PRE-SERVICE TEACHERS' ASSESSMENT OF INFORMATION TECHNOLOGY APPLICATION TO INSTRUCTION

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Abstract

Technology has moved into the classroom, and it becomes difficult talking of achievement in and attitude to learning without making mention of it. The use of technology makes learning easy, real and practical as it motivates learners, sustains their interest and improves their attitude to learning. This study, therefore examined the pre-service teachers assessment of information technology application to instruction. Learning and teaching emphasizes the use of technology and encourages active learning in the classroom. The study involved 100 pre-service teachers in the selected two (2) Colleges of Education, Nigeria. Purposive random sampling was used in selecting the participants and ex-post facto design was adopted the in which there is no manipulation of variables. Two valid and reliable instruments were used for data collection: Access Point ICT facilities and Knowledge of Computer. The study established that pre-service teachers have less access to ICT and Knowledge of ICT facilities in the college apart from those students having the access outside the college. Also fewer pre-service teachers used ICT facilities on weekly and monthly bases. It was concluded that the establishment of students' resources centers and Campus wide wireless connectivity must be implemented so as to improve and enhance students' achievement in and attitude to learning. The time and attention devoted to learning activities and strategic specialized ICT skills and requisite entrepreneur skills should be increased so as to have easy access to information sources and develop the research.
Key words: ICT, Pre-Service Teachers, Learning facilities, Computer, ICT Knowledge.

1.1 Introduction

The world is undergoing a major social and economic change andprogressive efforts had gone into the use of ICTs in educational sectors (Abimbade and Adesanya, 2012). Information Communication Technologies (ICTs) is an aid to teaching and tool in the facilitation of learning. It is supplementary to the fundamental process of teaching and learning. ICTs change the status of instructors from being the repertoire of knowledge to the coordinator of resources (Benedict, 2005). In a traditional classroom situation, the instructor delivers the content to the class and responds to their questions. According to Gillian (2001) in Adegoke and Owolabi (2007), ICTs makes teaching and learning to:

- become student centred;

- give opportunity for students to work independently;

- enable each student to obtain immediate feedback;

- allow the teacher to meet the individual needs of the students;

- motivate, increase and make teaching and learning to be meaningful;

- bring into the virtual classroom with sense of information, ideas and facts to meet the learners needs inside and outside the classroom.

In contemporary time, the Information Communication Technology popularly known as ICT is the latest innovation in the practice of education. The concept of ICT aided educational practice involves the use of the computer and computer related facilities as teaching aids in the education of students. The reliance on the Information Technology and its opportunities are steadily on the increase with the development and growth in the Information Communication Technology Sector. With every modification in the physical size, memory capacity, weight of the computer, processing speed and accuracy, there is a corresponding increase in its use globally and the education sector inclusive.

In Nigeria, there is an increasing awareness of ICTs in teaching and learning. The country has a number of initiatives such as:

- National Policy on Computer Education (NPCE)
- National Policy on Information Technology (NPIT)
- Establishment of National Information Technology Development Agency (NITDA).

Besides, in several sessions of various conferences organized for teachers and teacher-trainers, ICTs often form the theme of discussion. NGO's are not left behind in the efforts to create awareness about the potency of ICTs in the classroom. An example of such NGO's is the e-Learning Network of Nigeria (eLNN), a non-governmental organization promoting ICTs in education and training. The efforts by various segments of our society at promoting ICT use in the classroom were affected by some challenges that could hinder ICTs use in teaching and learning process. One of these challenges is the teacher factors. The teacher is the root of the educational system since the teacher is the moderator of the classroom. The teacher influence the child's learning in the classroom. A teacher is a significant figure in the school environment (Owolabi, 2004).Teacher, influence learning motivates attitudes and complex skills such as problem solving and original thinking ability of the children through his /her attitude to work.

National Policy on ICT in education (2004) emphasized the following objectives:

- To facilitate the teaching and learning process.

