

**PREDICTORS OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) USE FOR INTERACTIVE
TEACHING BY SECONDARY SCHOOL TEACHERS' IN EKET SENATORIAL DISTRICT OF AKWA IBOM SOUTH,
NIGERIA**

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ABSTRACT

Nigeria's National Policy for Information and Communication Technology (ICT) 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 in the education system to develop their ICT competence. This study investigated ICT use among secondary school teachers in Eket Senatorial District of Akwa Ibom State of Nigeria, teachers' attitudes towards ICT use, facilitating conditions for ICT use and cultural perception towards ICT. Stratified random sampling technique was used to draw up N-289 teachers from all public secondary schools in the study area. Descriptive and regression analysis was employed to investigate the variables that predicts ICT usage for interactive teaching. Result indicates that attitude, facilitating conditions and cultural perception predict ICT use. School culture and policy should demonstrate the benefits of ICT use, motivation and incentives are the keys to highlighting the positive impact of ICT integration, comprehensive training and re-training of teachers guided on specific needs of teachers were recommended.

KEYWORDS: Attitude, facilitating conditions, cultural perspective, ICT use

INTRODUCTION

The Federal Republic of Nigeria's Policy for IT or ICT (FRN, 2001) refers to computer hardware, software and ancillary equipment with similar procedures, services (including support services) and related resources. Equipment includes any interconnected system or sub-system of this equipment's that may be used in the automatic acquisition control, switching, display, storage, manipulation, management, transmission, movement, interchange, and or reception of information or data. Further to this policy, ICT is viewed as the foundation to any country's development and survival in a fast and dynamic global territory. Nigeria's ICT policy has a sustained program to build a significant number of ICT skilled personnel, integrate ICT into the national education curriculum, train and retrain, retool teachers and facilitators at all levels in the education system to develop their ICT skills. Prior to Nigeria's National Policy for Information and Communication Technology (ICT) 2012, the National policy of 1988 and 2001 brought about the introduction of computer education in the nation's secondary education system. The major goal of the 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). Several studies have investigated the reasons teachers choose to use ICT. These studies consist of case studies of classroom use of ICT from a longitudinal perspective or in a particular setting. All these studies present the use of ICT in teaching as being structurally favourable (Hennessy, et, al., 2005). Other studies have reported on the adoption of quantitative approach in exploring ICT access, and the reasons teachers choose to use ICT in their classrooms in various schools. Countries across the globe are returning to

the drawing board to develop strategies to rescue their education sector which is being damaged by the deadly Covid-19 pandemic (Mustapha, 2020). Statistics as presented by Mustapha (2020), quoting UNICEF, approximately an estimated 1.725 billion learners have been affected as a result of school closures, representing about (99.9%) of the world's student population, learners were affected by school closures in response to the pandemic. Statistics also as presented by him further revealed that one hundred and eighty-six countries had implemented nationwide school closures, impacting nearly (98%) of the world's population with Nigeria on the list. School closure had further thrown up challenges compounding the situation with remarkable impacts on pre-teachers, teachers, families and even economic and social consequences (Sustainable Education and Enterprise Development [SEED], 2020). The mission of all education systems of the world is similar as it is to improve or eliminate the challenges hampering the effective teaching and learning processes. However, at present, there is an urgent need to address the teaching and learning crisis that has been caused by the COVID-19 pandemic. The pandemic has negatively impacted the regular teaching and learning schedules of the educational systems of most parts of the globe, causing a major setback in providing quality teaching and learning and necessitating digital learning (Lindzon, 2020; Karp & McGowan, 2020). Player-Koro (2012), states that the motives and arguments in favour of implementing ICT come from many directions, from advocates within schools and more often, those outside schools. However, despite the positive results obtained in small-scale, often, experimental studies and the considerable effort and resources put into educational computing by many governments, there is still a lack of evidence that ICT has actually enhanced educational standards (Ottestad, 2010).

Teachers ICT Use. The use of ICTs in Nigeria and African countries generally is increasing and dramatically growing. However, while there is a great deal of knowledge about how ICTs are being used in developed countries, there is not much information on how ICTs are being introduced into schools in developing countries" (Beukes-Amiss & Chiware, 2006). ICT in education has come to stay, the world continues to revolve around technology, there is the need for teachers to continue incorporating these new technologies into their teaching. However, some studies conducted on uses of ICTs by teachers are particularly on teachers' professional development. A great number of these studies were conducted in developed countries where the use of ICTs has come of age it is no longer a challenge, also in the developed countries where there are resources and materials to maintain them (Akomolafe, 2008; Adelabu & Adu, 2015; Metu, 2020).

