Enhancing the Quality of Leaning and Teaching Via Information Communication and Technology (ICT)

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ABSTRACT

Information and Communication Technology (ICT) has obviously become an important part of our everyday life, ICT has changed the nature of work, skills required and qualifications for today's workers in most fields and professions due to its diffusion in our daily lives. For the quality of learning to be at its optimum, higher educational institution in most developing countries cannot continue to deliver traditional methods of education, without the involvement of ICT in its learning and teaching processes as tools to help merge them into the rapidly evolving information age.

In this paper, a higher institution in the South West region of Nigeria which is one of the leading Universities in the African continent was used in this study to analyze how ICT can transform the learning and teaching environment of the Higher Institution and if introduced to the institution, learning and teaching context will be sustainable. The study was achieved by carrying out a survey that included lecturers of the University and students presently studying in various higher institutions in the UK who at one time had prior educational experience at the University.

General Terms

ICT, Quality, Enhancing

Keywords

ICT, Enhancing, learning, Teaching, sustainable.

1.   INTRODUCTION

One of the major challenges faced by developing country like Nigeria is getting their societies and economy ready for globalization and the revolution of information and communication technology [1]. Information and communication technology (ICT) has transformed the way workers go about their daily endeavors and the skills

required of them in most businesses and working environment. These developments serves as a threat to higher educational institutions in preparing and equipping students with the required skills and knowledge to fit them into today's knowledge based society with accelerated and continuous technological changes [2]; [4].[1] also states that as access to information rapidly continues to evolve, colleges and universities can't continue to provide learning and teaching in the traditional way with little or no use of ICTs as an enhancing tools to transform learning and teaching in its classrooms. [3] also agrees to this view by pointing out that individuals are required to be efficient and effective ICT users to be successful in the continuously evolving and competitive economy of today, that require ICT skills and knowledge. [1] also suggested that higher educational institutions must

encourage and promote "learning to learn", change teaching and learning to meet students' lifelong requirements, equip learners with ICT skills and competence [5], and focus not only on knowledge and skills required in the learners' area of subject [6]. Learning should be made consistent to learner's life-long needs and the outcome of learning must be planned and targeted [7]. [8] and [1] states that the effective introduction of ICT into the learning and teaching context must not be seen as a solution to the shortcomings of education, but it should be aimed at transforming learning and teaching and also preparing students for the knowledge economy and help them to construct a relationship between school experiences and work practices [9]. ICT has the ability to provide new teaching and learning methods and also act as a tools to transform learning and teaching in higher educational institutions. ICTs are also tools that empower teacher's teaching and promote the attainment of the knowledge and skills required by learners in the 21st century [34]. [10] claims that extensive use of ICTs such as computers and internet technologies as a tool to deliver instruction and avail students with access to vast information resources will significantly transform higher education in various ways including student involvement and teachers roles.

1.1   RESEARCH OBJECTIVES

The main objective of this research is to critically analyze how the quality of learning and teaching at the University can be enhanced via Information Communication and Technology (ICT). Also, the study will highlight the impact of ICT on Students and Teacher. It further highlights the impact of ICT in the University's Learning and Teaching. All these will be achieved using both students and teachers with prior experience with the University and also Institutions in developed countries.

1.2   SCOPE OF STUDY

This research covers the preferences of the respondents on how the quality of learning and teaching can be enhanced through ICT. The respondents of this study includes students and lecturers who have had experience at the University and who also have the opportunity of doing so in developed countries where ICT has been effectively used in teaching and learning.