- To promotes problem-solving critical thinking and innovative skills.
- To promote long-life learning.
- To enhance the various teaching and learning strategies required to meet the needs of the population.
- To foster research and development
- To support effective and efficient education administration.
- To widen access to education and the range of instructional options and opportunities for any-time, any-peace and any-path learning

Therefore, the pre-service teachers need more exposure to ICTs, because they are moving into the classroom to exhibit their experiences in order to make learning meaningful. Jegede and Owolabi (2005) identify the teachers' attitude to ICTs use in the classroom and about their readiness for and disposition towards integrating computers into the curriculum. This study focuses on pre-service teachers because some the practicing teachers find it difficult to switch over to the use of ICTs in delivery of instruction. According to Ogunwale, Awosan and Ojo, (2007), Abidoye, Adelokun and Awoyele (2010) and Benedict, (2010) there are number of reasons for focusing on the pre-service teachers:

- some of the present teachers in the classroom are already getting old and approaching retirement age. They may not be enthusiastic about ICTs;
- there are so many distractions and responsibilities outside work facing the adult teachers. This includes family and community responsibilities;
- the take home pay given to the teachers cannot take much care of them so they have to look for extra engagement to make more money to make the two ends meet.

On the above reasons, it is therefore imperative to target the teacher trainees (pre-service teachers) to ensure effective integration of ICTs in instructional delivery in order to make teaching and learning meaningful. The advent of the information society has called into question many of our assumptions about education. New information and communications technologies (ICTs) are changing the world we live in, and the way we learn to live. ICTs changes teaching and learning through its potential as:

- a source of knowledge,
- a medium to transmit content,
- a means of interaction and dialogue.

Thus, ICT is both a cause of change and a means of achieving it.

According Jones (2003)applications of ICTs, such as email, Internet, the World Wide Web and video-conferences, have created many new communication possibilities for school. In a classroom connected to the Internet, communication over distance is simpler than every-before. Communication outside the closed culture of a school can extend cultural understanding beyond the immediate social environment. Learners in one country, for example, can exchange experiences with learners in another using email or a video-conference. In one case, pupils

linked up with an expedition on its way to the North Pole, demonstrating the dramatic possibilities or on-line interaction.

When learners work with ICTs, they often work collaboratively in groups or teams. Originating often as a solution to shortage of computers, the experience of group work brings new benefits, by stimulating pupils to develop the interpersonal skills necessary for life after school. The ethos is one of working together to solve problems and achieve goals. Each pupil has a distinctive role but is fully involved in a common task. ICTs give them a means to communicate and to control their communication. The challenge boosts their self-esteem and gives them a sense of power. Relations between teachers and pupils tend, in consequence, to change. On-line communication – when a computer is connected to the Internet – inevitably gives control to the user, that is the learners learn fast. In the connected classroom the teacher no longer controls what happens, and loses the monopoly of authority. The teacher becomes leader, helper, partner and evaluator, combining the traditional role of subject with that of a manager, through engaging pupils in joint endeavour, ICTs can help to make the classroom a more inclusive environment. ICT has something to offer most pupils, whatever their individual capabilities. E-mail, for example, offers "virtual mobility" to those who lack physical mobility.

According to Audu (2005) andNgozi (2010), higher education without the support of ICT makes the lives of learners and teachers equally difficult. A nation's intellectual strength depends on ICTs support. The use of ICTs in enhancing instructional delivery and promotion of classroom interaction makes learning more meaningful. The quality of an institution's environment for digital information, storage and retrieval has for any discipline, become more important than the institution's conventional library resources in print media. In the early days of computing in Nigeria only the students and the professionals that primarily studied computer science or related courses can interact with computer. Even in the school environment only students from the computer science department are found working with computer. Those in humanities are still of the opinion that computers are scientists machines.

This study therefore seeks to find out the pre-service teachers ability to use ICTs and effectively transferable skill useful in the classroom instruction. The findings of the study would enable the pre-service teachers to effectively embrace the use of the internet and other electronic information resources in the library. The result of the findings will affect the per-service teachers' attitude positively towards the use of ICTs and develop interest in applying it in instruction.

1.2 Research Questions
1. Does the Pre-service teacher have access to ICTs facilities?
2. What is the level of Pre-service teacher in ICTs application to Instruction?
3. Does Pre-service teacher's assessment of ICTs have effect in instructional delivery?

1.3 Scope of the Study

This study covers the one College of Education in Ogun State and another one in Lagos State. In all, a total of 100 pre-service teachers were selected for the study. The study is interested in the contributions of ICT to education changes among the respondents.

