecture rooms. The above findings suggests that the general presence of computers in the lecture rooms in Eastern Technical University is still wanting which directly hinders full integration of ICT in the teaching and learning process as students do not have access to new and different types of productive information. Thus, the process of learning in the class room can become significantly poorer as students do not have access to new and different types of information. The findings from Table 4.3 also reveal that majority (70.5%) of the respondents were not sure of the availability of internet connectivity in the University. About 17.9% of the respondents stated that internet connectivity is fairly available at the University. Only a small

number 11.6% of respondents cited that internet connection were available. Following a discussion with the administrators, it was revealed that the institution has not had efficient internet connection for a very long time majorly because of financial constraint in regards to internet subscription thus the difficulty for the students and lecturers to use the internet to access web based learning resources like online journals and general information for research and creation of knowledge. Table 4.3 also reveal that television set as a tool for learning in the University was lacking with a majority (36,37.9%) of respondents responding that they are not available, about 24 (25.3%) consented it was fairly available while a small number (35,36.8%) of respondents said TV was available. I had discussion with the students and disclosed that the University has only two TV sets on campus and these are mainly used for entertainment rather than for academic purposes. This suggests that, the institution doesn't utilize Television as a learning tool and as such important television based educative programs like national geographical channel, discoveries etc which may be very useful source of information for the students are missed out.

Table 4.3 further show that projectors for presentation of course materials were present in the University as supported by a majority (57, 60.0%) of respondents who acknowledged it is fairly available. About 25 (26.3%) responded that projectors are available while only 13 (13.7%) respondents were not sure. During the process of data collection, I saw very few students using the projector to present their course works. Besides, discussion with the students revealed that the class coordinators are responsible for picking and connecting the projector both for use. The above finding shows that projector for presentation of student's course materials and teaching were relatively available in ETU-SL, besides one projector can serve a whole class at once.

From Table 4.3, majority (55, 57.9%) of the respondents responded that computer laboratory in the University was fairly available, closely supported by 27 (28.4%) respondents who consented that computer laboratory was generally available. A small number (13, 13.7%) of respondents were not sure of the availability of computer laboratory in the institution. In the open ended questionnaire, the students noted that there is a good computer laboratory in the faculty of computer science; they however echoed the difficulty to get easy access to computers for use especially for the non IT classes. They also said that some computers do not have all programs they could use and others are faulty.

Table 4.3 also revealed that video conferencing equipment in the institution is still lacking as supported by a majority of respondents (69, 72.6%) consenting that they are not sure. About 11(11.6%) respondents said it is fairly available, while a small number (15, 15.8%) of respondents said it is available. The discussion with the administrators revealed that "it is true the University does not have and use video conferencing equipment because it called for bigger network band widths which the institution could not afford" said the dean faculty of Education and Humanities.

4.4 Respondents' opinions on accessibility of ICT resources

The respondents were asked how often they access ICT resources in various locations in polytechnic and the results are given in Table 4.4:

Table 4.4. Showing respondents' opinions on ICT facilities accessibility.

ICT resources location category	Response	Frequency	Percentage
Library	Never at all	10	10.5%
	Not Sure	9	9.5%
	Sometimes	57	60.0%
	Always	19	20.0%
Total	4	95	100%
Computer Lab	Never at all	4	4.2%
	Not Sure	9	9.5%
	Sometimes	65	68.4%
	Always	17	17.9%
Total	4	95	100%
Lecture Rooms	Never at all	73	76.8%
	Not Sure	2	2.1%
	Sometimes	11	11.6%
	Always	9	9.5%
Total	4	95	100%