2.   WHAT IS ICT?

Information and Communication Technology (ICT) is an umbrella term which describes technologically advanced communication devices or application of devices such as computers and the Internet, as well as the various services and applications that are associated with them [11]. According to

[12] (2003, p.70) ICT can be defined as one of the driving forces of globalization that encompasses a broad spectrum of communication technologies such as radio, television, film, press, and phones along with the electronic spectrum such as Internet, e-mail, and digital video. [13] defines ICT as the combination of video, computer, and telecommunication technologies in the use of multimedia computers, networks, and services based on them. [14] recognize the fact that ICT can be defined in many ways. One of the definitions used is that ICT is a diverse set of technological tools and resources used to communicate, create, disseminate, store, and manage information [14]. In simple terms, ICT discusses the technology that is used to handle information and aid in communication.

2.1 REVIEW OF ICT IN NIGERIA

Nigeria, like any developing country faces the challenge of preparing its society and economy for globalization and ICT revolution [1]. The major challenge affecting ICT implementation in Nigeria is lack of adequate electricity and telecommunications infrastructure in a significant part of the country [15]. Mobile telecommunication covers 60% of the country's territory while an estimate of 46% of the population can access internet connection from their personal computers at home. Nigeria is a member of a consortium that runs the SAT-3 submarine fiber optic cable [15]. However, there are still many factors to be overcome in order to enhance a higher implementation of ICT, such as empowering gender and sustainable poverty alleviation in Nigeria as suggested by [16]. [12] present their study on the rationale that ICT is gaining ground in almost all areas of life. The study however focuses on how developing nations are embracing the ICT opportunity to improve teaching in health care systems. Mobile phones, personal computers, and Internet hosts are some of the devices used to enhance teaching and learning. However, the study points to inadequate ICT facilities in Nigerian teaching hospitals, with internet and use of personal computers lacking in more effective usage. ICT enhances the effective and efficiency of implementing policies in organizations of various sectors. ICT usage can be used to achieve the laudable provisions and conceptual ideas in the Nigerian Educational Reform Act of 2007 [34]. Nevertheless, [15] observes that there is no specific ICT policy for education in the Federal Republic of Nigeria, despite the fact that several government agencies and private stakeholders have initiated projects and programs that are ICT-driven. For developing countries like Nigeria, ICT is supposed to be seen as a way to merge into a globalizing world.

2.2 ROLES OF ICT IN LEARNING AND TEACHING

As a strategy, ICT can play significant roles in addressing typical issues of learning and teaching but if considerable effort is put into its implementation and in an appropriate context. Substantial studies reveal that there is faster spread of the ICT usage in the educational processes as compared to any other form of curricula change and innovation in the world [8]. [13] review the theoretical approaches and frameworks that are helpful to understand the use of ICT in the formal education sector. Similar to [8] who argues that institution adopts ICT for its possibilities rather than educational needs, [13] argues that the inconsistencies, understanding and ICT's

use in education system must be reconciled so as to benefit from such systems.

According to [17], ICT integration into teaching and learning has attracted a growing effort of many educators in recent years. Based on the context of their systematic study, they suggest that ICT integration in teaching and learning can take place in three different areas-curriculum-the macro, topic-the meso, and lesson- the micro. Integration of ICT in the curriculum supports a more substantial amount of subject content, in the meso; it can be used to cover certain topics areas within the module, while at the lesson level it can be used to explain specific knowledge units. Moreover, ICT has a wide array of potential to promote the learner's motivation, avail the learners with so many information sources, promote collaborative learning, and give teachers more time for classroom facilitation.

[18] also argued that ICTs can also be distinguished into four different usages levels with regards to learning and teaching. These usage categories are: web-supplemented courses- which are the combination of the usual classroom time and activities with ICT tools e.g. online course notes; teacher-student interaction and communication are done online and online resources to support course notes. Web-dependent course-students use the internet for important aspects of their course such as online discussion, online assessment and online collaborative projects and the usual classroom time still remains intact. The other two usage levels are online course and the mixed mode courses.

