UNIVERSITI PUTRA MALAYSIA

PREDICTORS OF SECONDARY SCHOOL TEACHERS' USE OF INFORMATION AND COMMUNICATION TECHNOLOGY IN AKWA IBOM STATE, NIGERIA

ARIT UYOUKO UYOUKO

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PREDICTORS OF SECONDARY SCHOOL TEACHERS' USE OF INFORMATION AND COMMUNICATION TECHNOLOGY IN AKWA IBOM STATE, NIGERIA

By

ARIT UYOUKO UYOUKO

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Doctor of Philosophy

January 2015

To my Children

Okpoabasi, Otuanwan, Tenin, Arit-Halima and Uyouko II

The symbol of patience and an infinite ocean of love.

I am truly grateful for all your support, sacrifice, care and most of all your love.

You all have been awesome,

I love you all so much

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

PREDICTORS OF SECONDARY SCHOOL TEACHERS' USE OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN AKWA IBOM STATE, NIGERIA

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January 2015

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This correlational study was to investigate the extent of ICT use and its relationship with attitudes, perceived ease of use, perceived usefulness, facilitating conditions and cultural perception among secondary school teachers in Akwa Ibom State of Nigeria. It also sought to determine the presence and non-presence of the conditions that facilitate ICT use among secondary school teachers. In addition, the study determined if teachers' attitude, perceived ease of use, perceive usefulness, facilitating conditions and cultural perception are predictors of ICT use.

The study added a qualitative element to the design with an interview session. Data were collected from the target population of teachers in all 232 government secondary schools (N=6927) in the three senatorial districts of the state. A stratified random sample of 386 teachers was selected and a set of questionnaires distributed. The reliability testing yielded an acceptable internal consistency of .75, descriptive statistics were employed to describe and summarize the attributes of the collection of data from respondents, Pearson's Product Moment coefficient was to determine the relationship between individual independent variable of the study and the extent of ICT use by teachers. Also, multiple regressions was used to measure the proportion of the variance in ICT use by the independent variables and to identify the relative significance of each in explaining the dependent variable ICT use, the quantitative stage was followed up by an in-depth phone interviews with 10 teachers.

Findings in this study indicated that almost half of the teachers had never used ICT in class to conduct classroom activities, suggesting that teachers' ICT use was not evenly spread across schools, even as teachers highlighted the benefits of ICT use. Teachers held positive attitude towards ICT use and seemed to support and endorse its advantages over the "talk and chalk" method of teaching, though there was lack of ICT availability and accessibility. Findings in this study also indicated that teachers who agree to the presence and adequacy of facilitating conditions will use ICT for teaching and learning. Teachers' cultural perception concern was more on inappropriate postings on some internet sites that they acknowledge were not suitable to the Nigerian culture.

The study results revealed that teachers' responses were relatively mixed in their opinion on cultural perception towards ICT use in Nigerian society and schools. Four variables (attitude, knowledge and skill, cultural perception and resources) were found to be significant predictors of ICT use by teachers. More than half of the variance (61%) in ICT use was explained by the aforesaid variables for teachers' ICT use in teaching and learning.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysis sebagai memenuhi keperluan untuk ijazah Doctor Falsafah

PERAMAL PENGGUNAAN TEKNOLOGI MAKLUMAT DAN KOMUNIKASI DALAM KALANGAN GURU SEKOLAH MENENGAH DI AKWA IBOM STATE, NIGERIA

Oleh

ARIT UYOUKO UYOUKO

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Kajian korelasi ini adalah untuk menyiasat tahap penggunaan TMK dan hubungannya dengan sikap, persepsi kemudahgunaan, persepsi kebergunaan, kondisi pemudah, dan persepsi budaya dalam kalangan guru-guru sekolah menengah di negeri Akwa Ibom, Nigeria. Ia juga bertujuan untuk menentukan kewujudan dan bukan kewujudan kondisi yang memudahkan penggunaan TMK oleh guru-guru sekolah menengah. Sebagai tambahan, kajian ini menentukan samada sikap guru, persepsi kemudahgunaan, persepsi kebergunaan, kondisi pemudah dan persepsi budaya merupakan peramal kepada penggunaan TMK.

Data dikumpul daripada populasi sasaran iaitu guru-guru di 232 buah sekolah menengah kerajaan (N = 6927) dalam tiga buah daerah di negeri ini. Seramai 386 sampel dipilih secara rawak dan satu set soal selidik diedarkan. Analisis secara kuantitatif dijalankan dan diikuti oleh satu temu bual telefon secara mendalam dengan 10 orang guru sebagai sampel kajian.