1.4 Significance of the Study

Teachers are to know the importance of ICTs in the classroom thereby helping them with the courses they teach. Students on the other hand are to incorporate the use of ICTs into their various courses. Findings of this study would be useful to pre-service teachers as it will make them prepare themselves as class instructors and realize the various contributions which ICTs have on their education. This will be an eye opener to them so that they will pay more attention to their studies especially in issues relating to ICT.This study will also enable the government to provide funds through the responsible ministries, computer, internet access to secondary schools and other colleges of education.

2.1 Theoretical Framework

This study has a strong base in two learning theories namely: Stimulus – Response theory of the behaviourist psychology and Getsalt cognitive psychology. Contributors included Pressey (1915), Skinner in 1920s, 1930s up to 1950s and Crowder in 1950s.

2.1.1.   Stimulus – Response Theory

The instruction is based on Skinner's S-R theory. The theory states that "n any unit of activity there is a situation or Stimulus(S) which affects the individual and there is a Response (R)". A stimulus becomes connected with its response by the S-R bond so that on future occasions a repetition of the stimulus will produce the response. Where the probability that R will follow S is high, then the S-R bond is said to be strong (Balogun and Abimbade, 2002). The S-R bonds can be the cognitive, affective or psychomotor activity. Knowledge is such a system of bonds and learning is the process by which bonds are built and structured into systems.

2.1.2.   Bruner's cognitive theory of learning by discovery:

The implication of the theory for instruction is that there must be task analysis of the concepts, skills and knowledge to be learnt.. Bruner's theory is hinged on learning by discovery. In the context of this theory, discovery is used as all forms of obtaining knowledge for oneself by the use of one's mental processes. Bruner identified two forms of discovery: (i) when the new content is compatible with what is in the existing structure of knowledge in which case the new content is easily assimilated and (ii) when the new content is not compatible and hence the learner first restructures the cognitive frame-work so as to accommodate the new content. It was therefore concluded that assimilation and accommodation are two forms of discovery learning. The computer usage is stimulus-centered. In this study the stimuli (that is, the questions) have been structured to stimulate

learners to obtain information for themselves through cognitive restructuring. Responses are less overt and more intrinsic to the makes meaningful learning. When a correct answer is given by the learner, it means effective communication or meaningful learning has occurred (Seattler, 1990). The chunks of information must be assimilated and integrated with what the user already knows. Meaningful teaching and Learning contents should be a simple to complex sequence. The learner progresses by responding correctly, receiving feedback (Immediate knowledge of Result, IKR) and moving forward. If a response is incorrect, the learner repeats instruction until there are no mistakes. This allows the learner to set his/her own pace. The technique encourages mastery learning. According to David and Sorell (1995), mastery learning became revived in the form of programmed instruction in the late 1950s with the aim of providing students with instructional material text which would make them to learn at their own rate and receive constant feed back on the level of mastery.

The computer is one of the greatest inventions of the 20th century, which has contributed tremendously to the service of humanity. The use of computer in instruction can be traced to the work of Weiner's 'Cybernetics' 1948. Computer-Assisted instruction (CAI) was first used in education and training during the 1950s (Seattler, 1990). He further noted that early work was done by IBM and such people as Gordon Pask and Moore, but CAI grew rapidly in 1960s. Gordon Pask was the first to systematically apply cybernetics principles to education with the introduction of 'adaptive teaching systems.

3.1 Methodology
3.1.1 Research Design
This study adopted the ex-post facto design in which there is no manipulation of variables.
3.1.2 Selection of Participants
The participants for the study were made up of 100 pre-service teachers from two state College of Educations, both in Ogun State and Lagos State, Nigeria. These are: Tai Solarin College of Education, Omu-ijebu , Ogun State, Nigeria and Adeniran Ogunsanya College of Education, Ijanikin, Lagos State, Nigeria. Participating pre-service teachers were randomly selected in the two Colleges of Education.

3.1.3 Research Instruments
The following research instruments were developed and used for the study.
1. Access Point to ICT Facilities (APICTF)

2. Application of ICTs   (AICT)

Access Point to ICT Facilities (APICTF)
This was designed to measure the pre-service teachers' Access Point to ICTs Facilities. The instrument consists of two sections. Section A is on demographic information and section B

dwells on Yes or No options tailored towards pre-service teachers' access point of exposure to ICT facilities, designed by the researcher.