[19] expounds on the role of ICT in teaching and learning by noting that ICT has removed the idea of distance from distant learning as online education is possible nowadays. [7] also agrees with this by stating that through the flexibilities given by ICT, many learners who previously were unable to participate in educational activities are now finding opportunities to do so, such as workers undertaking courses from their desktops. Muirhead also added that online learning and teaching could promote relevant and consistent interaction among teachers and students compared to what is available in the traditional classrooms. ICT such as the Internet technology provides the joint of exploration of the delivery mechanisms of previous generations by adding stronger collaborative elements to learning.

Learning institutions are the appropriate places to develop crucial competencies, considering that most youngsters at least pass through compulsory education. There are two rationales under which ICT is seen to be of benefit to the education sector. As an educational rationale, ICT is considered as a supportive tool that can enhance learning and teaching whereas as a catalytic rationale, ICT is expected to accelerate the educational innovations [21]. The use of ICT helps students to acquire problem-solving and higher-order thinking skills. Other benefits from ICT usage include fostering collaborative learning, providing flexible learning opportunities, anytime and anywhere learning and offering opportunities arising from cross-cultural use [1].

Various researches recognize that ICT literacy will enhance chances for future employment, considering the ubiquitous nature of technology in business and industries. Students will require the skills and knowledge to handle the new technologies in the work places [22]. ICT also has the potential to help students acquire skills and dispositions in communicating, avail them with teamwork abilities, as well as critical-thinking and problem-solving skills which are

required in today's working environment [23]. Computers and Internet connectivity enhances both communication and interaction within faculties, between faculties, and between peers and students. Moreover, studies reveal that the use of technology motivates the students and energizes the classroom as well as empower the feminine gender [24]; [25].

ICT also enhances responsibility among students especially on learning and reflecting on the information available to them from the diverse sources. Internet is also enabling new local and global education synergies on teaching and learning for enhanced higher education to unlimited audiences, and beyond time and distance boundaries in an easier and more convenient manner [26].

3. RESEARCH METHODOLOGY

3.1 Research Design

A research design is the blueprint that guides the researcher to collect, analyze and interpret observations [27]; [28]. In relation to research, design defines the plan or general strategy that the investigator will follow in order to come up with solutions to the research problem(s). In this study, a quantitative approach was chosen. It was hoped that the quantitative data would enable the researcher to develop knowledge by making use of a survey as suggested by [29]. This was considered appropriate since the researcher sought to explore perceptions of lecturers and students regarding pedagogical adoption of ICTs in a Nigerian context. Since the purpose of the present study was to explore, describe and account for existing conditions relating to the adoption of ICT to enhance learning in a Nigerian universities, a descriptive survey was viewed as suitable because it enable the researcher to get as much detail as possible within a limited time. The survey offered opportunity for the researcher to involve many participants and thereby obtain a wealth of information.

3.2 Research Question

Information and Communication Technology (ICT) is now a vital requirement of the day to day life. ICT has revolutionized the approach to work, and institutions all over the world are striving to adapt these changes for the sake of sustainability in the 21st century. New skills, knowledge, and qualifications are required in today's field and professions as a result of ubiquity in technology [30]. This study generated several questions for the respondents to be able to answer the following main questions in regards to the introduction of ICT into the learning and teaching context of the University.

i   Can ICT transform the present method of learning and teaching at the University?

ii   What Impact will ICT have on learning and teaching at the University?

iii   What are the factors that can hinder the sustainability of ICT in the University?

Having answers to these study questions will enable the researchers know if ICT can actually enhance the quality of teaching and learning, and also know the factors that can hinder the sustainability of ICT in the University.

3.3   STUDY POPULATION

The target population was Nigerian students who have had university educational experience in Nigeria, who are now studying in different universities in the UK pinned down to only those who had studied at the University at some point in their life. In addition, lecturers from different faculty from the University were also targeted but pinned down to those in the Faculty of communication and Information sciences. Procedurally, the choice of random sampling was to minimize on the prejudice that could emerge. Initially, the study targeted fifty (50) students to participate in the study. On the other hand, a range fifty six (56) lecturers from the Faculty of Communication and Information sciences were sample population target.

