it purports to test. Ogbugo-Ololube concluded that there was significant relationship between parents' educational background and students' academic achievement scores. Students from good educational background tended to achieve more than students whose parents did not attain formal education.

Conclusion

After the correlation between the parents' level of education and the academic achievement of the students, the study found that parental level of education influenced the academic performance of secondary school students in Abia State, irrespective of the parents' positive or negative attitude to education. This finding compliments the finding from other researchers that the status of parents does not only affect the academic performance of students but also makes it impossible for children from low socio-economic background to compete well with their counterparts from high socio economic background under the same academic environment.

Recommendations

1. Parents and guardians are encouraged to utilize their high educational level by directly involving, participating and assisting in their children's homework, education and activities both at school and at home.
2. Parents of low educational status should as much as possible integrate their relatives, friends and neighbors (privileged to be educated) into the academic upbringing of their children at home.
3. Teachers and administrators should provide feedback to parents concerning the progress of their children.

REFERENCES

Abeya, D. (2018). *The relationship between parents' education and children's academic performance*. www.jister.org

Gratz, J.; Nation, S. O., School, S. O., & Kurth-Schai, R. (2006). The impact of parents' background on their children's education. *Educational Studies*, *268*, 1-12.

Grissmer, D. W., Kirby, S. N., Berends, M., & Williamson, S. (1994) "Student achievement and the changing American family" Washinging, DC: Rand Corporation Governmentof Kenya, (2000).

Hafiz, M. & Wagas R. (2013). Parental involvement and academic performance: A study on secondary school of Lahore. *International Journal of Humanities and Social Sciences*, *3*(8), 138-145.

Hountenvilli, A. J., & Conway, S. (2008). Parental involvement strongly impact student achievement. *Science Daily*, *28*, 23-25.

Jamila, E. H (2009). *The parents' socio-economic status and children's academic performance. Nowegian social research*. McGraw Hill.

Khajehpour, M., & Hazvin, S. D. (2011). The role of parental involvement affect tin children's academic performance. *Procedia-Social and Behavioural Sciences, 15*, 1204-1208.

Kingdom, E. O. and Maekae, J. (2013). The Role Of Education In National Development: Nigerian Experience, *European Scientific Journal*, October 2013 edition.9 (2), pp. 312-320.

Li, Z., & Qiu, Z. (2018). Educational and societal development. *The Journal of Chinese Sociology, 10*(3), 118-196. https://doi.org/10.1186/s40711-018-0083-8

Mutodi, P., & Ngirande, H. (2014). The impact of parental involvement on student performance: A case study of South Africa Secondary School. *Mediterranean Journal of Social Sciences*, *5*(8), 279.

Ogbugo-Ololube, R. (2016). Impact of students' parental background on academic achievement in secondary schools in Obio-Akpor LGA, Rivers State, Nigeria. *International Journal of Scientific Research* in Education, *9*(2), 115-126.

Ogbondah, L. (2010). Adequate funding of public universities in Nigeria for sustainable development. *Africa Journal of Historical Sciences in Education* 6 (2), 318-329.

Okantey, George (2008) " Facilitating educational attainment and student achievement: Science bound parents program" Purdue Extension, Marion County. 6640 Intech BLVD. Ste. Indianapolis, IN 46278.

Okorosaye-Orubite, A. K. (2008). The Role of the Teacher in the development of the Nigerian Nation. *Journal of Research in Education*, 2(1),41-45.

Rana, M. A., Nadeem, I. K., & Saima, T. (2015). The influence of parents' educational level on their children's academic performance. *Journal of Education Practice*, *16*(6), 47-62.

Shanka-Rao, C.N. (2013). Principles of Sociology with an Introduction to Social Thought, S.Chand & Company Ltd., Pp 370-371

Ukap A. (2014). The influence of parents' educational background and study facilities on academic performance among secondary school students. Unpublished Research presented to the National Teachers' Institute, Calabar Study Centre retrieved from https://www.academia.edu/7678232/

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Student-Teachers Competence and Attitudes towards ICT: A Case Study in a Nigerian Polytechnic

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Abstract

The present study was conducted to investigate the competence and attitudes of B.(Technology) student-teachers towards ICT in a Nigerian Polytechnic. Seven research questions and null hypotheses were constructed to guide the investigation. The descriptive cross-sectional survey design was used for the study. A proportionate stratified random sampling technique was used to select 200 participants. The instrument for data collection was an adapted structured questionnaire used in similar research. The tool consists of 35-items structured on a five-point Likert rating format classified into five sub-scales. The reliability of the instrument was determined using the Cronbach alpha technique yielded.95. The data collected was analyzed using both descriptive and inferential statistics. The research results reveals positive attitude towards ICT among the students .Similarly, the competence levels of student-teachers in the use of ICT were high. Research findings reveal no significant differences between male and female student-teachers as it relates to their ICT attitudes and

competencies. With these results, recommendations were made, including translating these positive attitudes and high competence into practice. Applying these theoretical concepts into practice during teaching-learning will help promote the effective integration of ICT throughout the curriculum implementation by student-teachers.

***Keywords**: Attitudes, Competence, ICT, teaching-learning, student teachers*

Introduction

The influence of Information and Communication Technology (ICT) has certainly affected the field of education positively. Academic literature had established the potential of ICT in facilitating students learning, improve teaching and enhance institutional administration (Kazu & Yavulzalp, 2008; Krishner & Woperies, 2003). It has been identified as an indispensable instructional instrument for developing quality teaching-learning processes and research in the education system. Hence, Yusuf and Balogun (2011) posit that using ICT as a tool for enhancing students' learning, teachers instruction and as a catalyst for improving access to quality education in formal and non-formal settings has become necessary. Recounting the impact of new technologies on the workplace and everyday life, teacher education training institutions need to re-structure their educational programmes and classroom facilities. To extract the potential of ICT in improving and sustaining the content of teacher education, it is imperative to start at the grass-root level, where sound competence and attitudinal disposition are laid.ICT as tools within the school environment include it utilization for effective school administration and management, teaching and learning of ICT related skills for enhancing the presentation of classroom work, teaching-learning processes via repetitive activities and tasks, teaching/learning of cognitive, affective and psychomotor domains, thinking and problem-solving skills, stimulating creativity and imagination as well as innovation, for research skills acquisition by teachers and students alike and as a communication tool by teachers and students (Yusuf & Balogun, 2011). Conceptually, ICT are computer-based tools used by

people to work within information and communication processing needs of an organization like the school system. It purview covers computer hardware and software, the network and other digital devices like video, audio, camera and so on, which converts information (text, sound, motion, etc.) into digital form (Moursund & Bielefeldt, 1999). Association of African Universities (2000) in Osansanya, et al., (2010) posit that ICT is a shorthand for the computers, software, networks, satellite links and related systems that allow people to access, analyze, create and exchange and use data, information and knowledge in almost imaginable ways. Similarly, Godstime and Joseph (2015) citing Federal Ministry of Education (2010) to have defined ICT as encompassing all equipment and tools (inclusive of traditional technologies of radio, video and television to the newer technologies of computers, hardware, firmware, etc.), as well as the methods, practices, processes, procedures, concepts and principles that come into play in the conduct of the information and communication activities.