Table 4.4 shows that the library and computer laboratory are the most popular places for students to access ICT for general use notably 17.9% of the students always accessed ICT Resources in the computer laboratory and 68.4% of the respondents accepted that sometimes they do access ICT resources in the computer laboratory. This result is echoed by a majority (60.0%) of respondents responding to sometimes accessing ICT from the library. The discussion with some respondents revealed that this access was not frequent. This was further

confirmed by the Dean Faculty of Education who asserted that access to the computer laboratory for non IT students was dependent on the laboratory being free which is not frequent. Only 9.5% of the respondents were not sure, yet 4.2% responded that they never accessed any kind of ICT resources in the computer laboratory. This suggests that restricted access to ICT facilities in both the Computer laboratory and library tends to deny students exploration of ICT resources for acquisition of information, and knowledge necessary for their academic pursuits. Results from Table 4.4 indicates that only 9.5% of the respondents claimed to always access ICT resources in the lecture rooms, about 11.6% responded that sometimes they access ICT resources in the lecture rooms. A small number (2.1%) of the respondents were not sure of any existence of ICT resources in the lecture rooms, while majority (76.8%) of the respondents responded that they never access any ICT resources in the lecture room. The findings reveal that access to ICT resources in the lecture rooms is still limited and if the lecture room is a typical learning environment, then access to ICT resources should be improved to allow both student`s and lecturer`s access to and production of, resource materials associated with the processes of learning and teaching .

4.2.2.1. Challenges affecting students' accessibility of ICT resources

The respondents were asked to give their views on the challenges affecting students in accessing ICT resources and their response are illustrated in table 4.5 and Figure 2:

Table 4.5 depicting the challenges affecting the accessibility of ICT resources in the University according to the respondents.

Challenges	Responses in percentage
Load Shedding	3%
Poor Management	6%
Unreliable Internet	7%
Limited Time to access the Lab	10%
Financial Constraints	13%
Few ICT resources	61%
Total	100%

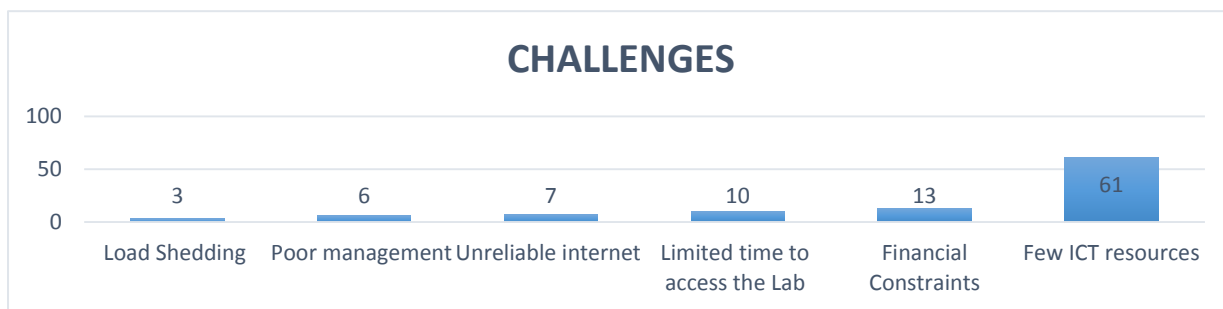


Figure 12. The chart depicts the challenges

From Fig12 and table 4.5 above the findings in the open ended question revealed that few ICT resources in the University remains the most serious challenge affecting accessibility of ICT facilities in the Institution as a majority of respondents (61%) expressed. The respondents stated that students are given limited time to practice since the computer laboratory is always competed for by students from the different faculties. Since most faculties do not have much time allowed in the computer laboratory, priority is always given to the students of computer science and information Technology. This is further supported by 10% of the respondents who consented that limited access to the computer laboratory remains the biggest challenge of accessing ICT in the University. As a result, students continually have limited access and use computers for their academic purposes. The results in figure 12, also revealed that financial constraints on the part of the administration as one of the major challenge to accessibility of ICT resources. One respondent exclaimed that “Eastern Technical University is still struggling, finances cannot allow it to meet all its demands and computers in the lecture rooms are secondary”. Sentiments of this nature have made students not to realize the place of ICT in their education. The discussion with the administrators revealed the need for increment in ICT facilities so as to increase on the

number of technology accessories in the institution. About 7% and 6% of respondent looked at unreliable internet and poor management respectively as challenges affecting accessibility while 3% thinks its power load shedding. The above findings reveal that accessibility of computers still remains a very serious hindrance to the students to engage the various technological tools to improve on their learning and training processes.