Dapatan kajian ini menunjukkan bahawa majoriti guru tidak pernah menggunakan TMK di dalam kelas semasa menjalankan aktiviti bilik darjah, menunjukkan bahawa penggunaan TMK guru adalah sederhana, walaupun guru-guru menekankan faedah penggunaan TMK. Guru-guru seolah-olah menyokong penggunaan TMK dan dalam masa sama menyokong kelebihan menggunakan kaedah pengajaran *Talk and Chalk*. Dapatan kajian ini juga menunjukkan bahawa guru yang bersetuju dengan kehadiran dan kecukupan kemudahan keadaan akan

menggunakan TMK untuk pengajaran dan pembelajaran. Guru mengakui bahawa pengetahuan dan kemahiran mereka tidak mencukupi untuk melaksanakan TMK dalam proses pengajaran mereka.

Hasil kajian menunjukkan guru mempunyai sikap positif walaupun terdapat kekurangan dalam ketersediaan dan akses kepada TMK, maklum balas guru agak bercampur-campur persepsi budaya terhadap penggunaan TMK dalam kalangan masyarakat dan sekolah di Nigeria. Empat pembolehubah (sikap, pengetahuan dan kemahiran, persepsi budaya dan sumber) didapati sebagai peramal signifikan terhadap penggunaan TMK. Lebih daripada separuh varians dalam penggunaan TMK telah dijelaskan oleh empat pembolehubah ini untuk penggunaan TMK oleh guru dalam pengajaran dan pembelajaran.

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This thesis submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:

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TABLE OF CONTENT

CHAPTER 4 RESULTS AND INTERPRETATION

CHAPTER

5 SUMMARY, DISCUSSION, CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

AKSG	Akwa Ibom State Government
FRN	Federal Republic of Nigeria
ICT	Information and Communication Technology
IT	Information Technology
ITU	International Tele-communication Union
JSS	Junior Secondary School
MDG	Millennium Development Goals
NECO	National Examination Council
NERDC	Nigerian Educational Research and Development Council
NICTP Policy	National Information and Communication and Technology
NITDA	National Information Technology Development Agency
NPC	National Population Commission
NRI	Networked Readiness Index
PEOU	Perceived Ease of Use
PU	Perceived usefulness
SPSS	Statistical Package for the Social Sciences
TAM	Theory of Technology Acceptance Model
TRA	Theory of Reasoned Action
UBE	Universal Basic Education
UNESCO	United Nations Educational, Scientific and Cultural Organization
WEEC	West African Examination Council
WWW	World Wide Web

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

The increasing use of technologies in all aspects of people's lives makes the functional use of Information and Communication Technology (ICT) a requisite skill that must be acquired in human life (Sulaiman, 2010). ICT adeptness is very important for involvement and engagement in modern society. ICT can be used to discover, present, develop, and explain information. Also, ICT can be used to replicate situations and to resolve issues. ICT are electronic technologies used for information retrieval and storage (Adomi & Kpangban, 2010).

The term Information Technology (IT) was formerly used to mean computer hardware and system but over time it has extended to include software applications, acquisition, dissemination, and storage of information materials. Most IT equipment was initially seen within office areas. In the context of Nigeria IT or Information and Communication Technology (ICT) is seen as a technology where the computer plays a major role. According to Federal Republic of Nigeria's Policy for IT (FRN, 2001) IT or ICT refers to computer hardware, software, and ancillary equipment with similar procedures, services (including support services) and related resources. These equipment include any interconnected system or subsystem of equipment that may be used in automatic acquisition control, switching, display, storage, manipulation, management, transmission, movement, interchange, and or reception of information or data. According to this policy, ICT is the foundation for the nation's development and survival in a hastily dynamic global territory. A statement from the Nigerian National Policy for Information Technology states the need for an IT Policy built on dependable and significant human assets in terms of skills and abilities, facilitates and systematises, accounts for the essential device and means of managing, plans and assesses developmental change in order to achieve sustainable growth, (http://www.nitdu.gov.ng).

Prior to the Nigeria's National Policy for ICT for 2012, the National policy of 1988 and 2001 brought about the introduction of computer education in the national secondary education system. However, the major goal of this new Nigerian National ICT Policy 2012 is to provide a framework for streamlining the ICT sector and enhancing its ability to help address some development and socioeconomic challenges while at the same time facilitating the transformation of Nigeria into a knowledge-based economy. The transformation to a knowledge-based economy requires significant investment in the development of ICT knowledge and skills (NICTP, 2012). The policy underlies a need for a sustained program

to produce a significant number of ICT skilled personnel, integrate ICT into the national education curriculum, train and retrain, as well as retool teachers and facilitators at all levels in the education system to develop their ICT competence.

The World Bank (2007) report emphasised the significant role of the teacher in the effective utilisation of this new global innovation and practice. According to this report, the presence of technology itself does not stimulate significant changes inside a school. Teachers play an important role. Without the active participation of the teacher and staff, most students may lose out and not be able to take full advantage of the potential available to them on their own. Thus, teachers' participation will enable school children to appreciate and use the computer in various aspects of life and subsequently in future employment. The reality of technology and market convergence implies that existing polices relating to the ICT sector in Nigeria are in need of critical review, as most of the objectives in existing polices have been overtaken by worldwide technological advancement and market transformation.