Table 1: Lecturers Gender and Demographic of Departments

Faculty Departments	Male	Female	Total
Computer Science	10	2	12
Information and Comm Science	4	3	7
Mass Communication	12	4	16
Telecommunication Science	9	7	16
Library Information Science	5	0	5
Total	40	16	56

Table 2: Student's Gender Demographic

Sex	Count
Male	31
Female	19
Total	50

3.4   SAMPLING PROCEDURE AND SAMPLING SIZE

Since the target population was large and the time was limited, it was not feasible to survey the entire population. In statistical studies, samples are often identified; a sample is merely a subset of the target population. Typically, a target population may be quite large. Thus, a complete enumeration may be quite intricate or impractical. This implies that a study targeting a large population has to identify its samples which ought to be manageable. The researcher therefore drew samples for the survey from the population. Sampling is the procedure of selecting a part of a given population to represent the larger group in research in a manner that ensures the conclusions arrived at by the research can be generalized to the entire population [31]. In order to choose the samples, the researcher first determined the sampling frames for the study as well as the actual ample size required. Two samples were drawn from the two populations: students who have had prior educational experience in the University and are now studying in various universities in the UK and the lecturers from the University's Faculty of communication and information sciences. Sampling was then done using simple random sampling procedure, which is a way of selecting individuals to participate in such a way that the chances that each can be picked to participate are the same [33] and [32].

To aptly decide on the sample frame, the study envisioned a participation of 50 students along with 56 lecturers as shown in (Table 1) and (Table 2) respectively. However, the study was limited due to the fact that most students were on holiday. As a result, 30 students as well as 21 lecturers participated in the survey. Thus, simple random sampling ensures adequate representation of the otherwise diminutive population. An appropriate sample was drawn from this population. The respondents who participated, filled and returned the data collection tool were 30 students and 21 lecturers respectively.

4.0 DATA ANALYSIS AND INTERPRETATION

The result gathered from the survey submitted by the respondent is analyzed, described and interpreted to show the impact of ICT on learning and teaching when introduced to the University and what factors can aid and hinder the sustainability of this strategy.

4.1 DEMOGRAPHIC PROFILE OF RESPONDENTS

The importance of the respondent demographic data is that it assists the researcher in understanding the detailed characteristics of the respondent sample. However, since the study is a survey, it is going to be represented using age and gender. Also the lecturers are also categorized based on their departments due to the fact that there are five departments in the faculty of Communication and Information Science.

Table 3: Respondent's Ages

Respondents	Statistics	Age Bracket			Total
		18-25	26-45	46-65	
Lecturer	Count	0	14	7	21
	%	0	66.7	33.3	100
Staff	Count	9	21	0	30
	%	30	70	0	100
Total	Count	9	35	7	51
	%	17.6	68.6	13.7	100

The findings in Table 3 indicate that among the 30 students who participated in the study, 9 (30.0%) were aged between 18 and 25 years while the remaining 21 (70.0%) were aged between 26 and 45 years. None of the students were aged 46 years and above. On the contrary, none of the lecturers was aged between 18 and 25 years. Majority of them (66.7%) were aged between 26 and 45 years while the remaining 33.3% were aged between 46-65 years.

4.2 DEMOGRAPHIC PROFILE ON LECTURER'S DEPARTMENT

The findings in Table 4 indicate that among the 21 lecturers who participated in the study aside from the actual 52 in the faculty of Communication and information sciences, 3 (14.3%) were from Information & communication, Telecommunication sciences and Library and information science departments, while the remaining 4 (19.0%) were from Mass communication department and (38.1%) were from computer science department.