4.2.2. User-ability of ICT resources and students learning

Respondents were requested to rate their knowledge and skills in the various ICT tools. In Table 4.6 and their responses are summarized.

Table 4.6: Distribution of respondents by rating of students skills in various ICT tools

ICT Resources	Status	Frequency	Percentage
Word Processing	Very Poor	9	9.5%
	Poor	8	8.4%
	Fair	15	15.8%
	Good	55	57.9%
	Very Good	8	8.4%
Total	5	95	100%
Spread Sheet	Very Poor	10	10.5%
	Poor	11	11.6%
	Fair	12	12.6%
	Good	57	60.0%
	Very Good	5	5.3%
Total	5	95	100%
Presentation	Very Poor	8	8.4%
	Poor	9	9.5%
	Fair	59	62.1%
	Good	11	11.6%
	Very Good	8	8.4%
Total	5	95	100%
Online Instruction Black Board	Very Poor	10	10.5%
	Poor	63	66.3%
	Fair	7	7.4%
	Good	10	10.5%
	Very Good	5	5.3%
Total	5	95	100%
Video Conferencing	Very Poor	12	12.6%
	Poor	27	28.4%
	Fair	23	24.2%
	Good	25	26.3%
	Very Good	8	8.4%
Total	5	95	100%
Publication Software	Very Poor	10	10.5%
	Poor	67	70.5%
	Fair	5	5.3%
	Good	8	8.4%
	Very Good	5	5.3%
Total	5	95	100%
Projectors	Very Poor	9	9.5%
	Poor	13	13.7%

	Fair	62	65.3%
	Good	5	5.3%
	Very Good	6	6.3%
Total	5	95	100%
Internet and Email	Very Poor	4	4.2%
	Poor	52	54.7%
	Fair	8	8.4%
	Good	26	27.4%
	Very Good	5	5.3%
Total	5	95	100%

Results from Table 4.6, show that majority of the respondents (55, 57.9%) emphasized that their skills to use MS word is good. In the same vein, 8 (8.4%) respondents claimed that their skills were very good whereas 15 (15.8%) rated their skills as fair. While 8.4% and 9.5% of respondents rated their skills as being poor and very poor respectively in using MS word. The finding reveals that the students` capabilities to use MS Word for their academic purpose like preparation of course work is relatively good which suggest that ICT can influence learning.

Table 4.6, recorded only 5 (5.3%) respondents who envisaged their skills to use spreadsheets as very good together with 12 (12.6%) who rated their skills as fair. Majority of the respondents (57, 60.0%) rated their skills of using spreadsheets as good. While 11 (11.6%) rated their skills as poor and 10 (10.5%) rated as very poor. During a discussion with some students revealed that the content taught to them is very shallow and even one lecturer consented that “we train them only basic components” which was a further proof of the shallowness of the contents` taught. The findings obtained from Table 4.6 above, show that only 8 (8.4%) of all the respondents` agreed that students` skills to use presentation software in performing learning tasks were very good. A total of 11(11.6%) respondents agreed that their skills were only good. On the other hand, a big number of the respondents totaling to 59 (62.1%) believed that their skills to use presentation software in performing learning tasks were fair. About 9 (9.4 %) rated their skills as poor and 8 (8.4%) rated their skills as very poor in using presentation software. The above findings suggest that the students were fairly capable and skilled in using presentation software like PowerPoint to present their course materials during discussions and lessons. Result from Table 4.6 shows that only 5 (5.3%) respondents rated their skills in online instruction to be very good. About 10 (10.5%) respondents said that their skill in using online instruction is good while the majority of the respondents (63, 66.3%) rated their skills as Poor. A total of 7 (7.4%) rated their skills as fair and 10 (10.5%) agreed that their skills in using online instruction is very poor. The above findings reveal that students are not well equipped to use online instruction like blackboard to share learning materials. Besides, discussion with the students also reveals that no active online instruction system was in place since the University has not had internet connection for a long period of time.