There seems to be an agreement in the literature that the differences observed in several studies conducted between stakeholders in developed countries and developing countries which includes Nigeria, are the lack of exposure to ICT training, development, and experiences in the latter countries (Okhiria, 2007). Etudor-Eyo, Ante, and Ema (2011) who argue for ICT as a facilitating tool and an aid to teaching and learning, posited that the launch of ICT equipment's in secondary schools could heighten learning interest and enhance benefits. Features such as the automatic spelling and grammar function in the Microsoft Word computer system allow teachers and students to spell check for word errors and be presented with the available alternatives in the range of correct words from which they can choose. Additionally, the use of educational software assists students to work without difficulty and makes their activity effortless, while at the same time improves teachers' expertise in the teaching-learning exercise and assist teachers to become more professionally refined (Ibadin, 2008).

Technology in teaching and learning has supported students to become more self-directed in their learning. It has encouraged open learning environments and has also stimulated a greater degree in teacher/student interaction. Positive changes have taken place in the learning setting, brought about by ICT over time as teachers become more competent with technology (Hannafin, Hill, Land, & Lee, 2014). These new teaching technologies offer wide new opportunities for schools to enhance the superiority and productivity.

National education programs have been found to fail in implementing ICT in educational systems because such programs were not supported with educational research and were formulated in non-educational domains (Albirini, 2006). According to Benzie (1995), governments especially in

developing countries (such as Nigeria) have tried to improve their national programs by integrating ICT into their education system. ICT plays a crucial role in information dissemination and equally in the education system. In these informed societies, the stakeholders of educational policy, redesign and reconstruct their educational systems based on new educational paradigms such as constructivist theory were both teachers and students develop the necessary knowledge and skills needed in the digital age.

However, to take advantage of the opportunities offered by ICT, educators and policy makers would need to update the whole school system to render it applicable to present developments (Long, 2005). Similarly, Kalusopa (2005) supports this need based on the absence of a clear national information policy. There is a fragile human capital and a lack of technical structures and facilities which point to the non-effectiveness of ICT use and integration in the society, w which is part of the school system.

Nigeria's academic landscape includes among others the teaching and learning activities, courses and educational programs, teaching methods, research activities, publication and dissemination, library services and information, as well as the management and administration of higher education (Beebe, 2004). Developing countries such as South Africa are similar to Nigeria where the potential of ICT to support pedagogy has yet to be fully realised (Chigona & Chigona, 2010). Attention has now shifted towards policy, research, and the absence of infrastructure and access to technology as it affects the use of ICT in teaching (Koo, 2008).

Grainger and Tolhurst (2005) in their study showed that there are a wide range of factors which influence educators' under-utilization of ICT in teaching. These include school policies, access to resources, quality of software and hardware, ease of use, background in formal ICT training, motivation to change, sustaining and sharing responsibility among colleagues in their school and an obligation to professional learning. It is believed that capabilities and barriers determine the efficacy (actual and perceived) of an individual taking particular actions. For many teachers who may have the capability to use ICT, the lack of self-confidence and experience in using the technology is noted to be a strong limiting factor to its use (Sadaf, Newby & Ertmer, 2012).

One of the goals for integrating technology (ICT) in education is to further enhance teaching and learning approaches which in turn improves the standard of education (Higgins, 2003). Teachers' use of ICT has been influenced by many interrelated factors. According to Player-Koro (2012) educational technology research classifies factors that facilitate (or act as barriers) to the use of ICT in schools by teachers as either arising from the external environment or the personal characteristics of teachers – including the beliefs, values and attitudes that are felt likely to influence them. Research in the field of teachers' use of technology in the

classroom identifies a complex pattern of interrelated factors that are assumed to be determinants for the successful use of ICT in education.

For the purposes of this doctoral level research, two studies from social psychological research are regarded as particularly relevant. These are Ely's (1987) Conditions of Change and Davis' (1989) Technology Acceptance Model (TAM).

ICT use by teachers in Akwa Ibom schools is not guided by research. Albirini (2006) points out that this is often the situation in most countries across the globe. No studies have yet investigated the extent of ICT use, the facilitating conditions, and the factors that will facilitate teachers' use of ICT at these schools. In an attempt to address the issues, Ely's conditions of change and the TAM were adopted as they propose a series of conditions that facilitate the use of educational innovations which in the context of this study is ICT use. Also, teachers' attitudes are considered valuable to the adoption of new tools because their attitude is critical in the implementation process. Their cultural perception of ICT and the ease, and usefulness of ICT which are inter-related are also important as predictors of ICT use.