Table 4: Lecture's Departments

Lecturer's Department	Respondent's Count	%
Computer Science	8	38.10
Information and Comm Science	3	14.30
Mass Communication	4	19.00
Telecommunication Sciences	3	14.30
Library and Info Science	3	14.30
Total	21	100

4.3 DEMOGRAPHIC PROFILE ON STUDENT'S DEPARTMENT

Table 5 shows the student's demography by department, Eleven (11) of the student belong to the Computer & Information Technology group, four (4) of the student belong to the Geology & Geosciences group, 2 fall under the law group, a student under the health sciences group and Six (6) student each belong to the management and Engineering group.

Table 5: Student's Departments

Student's Department	Count
Computer and Info Tech	11
Geology and Geosciences	4
Law	2
Health Sciences	1
Management	6
Engineering	6
Total	30

4.4   RESPONDENT'S PRIMARY USE OF ICT

The respondents were asked to indicate how frequently they utilize ICT, they were provided with the options of never, daily, weekly and monthly.

Table 6: Respondent's Frequency on the use of ICT

Respondents	Statistics	Frequency		
		Daily	Weekly	Monthly
Lecturers	Count	21	0	0
	%	100	0	0
Student	Count	27	2	1
	%	90.0	6.67	3.33
Total	Count	48	2	1
	%	94.1	3.9	2.0

The above table shows that a high percentage (94.1%) of the respondent use ICT in their day to day activities. Among the students, 88% indicated that they make use of ICT daily, 8% indicated they used it weekly, while one student (2.2%) indicated the frequency as being at once monthly. This finding suggests that both the students and the lecturers have embraced ICT.

4.5   RESPONDENT'S PURPOSE OF ICT USAGE

In order to determine the level of ICT use for educational purposes, the respondents were asked to indicate the primary purpose for their use of ICT.

Table 7: RESPONDENT'S PURPOSE OF ICT USAGE

Purpose of ICT Use	Statistics	Category of Respondents		Total
		Lecturer	Student	
Personal Communication	Count	11	2	13
	%	52.4	3.8	25.5
Educational Purposes	Count	9	3	12
	%	42.9	11.5	25.5
Both Personal Communication and Education	Count	4	21	25
	%	4.8	80.8	46.8
Other (Work)	Count	0	1	1
	%	0	3.8	2.1
Total	Count	24	27	51
	%	100	100	100

According to the findings in Table 7, it was established that more than half (52.4%) of the sampled Nigerian lecturers use ICT primarily for personal communication while 42.9% use ICT for educational purposes. In contrast, most of the students (80.8%) indicated that they use ICT for both personal and educational purposes, while 11.5% indicated that they use ICT primarily for educational purposes. This finding suggests that ICT is a tool that can be harnessed to enhance teaching and learning process because it implies the readiness levels of both students and lecturers to use ICT for teaching/learning are high.