Table 4.6 spells out very few respondents (5.4%) who accepted that they had very good skills of video conferencing. Again a small number (25, 26.3%) of respondents accepted their skills to be good. At least 23 (24.2%) of the respondents rated their skills as fair. Majority of respondents (27, 28.4%) accepted that they had poor skills of video conferencing. And 12 (12.6%) of the respondents agreed that their skills were very poor.

Results from Table 4.6, show that only 5(5.3%) of the total respondents said students` skills to use publication software were very good. About 8 (8.4%) respondents consented that their skills were good. Five (5.3%) rated their skills as fair, yet majority (67, 70.5%) said their skills were poor. A total of 10 (10.5%) respondents said their skills were very poor.

Results from Table 4.6 further reveal that 62 (65.3%) of the students had fair skills to use a projector in presenting their work. At least 9 (9.5%) respondents said their skills to use projectors were very poor and about 13 (13.7%) rated their skills as poor. On the sad side a total of 5 (5.3%) respondents consented having good skills while a small number of respondents (6, 6.3%) said they had very good skills to use projectors. Respondents who agreed of having good, fair and very good skills to use projectors are true because during the data collection I saw several students of Information Technology using it to present their course works. Besides, discussion with the students revealed that the class coordinators or technicians are responsible for picking and connecting the projector both for teachers/lectures and students` use which clearly suggest that the students were fairly knowledgeable and skilled in the use of projectors for learning and training purposes.

Table 4.6, recorded only 4 (4.2%) respondents who agreed that their skills to use Internet and online technology were very poor. About 52 (54.7%) respondents said were poor. A total of (8.4%) rated their skills as fair while at least 27.4% said their skills were good. Few of the respondents (5, 5.3%) agreed that their skills to use internet and online resources were very good.

4.23. Responses on students' learning respondents were asked to give their judgment on the different tasks and below (Table 4.9) is the summary of their responses.

Table 4.7: Distribution of respondents by opinion on performance of learning tasks

Learning Task	Opinion	Frequency	Percentage
I use computer to complete my projects and reports	Strongly Disagree	7	7.4%
	Disagree	6	6.3%
	Don't Know	7	7.4%
	Agree	58	61.1%
	Strongly Agree	17	17.9%
Total	5	95	100%
ICT helped me apply what I have learnt to the real world situation	Strongly Disagree	3	3.2%
	Disagree	2	2.1%
	Don't Know	4	4.2%
	Agree	70	73.7%
	Strongly Agree	16	16.8%
Total	5	95	100%
ICT made me develop interest in the learning content	Strongly Disagree	1	1.1%
	Disagree	4	4.2%
	Don't Know	4	4.2%
	Agree	69	72.6%
	Strongly Agree	17	17.9%
Total	5	95	100%
I use the internet / computer to look for information	Strongly Disagree	1	1.1%
	Disagree	5	5.3%
	Don't Know	6	6.3%
	Agree	65	68.4%
	Strongly Agree	18	18.9%
Total	5	95	100%
I have acquired some of the prerequisite skills for workplace	Strongly Disagree	2	2.1%

preparedness	Disagree	4	4.2%
	Don't Know	6	6.3%
	Agree	4	70.5%
	Strongly Agree	16	16.8%
Total	5	95	100%

Table 4.7 shows that majority (61.1%) disagreed, while about 17 (17.9%) respondents strongly agreed that they use computers to complete course works and projects. A total of 6 (6.3%) and about 7 (7.4%) respondents agreed and strongly disagreed respectively on their use of computers to complete course works and assignments. A small number (7.4%) of respondents were not sure. The finding implies that despite the difficulty in accessing computers, students were putting enough effort to use computers in their learning processes.

From Table 4.7, it can be noticed further that, at least (73.7%) respondent agreed that ICT would help them apply what they have learnt to the real world situation. A total of (16, 16.8%) of respondents strongly agreed. About 2 (2.1%) respondents disagreed and a small number (3, 3.2%) of respondents strongly disagreed.