In a more detailed form, Kpolovie (2011:455) avers that ICT is the science of production and utilization of computer equipment, subsystems, software, and firmware for the automatic analysis, acquisition, storage, manipulation, management, movement, transformation, control, display, interchange, transmission and retrieval of data(qualitative & quantitative information) to most appropriately meet human needs. Successful integration and adoption of ICT in the school system depend largely on teachers' competence and attitude towards the role of modern technologies in teaching and learning. Thus, Kyriakidou, et al., (2010) cited by Yususf and Balogun (2011) expressed that experienced teachers, newly qualified and student-teachers need to be confident in using ICT effectively in their teaching. If that is the expectation, then teacher-training institutions are the place to lay the solid foundation for the actualization of their ICT competence and attitudinal propensity.

The availability of ICT in schools will not guarantee their effective utilization. Supporting this assertion, Kpolovie and Iderima (2013) posit that even in developed countries, the mere acquisition of knowledge and skill of ICTs and its competence in its use does not guarantee their use with students and lecturers alike. Regardless of the quantity and quality of technology placed in classrooms, their cardinal key to how these tools are used is the teacher; therefore, teachers must have the competence and the right positive attitude towards technology (Kadel, 2005).

Attitudes refer to one's positive or negative judgment about a concrete subject while Kpolovie, Joe and Okolo (2014) conceptualize attitudes as the total of an individual positive and negative disposition or mental state of preparation for action in response to a social object. Relating attitudes to ICT in the context of this research, Kian-Saw and Chee-Kiat (2002)posit that attitude may influence the attitude to objects, the use of sets for encoding information and the interpretation, judgment and recall of attitude-relevant information. Studies have established close links and association between teachers' attitude and their use of ICT. Dyck and Smither (1995) and Teo (2008) revealed that more positive attitudes towards the computer were associated with a higher level of computer experiences. Hence, students' confidence in ICT can be explained through the attitude and behaviours of their teachers. Teachers' behaviour is a crucial and essential influence on students' confidence and attitudes towards ICT as they provide important role-model to their students (Dertystira, 2003).

Furthermore, Bako (2011) submitted that teachers with a positive attitude tend to apply ICT in their daily life, including in the classrooms and subsequently contribute to the diffusion of ICT in their educational practice. On the contrary, a negative attitude towards ICT may create a major obstacle for the effective use of technology in the classrooms (Chraryension & Knezek, 2009). Thus, teachers' attitudes, values and beliefs should support such effort (Albirmi, 2006; Levin & Wadmany, 2006).

Empirical literature findings suggest that a lack of adequate training and experience is one of the main postulated reasons why teachers do not use technology in their teaching-learning process. This also reflects in In-Service teachers' attitude towards computer and technology, including the senior teachers and lecturers alike. Similarly, lack of confidence leads to reluctance to use computer and technology (Kumar & Kumar, 2003). No wonder Zammit (1992) opined that both pre-service and in-service teachers' attitude towards computer and technology skills could be improved by integrating technology into teacher education programmes. Research findings have also revealed a significant relationship between computer attitude and its use in institutions for pre-service teachers (Chine, 2006) and serving teachers in the affective attitude, general usefulness, behavioural control, and pedagogical use (Yuen & Ma, 2002). Indeed this assertion has important implication to the educational curriculum designers and implementers. Attitude is an internal state that influences behaviour and is a major predictor of future computer usage.

Emphasizing, Lee's (1997) study reveals the importance of appropriate responses to the trainee's feeling about using ICT as one of the factors crucial to success. Therefore, there is the absolute need to take care of student teachers' psycho-socio-emotional needs during training, as attitude is a major predictor of future ICT utilization after graduation in the workplace. Corroborating further, Kennewell and Norgan (2003) discovered that student- teachers have a positive attitude and are highly enthusiastic about interactive whiteboards as an important feature of teaching and learning, thus motivating them to practice using technology.

The preponderance of research on ICT had investigated different constructs or variables such as ICT knowledge, competence, availability, accessibility, barriers, integration, adoption, implementation, computer anxiety, demographic variables such as gender, fields of specialization, age, and status etc. The issue of gender and science-oriented gaps tends to exist in Nigeria and in Sub-Saharan Africa, hence attributable reasons for our backwards status. In Africa, many children are out-of-school, most of whom are girls who are deprived of any opportunity to gain ICT-related knowledge and skills in schools. The situation is even worst in Nigeria, for women have the lowest enrolment rates in the field of science and technology, Technical and Vocational Education (TVET). Research findings are inconsistent and inconclusive on gender as relates to ICT A study conducted by Derbyshire (2003) in four African countries identified that while principles, girls when are given the same opportunity as boys of a class to computer, gender equity does not exist in practice. On the other side, Kirkpatrick and Giben (1999) research established that when female and male students had the same amounts and types of computer experiences, females' achievement scores and attitudes are similar to that of male at all educational levels.

Series of empirical studies by Schaumburg (2001) had established that females tend to be less interested in computer and use them less often in their spare time. Also, research findings revealed that girls are less confident than boys in their computer skills and that some international findings discovered that boys scored better than girls in computer-related knowledge and skills in the vast majority of countries.

Amley and Enger (2207) reported that males are more positive in their attitude towards ICT than female. Papaloannou and Charalambous (2011) investigated the impact of gender on the attitudes towards ICT. The research findings

concluded that both male and female have positive attitudes towards ICT; however, they reported males having stronger positive attitudes than their female counterparts. Other researchers have found no significant difference in attitudes towards ICT by gender (Intaganok, et al., 2008; Elsadaani, 2012; Omollo, et al., 2013)

In his research, Derbyshire (2005) submitted that the three computer-related occupations (computer scientists, computer engineers' and system analysts, computer science and engineering) are the boys' top career choices. Females also have more negative attitudes towards computer (Bebetos & Antmiouv, 2008) thus they are often less computer literate than male (Kadal, 2005; Schaumburg, 2001; Townsend, 1997); thus they are often less computer literate than males (Schaumburg, 2007) and this may result in different ways of using the computer (Jackson, Eruuvin, Gardner & Schmitt, 2001). While from another perspective, a study conducted by Sefyrin (2005) reveals; that competence in ICT could be seen as a question of interest in ICT, where men are more interested in ICT than women. The summary of the reviews indicates the inconsistency of research findings as it relates gender to ICT competence. Hence, further clarification is needed through subsequent researches to have a better understanding of the constructs.

Consequently, both student teachers and In-service teachers are expected to be skilful in using ICT and be able to critically evaluate strategies and procedures for the acquisitions and the appropriate application of ICT in different curriculum areas (Robbin, 1998). Highlighting major ICT competence required by teachers, Krishner and Woperies (2003) elucidated:

- Competency in making personal use of ICT.
- Mastery of a range of educational paradigms that make use of ICT.
- Competency in making use of ICT as minds tools.
- Competency in mastering a range of assessment paradigms which involve the use of ICT and
- Competency in understanding the policy dimensions of the use of ICT for teaching and learning.