Ely's condition of change seeks to identify the conditions fostering implementation of ICT by teachers. According to Teo (2010) facilitating conditions imply the factors that are present in the environment that bring to bear and impact on a person's desire to perform a task. These conditions are therefore the focus of this study. The intent of TAM is to make available a description of the factors that determine general computer acceptance, and be disposed to describing a user's behaviour covering a large area of end-user computing technologies and user populations, and in doing so being both sparing and theoretically good (Davis, Bagozzi & Warshaw 1989). The TAM model explains technology usage as a direct activity of use behaviour, which weighs heavily on the activity of Attitude towards usage through Perceived Ease of use (PEOU) and Perceived Usefulness (PU). These two areas will be presented in relation to prior studies investigating facilitating conditions and the selected factors that predict teachers' use of ICT in their classroom practices.

1.2 Country Background

The Federal Republic of Nigeria is the most populous black nation in the world with a population of 160 million people (NPC, 2007). It is located in West Africa, south of the Sahara. It borders the Gulf of Guinea in the South, Cameroon in the east, Niger and Chad in the north, and Benin in the west. It is a federation of 36 states divided into six geo-political zones. The state of Akwa Ibom is one of the 36 states in Nigeria. The State is mainly an agrarian society with a civil service economy, and is situated within the tropics in the south-south region of the country. The

population of Akwa Ibom is 3.9 million people (NPC, 2007) with a landmass of 8,412 sq kms. Its closest neighbours are the Republic of Cameroon, Cross Rivers Rivers, Abia, and Imo states, and to the south by the Atlantic Ocean.

The state has 31 Local Government Areas, 232 governments' owned secondary schools and 198 government approved private secondary schools located around the urban areas. There are also other important educational institutions in the state which include the University of Uyo, the Akwa Ibom State University; the Maritime Academy of Nigeria, State-owned Polytechnic, the College of Agriculture and the State College of Education, the School of Health Technology, School of Nursing and Midwifery, and Federal Government Unity Schools.

1.3 The Nigerian Education System and Information Technology

The ICT department in Nigeria's Ministry of Education was inaugurated in February 2007. Since its inception, a number of different initiatives were taken by the authorities, agencies, and the private sector to initiate and advance ICT in the national education system. Secondary education has certainly been affected by the penetrating influence of ICT in Nigeria. ICT is taught in schools and also assists teaching and learning through flexible, dynamic, engaging and interactive contents (Yusuf, 2005). ICT operation makes schools more structured and productive, thereby creating an array of tools to facilitate and assist teachers' teaching procedures (Mutula, 2003).

The National Council on Education is a unit within the Federal Ministry of Education,that is responsible to formulate policy, co-ordinate planning, and finance the education sector. The National Council is made up of the Commissioners of Education from each state in the federation, the Minister of Education as well as the Joint Consultative Committee on Education. Education administration and finances are responsibilities divided with the Federal Government covering the levels (is that what you mean?) by the different administrative organs such as: primary school level by local governments, secondary school level by the state governments, and tertiary/university level by the federal government. The Federal Ministry of Education also engages different bodies in the country to oversee standards and maintenance role in the specialized aspects of education. The organisations include The Federal Inspectorate Service, The Nigerian Educational Research and Development Council, The Science Equipment Centre, and The School Broadcasting Unit. The primary and secondary levels of education are six years each, while tertiary education may take a period of one to six years depending on the qualifications awarded. Compulsory basic education is for a total nine

years which is a merger of six years of primary schooling and three years of Junior Secondary School Education (bffa-online.org/education.htm).

The implementation of Nigeria's ICT policy started in April 2001 after the approval by the Federal Executive Council. The National Information Technology Development Agency (NITDA) was set up as the ICT implementing body (http://nitda.gov.ng/document/nigeria). The policy empowered the NITDA to enter into commercial ventures and strategic alliances with the private sector to collaborate and realise the country's specific vision of "making Nigeria an ICT capable country in Africa and a key player in the information society through ICT use as the machinery for sustainable development and global competitiveness" (NITDA, 2001, p.13). In February 2007 an IT department in the Federal Ministry of Education was created. Several implementation plans by government agencies and the private sector were initiated to complement the activities of the department. The promotion of ICTs in education has been on-going at all levels in the country.

1.4 Nigeria's Policy on Information and Communication Technology

Over the years, the Federal Government of Nigeria has initiated or adopted several ICT associated polices and laws (FRN, 1977, 1981, 2004, 2005; NNPIT, 2001) with the major goal of assisting the establishment of the ICT sector and to harness its capacity for national development. But similar to other developing nations, Nigeria could not keep abreast with the fast paced technological advancement in the global ICT industries.

The Nigerian National ICT policy, NICTP (2012) re-emphasised the essential need to incorporate ICT into the Nigerian educational system, with major objectives to blend ICT into the conventional system of education, training and the formation of different ICT schools as centres of distinction in ICT. To achieve success, nine strategies were outlined to guide the process. There are to make ICT compulsory at all educational levels, develop ICT modules for all the different levels in the education system, use ICT in long distance learning, encourage ICT companies to invest in education, provide study awards and scholarships on ICT training, organise train – the- trainers workshop for youth corps members on ICT, build ICT proficiency at the zones, state and local government areas, and establish private and public committed ICT training schools in collaboration with international and local plans on the transfer of ICT knowledge.