Application of ICTs (AICT)

This instrument was adopted from Abimbade (2006) Computer Research in Higher Education tailed towards students' knowledge of computer. It consists of a 4-point Likert scale type response (Strongly Agree, Agree, Disagree and Strongly Disagree and Strongly Disagree) was used with Twenty-five questions on students' application to ICT to teaching and learning.

3.1.4 Validation of the Instrument

The instruments was prepared and presented to peers and experts in ICTs in the Tai Solarin University of Education, Ijagun Ogun State and University of Lagos , Nigeria for face and content validity while a Cronbach alpha was used for reliability test. This yielded a reliability coefficient value of 0.73. This implies that the test is reliable and is neither too simple nor difficult. The score ranged from 4 to 7 out of maximum score of 10.

3.1.5 Data Analysis

The questionnaires used to investigate the pre-service teachers' assessment of Information Technology Application to Instruction were collected for data analysis. The result was subjected to descriptive analysis in order to provide a global perception on general access to ICTs facilities and knowledge in ICT. Frequency, means, standard deviations and percentages were also used in the analysis

4.1 Result

The results are presented in relation to the three research questions formulated.

4.1.1Research Question 1: Does the Pre-service teacher have access to ICTs facilities?

Table 1: Access Points of Students to ICT Facilities

Access Points	Frequency	Percent
School ICT Suite	12	12.0
Lecturers' Office	44	44.0
Mobile phones	20	20.0
College Library	12	12.0
Cyber Cafes	52	52.0
Total	100	100.0

Table 1 shows that there are 52% of pre-service teachers that has access to ICT facilities from cyber cafes. 20% access from the mobile phones while 12% access to ICT facilities in school ICT cafe and college libraries. And 4% access ICT facilities from lecturer offices. Therefore this

revealed that pre-service teacher have not really have access to IICTs facilities in the school that can improve them.

Table 2: Level of study of the pre-service teachers

Level	Frequency	Percent
100	26	26.0
200	44	44.0
300	30	30.0
Total	100	100.0

Table 2 shows that there are 26.0% of the pre-service teachers in 100 level, 44.0% in 200 level and 30.0% in 300 level.

Table 3: Department of the Students

Department	Frequency	Percent
Tech/Voc	29	29.0
Science	27	27.0
Arts	44	44.0
Total	100	100.0

Table 3 shows that there are 29.0% regards from school of technology.

4.1.2 Research Question 2: What is the level of Pre-service teacher in ICTs application to Instruction?

Table 4: Length of Time of Using ICT Facilities

Time (months)	Frequency	Percent
Less than 6	44	44.0
7-12	24	24.0
13-18	88	88.0
19-24	12	12.0
24 and above	12	12.0
Total	100	100.0

Table 4 shows that there are 40% of the pre-service teachers that have been using ICTs facilities for less than 7 to 12 months. Also 8students have used ICT facilities for 13to 18months while 12 students have used it for 19-24 months and above respectively.

Table 5: Possession of e-mail Addresses

Response	Frequency	Percent
No	8	8.0
Yes	92	92.0
Total	100	100.0

Table 5 shows that there are 92% pre-service teachers that possessed e-mail address, while only 8 had none. This implies that the pre-service teachers used ICTs facilities only outside the school.

Table 6: Frequency Use of e-mail

Freq (per week)FrequencyPercent		
None	64	64.0
Once	32	32.0
Thrice	4	4.0

Table 6 shows that,4.0% of the pre-service teachers used e-mail thrice a week, 32.0% used e-mail once a week, while 64.0% do not use e-mail at all. This revealed that the pre-service teacher had no access to ICTs facilities in the school environment.

Table 7: Possession of Home-Based e-mail Facility

Response	Frequency	Percent
No	92	92.0
Yes	88	88.0
Total	100	100.0

Table 7shows that only 8.0% of the students have e-mail facilities in their home, while 92.0% had none.