Table 4.7 further reveals that majority (68.4%) of the respondents agreed that they use the internet to look for information. About 18.9% strongly agreed while a small number (5.3%) disagreed. A total of 1.1% strongly disagreed. The findings suggest that interactive educational technologies help students to learn to organize complex information, recognize patterns, draw inferences, communicate findings and learn better organizational and problem solving skills. Table 4.7 also reveals that majority of the students are not familiar with technology and are usually not able to judge its potential as 70.5% of respondents agreed and 16.8% strongly agreed to not acquiring some of the pre-requisite skills needed for workplace preparation. This is further. The findings suggest that technology provides students with knowledge-based and skillful intellectual work required in industrial, professional and business occupation since a worker's ability to use ICT is a necessity in many occupations.

4.2.4 Responses on where the few available ICT tools are concentrated in the University from the table 4.8 illustrated below explains better

Locations	Opinion	Frequency	Percentage
Library	Never at all	9	9.7%
	Not Sure	10	20.4%
	Sometimes	30	29.4%
	Always	46	50.4%
Total	4	95	100%
Computer Lab	Never at all	4	4.2%
	Not Sure	13	13.7%
	Sometimes	28	29.5%
	Always	50	50.5%
Total	4	95	100%
Lecture Room	Never at all	50	50.6%
	Not Sure	9	9.5%
	Sometimes	15	15.8%
	Always	21	21.1%
Total	4	95	100%

From the analysis extracted it is demonstrated in the table above by respondents that most ICT resources are always concentrated in the University at the library of about 46(50.4%) consented to agree. A good number of

29.4% responded that sometimes. 20.4% and 9.4% of the respondents were not sure and responded that never at all. 50.4% of the respondent responded that ICT resources are always concentrated in the computer Lab but very restricted for Non IT student to access it. A good number responded of about 29.5% responded that sometimes the resources are concentrated at the Computer Lab for learning and training of student at the Eastern Technical University (ETU-SL) . While 4.2% and 13.7% of the respondents were not sure responded that the resources are never at all concentrated at the Computer Lab. A huge of the respondents of about 50.6% and 9.5% responded to have seen ICT resources concentrated in the lecture and they were not sure respectively. Few number of about 21.1% and 15.8% responded that sometimes the resources are concentrated there and others consented always.

5.0 Discussions, Conclusions and Recommendations

5.1 Introduction

The findings reported in chapter four are discussed in relation to research questions earlier formulated and outlined. The chapter is divided into five sections: Introduction, discussion, conclusions and recommendations for improvement in ICT integrations in the teaching and learning process in Eastern Technical University (ETU-SL) . The chapter concludes with recommendations for further research.

5.2 Discussions

The following is the discussion according to the research objectives.

5.1.1. Discussion on the availability of ICT resources on students' learning in lecture rooms at Eastern Technical University (ETU-SL) .

The study established that the availability of the different ICT resources in the University is still very much wanting. About 71% of the respondents were not sure of the presence of computers in the lecture rooms, 57.1% of the respondents stated that they were not sure of internet connection in the University and about 50.3% consented to computer laboratory being fairly available. For proper and thorough integration of ICT into the teaching and learning process, technology gadgets and their accessories should be made available for use to yield the intended benefits. According to Mbwesa (2000), the availability of ICT resources can enhance learning by making education less dependent on differing teacher quality and by making education available at home throughout the day. Furthermore, Riel (1998) stressed that the availability and use of ICT can help students exploit enormous possibilities for acquiring information for schooling purposes and can increase learning through communication. Jonassen (1996) explains that when computers and related technology are made available in schools and institutions, students are compelled to use databases, spreadsheets, multimedia, email, and network search engines to complete their projects, such processes provide greater potential to promote cognitive development. Also according to Jackson, D., B. Edwards and C. Berger (2003), computers raise the potential to equip students with higher-order skills such as inquiry, reasoning, problem solving and decision making abilities, critical and creative thinking and learning how to learn. Research also showed that using computers has a positive effect on students achievement compared to traditional methods (Sterling and Gray, 1991 in Means, Barbra (ED.) (2004). The study further reveals that ICT resources in the University are inadequate. About 65.5% said computers in lecture rooms were inadequate, 60% of the respondents consented that internet and email is inadequate and about 57% looked at computer lab as being inadequate yet according to Jonassen (2001), availability of computers and related technologies without being made adequate in regards to students needs may make no difference in the teaching and learning processes.

