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Teacher Readiness to Integrate Information Technology into Teaching and Learning Processes in Nigerian Secondary Schools: A Case Study   *(Pp. 178-190)*

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Abstract
The first mission statement of Nigerian National policy for Information Technology (IT) is to use IT for education and a major underlining factor in achieving the goals of the National IT policy is the readiness of teachers to use IT. It is against this background that this study was set to investigate the readiness of teachers in Nigeria to integrate IT in instruction. Three research questions were generated and answered in the study. The study adopted the descriptive survey design using two questionnaires (Teachers Information Technology Preparedness Questionnaire and Basic Information Technology Practical Skills Activities) to collect data from a total of 470 teachers who were selected through the simple random sampling technique. Data analysis for the research questions was done through the use of simple percentage

and frequency calculation. The results revealed that majority of the teachers have low level of knowledge about IT. In the same vein, majority of teachers in the schools in this study did not have adequate IT skills. However, the teachers have positive attitude toward the use of information technology.

Introduction

Information Technology (IT) could be defined as the applications of computer and technology or of using computers to handle data. Information technology connects people around the world. It is not only limited to computers but also includes the software applications and the internet (Wong 2002). Thus, we cannot separate computers from information technology. Computers are great technological advancement which helps in handling information. On yearly basis, a growing amount of information becomes available about every subject that interest people. It is even estimated that the volume of materials in print doubles every five to ten years (World Book Encyclopedia 2002). The advance in technology however has provided the opportunity to deal with large amount of information.

The innovation of IT has been found to be useful and relevant to all aspects of life ranging from banking, business and communication to religion, politics and education. As noted by Okeke (2005), the improvement in technology as occasioned by IT makes things easier for every part of daily life and this does not exclude education.

The Nigerian National policy for Information Technology asserts that information technology is the bedrock for national survival and development in a rapidly changing global environment. Thus, the policy's vision statement is to make Nigeria an IT capable country in Africa and a key player in the information society by the year 2005 using IT as the engine for sustainable development and global competitiveness. This underscores the importance of information technology in societal life and development

The National policy on education on secondary education also recognizes the prominent role of information technology in knowledge advancement and therefore noted that Government shall provide necessary infrastructure and training for the integration of IT in the school system. In relation to this, the first mission statement of the national policy for information technology is to use IT for education. It further has as one of the general objectives to integrate IT into the mainstream of education and training. This will undoubtedly be an innovation in the Nigerian educational system

Nigeria presently runs the 9-3-4 educational system which is broadly divided to three segments of basic education, senior secondary and higher education. Here, the primary and the junior part of secondary education is compulsory for all children as embedded in the Universal Basic Education policy which is a derivative of the global Education for All (EFA). In line with the global trend on information technology application in education, the government of Nigeria has integrated its educational use in the general objectives of the national policy on information technology. The sixteenth objective as stated in the policy is 'to integrate IT into the mainstream of education and training'. This also explains why the National policy on Education (2004) specifically stated on secondary education that 'government shall provide necessary infrastructure and training for the integration of ICT in the school system in recognition of the role of ICT in advancing knowledge and skill in the modern world. This indicates that the Nigerian society also recognizes the importance of IT in its secondary education. According to the World Bank (2009), secondary education is now being recognized as the cornerstone of educational systems. This is because secondary education has the peculiarities of being at the same time terminal and preparatory, compulsory and post-compulsory. It stands as the crucial link between primary schooling, tertiary education, and the labor market. It also has the ability to connect the different destinations and to take young people where they want to go in life.

The role of the teacher in any instructional situation is that of a communicator. He tries to effect changes in the behaviour of the learner by presenting facts and integrating teaching rules and procedures, catching learners attention by actively involving them in meaningful participation propelling their thinking and stimulating their imagination for effective transfer of knowledge. This is done through spoken words, public address systems, radio, prerecorded tapes, video tapes, computers and other related materials. The teacher's success in getting the learners to do what he wants them to do and also to perform at a desired level hinges on his ability to communicate his intention and the extent to which the learners are involved during and after the period of instruction. The teacher's role in the integration of computers in schools is obviously very important, and every educational reform effort should take into consideration teachers' knowledge, skills, beliefs, and attitudes (Cuban, 2001). According to Milken Family Foundation (2000), in the past few years the pre-service teacher education programs have made substantial progress in preparing future teachers in information technology but they still have a long way to go. There is the confidence that

there is more technology awareness and experience out there, but it is not being used in teacher training to the extent nor in the manner we think necessary.