Thus Pre-service teacher education programme should focus on the need for student-teachers to have ICT skills for their use in the preparation of instructional materials for teaching and learning activities; they need to facilitate the direct usage of ICT in students learning activities within the classroom situation, and the need for teachers to develop their student's critical

awareness of ICT applications and the social implications (Robbin, 1998). Supporting this assertion, both the Association of African Universities (2010) and Yusuf (2005) identified that following application of ICT in teaching and learning:

- To provide basic computer literacy skills.
- To provide basic computer literacy skills relevant to respective academic disciplines.
- To improve students motivation.
- To improve access to remote resources.
- To improve communication skills.
- To improve higher-order thinking skills.
- To provide content (e.g., CD-ROM, WWW, etc.).
- To support teaching methodology (e.g. group work tools for group assignments on the internet)
- To improve course management (both in the regular curriculum and in distance education)
- To collaborate in online teaching and learning with other faculty and students from around the world.

Similarly, Yusuf and Balogun (2011) citing Marija and Palmira (2007) classified ICT competencies into two, namely basic and educational ICT competences. These competencies are further elaborated in the ICT Competency Standards for teachers developed by the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2008a, 2008b). Based on these Universal Documents, the Information and Communication Technology competency is comprehensive rather than merely focusing on ICT skills. Rather, it is a comprehensive approach to education reform in six (6) broad areas of Policy, Curriculum and Assessment, Pedagogy, the use of technology, School Organization and Administration and Teacher Professional Development. Indeed the UNESCO (2008a, 2008b) Standards for teachers are meant to improve teachers practise in using ICT in an innovative way for teaching, collaborating with colleagues, and for school organization.

To re-address the educational gap in the acquisition of ICT competence and skills by student-teachers, the teacher-training institutions should be the starting point. No wonder Lee (1997) found that many pre-service teachers are not equipped with basic computer operational skills and subsequently proposed that

for teachers to integrate ICT into the school curriculum, groundwork must be done at the pre-service teacher education levels. Hence, teacher educators' curriculum developers and implementers and other ICT stakeholders' need to understand the dimension and relevance of pre-service teachers' attitude to develop, implement, and sustain teacher education curriculum relevant for the contemporary ICT knowledge and skills.

Statement of the Problem

In a developing country like Nigeria, a series of investigation proved that despite introducing ICT from primary to tertiary educational levels, the result had not been satisfactory. Studies by Jegede and Oluolabi (2005), Kpolovie and Awusakei (2016) have revealed a wide gap between policy development and implementation in Nigeria schools regarding computer education. Examining ICT in the Nigerian Health Sectors, only a mobile phone and the internet are available and used in Nigerian Hospitals (Idowu, et al., 2003). Relating to teachers ICT competence, teachers in Nigerian Secondary Schools as well as lecturers in tertiary institutions' are not competent in the basic computer operation and the use of generic software (Yusuf, 2005; Kpolovie & Awusaku, 2016; Jegede, et al., 2007; Berner, 2002). These research findings have revealed the low level of ICT penetration. It could be seen that several kinds of research embarked upon investigating the ICT usage for instructional purposes in various level of education had produced mixed results. Series of issues or posers are begging for answers.

Are Pre-service teachers familiar with ICT resources' for teaching-learning processes? Are the B.(Tech) Education student-teachers accessible to these ICT resources? What is the attitude of the Student-Teachers towards ICT? How competent are the student –teachers on the utilization of the ICT components? What is the perception of the student-teachers towards ICT skills in a future career? All these questions can only be answered through conducting research. It is against this background that it becomes necessary to investigate B. (Technology) Education Student-Teachers competence and attitude towards ICT in Kaduna Polytechnic, Kaduna Nigeria. Hence, this research aimed to gain an appreciation of this unique set of student-teachers attitude and perceived competence in the use of ICT and may help provide useful justification into the future of ICT effective implementation, integration, acceptance, and utilization teaching-learning process in Nigerian teacher education institutions.

Purpose of the Study

The main purpose of this research was to investigate B.(Technology) Education Student-teachers' competence and attitude towards ICT. Specifically, the study assessed:

1. Attitude of the student-teachers towards the use of ICT.
2. Competence of student-teachers in the use of ICT
3. Perception of the student-teachers on acquired ICT knowledge and skills, and for future career usage.

Research Questions

The following research questions were formulated to guide this research.

1. What is the attitude of B. (Tech) student-teachers towards ICT?
2. What is the competence level of student-teachers in the use of ICT?
3. What is the relationship between student-teachers attitude towards ICT and competence level in the use of ICT?
4. Will there be differences between the attitudes of male and female student-teachers towards ICT?
5. Will there be differences in the competence levels between male and female student-teachers in ICT use?
6. What is the difference between student-teachers in Vocational and Industrial programmes as it relates to their attitudes towards ICT?
7. What is the difference between Vocational and Industrial student-teachers' competence levels in ICT usage?

Hypotheses Postulation

The tenability of the following null hypotheses were postulated and tested at .05 alpha levels.

1. The attitude of student-teachers towards ICT will not be significantly positive.
2. The competence levels of student-teachers in the use of ICT will not be significantly high.
3. There is no significant relationship between students-teachers' attitudes towards ICT and competence in ICT usage.
4. Significant difference does not exist between the attitudes of male and female student-teachers towards ICT.

5. There is no significant difference between the competence levels of male and female students in the use of ICT
6. There is no statistically significant difference between student-teachers in Vocation and Industrial programmes as it relates to their attitudes towards ICT.
7. Significant difference does not exist in students' competence levels – teachers in Vocational and Industrial programmes in ICT use.

METHODOLOGY

Research Design: This quantitative research employed a descriptive survey design that is cross-sectional in nature, designed to compare male and female as well as specialization areas with regards to their competence and attitudes towards ICT. Denga and Ali (1998) citing Best (1986) reveals descriptive survey design as concerned with conditions of relationship that exist, practice that prevails, belief of view or attitudes held, processes that are going on, effort that is being felt or trends that are developing.

Population and sample of the study: The target population comprised of all the final year B.(Technology) Education student-teachers in the Department of Education (Technical), Kaduna Polytechnic, Kaduna Nigeria. These sets of pre-service student teachers are in their final semester about to graduate soon to join the world of work. Thus, these participants are the most suitable for having offered all the necessary courses as required before graduation. A sample size of 200 participants was selected using proportionate stratified random sampling technique using the Industrial and Vocational programs as strata out of the 230 total populations as against the minimum 144. The justification of the sample size was based on Krejice and Morgan (1970) Table for determining sample size from a given population, which helps ascertain its adequacy (Kpolovie, 2011).Application of Taro Yamani's formula as postulated by Baridam (2001) and Isangedighi, et al, (2004) equally confirmed the sample's adequacy for this research.