4.6   RESPONDENT'S FREQUENCY ON USE OF ICT TOOLS

Figure 1 below shows lecturers and student frequency use of ICT tools on daily, weekly and monthly bases
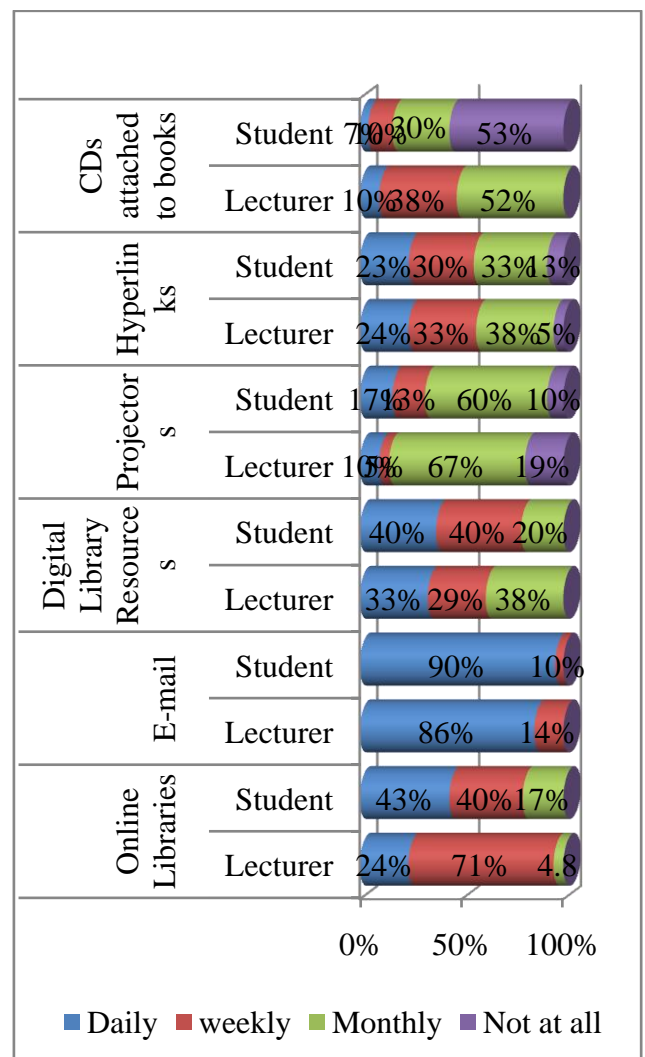
The data in Figure 1 indicates the e-mail is the tool that is most frequently used for educational purposes among both the lecturers and the students. Among the sampled lecturers, 86% answered that they use it daily, while among students the Figure stood at 90%, translating to an average of 88%. The student numbers were even higher with 90% of them indicating that they use e-mail daily and the remaining 10%

indicating that they use it weekly. This indicates that the respondents access the internet frequently, implying that it presents a potential that can be harnessed to enhance teaching and learning processes. The second most frequently used ICTs are online libraries, which at least 40% of students and 33% of the lecturers indicated that they use either daily, with a further 40% of students and 29% of lecturers indicating that they use it on a weekly basis.

In contrast, CDs attached to books are the least used by students. Students indicated that they least use CDs attached to books since only 7% responded that they use it daily while 53% responded that they do not use it at all. As compared to the students, more lecturers use CDs. Thirty-eight point one percent (38%) of the lecturers responded that they use CDs attached to books weekly while another 52% indicated that they use them on a monthly basis.

On another note ICT tools such as multimedia and projectors engage the learners in the learning process and the findings in Figure 1 shows that a higher percentage of the respondent rarely use it, with a average of 64% use them on a monthly bases and approximately 15% of them don't even use it at all.

4.7 CURRENT LEVELS OF PEDAGOGICAL INTEGRATION

Respondents were asked questions that were expected to test the extent to which lecturers make use of ICT in either teaching or learning.
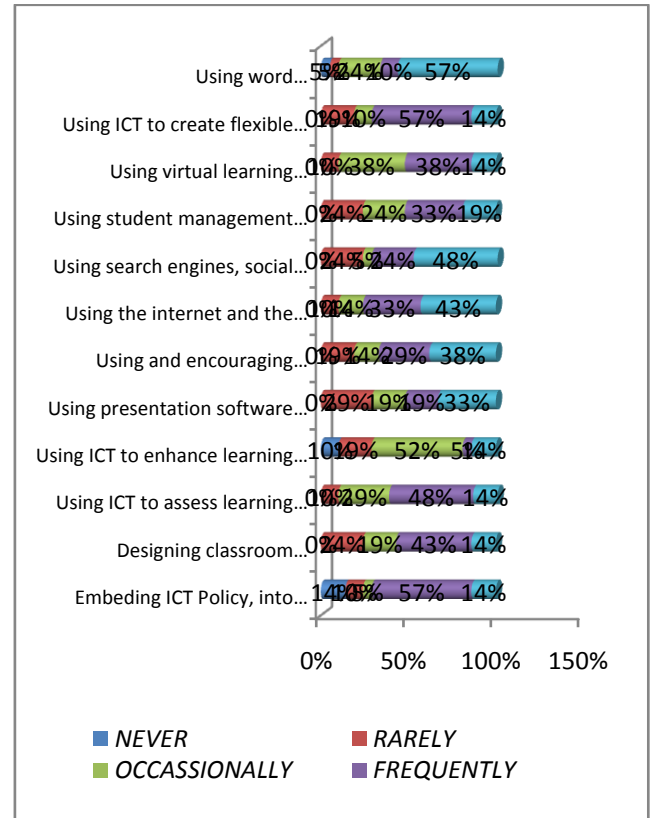