The reality of the ICT aims and polices is not yet evident in Nigeria. The bodies and agencies that are mandated to develop and regulate the ICT sector still lack coordination as each act differently as a single unit in the industry (NICTP, 2012). While there has been significant gains mostly with regards to mobile telephony in the last decade, the absence of

industry process in the Nigerian ICT sector has resulted in the breaking down and disorganisation in the management of materials in the sector. Nevertheless, the National ICT policy remains as action plans to improve the sub-sectorial policies and to organise definite execution instructions that are deemed suitable (NICTP, 2012).

1.5 ICT at the Secondary Education Level

The Federal Republic of Nigeria's National Policy on Education (1999) defines secondary education as instruction that children receive after primary school level education and before the tertiary stage. Schools that provide secondary education are classified under four major nomenclatures: Secondary School, College, Grammar school, and High School. Based on the ICT policy of the Federal Ministry of Education Nigeria, and the need to implement the national ICT policy, the country launched a project known as the SchoolNet Nigeria in 2001. SchoolNet Nigeria and other projects came up with intervention initiatives to impact the life of secondary school students. SchoolNet is a non-profit organization that was launched to address the use of ICT in Nigerian secondary schools to create learning communities for instructors and students to use ICT to enrich education by supporting, implementing and coordinating ICT development projects in education, support and provide lower-rate range of technological solutions and Internet facilities for institutions, and provide support system/assistance in schools for technical resources and connectivity (http://www.schoolnetafrica.org/english/index.htm). So far SchoolNet has the following on-going projects: ETF-NEPAD Interactive Learning Network; Intel Teach Programme; Multichoice Resource Center project 5; MTN School Connect Enhancement Project; ETF DigiNet 2. The upcoming projects consist of Schools and Teachers performance enhancement, Teacher Net , Schools and Teachers performance enhancement, Geogebra for Nigerian schools, SchoolNet- CDSL Home Tutors, SchoolNet-CDSL Virtual Science Labs , IEARN Nigeria Newspaper an educational advisory based column, Multichoice Resource Center Project 6, and Pristine Learning – SchoolNet TV.

1.6 Statement of the Problem

In Nigeria as in many countries of the world, the need for social development and economic change is often used as a justification of investments in educational reforms and in ICT for education. Considerable large resources have been invested in these aspects to defend the status of technology in education particularly as many research studies have disclosed the gains and benefits that can be achieved by administrators, teachers, and students (Jhurreev, 2005). In the last six years the Akwa Ibom State Government through the Ministry of Education has invested huge sums in its free education programme for the

renovation of schools, increase in teachers' pay and fringe benefits, provision of ICT related training and courses for teachers (www.aksgonline.com). The goal is for teachers to acquire fundamental computing knowledge and skills. These efforts indicate the commitment of the government to education. However, despite these efforts, there have been no tangible returns from these huge annual budgetary allocations in terms of facilities and structure for ICT use by teachers for teaching and learning.

Etudor-Eyo, Ante and Ema (2011) reported that ICT equipment and computers have become major devices in the exchange and communication of information among governments, organizations, corporate bodies, individuals, and others in Nigeria. They further stated that the introduction of ICT use for supervisory activities in most secondary schools in Akwa Ibom State was not extensive suggesting that the situation is made burdensome by various challenges which includes the absence of adequate funds to maintain the ICT structures and facilities, incapability of secondary school supervisors to keep up with the rapid pace of ICT advancement, personnel with inadequate skills to manage ICT both at the strategic and functional levels, and non-presence of school ICT policies and plan to assist and coordinate ICT use. Secondary school management is largely dominated by the use of manual operational equipment (Etudor-Eyo et al., 2011), although recent research indicates that nearly all the secondary schools have a good number of computers made available by the federal and state governments, philanthropists, as well as a number of non-governmental organizations (Stephen, 2013). The need for effective ICT use is further exacerbated with the increasing student population, multiple objectives/goals, programmes, and resources within the school.

The lack of ICT access in institutions suggests that most schools in Nigeria are not properly equipped for the application of ICT in the classroom (Oyejola, 2007; Fakeye, 2010). A study on the assessment of secondary school teachers' use of ICT in the Oyo metropolis of Oyo state revealed that ICT facilities are not readily/easily accessible (Obakhume, 2011). Findings from an assessment of secondary school teachers' professional growth and development in the use of ICT for teaching Mathematics in Ejigbo, Nigeria, reveal that teachers at the secondary school level are still far behind in modern technological modes of instruction (ICT use) (Salman, Ogunlade, Ogunlade, & Adegbami, 2013). These studies present evidence of poor ICT integration in Nigeria.