Readiness or preparedness has to do with awareness, knowledge of use, attitude to use as well as getting skilled in the use of information technology. Wild (1995) asserted that the degree of preparedness of students to use ICT is traditionally measured in terms of their knowledge, skills and attitudes regarding the computer. This is also relevant in the case of teachers. Knowledge, skills and right attitudes have also been identified as important factors in teachers' preparedness to use ICT (Wong, 2002). Therefore, the level of teachers' readiness will be dictated in this work by their level of knowledge, skill and attitude to information technology.

Statement of the Problem

The world is presently in the stage of growing information which some refer to as information explosion. The technological advance in computers has also provided the opportunity to adequately manage the growing information. Nigeria as a developing world is just embracing the use of information technology. The National IT policy has also stipulated year 2005 as the target for making Nigeria an IT capable country in Africa. This translated to one of the general objectives which sought to integrate IT into the mainstream of education and training. However, five years after the target date, evidences suggest that information technology has not yet been sufficiently integrated into teaching and learning process in most Nigerian public schools. This raises question on an early realization of the objectives of this policy, even though, it is already behind schedule. More importantly, for this objective to be realizable, the preparedness of teachers to use IT remains an important factor. This is because negative attitudes and or lack of support for the policy statement by the teachers will be a great stumbling block in achieving early the good objective.

Objectives

It is against this background that this study sets out to investigate the IT preparedness of teachers with a view to achieving the following objectives:

1. To determine whether the teachers are ready to integrate information technology to instruction or not.

2. To determine the level of information technology knowledge possessed by teachers

3. To investigate the type of attitude the teachers have towards information technology.

4. To determine the level of information technology skills possessed by teachers.

Research Questions

1. What are the teachers' levels of knowledge about information technology?

2. What are the teachers' levels of basic skill in the use of information technology?

3. What are the teachers' attitudes to the use of information technology?

Literature Review

As noted by Cooper (1998), the integration of technology in the school curriculum continues to be a complex and challenging process and the seamless integration of computers in teaching and learning is yet to be achieved (Kozma & Anderson, 2002). Shi and Bichelmeyer (2007) also established that research evidences (Cuban, 2001; Kirkpatrick and Peck, 2001) show unsatisfactory results regarding computer integration in schools. This may also reflect the situation in Nigeria.

In relation to the teaching profession, a study on readiness of Hong Kong teachers regarding e-learning was conducted by Keung and So (2005). Results of the study indicate that teachers in Hong Kong are not very prepared to use e-learning technologies for teaching and learning. There are differences in readiness perceived between male and females, secondary school teachers and primary school teachers, and teachers of different secondary schools of different bandings.

In a related study, Hlatshwayo (2008) examined the readiness of teachers to integrate Information and Communication Technology (ICT) for learning in a selected school in the Gauteng Online (GoL) Project, through the data collecting method of Questionnaire, observations and interview. The study showed that a large number of teachers showed some interest in using ICT learning but had difficulties on how to get started due to the lack of suitable ICT skills. It has been observed that computers in this school are mainly used by a few teachers for administration purposes. The research results provided evidence that there was poor utilization of ICT integration in this school,

though teachers were interested in using computers. The research indicated that many teachers are reluctant to attempt to integrate computers into teaching and learning without ICT teaching assistance. Clearly, there is still a long way to go before some schools and some teachers are able to use computers as effectively and efficiently for teaching and learning.