Greenleaf (1994) further explained that inadequacy of ICT facilities translates into lack of skills in the use of ICT equipment and software which results in a lack of confidence in utilizing ICT tools among the students. This is consistent with Herman and Joan (1994) who concluded that lack of enough ICT tools to be key inhibitor to the use of ICT in classroom.

5.1.2. Discussion on the accessibility of ICT resources on students' learning.

Learning using ICT is hindered by accessibility to different ICT resources. Bardwell (2002) emphasized the issue of accessibility as a feature of ICT integration into teaching and learning process. The study reveals that, because of the limitation in the numbers of functional computers and laboratories, the computer laboratories are time for accessibility is limited. Lecturers and students from the different faculties are supposed to adhere to time schedules which do not promote accessibility at convenience. Nonetheless, timetabling is aimed at better organization and management of the few resources and most respondents agreed that there is access though insufficient in the University. The study indicates that easy access of ICT facilities was a problem all the time. According to the findings, majority of the students hardly accessed ICT facilities at lecture rooms. Limited time was allocated for students' practice in the computer lab. Besides, the lecturers also compete for facilities in the computer lab with students. However, the study also shows that computer lab and the library remains the two most popular places to access ICT resources. It is worth noting that accessibility to the internet which is one of the major indicators of ICT in learning in an institution is not fully implemented in every sector especially,

lecture rooms and resource center. Alessi and Trollip (2002) precisely hint that the internet will transform many activities including teaching and learning. This makes ICT in learning to manifest and be limited to computer lab and the library only. Learning on the internet conforms to constructivist approach to instruction (Jonassen, 2002) so the limit to places is not an ideal practice. UNESCO (2000b) points out that the success of ICT in teaching and learning process in higher education shall base on the degree with which students and teaching staff access ICT facilities. Findings from respondents echoed limited ICT resources as the biggest challenge affecting students' access to ICT facilities (61%). This was closely followed by financial constraints cited by 13% of the respondents. The discussion with the administrators reveals the need for increment in ICT facilitation so as to increase on the number of technology accessories in the University. Limited time to access the computer lab (10%), Internet connectivity (7%) and power fluctuation (3%) were some of the other reasons cited as affecting students' access to ICT resources.