Research Instrument: The researchers(s**)** used the adopt/adapt strategy where a self-developed structured questionnaire used in similar research was adopted as an instrument for data collection (Yusuf & Balogun, 2011). The tool was based on the established procedure in literature after extensive review. The questionnaire comprised of sections. Section A elicited demographic data of the student-teachers such as programmes, specialization areas, gender, age. Section

B focused on student-teachers attitude towards ICT. It contained 14-items structured on five-point modified Likert response mode of Strongly agree (SA) to Undecided (U). Section C was designed to measure student-teachers' level of competence in the use of ICT, specifically basic ICT competence. This portion consists of 35-items divided into four sub-scales namely (i) competence of basic computer operation (9- items), (ii) competence in the use of application software (10- items), (iii) competence in the use of internet resources (12 - items), and (iv) competence in the use of peripherals ICT equipment (4- items). These items were modified and structured on five-point rating format of (5=I am fully competent with this application/operation; 4=I am a regular and confident user of this application; 3=I have used this occasionally but need further training; 2=I do not use; 1=I am not aware of this application/operation). Section D contained two items that addressed the issue of where student-teachers acquired their ICT knowledge and skills and future use of ICT.

Validation and Reliability of the Instrument: To ascertain the instrument validity and reliability, the initial draft was trial-tested on 30 student-teachers who would not be part of the research population. The feedback from this trial-testing was used to modify the final instrument. The internal consistency reliability of the tool was determined using the famous Cronbach Alpha Coefficient Method. The developer of the instrument obtained the following reliability coefficients using test-retest method of three week intervals for the five sections thus: ((a) attitude = .76; (b) basic computer operation = .81; (c) use of application software = .84; (d) use of internet resources = .80; (e) use of Peripheral ICT equipment = .75). In the present research, the following reliability coefficients were computed using Cronbach alpha technique: (a) attitude = .74, (b) basic computer operation = .93, (c) use of application software = .91, (d) use of internet resources = .86, (e) use of Peripheral ICT equipment = .73 and overall competence sub-scales = .95.

Procedures for Data Collection: The participants were informed properly about the study and its importance. The tool was administered to the student-teachers before a normal lecture period by the researchers personally. Participation was voluntary after the participants were informed on how to respond to the questionnaire items by reading the instruction properly. Responding to the whole items took between 10-15 minutes. All this is to ensure valid and reliable data collection and guarantee a high return rate.

Methods of Data Analysis: The data collected were properly coded, cleaned for errors, and preliminary analyses performed. Descriptive statistics of frequency, percentage, mean and standard deviation were used to answer the research questions while parametric tests were utilized to test the tenability of the hypothesis. All these analyses were facilitated with the help of a computer software package called SPSS version 23.

Results

Table 1: -Demographic characteristics of the study sample (n = 175)

Programme	Frequency	Percentage
Vocational Technology	74	42
Industrial Technology	101	58
Gender		
Male	140	80
Female	35	20
Age Bracket		
21 – 40 Years	100	57
41 – 50 years	**56**	**32**
51 – 60 years	1	1
Marital Status		
Single	82	47
Married	91	52
Separated	**2**	**1**
Total	175	!00

Table 1 contained the respondents' demographic data for this study, indicating that 74 (42%) of the respondents are in Vocational Technology programmes, while 101 (58%) are in Industrial Technology Programs. Out of the 175 respondents, 140(80%) are males, while 35(20) are females. Also, 100(57%) of the respondents are between 21 – 30 years old, 56(32%) are between 32-40 years old, 18(10%) are between 41-50 years old while 1(1%) is between 51-60 years old. The marital status distribution reveals that 82(47%) are singled, 91(52%) are married, while 2(1%) is separated.

Research Question One: What is the attitude of B.(Technology) students towards ICT?

Table 2: Analysis of results on the Attitudes towards the use of ICT

No	Items (Competence of students teachers in Basic computer Operation and Issues)	Mean	SD	Decision
1	ICT enhances students learning.	4.73	0.54	Agreed
2	Teacher education programme should include ICT.	4.45	0.72	Agreed
3	Mail creates more information between teachers and learners.	4.13	0.80	Agreed
4	ICT Provides better learning experiences.	4.35	0.69	Agreed
5	I would work harder if l could use ICT	4.15	0.95	Agreed
6	I learn more from ICT than l do from books.	4.03	0.91	Agreed
7	ICT is useful in the dissemination of information	4.20	0.91	Agreed
8	ICT makes the course more interesting.	4.28	0.81	Agreed
9	ICT skills are worthwhile	4.13	0.83	Agreed
10	ICT gives an opportunity to learn more	4.10	1.11	Agreed
11*	I won't have anything to learn more.	3.26	1.19	Agreed
12*	I have a phobia for ICT equipment.	3.11	1.27	Agreed
13*	ICT can't address.	3.18	1.17	Agreed
14*	The state of facilities discourages me from using ICT.	2.86	1.23	Disagreed
	Grand Mean	**3.93**	**0.93**	**Agreed**

Based on the data analysis presented in Table 2 reveals responses to attitudes towards the use of ICT by student-teachers produced an overall grand mean of 3.93(SD=0.93) was greater than the mean cut-off-point indicating an overall positive attitude towards the use of ICT. Item by item analysis reveals that item No 1 with the highest mean indicates ICT enhances students' learning, followed by item No 2. Teacher education should include ICT, followed by item No 4 specifying ICT provides better learning experiences and item No 8, implying ICT makes the course more interesting. Only item No 14, whose mean was less than the cut-off point, disagreed that facilities' state discourages me from liking ICT. In the final analysis, 13 out of the 14 items produced positive attitudes towards the use of ICT

Research Question 2: What is the competence level of student teachers in the use of ICT?

Table 3: Analysis of results on the competence of student teachers in Basic Computer Operation and issues

No	Items (Competence of students teachers in Basic computer Operation and Issues)	Mean	SD	Decision
1	I can locate and run an application program, e.g. MS word.	3.96	1.24	Competent
2	I can search for files on a computer system.	4.11	1.08	Competent
3	I can connect the computer and its peripherals.	3.90	1.15	Competent
4	I can access information on CD/DVD	3.86	1.21	Competent
5	I can organize electronic files into folders	3.72	1.29	Competent
6	I can move files between drivers (e.g. from A to C).	3.67	1.31	Competent
7	I can print to various networked printers.	3.71	1.28	Competent
8	I am aware of computer security, copyright and the law.	3.58	1.22	Competent
9	I am aware of health and safety issues relating to the computing environment.	3.77	1.19	Competent
	Grand Mean	**3.81**	**1.22**	**Competent**

Empirical data analysis in Table 3 displays student's teachers' competence level in basic computer operation and issues. Majority of the respondents indicated that they are competent on most of the items as it relates to basic operations. For items 2, 1, 3, 4, and 9, each produced mean values above the mean cut-off point. Item, no 2 with the highest mean value, implies that they can search for files on the computer system; followed by item no 1 that they can locate and run an application program like MS words; followed by item no 3, which specify connecting the computer and its peripherals. Grand mean of 3.81 and a standard deviation of 1.22 is far above the mean cut-off point, indicating that the respondents are very competent in all the operations and issues to specify by this component.