In Nigeria, Jegede and Owolabi (2003) studied the computer education in Nigeria secondary schools. The study compares Nigeria National computer policy ((1988) with existing school practice policy dictates for computer hardware, maintenance and funding, teaching personnel & training. They reported that computer education was still limited to Federal Unity Secondary Schools and scarcely offered in any of the state secondary schools which constitutes more than 80% of Nigeria Schools though some private schools have introduced computer instruction into their school system. The majority of the teachers, whether private or public, are proficient in basic programming. Very few teachers are proficient in LOGO programming while 75% of the observed teachers in public schools and 66% in private schools expressed that they have had no in-service training in computer education.

Moreover, Yusuf (2005) investigated the perceived self efficacy of teachers in the implementation of computer education in Nigeria secondary schools. The findings revealed that most of the teachers in Federal Government Colleges do not have the needed experience in the use of computer. Moreover, majority of the teachers – both male and female- do not have needed competence in basic computer operations. They also do not have needed skills and knowledge in the use of common computer software. The study further revealed no significant difference between male and female teachers use of common computer software.

In the same vein, Njoku (2006) investigated the awareness and use of ICT by teachers in selected secondary schools in Owerri, Nigeria. 177 teachers participated in the study. While 164 (92.7%) of the respondents claimed to be computer literate and eight (4.5%) admitted that they were not computer literate; five (2.8%) of the respondents did not disclose their computer literacy status. This shows that ICT awareness and use among teachers in secondary schools in Nigeria is generally low.

Methodology/ Sample and Sampling Procedure

The South-west geo-political region of Nigeria is acclaimed to be the most educationally advanced in the country. One of the states in this region was thus chosen for this study. From this state, a Local government Area (LGA)

was picked. This LGA is one of the LGAs that teachers have most access to computer facilities, being in the urban area of the LGA. There are 20 each of senior and junior public secondary schools in Abeokuta South LGA of Ogun state. This forms a total of 40 schools. There are also a total of 474 teachers in the senior schools while the junior schools have a total of 485 teachers. In order to have a fairly representative sample, a sample of 50% of the total population of teachers was employed for this study. This gave a total sample of 520 subjects and a sample of about 13 teachers from each school. The simple random sampling technique was adopted to select the sample for this study. This involves giving every subject in the population equal opportunities of being selected or included in the sample for the study.

This study adopted the descriptive survey design, employing the instruments of questionnaire to collect data. Two instruments - Teachers Information Technology Preparedness Questionnaire and the Basic Information Technology Practical Skills Activities were used to collect data for this study. The Teachers Information Technology Preparedness Questionnaire comprise of question items on the IT preparedness of teachers in the areas of knowledge and attitude. The question items on knowledge were adapted from the IT based instrument developed to measure Teachers IT preparedness by Wong (2002). The adaptations in Wong's instrument were necessitated in order to change the Malay language to English and also change names to familiar ones. In the same vein, items on attitude were also adapted from the *Computer Attitude Scale* (CAS), developed by Selwyn (1997)which has been adopted for use in a study by Teo, (2008). The Basic Information Technology Practical Skills Activities comprise of a set of practical activities as adapted from the IT based Instrument to measure Teachers IT preparedness developed by Wong (2002). The content validity was also established by the unanimous agreement by the panel of judge that the content of the instrument were appropriate and sufficient (Wong, 2002).The reliability estimate of the items on 'skills' and 'knowledge' range from .92 to .98 and.52 to .67 respectively. Moreover, the adapted items from the *Computer Attitude Scale* have also been found to have a high level of reliability coefficient of 0.90, test retest reliability of 0.93 and significant construct validity of $p<0.001$ (Selwyn, 1997).The questionnaires were administered on the respondents personally by the researcher and two research assistants. Only those that responded to the questionnaire (knowledge and attitude) and retuned same were included as participants in the practical skill. In order to perform the practical activities in the Basic

Information Technology Skill Activities, each subject was given a laptop and flash disc to work with. The laptops also have internet connection. The researcher observed and scored the participants as they progressed in the practical activities.

Data Analysis
Data analysis for the research questions was done through the use of simple percentage and frequency calculation.