This was further strengthened by the report of The World Economic Forum's Networked Readiness Index (NRI 2013) (which provides a yearly report that evaluates the susceptibility for countries to put to good use the opportunities offered by ICT). The NRI report attempts to better understand the effect of ICT drives of countries. The report is made up of three elements: the readiness of the country's key participants (individuals, businesses, and governments) to use ICT, the environment for ICT

presented by a given nation or community (market, political, regulatory, and infrastructure environment), and the usage of ICT among these participants. The 2013 report of 142 countries ranks Nigeria at 113, compared to Malaysia at 29 and South Africa at 60. The quality or value of teachers could be determined by their ability to cope with innovations in teaching and learning (Salman et al., 2013). Albirini (2006) observed that as national programmes in developing countries are not based on investigation, the successful outcomes of such programmes are small.

These studies on ICT use underlines the need for the government to facilitate, provide access and make huge investment to ensure that the Akwa Ibom State education program will be a success. This study therefore seeks to determine the extent of ICT use by teachers and investigate the presence or non-presence of conditions that are thought to facilitate and predict teachers ICT use. In the absence of proper monitoring and evaluation, it is not possible to establish accurate data depicting the extent of ICT use by teachers and also the impact of government investment towards improved educational opportunities. Further, the need to monitor the situation is imperative to ensure that the government's aims, efforts, as well as returns on investment are realised and most of all, to avoid students being left out of the benefits of using ICT in the classroom.

1.7 Objectives of the study

The purpose of this study was to determine the facilitating conditions and selected factors as predictors of ICT use by teachers in Nigeria. Ely's eight Conditions of Change (1978), Davis' Theory of Acceptance Model (TAM) (1986) and previous research served as a foundation and in doing so to identify the presence of these conditions and the factors in the school environment. The study was carried out to achieve the following objectives, Objective 1 – 6 were to elicit quantitative data while objective 7 was to elicit qualitative information. These objectives are as follows:

1. To determine the teachers' use of ICT for teaching and learning.

2. To determine the presence and non-presence of facilitating conditions: dissatisfaction with status quo; knowledge and skill; resources; time; reward and incentives; participation; commitment; leadership.

3. To determine teacher's attitude; perceived ease of use; perceived usefulness; and cultural perception towards ICT.

4. To determine the relationship between the facilitating conditions and ICT use by teachers.

5. To determine the relationship between attitudes; perceived ease of use; perceived usefulness; cultural perception and ICT use by teachers.

6. To determine the proportion of the variance in ICT use by teachers in secondary schools that can be explained by the facilitating conditions and the selected factors, and the relative significance of each in explaining ICT use.

7. To explore secondary schools teachers' opinion on their use of ICT and the variables of study.

1.8 Research Questions

The following research questions were formulated to guide the study. Research questions 1-9 were related to qualitative aspects and question 10 was for the qualitative aspect of the data. These questions are as follows:

1. What is the extent of teachers' ICT use for teaching and learning?
2. What are the conditions that are present or not present in facilitating the use of ICT amongst school teachers?
3. What are teachers' attitudes towards ICT use?
4. What are teachers' perceived ease of use towards ICT use?
5. What are teachers' perceived usefulness towards ICT use?
6. What are teachers' cultural perceptions towards ICT use?
7. What is the relationship between facilitating conditions: - dissatisfaction with status quo; knowledge and skill; resources; time; reward and incentives; participation; commitment; leadership and ICT use by teachers?
8. What is the relationship between attitude; perceived usefulness; perceived ease of us; cultural perception and ICT use by teachers?
9. What are the proportion of the variance in ICT use by teachers in secondary schools that can be explained by the facilitating conditions and selected factors and the significance of each in explaining ICT use?
10. What is the secondary schools teachers' opinion on their use of ICT and the variables of study?

1.9 Significance of the Study

There is now an increase interest in ICT in education. Much attention is being paid to ICT use and huge investments are being made into the use of ICT in education on a global scale (Albirini, 2006). The findings of this study will contribute significantly to existing knowledge in the use of ICT among teachers in secondary schools. Within the context of this study, constraints to the successful use of ICT will be identified. Discovery of

any challenges faced by teachers will lead to the advancement of lasting solution to overcoming these constraints, the development of useful professional training programmes, and will encourage teachers to use ICT.

This study will also add to the literature on the current status of teachers' use of ICT in Akwa Ibom State and also Nigeria. It would serve as a reference for educational administrators, professional associations, providers of professional programmes, and for the training of teachers on the specific competence and needs of each school to keep abreast with current developments to enable them to use ICT in teaching. In doing so, the single major barrier to ICTs use in education in teacher training in Nigerian in general and Akwa Ibom State in particular will be removed. The State Ministry of Education as well as the Nigerian Educational Research and Development Council (NERDC) will find the result of this study valuable particularly in complementing current government efforts to provide free and quality education, restricting and implementing the curriculum, developing teaching and learning materials as well as guiding teachers in the development of instructional resources from local materials. The examination bodies – National Examination Council (NECO) and West African Examination Council (WAEC) will also be guided on the inclusion of Computer studies as a subject in the examinations.