The use of ICTs by teachers in Nigeria is just beginning to gain popularity and researches in the area have just started emerging. Teachers' use of technology is an important indicator of their readiness to carry out the daily lesson's obligations. According to Edwards and Roblyer (2000), there are five major reasons for teachers to make use of technology in education: (1) motivation, (2) distinctive instructional abilities, (3) higher productivity of teachers, (4) essential skills for the Information Age, and (5) support for new teaching techniques. Loveless (2003) study posit that beliefs held by teachers towards ICT in education are not only impacted by the debate on official documentation and direction, but also by teachers own experiences of using ICT. Studies have point out that teachers in most countries have been known to display a lack of interest in ICT use, and this may be due to the misconception of the concept of "integration" which can be explained by the fact that they possess insufficient knowledge to integrate ICT (Mooij & Smeets, 2006). The absence of or inadequate teacher training is viewed as another challenging factor, this view points that through teacher training the objectives of integrating ICT could be clarified. For proper clarity on ICT use and aid proper response, there is a need to probe on factors affecting teachers use of ICT as an educational tool in teaching. While various factors have been associated with the knowledge and utilization of ICT in education, this study will shed more light the extent of ICT use and challenges militating against its use in teaching. It will also contribute to literature to fill the gap in the dearth of data on the extent of ICT Use by teachers in the study area.

Teachers Attitude. In addition to examining the extent of teachers' ICT use in teaching, it is also important to consider teachers' attitudes toward technology use in education. Early studies on teachers attitude according to Aiken (1980), defines attitude "may be conceptualized as learned predispositions to respond positively or negatively to certain objects, situation, concepts, or persons" (p. 2). The researchers study used modeling theory to analyze the development and the change of attitudes in people.

"Many attitudes are not the result of direct reinforcement but are learned by observing the activities of people who are perceived as significant. As a person grows to maturity, numerous individuals, parents, peers, and television stars, others also serve as models of attitudes and behavior. In the process of modeling the behavior of people who are important to her or him, a person makes provisional attempts to act and believe as the model is perceived to act and believe" (p. 16).

Few studies have been conducted to directly connect teachers' use of technology and teachers' attitudes toward technology. "Teachers teach as they have been taught, and it is unlikely that computer skills will be transferred to students and encouraged by teachers unless the teachers have positive attitudes toward computer use" (Yildirim, 2000, p. 481). Review of Literature on social psychology reveals several diverse definitions of attitudes. Agut, Lozano and Peris (2014) posit that people with positive attitudes are those ones which are assumed can allow the individual to behave in a way that allows him/her to approach support or improve on the attitude object. While those with a negative attitude the opposite assumption of outcomes could be expected.

Researchers have defined attitude as emotional reaction towards a precise situation either positive or negative. Fishbein (1967) defines attitude as a learned predisposition, an influence to behave in a particular way to an object or class of objects in a consistently favorable or unfavorable way. According to Al-Zaidiyeen *et al.*, (2010), an attitude is seen to play a vital role in determining an individual's reaction towards a situation. In applying Azjen's Theory of Planned Behavior (1988) to teachers' attitude towards ICT use, it is viewed that the use of ICT in teaching depends a great deal on the teacher's positive intention to use ICT. According to Rogers (1995), people's attitudes towards a new technology are a key element in its diffusion. This study therefore investigates teachers' attitude as predictor of ICT use.

Teachers Cultural Perception. The study of teachers' cultural perceptions according to Albirini (2006) are particularly important especially in developing countries where ICT is not usually part of the classroom culture. ICT having an unprecedented presence in society at large and in schools in particular, even in its novel state ICT may not be well received by developing-country teachers under various cultural influences. It is not out of place for Nigeria as a developing country to fall to be in this line of thought. Further in Albirini (2006) study, states that the integration of ICT in education a view held by many technology experts should occur in the light of the cultural conditions of the country and the prevailing school culture.

Culture as defined by Tylor (1924, p.1) is "knowledge, belief, art, morals, law, custom, and any capabilities and habits acquired by man as a member of society". Culture as seen by Castells (2004) are all societies are cultural constructs, culture is understood as the set of beliefs and values v that inform and motivate people's behavior. The concept of culture points at the shared way of life of a group of people which influences people's behavior, perspectives, values and understanding (Berry, 2002). Perceptions are cognitive processes that build on internal and external experiences (Sang, Valcke, Braak & Tondeur, 2010).