Table 4: Analysis of results on the competence of student teachers on the use of Application of software use of ICT

No	Items (Competence of student-teachers is Use of Application Software)	Mean	SD	Decision
10	I can open a new document in word.	4.02	1.23	Competent
11	I can use simple editing (e.g. bold, italics, centring, font size, etc.)	3.99	1.13	Competent
12	I can use spreadsheet to make predictions	3.57	1.27	Competent
13	I can sort and filter data.	3.44	1.20	Competent
14	I can use spreadsheet package very well.	3.48	1.32	Competent
15	I can create a basic presentation package.	3.60	1.18	Competent
16	I can modify colours of text, lines, and spaces on a slide.	3.65	1.17	Competent
17	I can introduce animation into slides	3.41	1.13	Competent
18	I can set up a database.	3.35	1.23	Competent
19	I can enter and update data in a database.	3.53	1.17	Competent
	Grand Mean	3.60	1.22	Competent

The results of the analysis in Table 4 are on student-teachers competence in the use of application software. The grand mean computed is 3.60, and standard deviation is 1.22. Item analysis reveals that respondents indicated competency in the use of all application software. The items with the highest mean values are no 10 which specify that "I can open a new document in the word, item no 11. "I can use simple editing, e.g. bold, italics, centring, font size, followed by item no 16, "I can modify colours of text lines and spaces on a slide. The item with the lowest mean is the no 18, "I can set up a database. Indeed this result indicates a high level of competency in the use of application software system for student-teachers. The implication is that they can comfortably and effectively utilize ICT for their teaching-learning process.

Table 5: Analysis of results on the competence of student teachers on the use of Internet Resources

No	**Items (Competence of student-Teachers is Use of Internet Resources)**	**Mean**	**SD**	**Decision**
20	I can access an Internet site via its website address.	4.06	1.15	Competent

21	I can download files from the internet.	4.20	.98	Competent
22	I can send and receive e-mail messages.	4.20	1.02	Competent
23	I can attach files to outgoing E-mails.	3.88	1.09	Competent
24	I can sort messages and file in created folders.	3.73	1.11	Competent
25	I can save a document in various file formats, including HTML.	3.73	1.11	Competent
26	I can save text and images from web pages.	3.95	1.04	Competent
27	I can communicate online with other students on homework/assignment.	4.00	1.04	Competent
28	I can use web search engines (Google, AllTheWeb, AltaVista, etc. very well.	3.81	1.15	Competent
29	I can do deep web searching using appropriate meta-search engines (Surf Wax, Vivissimo, HotBot, etc.) very well.	3.77	1.07	Competent
30	I can use web authority tools.	3.74	1.12	Competent
31	I can chat on the internet using instant messaging tools (Yahoo, MSN, Skype, etc.).	3.68	1.11	Competent
	Grand Mean	**3.89**	**1.07**	**Competent**

The empirical data contained in Table 5 is in relation to the use of Internet Resources. The grand mean of 3.89(SD=1.07) reveals that the respondents are competent in using all items associated with internet resources. Item-by-item analysis indicates that items no 21 and 23 recorded the highest mean values implying that respondents are competent in downloading files from the internet and can send and receive e-mail messages effectively. Other items are item no 20, implying that they can access on internet site via its website address. The item with the lowest mean value is item no 31 which specify that respondents can chat on the internet using instant messaging tools like Yahoo. MSN, Skype, etc. The conclusion that can be drawn is that the student-teachers are fully competent or regular and confident users of the internet resources, including websites HTML, e-mail, search engines like Google, AllTheWeb, AltaVista, surfing, authoring tools. As student-teachers, the utilization of these internet

resources in the teaching-learning process will help to ensure more positive attitudes and expertise in the prospective teachers.

Table 6: Analysis of results on the competence of student teachers on the use of Peripheral ICT Equipment

No	Items (Competence of student-Teachers in the Use of Peripheral ICT Equipment)	Mean	SD	Decision
32	I can use a digital camera to capture images.	3.94	3.94	Competent
33	I can use the web camera to communicate on the internet.	3.78	3.78	Competent
34	I can set up and use Liquid Crystal Display (LCD) or Multimedia Projector	3.61	3.61	Competent
35	I can use a scanner to copy images.	3.74	3.74	Competent
	Grand Mean	**3.77**	**1.15**	**Competent**

The results in Table 6 are on student-teachers competence in the use of peripheral ICT equipment. The grand mean of 3.77(SD=1.15) is far above the mean cut-off point, indicating that the student-teachers are competent in the use of peripheral ICT equipment. From the computed mean values, the student-teachers are competent in all items. The item with the highest mean value is item no 32, which indicates that they can use a digital camera to capture images, followed by item no. They can use a web camera to communicate on the internet. The item with the least mean value is item no 34 which specify "I can set up and use Liquid Crystal Display (LCD) or multimedia projector.

Also, based on the responses of the student-teachers on their competence in the use of ICT, further information was elicited on where the students-teachers acquired ICT knowledge and skills and their perception on the importance of ICT on their professional future career. The results are presented in Tables 7 and 8.

Table 7: Response on where student-teachers learnt ICT knowledge and skills

Variable		Special course	In Poly	Taught by friends	Self-taught	Outside poly	Total
Gender	Male	54(39%)	24(13%)	4(39%)	28(20%)	30(26%)	140
	Female	14(28%)	1(3%)	-	3(9%)	17(49%)	35
Programs	V. Tech.	34(46%)	11(15%)	-	5(7%)	24(55)	74

	I. Tech.	34(34%)	14(14%)	4(4%)	26(26%)	23(23%)	101

The data analysis results in Table 7 reveals where the student's teacher learnt their ICT knowledge and competences. As shown, two parameters were used to display these results – gender and programme. It could be seen that majority of the male student-teachers learnt ICT knowledge and skills compared to female while Industrial Technology students acquired it more than Vocational technology students. The statistical analyses reveal that there is a similarity in the avenues of learning ICT knowledge and skills. These findings indicate that most student-teachers had acquired their ICT competence independent of the Polytechnic before being admitted. This could be attributable to the fact that there is no specific course available in the Nigerian teacher education program on ICT. Even where it is available, there are not ICT laboratories for practicals. Until the acquisition and utilization of ICT are viewed with seriousness among student-teachers in a teacher-education programme, it would be very difficult for the prospectiveteachers to develop positive attitudes and implementation in their teaching-learning process after graduation.

Table 8: Responses on the student-teachers perception of ICT skills in future career

Variable		V/Important	Important	Of some value	Little or no importance	Total
Gender	Male	111(79%)	24(17%)	5(4%)	-	140
	Female	28(80%)	6(17%)	-	1(3%)	35
Program	V. Tech.	61(82%)	12(16%)	-	1(2%)	74
	I. Tech.	78(77%)	18(18%)	5(5%)	-	101

Table 8 reveals that the majority of the male compared to the female and more of the Industrial Technology students compared to their Vocational Technology counterparts indicated that ICT skills would be very important for their future professional career as teachers. The thematic column analyses reveal the recognition of the importance of the role of ICT in their future professional growth and development. This further explains their acquisition of basic ICT

competencies and knowledge, even when their Teacher Education programmes place less importance and do not lack adequate ICT acquisition and implementation provision.