This study will be useful in identifying the presence or non-presence of facilitating conditions and factors that predict ICT use and integration in schools. As such stakeholders might be aware and be informed on the status of ICT use and the possible barriers to teaching. This study will provide information to alumni associations, communities, and other bodies who should be involved in the design, development, and implementation of ICTs policies at school level. A more authentic and conceptualised approach to learning could be organised by working with community (Scrimshaw, 2004).

The theoretical model used in this study will be useful in structuring and understanding the relationships within the model (TAM), Ely's condition of change, and the external factors. This model also represents further critical investigation in developing an action plan devoid of sweeping generalisations on the predictors of ICT use.

Thus, new conclusions can be drawn regarding ICT use by teachers in Nigeria. By developing a better understanding of the factors that predict ICT usage, policy makers should be able to design and develop appropriate policies to efficiently promote ICT adoption. In addition, teachers could take measures within their schools to maximise efforts to promote ICT use and increase teaching productivity and performance.

Finally, the study will serve as a guide and form the literature for reference materials for future researchers in related areas that may examine ICT use by teachers in similar context.

1.10 Delimitation and Limitation of the Study

The study concerned public secondary schools in the Akwa Ibom State. Only teachers of these schools were involved in the study. Only public secondary schools were selected for this study as the administration and finance of these schools are under the responsibility of the government. While there are private secondary schools in the state, these institutions were excluded from this study due to reasons of economics and quality control.

Data for this study were obtained from secondary schools teachers in these government funded schools in the State. The result of the study however, may not be used to generalize teachers in other types of schools in the state or the country. Furthermore, while secondary school administration and finances are the responsibilities of the each state government, these administration and policies are not standardised in all the 36 states in the country. Several factors in each state determines its administrative policy as there are different school environments and different levels of technology implementation.

Government owned secondary schools were selected for this study because these schools are funded by the state government with a free education policy. Also, these schools have been renovated to provide access to Internet facilities and electricity supply. Furthermore educational projects usually are implemented first in selected schools in the senatorial districts before the rolling out to other schools in the state. The study took place at one point in time which limits the ability to generalise the findings to other times.

1.11 Definition of Terms

Every key term used in the study were conceptually and operationally defined. Clearly defined terms in this study served as a guide to the researcher in data collection, data analysis, as well as in generalization of the research results.

1.11.1 Information and Communication Technology (ICT)

ICT is defined as technologies that promote, by electronic means, the storage, acquisition, processing, disseminating and transmission of information in all forms including data, text, voice, video and graphics (Michiels & Van Crowder, 2001). In defining ICT in education, four major elements can be taken into consideration, ICT as an assisting

device, a medium for teaching and learning, ICT as an object that refers to learning about ICT, and finally a device for management and organization in schools (Cavas, Cavas, Karaoglan, & Kisla, 2009). In this study, ICT is defined as all technologies that facilitate retrieval, storing, processing, all computer applications and the internet, electronic mail, and the World Wide Web for teaching and learning.

1.11.2 Facilitating Conditions

Ely (1999) uses the term conditions of change to refer to a set of facilitating conditions that describes the setting in which a new plan is introduced. Innovation infers change. The acceptance or adoption of an innovation usually demands some type of change, (in this case ICT) (Ely, 1978). The change process takes place when an individual or institution approves and executes an innovation. Thus, the setting in which the alteration is to be introduced, can play an equally important role in determining a change effort's success (stated as facilitating conditions in the environment). Therefore in this study, facilitating conditions refer to the availability of technology (ICT) needed to engage in a behaviour, such as time, access, knowledge and skills, money, or other specialised resources for teachers' use of ICT. Facilitating conditions for ICT will be measured using a questionnaire developed by Nawawi (2005) from Ely's condition of change, and adapted for this study. The scale consists of 40 items of five statements that represents each of the eight conditions. Ely's eight conditions of change are stated and defined as follows:

1.11.2.1 Dissatisfaction with the Status Quo

Ely (1990) refers to dissatisfaction with the status quo as an emotional agitation resulting from the use of current practices or technologies that are perceived as ineffective or not competitive and inefficient. In this study, dissatisfaction with status quo is the feeling of dissatisfaction among teachers over the source of information for their teaching process and the general work environment.

1.11.2..2 Time

Time according to Ely (1990) is the readiness of institutions to provide paid time for participants to learn new skills or procedures in order to use the innovation, as well as the user's readiness to commit their time to develop these new skills. In this study, time refers to the teachers' readiness to commit to the time needed to adapt the use of ICT for the needs of the classroom.

1.11.2.3 Resources

Ely (1990) refers to accessibility and availability of the resources needed to implement innovation. Resources include hardware, software, finances, materials, personnel, and technological support. In this study, resources refer to all the relevant materials, tools, facilities, and equipment to assist teachers in their use of ICT.

1.11.2.4 Knowledge and Skills

According to Ely (1990), knowledge and skills are what users should possess and/or acquire. They need to have the required knowledge and skills to make use of the innovation. In this study, knowledge and skills refer to relevant knowledge and skills teachers possess to use ICT.