Table 8: Frequency of students' search of the Internet

Frequency (per week)	Frequency	Percent
Less than 1 hour	84	84.0
1-3hours	12	12.0
7-9hours	44	44.0
Total	100	100.0

Table 8 shows that there are 84.0% of the pre-service teachers searched internet for less than one hour in a week, 12.0% search internet in a week for between 1-3 hours a week, while only 4.0% spent between 7-9 hours searching internet in a week.

Table 9: Availability of College Website

ResponseFrequencyPercent		
No	44	44.0
Yes	56	56.0
Total	100	100.0

Table 9 shows that 56% of the pre-service teachers that have Website in their College while 44% of the students had none.

1. **4.1.3 Research Question 3:** Does Pre-service teacher's assessment of ICTs have effect in instructional delivery?

Table 10: Pre-service teachers' Knowledge in ICTs

Score	Frequency (No of students)	%	X	Standard Dev
4	12	12.0%	5.46	.96
5	28	28.0		
6	40	40.0		
7	20	20.0		
Total	100	100.0		

From table 10, the scores of pre-service teachers' knowledge of ICT ranged from 4 to 7 out of a maxims score of 10. The distribution of the scores shows that 12.0% scored 4 marks; 28.0%/ scored 5 marks. And 40.0% scored 6 marks, while 20.0% scored 7. The mean score for all the 100 students is 5.46 which indicate that the level of the students in ICT is average.

Table 11: College Plan to Develop Website in the nearest future

Response	Frequency	Percent
No	92 92.0	
Yes	8 8.0	
Total	100	100.0

Table 11 shows that there are 92.0% responded that their colleges do not have any plan to develop website in the nearest future while only 8.0% responded that their college has such plan.

5.1 Discussion

The results seem to confirm studies that pre-service teachers' assessment to Information Technology Application to Instruction are useful tools in the education of students. The result of the findings in Table 1 shows that pre-service teachers have less exposure to ICTs in the college and college library. The use of ICTs in education as shown in various studies particularly in the survey conducted by Jones (2003), Njoku (2004), Jegede and Owolabi (2005) and Ngozi (2010) that it improve students skill useful for their future life as well as enabling the positive and successful application to Instruction. These studies revealed that pre-service teachers' assessment to ICTs is low and not familiar with the resources including electronic resources. The result also revealed that ICTs constitutes a valuable educational tool and a way to facilitate learners.

Almost all the respondents revealed a frequency access points of pre-service teachers to ICTs facilities is not encouraging with the school apart from the cyber café and mobile phones. Research shows that only 12% of the pre-service teachers has lengthen time using ICTs facilities, while 65% has no frequency use of e-mail, 32% with once per week, and 4% thrice per week access. Lesser pre-service teachers has low frequency to search the internet and the knowledge of pre-service teachers in ICTs mean score for all the 100 participants is 5.46% which indicates that the level of the pre-service teachers in the use of ICTs is not encouraging. Therefore it needs more attention.

5.2 Conclusion

Based on the findings of this study the following conclusions are drawn:

The study established that pre-service teachers has less access to ICTs and knowledge of ICTs facilities in the school apart from those students having the access outside the school. Pre-service teachers play vital role in the implementation ICTs in the present and future classrooms. Their technical and pedagogical training in the use of ICTs in today's classrooms can constitute a barrier or adjustment for an innovative and supporting use of IUCTs in the classroom. And more importantly, it must be consider that a correct educational implementation of ICTs strongly

depends on the teachers' training and capacity of ICTs facilities available for their use. ICTshas potentials to empower students, promoting facilitating the full apprehension of their educational background, developmental process and improve teaching and learning process.ICT will make relationships between teachers and students more interactive and guiding, rather than transferring information from teacher to student

5.3 RECOMMENDATIONS

- Students should demonstrate a greater spontaneous interest in a learning activity

- The time and attention devoted to learning activities should be increases when students use ICT, because the ease of access to information sources develops the research spirit.

- The establishment of students resources centers and campus-wide wireless connectivity

- Computer acquisition scheme for staff and students.

- Provision for alternative power supply.

- Strategic and specialized ICT skills and requisite entrepreneur skills among staff and students

- Acceleration of the implementation of policy to re-forces TET Fund exclusively in tertiary education

- Establishment of national ICTs awareness machine

- Building of a critical mass of ICTs proficiency and competences in tertiary institutions.

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