5.1.3. Discussion on user-ability of ICT resources on students' learning.

According to UNESCO (2002), the safe way to bring computers to institutions is teaching students skills of how to use word processors, spread sheets, data bases and graphic tools. These are the productive tools required later on in life. The developments of appropriate strategies to use these tools productively are through identifying and developing the level of user-ability skills. The study has shown that 41.7% of respondents rated their skill as good in MS Word, about 34% rated as good in Spreadsheets. Although the respondents scored high on ICT user-ability skills, this does not mean that they use ICT effectively. Only what can be inferred is that the respondents rate their skills highly and rating the user skill is not based on any standard measure. It is just a way one perceives his or herself. However, perceiving oneself positively is a very important basis on which to judge the ability to participate effectively in an activity. The study reveals that computer user-ability skills influence learning. Students and lecturers with such skills were seen to be more comfortable in their application of the various computer programs, meaning that those who rated their ICT user-ability skills high also have high skills to gage ICT into learning processes. This was also observed in practice where learners with good user-ability skills were more proficient than their colleagues who had rated themselves low. It was found out that emphasis was put on training students basic concepts of ICT. The introductions were based on students' identification and use of computer terminology appropriately such as hardware and software. Students were trained to identify the main components of the hardware in use (i.e. Central Processing Unit (CPU), input devices, output devices and storage devices); students demonstrated an understanding of the functions of the main components of the hardware in use; identified various peripheral devices (e.g. printers, scanners, plotter, digital camera); and use of email, demonstrated an understanding of the functions of the various peripheral devices which was in agreement with UNESCO's module one for skills in ICT curriculum (UNESCO,2000b). Just like Jonassen, emphasis was put on this section because it formed a rich examinable area for ICT assessment Like Tearle (2003), Drenoyianni (2004) agrees that variations in the ICT skill base of individuals can impede the use of ICT for teaching and learning. Drenoyianni (2004) advocates a phased approach where students are required to complete a mandatory initial introduction to ICT and this in turn leads on to training in the more complex ICT packages. In this way the introduction to ICT is a preparatory stage allowing students to build their ICT confidence where they later learn to utilize ICT in the learning context. Minimum standards of expertise are maintained and standards met but not ending on the Microsoft office suite like what the institution was doing (Mbwesa 2002).The study reveals that limited ICT facilities remained the major factor affecting students' use of ICT resources with a majority (37%) emphasizing it. This was evident where students accessed the computer laboratory in different shifts not for convenience but to share the few computers. This was further supported by 22% of respondents who stressed that they have limited time to access the computer lab. It is agreed with Davis (2003) that the need exists for a policy that will outline minimum standards of ICT competency for students and teachers but that competency must be grounded in use of ICT for learning and this can only be achieved when ICT tools are adequately available (Drenoyianni, 2004). Also there is a need for change in the type of training offered to students. Clearly a basic level of ICT skill must be achieved but this should be followed by an integrated approach ICT resources on students' learning and training. The aim should be for embedding ICT firmly into the teaching and learning process so that it is no longer considered a separate and discrete element (Tearle, 2003; Davis, 2003).

5.2. Conclusion From the discussions, the following conclusions are drawn:

1. The ICT infrastructure of Eastern Technical University is poorly developed, unevenly distributed and inadequate. However, some ICT resources like computer lab, projectors and television sets were considered to be fairly available. Though not fully adequate, the institution recognizes the need for ICT resources in its academic endeavors and as such there is already something to build on.
2. ICT access in the different sector for both lecturers and students was not well attended to. The biggest challenge still affecting easy access to ICT facilities in the University remains the limited number of ICT resources which does not match with the ever increasing student population. But there was at least something in place to build on though still was limited to computers.
3. To a large extent, students' training in ICT in the University was mainly limited to Ms Office suits but not skill acquisition that led to ICT skill transfer to use ICT both for learning and in other settings.

5.3. Recommendations

Base on the findings of this study, in order to integrate ICT on students' training and learning, the following recommendations may be considered.

1. There is need for the University to invest more in computers and related technology as means of not only solving accessibility problem but improving on the presence of the facilities especially computers in the classroom and computer lab. More infrastructures: printers, computers, projectors should be put in place for more practice and utilization.
2. There is a need to maintain internet connection in the University and connect more computers to the internet. The institution should then liberalize accessibility of internet and e-mail in the institution in form of establishment of ICT resource centers where all software can be accessed, students' packages and all versions of technology. All in all, the University shall take time and even not get there to afford a 1:1 ratio of Student - ICT access to facilities thus students should also endeavor to acquire themselves what can be afforded or visit commercial ICT providers like internet café to access ICT facilities.
3. Training in ICT skills should not be limited to MS Office suits; the University should go ahead to integrate the other programs and packages as recommended by UNESCO (2000, a) curriculum for schools. Clearly a basic level of ICT skill must be achieved but this should be followed by an integrated approach to ICT and learning. The aim should be for embedding ICT firmly into the teaching and learning process so that it is no longer considered a separate and discrete element. Such changes may offer the potential to improve on teaching and learning using modern technology.
4. Electrification of lecture rooms and requisition of new heavy duty generator to provide power supply.

5.4 Possible areas for further research

Since ICT is relatively new in the teaching and learning process a lot of research is needed to be carried out. This study has exposed many things that could not all be covered. I, thus recommends the following possible research areas.

1. The link between technology and authentic learning in higher institutions of learning.
2. Students' perception and use of the internet as a hub for learning.
3. The effect of modern technology on students' performance.