Table 9: Responses on Daily computer usage among student -teachers

Variable		Never	1-2hra	3hrs	5-7hrs	8-10hrs	Total
Gender	Male	16(11%)	60(43%)	323(23%)	21(18%)	1(8%)	140
	Female	-	13(37%)	16(46%)	3(9%)	3(9%)2(3%)	35
Programs	V. Tech.	2(3%)	19(26%)	27(37%)	18(24%)	8(11%)	74
	I. Tech.	14(14%)	54(54%)	21(21%)	6(6%)	6(6%)	101

As revealed in Table 9, are the responses on the Daily computer usage among the student teachers. Gender wise, it shows that male students (140) are greater users of the daily computer than their female counterparts. In terms of the programme specialization, the results reveal that students in Industrial Technology tend to use the computer daily more than their Vocational technology counterparts.

Hypotheses Testing

HO 1: The attitude of student-teachers towards ICT will not be significantly positive.

Table 10: One-sample t-test analysis on student –teacher's attitudes towards ICT

Variable	N	Sample Mean	Sample SD	Reference t-value	t-value	Sign	Remark
Student Attitudes towards ICT	175	84.95	5.59	27	30.63*	<.001	S

The results of data analysis presented in Table 10 revealed statistically significant positive attitudes towards ICT among the students –teachers (M=54.95, SD=5.59) = t(174) = 30.63, P<.001, leading to the non-support of the fist null hypothesis. This then implies that the student-teachers attitude towards ICT is significantly positive indeed.

HO 2: The competence levels of student-teachers in the use of ICT will not be significantly high.

Table 11: One-sample t-test analysis on student-teachers competence levels on the use of ICT

Variable	N	Sample Mean	Sample SD	Reference t-value	t-value	Sign	Remark
Student competences in the issue of ICT	175	34.28	8.69	27	11.07*	<.001	S

Similarly, analyzed data displayed in Table 11 reveals statistically significant high levels of competence in the use of ICT among student-teachers (M=34.28, SD=8.69), t(174) = 11.07, P<.001, leading to the non-support and thus the rejection of the second hypothesis. This then means that the competence levels of the student-teachers in the use of ICT was significantly high.

HO 3: There is no significant relationship between students-teachers' attitudes towards ICT and competence in ICT usage.

Table 12: Pearson Product Moment correlations students attitudes towards ICT and Competencies in the usage of ICT

No	Variable	Mean	SD	1	2	3	4	5
1	Attitudes toward ICT	34.95	8.59	1	.068	-.023	.210*	.104
2	Compete. on Comp. Operation.	34.28	8.69	.068	1	.739**	.635**	.529**
3	Compete. on Appl. Software.	36.04	8.86	-.023		1	.556**	.566**
4	Compet. On Internet Resc.	46.74	8.22	.210			1	.531**
5	Comput. On Use of Prep. ICT	15.07	3.45	.104				1

**Correlation is significant at the .01 level (two-tailed).

In testing hypothesis three, a series of Pearsonian correlational analyses were performed between students' attitudes towards ICT and the various ICT competencies components. The results in Table 12 reveals a non-statistical positive but weak relationship between attitudes towards ICT and competence of basic computer operation, r(173) = .068, p = .37, a non-statistically negative and weak association with competence in the use of application software, a non-statistically significant and small positive correlation with competence in the use of internet resources'(174) = .21, p=.005 and a non-significant and weak positive relationship with competence in the use of peripheral ICTY equipment, r(174) = .104, p=.17.

All the interpretations were based on Cohen (1988, p79-81) suggested guidelines of small relationship (r= .10 to .29), medium (r= .30 to .49) and large (r= .50 to 1.0), respectively. In addition, intra- correlational analyses between the components of competences all revealed large positive significant correlations.

HO 4: Significant difference does not exist between the attitudes of male and female student-teachers towards ICT.

Table 13: An independent t-test analysis whether the attitudes of male and female students differ towards ICT

Gender	N	Mean	SD	T	p-value	Remark
Male	140	54.92	5.65	-.13	.89	NS
Female	35	55.06	5.45			

An independent sample t-test was utilized to compare the difference between male and female student-teachers attitudes towards ICT. The analysis presented in Table 13 revealed that the no statistically significant difference between male students (M=54.92, SD=5.65) compared to the female students (M=55.06, SD=5.45), t(173) = -.13, P=.89. The magnitude of the difference in the means = -.14, 95% CL= -2.23 to 1.96 was very small (eta squared = .006) in terms of effect size. Cohen (1988:284-7) proposed the following guidelines for interpreting the value of effect size (.01= small effect, .06 moderate effect and .14=large).

HO 5: There is no significant difference between the competence levels of male and female students in the use of ICT

Table 14: An independent sample t-test on differences between the competence level of male and female student in the use of ICT

Variable	Gender	N	Mean	SD	T	Sign	Remark
Basic computer Opert.	Male	140	34.18	9.05	-.352	.73	NS
	Female	35	34.69	7.23			
Use of App. Software	Male	140	35.51	9.09	-1.77	.08	NS
	Female	35	38.17	7.64			
Use of Internet Resc.	Male	140	47.20	8.19	.17	.14	NS
	Female	35	44.91	8.20			
Use of Perh. Equipt.	Male	140	14.94	3.55	-1.02	.31	NS
	Female	35	15.60	3.00			
Total	**Male**	**140**	**131.82**	**25.27**	**-.33**	**.74**	**NS**
	Female	**35**	**133.37**	**23.24**			

Independent samples of t-tests were explored to compare the differences between male and female student teachers on their competence levels in the use of ICT on the four competencies. The analysis displayed in Table 14 reveals clearly that there was no statistically significant difference between the male students in the overall values (M=131.82, SD=25.27) compared to their female counterparts (M= 13.37, SD=23.24), t(173) = -.33, P=.74. The magnitude of the difference in the means = -1.56, 95% CL: -10.83 to 7.73 was very small (eta squared =.006). A closer look also reveals that relative competence levels between male and female students reveal non-statistical significant differences. With all these results, the fifth null hypothesis is hereby supported and thus sustained. This then implies that there is no significant difference between the competence levels of male and female students in the use of various ICT components.

HO 6: There is no statistically significant difference between student-teachers in Vocation and Industrial programmes as it relates to their attitudes towards ICT.

Table 15: An independent t-test analysis whether the attitudes of male and female students differ towards ICT

Program	N	Mean	SD	T	p-value	Remark
Voc. Tech.	74	55.99	5.44	2.12*	.035	S
Indust. Tech.	101	54.19	5.60			

Similarly, an independent sample t-test was utilized to compare the differences between student-teachers in Vocational Technology and Industrial Technology programmes as it relates to their attitudes towards ICT. The empirical results presented in Table 15 shows that there was a statistically significant difference in the attitude of students in Vocational Technology (M=55.99, SD=5.44) compared with their counterparts in industrial Technology (M=54.19, SD=5.60), t(173) = 2.12, P = .035. The magnitudes of the difference in means =1.79, 95% CL: .126 to 3.47 was very small (eta squared =.006). With these results, the sixth null hypothesis was hereby not supported and thus rejected for the alternative. It then implies a significant difference between students in Vocational compared to those in Industrial Technology programs as it relates to their attitudes towards ICT. A closer critical look reveals that students in Vocational Technology tend to have a slightly higher mean value than their Industrial technology counterparts.