Figure 2: The Frequency with Which ICT Policy is embedded into Classroom Practice to Improve Student Learning Outcomes; (Lectures)

The responses indicate that lecturers frequently embed ICT policy to better student learning outcomes. Fifty-seven percent (57%) of lecturers indicated this while another 14% indicated that this is the case always. In comparison, the use of ICT to create flexible learning environments elicited a similar response. Fifty-seven percent (57%) of lecturers indicated this while another 14% indicated that this is the case always. However, 19% of the lecturers indicated that they rarely use ICT for flexibility reasons.

The most frequently used format of ICT, according to the sampled lecturers, is the use of word processors, presentation software and other digital resources to enhance learners. Fifty-seven (57%) percent of the lecturers indicated the frequency of this as 'always' while another 10% responded with 'frequently'. This is followed by the use of search engines, which obtained a response of 48% (always) and 24% (frequently). The least frequent use is the use of ICT to meet the needs of learners with special education needs (14% 'always' and 5% 'frequently'). However, a remarkable proportion, (52%), uses it occasionally for the same reason.

Additionally, students had a similar response to that of the lecturers. Their responses were represented in Figure 3. However, a contrast amid the respondents is evident. For instance, 57% of the lecturers opinionated on the embedded ICT, that ICT policy in their teaching are to better student learning. The students' response on the same is somewhat diminutive with only 17% asserting that lecturers employed the policies. On a lighter note, however, 17% were of the

opinion that lecturers always embedded ICT policy in their teaching. In comparison, the students' responses on ICT inducing a flexible learning environment, 37% concurred with this assertion. Though proportional to policy embedment, the student frequencies contrasts those exhibited by the lecturers, (57%), on the same. Vital to note is that close to 33% of the students believed ICT integration was intended to enhance flexibility.

The imminent contrast is also clear when it comes to the most used ICT format. From the frequencies, 57% of the lecturers were of the opinion that word processing and software for presentation were the most formats used. The responses of the students, however, indicate that "using virtual learning environments were not the predominant format", with 53% supporting the idea. This was further simulated to the use of ICT "to enhance learning for students with special education needs which had the same score, 53%, indicating 'not used at all'. Overall, majority of the students believe that the cases being studied are rarely used.
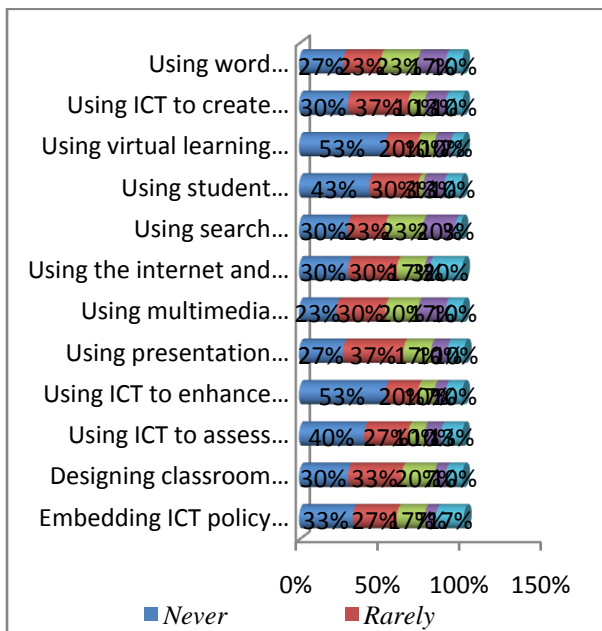