Profile of Participants in the Study
A total of five hundred and twenty (520) teachers were selected as participants with questionnaire on knowledge and attitude administered to them, but a total of four hundred and seventy (470) participants returned the completed questionnaire. This forms 90.4% return rate. The 470 participants comprise of 238 teachers from senior school and 232 teachers from junior school and a total of 187(39.8%) male and 283(60.2%) female. There were 32(6.8%) master degree holder, 297(63.2%) bachelor degree holder and 141(30%) NCE holders. Majority of the participant fell within the age range of 26 – 35, followed closely by those within the age range of 36 – 45, while those within the age range of 56 and above form the lowest number of participants.

Results and Findings

Research Question 1: *What is the level of knowledge of the secondary school teachers about information technology?*

Out of the 232 participants in the junior schools 130(56%) have below average knowledge of IT while 102(44%) have knowledge above average. However, while 120 of teachers in the senior schools have knowledge below average, 118 have above average. This is evident in table 1.

This indicates that while majority of the teachers in the juniors schools have below average knowledge about IT. The trend is however a bit different in the senior schools as the number of teachers with above average almost equaled those with below average. This may indicate that the senior schools have more teachers with above average knowledge of IT than the junior schools. This is further illustrated in figure 1.

In all, a total of 250(54%) participants are with below average knowledge while 220(46%) are with above average knowledge of IT. Therefore, it is deductible that majority of the participants have below average knowledge

about IT. Thus, the level of knowledge of majority of the participant about IT could be described as low. It could therefore be concluded that majority of the teachers have low level of knowledge about IT.

Research Question 2: *What is the level of skill of the secondary school teachers in the use of IT?*

The measurement of skill in this study is based on practical performance by the participants in word processing, spread sheet and PowerPoint applications as well as the use of internet. Analysis of performance of the participants in these identified areas shows that only 201(87%) of teachers in junior school and 202(85%) of teachers in senior have low level of IT skill Moreover, only 31(13%) of teachers in junior school and 36(15%) of teachers in senior have high level of skill in the use of IT. This is evident in table 2.

This shows that while 86% of the participants have low level of skill in use of IT only 14% have high level of skill in use of IT. This shows that majority of the teachers have low level of skill in the use of IT. This is further illustrated in figure 2.

From the illustration, it is obvious that participants with low skill in the use of IT are far more than those with high skill. It could therefore be concluded that majority of teachers in the schools included in this study have low skill in use of IT.

Research question 3: *What are the teachers' attitudes to the use of information technology?*

The attitude of teachers to information technology was measured using computer attitude scale divided into the affective, perceived usefulness, perceived control and behavioural intention components. The overall attitude was in the final analysis deem to be either good or poor. Analysis of the responses of the participants indicate that majority of teachers in both junior 215(92.6%) and senior schools 197(83%) have good attitude while just a few of the teachers 17(7.3%) and 41(17%) in the junior and senior schools respectively have poor attitude to the use of IT. This is evident in table 3.

Of the 470 participants, a total of 412(87.7) have good attitude to the use of IT while only 58(12.3%) have poor attitude. This shows that majority of the teachers in the secondary schools involved in the study have good attitude to the use of IT.

Conclusion and Recommendations
This study examined the readiness of secondary school teachers in Abeokuta South local government area of Ogun state (as a case study) to integrate information technology to educational instruction. The study found that majority of the teachers involved in the study has low level of knowledge about IT. It was also found that majority of teachers in the schools included in this study have low skill in use of IT. This may indicate that most teachers are not adequately knowledgeable and skilled in IT use. This may also imply that the teachers are not actually ready for the use of IT in instruction. This may also not be desirable for a nation that wants to integrate IT into the classroom setting, since the teachers are a major factor in use of IT. However, the fact that the participants were found to have positive attitude toward the use of information technology is a positive indication, since attitude is also a major factor in use.