1.11.2..5 Rewards and Incentives

Rewards and incentives refer to either intrinsic or extrinsic rewards that result from using the innovation and these rewards vary from user to user (Ely, 1990). In this study, rewards and incentives refer to the appropriate motivation teachers experience in using ICT for teaching.

1.11.2. 6 Participation

According to Ely (1990), participation is the degree of complicity the administrators have in the decision making process to adopt and implement an innovation. In this study, participation refers to teachers' effort, ideas, and opinion in the decision process of ICT use.

1.11.2.7 Commitment

Commitment refers to "noticeable," support by the senior supervisors and leaders, or powerbrokers (Ely, 1990). In this study, commitment refers to school leaders' use, value, and effective commitment to ICT use.

1.11.2.8 Leadership

Ely (1990) states that, leadership refers to the level of possession and assistance given by the administrators who will direct the daily activities of those using the innovation. In this study, leadership refers to leadership by example, support, and management of daily school activities of ICT as used by teachers.

1.12.1 Attitude towards ICT Use

Ajzen (2000) defines attitude as an individual's degree to respond in a favourable or unfavourable manner with respect to a psychological object. An attitude is the susceptibility of an individual to assess some symbol or object or aspect of his world in a favourable or unfavourable manner (Halloran, 1970). Albirini (2006) measures attitude using three distinct components: affective, cognitive and behaviour. In this study, ICT attitude is operationally defined as the degree of favour or disfavour with which secondary school teachers in Akwa Ibom State evaluate the presence and use of ICT in education. Attitude towards ICT is measured by a questionnaire developed by Albirini (2006) and adapted for this study. The scale consists of 15 items divided into three components of the affective, cognitive and behavioural.

1.12.2.1 Affective Component of Attitude towards ICT Use

Breckler and Wiggins (1989) define the affective component of attitude as emotions and drives that are engendered by a specific object. The affective element refers to the individual's emotional feelings or liking of a person or an object. In this study, the affective domain of ICT use is measured by the teachers liking of ICT as a tool for teaching and learning.

1.12.2.2 Cognitive Component of Attitude towards ICT Use

According to Breckler and Wiggins (1989), the cognitive component of attitude refers to the location of an object of thought on one or more dimensions of judgment. This is the mental component, consisting of beliefs and perceptions. In this study, the cognitive component of ICT is the teachers' judgment of ICT as a tool in teaching and learning.

1.12.2.3 Behavioral Component of Attitude towards ICT Use

Hasan (2010) states that the behavioural component pertains to the behavioural intention, covert, or overt actions toward the object; what type of action a person will take regarding the given object. In this study the behavioural component of ICT is the behaviour of teachers using ICT as a tool in teaching and learning.

1.13.1 Perceived Usefulness (PU)

Perceived Usefulness (PU) is defined as the degree to which a person believes that using a particular technology will enhance his or her job

performance (Davis, 1989). In this study PU refers to the degree of the teachers' feelings on whether ICT use will improve their efficiency and decrease their work load. PU is measured by using the instrument developed by Davis (1989).

1.13.2 Perceived Ease of Use (PEOU)

This refers to the degree to which a person believes that using a particular technology will be free of effort (Davis 1989). PEOU explains the user's perception of the amount of effort required to utilize the system or the extent to which a user believes that using a particular technology will be effortless. In this study, PEOU refers to the extent to which the teachers believe that using ICT would be free of great effort. PEOU is measured by using the instrument developed by Davis (1989).

1.13.3 Cultural Perception

Hofstede (2001) defines culture as the collective programming of the mind which differentiates the members of one group from the other. Within the social system, social norms play vital roles in determining the rate of an innovation's adoption. Norms are the established patterns of behaviour that tell members of the group what behaviour is expected (Rogers, 1995). Albirini (2006) defines cultural perception as teachers' perceptions of the value, relevance, and impact of ICT as it relates to the cultural norms in schools and society. In this study, cultural perception is operationally defined as the value, habits, relevance and use, when applying technology and computer software in the instructional process, as it relates to the norms of society and school. Cultural perception is measured by a questionnaire developed by Albirini (2006), and consists of 15 Likert-type statements.

1.14 ICT Use for Teaching and Learning

ICT use in general terms refers to any use of computing devices such as desktop computers, laptops, handheld computers, software, or the Internet used in schools for teaching and learning purposes (Hew & Brush, 2007). Specifically however, ICT use refers to the use of technology by teachers for lesson preparation, teaching method, and the use of technology as a learning device for students (Inan & Lowther, 2010). Braak, Tondeur, and Valcke (2004) define ICT use as supportive device, which refers to the use of ICT for administrative and pro-active tasks and class use of ICT as the use of ICT to support and/or enrich the teaching and learning activity. In this study, ICT use is defined as teachers' ICT use, practices, and knowledge in teaching and learning.

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