Facilitating Conditions. The term "facilitating conditions" is congruous to the type of assistance that an individual gets with the goal of encouraging their use of technology Venkatesh, et, al

(2008). Facilitating conditions may be of several types according to the environment and type of technology implementation. Facilitating conditions for teachers imply knowledge and skills, availability of facilities, support services, and professional training programs. Facilitating conditions are environmental factors that affect one's desire to perform a task (Aypay, *et al.*, 2007) and play effective roles on both adoption and infusion of new technology.

Ely's (1976) conditions of technological change led to further research on a well-accepted paper on conditions he believed could facilitate and explain successful implementations of technology (Brown 2008). From literature, Ely discovered that certain conditions such as (leadership, commitment, knowledge and skills, dissatisfaction with status quo, incentives and rewards, participation, support and time) were held as most noticeable and could facilitate implementation of technologies in a many of ways. Although Ely's research is well accepted, however some researchers hold reservations in generalizing technology transfer among developing countries such as Nigeria, this according to research is difficult due to variations in each country's developmental stages, environment, culture and differences in demand of training and education, as what works for one country may not work for the other.

All eight conditions are required and expected in the school environment to assist teachers' ICT use in their teaching process. Ely's conditions of change are formed in a mix of conditions and are all connected to each other. This means that some conditions such as, participation, resources and support, leadership, commitment will be difficult to obtain, when a change in the institution's culture and the behavior of school administrators and educators is required. Ely's Conditions of Change are interrelated to a certain point, the conditions also interact, a summary of the interaction of this conditions are stated by Ensminger (2001), when restated it reveals connections such as: commitment will reveal a sign of leadership that in turn encourages participation from all persons in the system and that affects the status quo, when that happens it implies an interest from leadership to make training possible for all concern from support and time, in place is incentives and resources, which in turn encourages continued participation, there is increase in participants knowledge/skills, thus efficiency improves.

Investigating the conditions for technological change in the environment, and the cross-cultural applications of the conditions when studied revealed the presence of these conditions in various cultures and posited that the presence of the conditions may be generalized to other settings, a reason the framework was adopted for the present study. According to Tezci (2010), besides the individual's knowledge, experiences also affect attitudes towards a given object. In the absence of proper monitoring and evaluation of teachers ICT use in the study area, it is not possible to establish accurate data depicting the extent of ICT use and also the impact of government investment towards improved educational opportunities. The purpose of this study therefore is to investigate the factors and conditions for interactive ICT use by secondary school teachers in Akwa Ibom South of Nigeria.

RESEARCH QUESTIONS

The following research questions were formulated to guide the study, research questions

- What is the extent of teachers' ICT use for interactive teaching?
- What are the conditions that are present or not present in facilitating the use of ICT amongst secondary school teachers?
- What is teacher's attitude towards ICT?
- That is the cultural perception of teachers as predictor of ICT use?

- What are the proportion of the variance in ICT use for interacting teaching by teachers in secondary schools that can be explained by the facilitating conditions and selected factors and the significance of each in explaining the dependent variable?

METHODOLOGY

Design of the Study:

The study employed correlational research design to determine the relationship between variables and in turn, use these inter-relationships to make predictions. Creswell (2011) suggests that exploratory elements are nearly helpful when not much research has been done about the population or topic being investigated. Questionnaires were used for data collection from the sample of secondary school teachers. Data collection was done using a structure instrument, to ensure that comprehensive lists of scales were included, instruments from previous researchers was adapted and modified, and statements were constructed by the researchers based on their admissibility to the present study and on the cultural relevance to suit area of study. Measures for attitude and cultural perception were based on Albirini, (2006); ICT use by Braak, Tondeur, and Valcke (2004); and facilitating conditions by Nawawi, (2005). Their responses were measured by five point category rating systems scored 1 as low and five as highest. (SA), 5 Strongly Agree (A). 4 Agree, (N), 3 Neutral, (DA), 2 Disagree,(SDA), 1 Strongly Disagree. In this study, the alpha coefficients for the scales had values higher than .77 which showed a good internal consistency.

Description of study Area/Site:

Akwa Ibom South comprises of 12 Local Government Areas. The accessible population for this study were all teachers of the 63 public secondary schools in the area. With a population size of 1152 teachers during the 2022 - 2023 school year. A stratified random sampling technique was used to draw up two hundred and eighty- nine (289) teachers for the study. Oversampling recommended by Salkind (2012) was employed to account for uncooperative subjects allowing for more reliable estimates to be reported when questionnaires are employed for data collection. Sampling error formula by Cochran, (1977) was applied stating a (40-50%) addition to sample size. Missing values, outliers were detected during preliminary analysis, 96 questionnaires contain missing values. Imputation method was applied to avoid loss of sample size and statistical power (Tate 1998). In this study, 434 questionnaires were distributed with (50%) more to account for uncooperative subjects, finally 336 questionnaires were used for the study a return rate of (77.9%).