Based on the findings of this study, the following recommendations are suggested to improve the IT preparedness of teachers

1. The importance of awareness and knowledge of IT by teachers in Nigerian secondary schools could not be underestimated; programmes of mass awareness of IT for teachers should be mounted for all schools

2. Arrangements should also be made at each zonal level to expose the teachers to the appropriate skills in use of IT.

3. Functional IT facilities should also be provided in all schools and be made accessible for teachers' use

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Table 1: Level of IT Knowledge of participants

School	Level of Knowledge		Total
	Below Average	Above Average	
Junior	130 56%	102 44%	232
Senior	120 50.2%	118 49.8%	238
Total	250 54%	220 46%	470

Fig 1: **Participants Level of IT knowledge of**
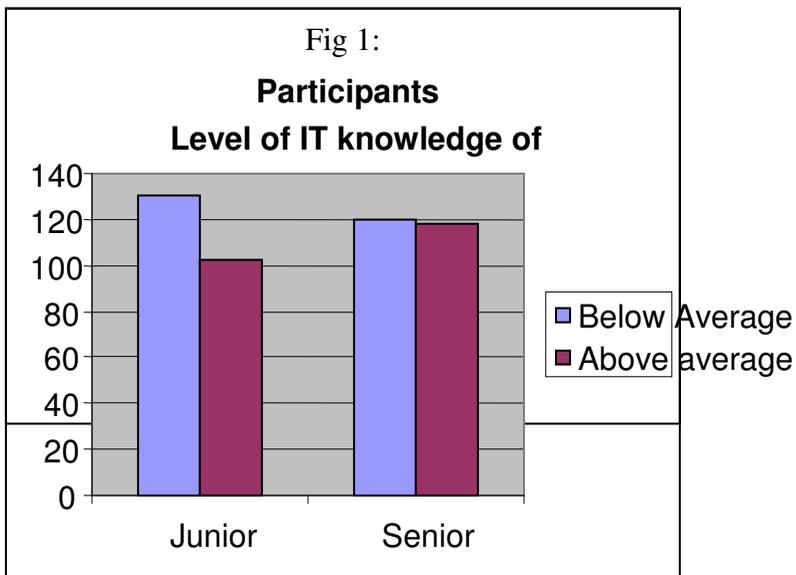
Table 2: Level of skill of participants in the use of IT

School	Level of Skill		Total
	Low skill	High skill	
Junior **N=232**	201 87%	31 13%	232
Senior **N=238**	202 85%	36 15%	238
Total **N=470**	403 86%	67 14%	470

Fig 2: **Level of skill in use of IT**
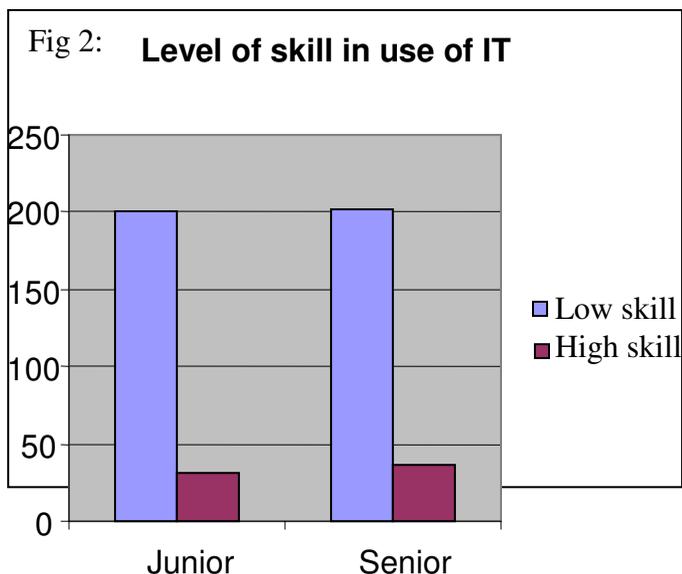
Table 3: Teachers' attitudes to the use of information technology

	Level of Attitude		Total
School	Poor Attitude	Good Attitude	
Junior **N=232**	17 7.3%	215 92.6%	232
Senior **N=238**	41 17%	197 83%	238
Total **N=470**	58 12.3%	412 87.7%	470