References

1. Museveni (2006) observed that ICT is no longer a matter of choice it is a necessity in today's world which is driven by technology and knowledge.
2. UNDP (2001) that: Across a range of educational applications, ICT is being harnessed to improve the efficiency, accessibility and quality of the learning process in developing countries.
3. According to a report on ICT Education Needs by ICT Consultants (2005), Information and communication technology (ICT) education is relatively new in Sierra Leone Universities
4. Russel, (1999) Inappropriate use of technology can lead to negative effects
5. (Earle, 2002) Integration has a sense of completeness or wholeness
6. William, (2003) the ingredients are taken away from the ICT integrated lesson, the quality of the lesson would be somehow be diminished).
7. Earle, (2002). The computer should be fitted into the curriculum not the curriculum into the computer
8. Wong et al, (2006) These types of interactions make the learning process more interactive and learners more active and engaged).
9. Pelgrum and Law (2003), towards the end of 1980's, the term 'computers' was replaced by ICT (Information Communication Technology).

10. Blurton, (2000) Information Communication Technology (ICTs) are commonly defined in education as ‘a diverse set of technological tools and resources used to communicate, create, disseminate, store and manage information’
11. The World Bank (2003 citing Rodriguez & Wilson, 2000) opines that ICT is the set of activities which facilitate by electronic means the processing, transmission and display of information
12. (UNESCAP, 2001) According to United Nations Economic and Social Commission for Asia and the Pacific ICTs refer to technologies that people use to share, distribute, and gather information and to communicate, through computers and computer networks.
13. Bakkabulindi (2002; 2000) observes that ICTs are of two major types namely; ICTs for converting or processing data into information such as adding machines, calculators, typewriters and computers; and ICTs for communication of data and or information from one place to another:
14. (Warschaure, 1996) Learning refers to concerted activity that increases the capacity and willingness of students to acquire and productively apply new knowledge and skills, to grow, mature and to adapt successfully to changes and challenges
15. (Mbwesa, 2002) ICT resources can enhance learning by making education less dependent on differing teaching or lecturing quality and by making education available at home throughout the day).
16. Bonnet (1997) argues that the use of ICT can positively transmit knowledge to students
17. Bonnet (1997) argues that the availability of visual digital Technology (such as animation, simulation and moving images) involves students and reinforces Conceptual understanding.
18. (Swedish National Association for School Improvement, 2008) ICT integration also encourages development from a lecturer -focused or Teacher-led model to a more student-focused model in which students work together, make their own decisions and take an active role in learning
19. Davis (2000) asserts that increased availability of ICT is especially useful for students who suffer from learning disabilities since ICT use allows teachers or lecturers to prepare suitable tasks for individual needs and each individual more effectively
20. Cox (1999) believe that allowing certain students to use computers distracts them from focusing on the task at hand
21. (Fabry, et al., 1997 Central to the argument of availability are the issues of whether or not the teachers or lecturers and students have ample and convenient access to computers and their accessories let alone the software that is necessitated in the context of their day-to-day research, collaboration, teaching and student evaluation
22. Russell (1997), Ross (1997), Guha (2000), Mumtaz (2000) and Pelgrum (2001) students and lecturers should have confidence in these facilities, which is in turn reliant on the facilities’ reliability or degree to which the tutors and students are sure that they will have access to them at all expected times and utilise them predictably to the betterment of their academic work, an issue on which consensus is enormous as is clear from ICT in education scholars like
23. (school net Africa, 2004) Large and small group presentation facilities are readily available
24. (Singh, 1993) Limited infrastructure in terms of satisfactory physical conditions of laboratories and the subsequent accessibility of the resources (ICT) to the learners.
25. (Singh, 1993) Many commercial and academic developers of educational multimedia have focused primarily on information access and presentation).
26. (Shank & Kass, 1996) The problem has more to do with that information
27. (Reginald Grégoire inc., Bracewell & Laferrière, 1996; Riel, 1998 Accessibility and use of ICT allows students to investigate more thoroughly the real world.
28. (Riel, 1998) They can more readily access information sources outside the classroom and can use tools to analyze and interpret such information. Information may be accessed through online systems or through data logging systems