Description of Data:

Demographic data on Teacher's age were from 34 years to 60 years old, with a mean score of 30.83 (S.D. = 7.08). The data also shows the distribution of their highest academic qualification, approximately (15%) of the participants held a National Certificate of Education (NCE), (42%) with a bachelor's degree, (41%) held a master's degree and only (2%) with a doctoral degree in-view. In the study data shows that more than half of the participants (67%) indicated that they had some professional training development (PTD) in computer training, same number had undergone such training more than two times in the course of their job. The training sessions were in basic computer operations, Microsoft Word. Email and searching the Internet. The participants in this study comprised (32.0%) males and (68.0 %) females as shown in Thus, indicating that a higher percentage of the participants involved were females.

RESULTS

Research Question One

What is the extent of teachers' use of ICT for interactive teaching?

Table 4.1: Mean and Standard Deviation of ICT Use

	Low	Moderate	High	Mean	S.D.
ICT Use	20.2	33.2	43.6	2.46	.81

Table 4.1 illustrates the frequency of the participant's responses to the 15 item ICT Use Scale. Nearly half of the respondents sometimes use ICT in the teaching process (45.1%, M = 2.72, S.D. = 1.31), while less than one third of the teachers use ICT to show examples such as pictures, animation, audio to enhance students learning.' Extent of Teachers' ICT Use as indicated in the table, a possible score for ICT use might range from 1.00 to 5.00 on 10-items. In the study these scores were divided into categories, obtained scores with 2.12 to 3.33 were considered moderate, while scores lower than 2. 11 were categorized as low and greater than 3.34 were considered as high. Scores on the scale obtained showed a moderate use of ICT by teachers.

Research Question Two

What is the extent of presence and non-presence of the facilitating conditions towards ICT use by teachers?

Table 4.2: Mean Scores and Standard Deviation of Teachers' Responses of the Presence of Conditions of Change

Facilitating Conditions	Mean	SD
Overall Mean/SD	2.95	.60

Table 4.2 presents the mean scores and the standard deviation for facilitating conditions The result indicates that teachers who had knowledge and skill were split on their score with those who did not have any knowledge and skills to use ICT, low scores on teachers' knowledge and skills accounted for their inability to use ICT. A total mean score reveals a degree of presence as the mean score was close to 3 representing a presence of the condition.

Research Question Three

What is the extent of teachers' attitude as predictor of ICT use?

Table 4.3: Percentage, Mean, and Standard Deviation of Attitude

Scale				Mean	S.D
	Negative	Neutral	Positive		
Attitude	16.9	36.2	46.9	2.53	0.99

The findings concerning attitude towards ICT use is given in Table 4.3, the total mean score on this scale as shown was 2.53 with a standard deviation of 0.99. Teachers reported a favourable attitude to their use of ICT in all subjects taught. Teachers' attitude towards ICT use for interactive teaching is as indicated on the table with scores for ICT use with a range from 1.00 to 5.00, scores were divided into categories. Scores with 2.34 to 3.33 were considered positive, while scores lesser than 2. 33 were categorized as neutral and greater than 1.33 were considered as negative.

Research Question 4

What is the cultural perception of teachers as predictor of ICT use?

Table 4.4: Percentage, Mean, and Standard Deviation for Cultural Perception

Scale				Mean	S. D
	Low	Neutral	High		
Attitude	3.1	13.2	33.7	3.04	0.70

Teachers' cultural perception towards ICT Use is as indicated on the table 4.4. Cultural perception is revealed as the essential factor that accounts for teachers' basic attitude towards ICT and an indicator teachers' future acceptance of the new technology in teaching. The mean scores on a 10-item factor were divided into categories. Scores with 2.34 to 3.33 were considered high, while scores lesser than 2.33 were categorized as neutral and moderate than 1.33 was considered as low, indicating on each category the level of perception held by teachers.