HO 7: Significant difference does not exist in the competence levels between students –teachers in Vocational and Industrial programmes in ICT use.

Table 16: An independent sample t-test on differences between the competence level of male and female student in the use of ICT

Variable	Program	N	Mean	SD	T	Sign	Remark
Basic computer Opert.	Voc. Tech.	74	33.59	9.19	-.89	.37	NS
	Indust. Tech.	101	34.76	8.34			

Use of App. Software	Voc. Tech.	74	36.79	9.57	.19	.76	NS
	Indust. Tech.	101	36.22	8.35			
Use of Internet Resc.	Voc. Techn.	74	46.29	7.63	.43	.54	NS
	Indust. Tech.	101	47.07	8.66			
Use of Perh. Equipt.	Voc. Tech.	74	15.76	3.06	.09	.02*	S
	Indust. Tech.	101	14.56	3.64			
Total	**Voc. Tech.**	**74**	**131.45**	**25.51**	**-.31**	**.76**	**NS**
	Indust. Tech.	**101**	**132.63**	**24.42**			

In testing the seventh hypothesis, an independent sample t-test was similarly utilized to compare the differences between students in Vocational and those in Industrial Technology on their competences in the use of ICT on the four components. The results shown in Table 16 indicated clearly that there was no statistically significant differences between the students in Vocational Technology in terms of overall results (M=131.45, SD=25.51) compared to their Industrial Technology counterparts (M=132.63, SD=24.42), t(173) = -.31, P=.76. The magnitude of the difference in the means = -1.18, 95% CL -8.70 to 6.33 was also very small (eta squared =.006).

A closer look at the four individual competency components reveals that only one component; the use of Peripheral ICT equipment produced a statistically significant difference in favour of the Vocational Technology students. However, all the other three components failed to produce any statistically significant difference between the two groups of students. With these results, the seventh null hypothesis is hereby supported and upheld, except for the use of Peripheral equipment. It then means that there was no significant difference between the two groups of students as it relates to their levels of competence in the use of ICT, except with the use of Peripheral ICT equipment.

Discussion of Findings

The potential of ICT as an essential educational tool in teacher-education programmes had been well documented in numerous studies. The current

research investigated the competence and attitudes of student's trenchers towards ICT in Kaduna Polytechnic, Nigeria. This research reveals that student-teachers at the Polytechnic seem to have positive attitudes in ICT comparable to other students in other settings. Thus, the first hypothesis's finding is in line with other research findings by (Dyck & Smitter, 1995; Teo, 2008; Balco, 2011). Indeed this positive attitude is an important indicator of student teachers willingness and first step in effective ICT integration and subsequent implementation.

Similarly, the second hypothesis results reveal a high level of ICT competencies and a usage among the student-teachers. Generally, most student teachers possess skills in various ICT applications and equipment operations that are important to support and enhance their learning experiences and ICT integration. The finding is consistent with the findings of (Chine, 2006; Yuen & Ma, 2002).

Research findings related to the fourth hypothesis reveal no significant difference between male and female student-teachers in relation to their ICT attitudes. This finding is consistent with that of (Derbyshire, 20p03; Kirkpatrick & Giben, 1999). However, the research finding is contrary to Amley and Enger (2007) findings that reported that males have had more positive attitudes towards ICT than females. With this inconsistency still unresolved, periodic investigations need to be conducted to push the frontier of knowledge in this direction.

Also, no gender differences were established between male and female in relation to their ICT competencies. This study's findings are also contrary to that of (Bebetos & Antimiov, 2008; Kadel, 2005; Schaumbug, 2001; Townsend, 1997) who found that females are often less computer literate than males. With the present opportunities provided by ICT exploration and revolution, institutions of higher learning should ensure that ICT competencies and skills are utilized in the teaching-learning process instead of students wasting away on Social media.

Conclusion

This study's main focus was to investigate the competence and attitudes of B.(Technology) Education student teachers towards ICT. It was discovered that student-teachers have positive attitudes towards ICT. Similarly, the competence level as it relates to ICT usage was very high. Despite these findings, the

student-teachers need to translate these positive attitudes and high competence into practical when they graduate into work. It is applying these theoretical concepts into practice during the teaching-learning process that will help promote effective integration of ICT throughout the curricular implementation by student-teachers.

Gender had no significant influence on both the attitudes and competence levels of the student teachers. This is a welcomes development. However, it was discovered that both male and female student teachers learned their current ICT skills and knowledge of computer programs outside the institution. This calls for serious concerned and practical implications, because, the skills and knowledge of ICT application into their teaching-learning process need to be emphasized at this stage before graduation. To actualize that the lectures and educators should practically incorporate and adopt delivering their lectures using the ICT hence ICT integration into the curriculum. By so doing, the students would eventually emulate their lecturers after graduation.

Another finding of this research was that there was no statistically significant difference between Vocational Technology and Industrial Technology students regarding attitudes and competence towards ICT. This tends to support and buttress the earlier findings. To sustain these positive attitudes and high competence on ICT usage, provisions should be further made and sustained for lectures and students to be able to integrate ICT-based methodology into their lectures. It is one thing to have positive attitudes and high ICT competencies; It is another thing to ensure constant utilization of their ICT competence during the teaching-learning process.

Finally, it may be necessary for further research to be explored in the institution on online registration, computer-based test, use of computer software like SPSS on students ICT competency in the Polytechnic and other tertiary institutions.

References

Association of African Universities. (2010). Technical experts meeting on the use and application of Information and Communication technologies in higher education institutions in Africa. May, 17-19 University of Dar-es-salam, Tanzania. http://www.aau.org/english/documents/aau-ictreport.html

Baridam, D. M. (2001). *Research methods in administrative sciences.* Port Harcourt: Sherbrook, Associates.

Bebetsos, E. & Antoniou, P. (2008, October). University students differences on attitudes towards computer use. Comparison with student's attitudes towards physical activity.

Interactive Educational Multimedia, 17, 20-28. Retrieved 3 February 2009 from http://greav.ub.ed/iem/index.php?journal=iem&op=view&path{}=130&path{}=198

Berner, J. E. (2003). A study of factors that may influence faculty selected schools of education in Commonwealth of Virginian to adopt computer in the classroom. Doctoral Dissertation. George Masson University (UMI NO AA13090718). Retrieved from http://www.edu/tech/jin/pubs/html.

Denga, D. I. & Ali, A. (1998). An introduction to research methods and statistics in educational and social sciences. Calabar: Rapid Educational Publishers.