Figure 3: Frequency at which ICT policy is embedded into classroom practice to improve student learning outcomes

4.9 SUSTAINABILITY OF ICT IN LEARNING & TEACHING

Table 8 Sustainability of ICT introduction to a Nigerian higher educational system

Category of Respondents	Statistics	YES	NO	Undecided	Total
Lecturer	Count	20	0	1	21
	%	95.0	0.0	5.0	100
Student	Count	21	3	6	30
	%	70	10	20	100
Total	Count	40	3	7	51
	%	82.5	5	12.5	100

The data in Table 8 indicates that 95% of lecturers and 70% of students believe that the introduction of ICT into the teaching/learning processes in a Nigerian higher education system will be sustainable. This suggests that the Nigerian system of higher education is perceived by its users as being ready to adopt ICTs for teaching/learning.

5.0 RESULT SUMMARY

This chapter presents the survey findings using descriptive statistics and tabulations. The findings reveals a distinctive trend that shows that the lecturers are willing to adopt ICT and the students who have had prior educational experience, they are also of the perception that ICT will have a highly positive impact on the learning and teaching context in the University when integrated. ICT has the ability to transform learning and teaching in a Nigeria university, expose learners to quality and enormous learning resources, encourage learners to take control of their own knowledge by guiding them to the desired knowledge, motivates both learners and teachers alike, and encourages good communication plus collaboration among colleagues. Most importantly the findings also indicates that majority of the lecturers are of the view that ICT can transform learning and teaching in a Nigerian context, its introduction to the University can be sustainable and that ICT enhanced pedagogy is better than the traditional chalk and talk method. The chapter has also shown some of the aiding and hindering factors to ICT sustainability based on the students and lecturer's perspective. Chapter 5 will present a detailed conclusion of the research, recommendation and suggestion for future work.

5.1 RECOMMENDATION

As we have seen in this study the rational for using information and communication technology in today's learning and teaching, the roles, impact and importance of Information and communication technology, It can be argued that ICT has a crucial role to play in equipping both students and teachers as lifelong learners and more so student are provided with skills and knowledge that will make them prevail in the 21st century economy with continuous technological evolution. The University, like most of its other counterpart in developed countries must see ICT has a powerful tool to change the phase of education.

Based on the findings of this study, the following recommendations are deduced for ICT to effectively transform learning and teaching and be sustainable. Adequate attention must be put into the usage of ICTs; so that the technologies are used by the learners for their actual purpose, teachers must be trained, so that they can develop the right attitude, be confident and improve their skills on the use of this technology with their students. Also the Introduction of ICT into the learning and teaching context should not be seen as a solution to the shortfalls of traditional approach of learning and teaching as a whole, but as a tool to help transform learning and teaching. However, The University's administration should also put into consideration the factors that can aiding and hindering the sustainability of ICT, such as inadequate power supply, train teachers to be confident ICT users, adequate support for ICT users and periodic maintenance for ICT equipments to fully harness the full potentials of ICT in regards to learning and teaching.

6.0 CONCLUSION

This study has revealed that the introduction of ICT into the University can transform its teaching and learning, based on the lecturer's belief that ICT has numerous benefits and the potential to transform education in the Nigerian context. However, the study also reveals that for ICT to withstand the test of time, there are aiding and hindering factors that must be put into consideration. In conclusion the University should not see ICT as another tool to aid learning and teaching but as a change catalyst to transform learning and teaching to help produce graduates who are competent, skilled and relevant to the 21st century global market. Hence, the University should harness the full potential of ICT, because ICT will not only be beneficial to the students and lecturers alone, but it will make the institution attain and sustain its educational standard.

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