Research Question 5

Table 4.5: What is the proportion of the variance in ICT use by teachers in secondary schools that can be explained by the facilitating conditions, attitude, cultural perception and the relative significance of each in explaining ICT use.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.803 ^a	.645	.642	.508	.645	212.556	3	332	.000

- a. Predictors: (Constant), Attitude, Cultural Perception, Facilitating Conditions
- b. b. Dependent Variable: ICT Use

Table 4.6

Model		Coefficients ^a			t	Sig.
		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta		
1	(Constant)	-.133	.156		-.849	.397
	Cultural Perception	.157	.041	.128	3.812	.000
	Attitude	.561	.029	.659	19.312	.000
	Facilitating Conditions	.290	.048	.214	6.091	.000

a. Dependent Variable: ICT Use

The model in table 4.5 explains a 64% of the variance (adjusted R² = .642). The result shows the model summary table. In the model (1) attitude, cultural perception, facilitating conditions accounted for 64% of the variance (Adjusted R² = .642). This model shows that attitude, cultural perception, facilitating conditions were the predictors for teachers ICT use for interactive teaching. This table also indicates that all three variables in the study predicts teachers' use of ICT at a 0.05 level of significance.

DISCUSSION OF FINDINGS

The utmost aim of the study was 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 teacher's ICT use for interactive teaching. Teachers' ICT use is influenced by their acceptance of the value and importance of ICT and its use in teaching (Huang & Liaw, 2005).

Teachers' use of ICT is associated with many interrelated factors according to research (Player-Koro, 2012). This study contributes to the pool of knowledge about how Ely's condition of change and other constructs that seem to predict ICT use and can be used to explain teachers' use of ICT in the teaching process. Result from the study revealed that teachers in Eket Senatorial District were at a moderate stage of ICT use. Teachers' extent of ICT use for interactive teaching was evident in their response on Internet use, teachers responded to using ICT always to search for teaching materials from the Internet. Majority of the teachers reported that they had never used ICT in class to conduct classroom activities, reporting on lack of internet access in school, lack of ICT facilities and lack of implementation skills. This indicates that the lack of ICT facilities is a major contributing factor to teachers' low use of ICT which could also suggest that teachers may use ICT tools if it was made available.

Research has also highlighted the importance of teachers' attitudes in influencing the integration of technology in teaching practices. The study on in-services teachers attitudes towards ICT found that while their attitudes were highly positive, the use of ICT in the classroom was scarce and subject to innovative processes (Sánchez, 2012). While another study aimed to develop a scale to measure teachers attitudes towards ICT use and emphasized the central role of teachers in the effective use of ICT in teaching and learning Bariu & Chun (2022). Findings also indicate that teachers support that the presence and adequacy of facilitating conditions will facilitate ICT use for interactive teaching. Facilitating conditions were measured to determine the presence or non-presence in schools. It is indicated that in adopting ICT by teachers in secondary schools for interactive teaching Ely's eight facilitating conditions have probably been left behind in the implementation of ICT. Findings reveal that teachers reported that they did not know enough to implement ICT in their teaching process, however the findings from study revealed that knowledge and skill was almost evident as the scores showed.

Albirini (2006) study states that many technology experts have pointed out that when integration of ICT in education is contemplated such should occur in the light of the cultural perceptions of such a country and the prevailing school culture and school policy, Literature does have not sufficient studies in the innovation-diffusion research despite the indisputable importance of cultural conditions and/or social norms in an educational setting. There is limited information on teachers' cultural perception towards ICT in the study area particularly, and the state in general. In the present study cultural perception implied values, habits, relevance and its use in the application of technology and software in teachers instructional process, as it is viewed as connected to values, habits and norms of a given society and or school, emphasis stated that the cultural morals of different countries determine ICT use, in the Nigerian context and the state, the culture of some regions do not support teachers use of ICT facilities, the believe being that the students would be expose to internet sites that it could influence their attitudes, norms and values.

CONCLUSION OF THE STUDY

Based on the result of the study and the comprehensive discussion, findings emerged from the study. Attitude, cultural perception and facilitating conditions were found as predictors to ICT use for interactive teaching. A new model emerged from the result of the study as predictors of ICT use for interactive teaching by teachers.

RECOMMENDATIONS

- To encourage teachers use of ICT, schools, government may consider offering adequate, comprehensive and on-going training to teachers. This training should be guided on specific needs of the teachers especially those who are not regularly expose to ICT in their private and personal lives.
- School culture and policy should demonstrate the benefits of ICT use with examples of how it can improve teaching and learning, motivation and incentives are the keys here by highlighting the positive impact of ICT integration
- Emphasis is on good teaching not in ICT use. As technology is used as a tool to enhance good teaching practices instead of being placed as a substitute to their teaching methods.

DECLARATION OF INTEREST

The authors have no conflict of interest to declare. The research incorporated ethical principles involving informed consent and guidelines. This included informing participants on the research purpose, voluntary involvement and no identifiers were used in the data collection and analysis.

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