Derbyshire, H. (2003). Gender issues in the use of computers in education in Africa. Retrieved 25 January 2008 from http://imfundo.digitalbrain.com/imfundo/web/leran/documents/Gender%20Report.pdf.

Dyck, J. L. & Smitther, J. A. (1995). Older adults acquisition of words processing. The contribution of cognitive abilities and computer anxiety. *Computer in Human Behavior,* 12(1), 107-199.

Federal Ministry of Education. (2010). National Policy on Information and Communication Technologies (ICT) in Education, Abuja: MFE.

Godstime, T. C. & Joseph, A. O. (2017). Demographic differences in postgraduate students attitudes and use of ICT facilities in Rivers State University of Science and Technology, Port Harcourt. *International Journal of Scientific Research Engineering and Technology*, 6(1), 53-58

Idowu, B. Ogunbodede, E. & Idowu, B (2003). Information and technology in Nigeria: The health sector experience. *Journal of Information Technology Impact*, 3(2), 69-76.

Isangedighi, A. J., Joshua, M. T., Asim, A. E. & Ekuri, E. E. (2004). *Fundamentals of research and statistics in education and social sciences'.* Calabar: The University of Calabar Press.

Jackson, L. A., Ervin, K. S., Gardner, P. D., & Schmitt, N. (2001).Gender and the internet. Women communication and mean searching. *Sex Roles*, 44(5), 363-379

Jegede, P. O. & Owolabi, J. A. (2003). Computer education in Nigerian Secondary schools. Gaps between policy and practice. *Meridian*,6(2). Retrieved 23 November 2018 from http://www.ncsu.edu/meridian/sum2003/nigerian/index.html.

Jegede, P. O. Dibu-Ojerinde, O.O. & Ilorin, M. O. (2007). Relationship between ICT competence and attitude of some Nigerian lecturers. *Education Research and Review.* Retrieved November, 30, 2007 from http://www.digitalopporunity.org/article/view/125462/1/

Kadel, R. (2005). How teacher attitude affect technology. *Learning and Learning with Technology,* 39(5), 34-47.

Kazu, I. Y. & Yavulzalp, N. (2008). An analysis of the primary school teachers' usage of instructional software. *International Journal of Emerging Technologies,* 3(1), 45-53.l

Kian-Sam, H. & Chee-Kiat, K. (2002). Computer anxiety and attitude towards computers among rural secondary school teachers. A Malaysian perspective. *Journal of Research on Technology in Education, 35(*1), 27-35.

Kirkpatrick, H. & Cuban, I. (1998). Should we be worried? What the research says about gender differences in access, use, attitudes, and achievement with computer. *Educational Technology,* 38(4), 56-60.

Kirschner, P. & Woperies, I. G. J. H. (2003). Pedagogic benchmarks for information and communication technology in teacher education. *Technology, Pedagogy and Education,* 12(1), 127-149.

Kpolovie, P. J. & Awusaki, O. K. (2016). ICT adoption attitudes of lecturers. *European Journal of Computer Science and Information Technology*, 4(5), 9-57

Kpolovie, P. J. (2011). *Statistical techniques for advanced research.* Owerri: Springfield Publishers'

Kpolovie, P. J., Joe, A. I. & Okoto, T. (2014) Academic achievement prediction: Role of interest in learning and attitude towards school. *International Journal of Humanities. Social Sciences and Education* (IJHSSE), 1(11), 73-100.

Kpolovie, P.J. & Iderima, E. C. (2013). Integration of Information Communication Technology in Nigerian education. In A. Ejiagu, U.Uma and R.Esene (Eds.). *Globalization and Education in Nigeria.* Lagos: West & Solomon Publishing Copy Ltd, pp1-32.

Krejice, R. V. & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30, 607-610.

Kumar, P. & Kumar, A. (2003). Effect of a web-based project on pre-service and in-service teachers attitudes toward computers and technology skills. *Journal of Computing in Teacher Education*, 19(3), 87-92.

Kyriakidou, M. Chriostomou, C. & Bank, F. (2000), September). Primary teacher's attitude to the use of ICT: A comparative study between Cyprus and the UK. *Paper presented at the European Conference on Educational Research*. Lahti, Finland.

Lee, D. (1997). Factors influencing the success of computer skills learning among in-service teachers. *British Journal of Educational Technology, 28*, 139-141.

Moursund, D. & Bielefeldt, T. (1999). *Will new teachers be prepared to teach in a digital age*? Santa Monica: Milken Family Foundation.

Oansanya, S. A., Shehu, R. O. Oduwaiye, A., & Shehu, L. A. (2010). Higher institutions lecturers' attitudes towards integration of ICT into teaching and research in Nigeria. *Research Journal of Information Technology*, http://www.academic/journal.im

Papaioannou, P. & Charalambous, K. (2011). Principals' attitudes towards ICT and their perceptions about the factors that facilitate or inhibit ICT integration in primary school of Cyprus. *Information Technology Education*. Http://edu.jour.org.au.injurration

Robbins, V. (1998). The development of information technology skills in trainee teachers for further education sector. *Research in Post-Compulsory Education*, 3(2), 240-251.

Schaumburg, H. (2001). Fostering girls computer through laptop learning – Can mobile computers help to level out the gender differences? Retrieved 17 July 2008 from http://www.notesys.com/Copies/necc01.pdf

Sefyrin, I. (2005, July). Understanding of gender and competence in ICT. Paper presented at 6th International Women into Computing Conference. University of Greenwich. Retrieved 12 April 2008 from http://www.miun.se/uplad/institioner/ITM/KS/SI/publisherner/sefyrin-WiC.pdf.

Teo, T. (2008). Pre-service teachers attitude towards computer use. A Singapore survey. *Austrian Journal of Educational Technology*, 23(4), 413-424.

Townsend, M. (1997). Computer block – does it exist in the comprehensive secondary schools? British *Journal of Educational Technology*, 28, 219-221.

United Nations Educational, Scientific and Cultural Organization. (2008a). ICT competency standards for teachers: Policy Framework. United Kingdom. Author. Retrieved 3 January 2009 from http://www.oei.es/tic/comptencies-tic-docentes-marcos-poliiticas.pdf

United Nations Educational, Scientific and Cultural Organization. (2008b). ICT competency standards for teachers: Implementation guidelines (Version 1.0). United Kingdom. Author. Retrieved 23 January 2009 from http://unescdoc.unesco.org/imaes/0015/001562/156209E.pdf.

Yuen, H. K. & Ma, W. K. (2002). Gender differences in teacher computer acceptance. *Journal of Technology and Teacher Education*, 10(3), 365-382.
Yusuf, M. O. (2005). An investigation into teachers self-efficacy in implementing computer education in Nigerian secondary schools. Meridian: A Middle School Computer Technologies Journal, 8(2).
Yusuf, O. M., & Balogun, M. R. (2011). Student-Teachers competence and attitude towards Information and Communication Technology: A case study in a Nigerian University. *Contemporary Educational Technology*,2(1), 18-36.
Zammit, S. A. (1992). Factors facilitating or hindering the use of computers in schools. *Educational Research*, 34, 57-66.