

EVALUATION OF TEACHERS' CAPACITY IN ABSORBING NEW TECHNOLOGIES FOR TEACHING STUDENTS IN SELECTED TERTIARY INSTITUTIONS IN NIGERIA

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Abstract

This study examines how teachers manage new technologies in the process of teaching their students. The advent of Information Communication Technology (ICT) has doubtlessly impacted on almost every discipline, and teaching inclusive. Both hardware and software have been made available to aid teaching and learning including e-learning, e-assessment, etc. Despite the great potentials that the technologies have, not only to revolutionise the educational process, but also to engender the suitability of graduates to take on real life challenges in the ever evolving global working environment. After considering the issue of ICT availability, however, there remains the pivotal role of teachers. This study, therefore, examines the interest, willingness to learn new things, and competence of teachers in the use of new technologies. Considering that they mediate what eventually gets to the students, it becomes germane to assess their exposure. To realize the objectives of the study the method of data analysis will utilise the logit regression framework.

Keywords: ICT, e-learning, e-assessment.

1 INTRODUCTION

The statement, "teachers' importance in the learning process cannot be overemphasized", may be considered a cliché in some quarters; nevertheless, it remains an undisputed fact. Not only do teachers oversee the learning process, they also tend to function as "gatekeepers" in determining which information gets to the students. Rowe (2003) observes that though the background and intake characteristics of students are considered to have considerable influence on their literacy skills, attitudes, and general academic achievements among others, this influence "pales into insignificance compared with class/teacher effects"(p.1). Consequently, the quality of teachers invariably determines the quality of students.

The interaction among industry, teachers and students can be described as a continuum. The industry evolves technology; teachers learn the technology and use it to train students, while students utilize their knowledge through and of the technology to fit into the industry. Hence, the role of the teacher is pivotal to the preservation of the continuum. This paper, therefore, examines how teachers in tertiary institutions are able absorb new technologies for teaching their students.

2 INFORMATION AND COMMUNICATION TECHNOLOGY

Information and Communication Technology (ICT) generally refers to those technologies that are used for accessing, gathering, manipulating and presenting or communicating information. These technologies, therefore, include hardware (e.g. computer and other devices), software applications and connectivity (e.g. Internet access), local network infrastructure, etc (Toomey 2001 in Lloyd, 2005, p. 3).

As a force, ICT has changed many aspects of human life. Though its impact on various fields of human endeavour over the past two decades has been enormous, Adesote and Fatoki (2013, p. 2155) observe that a look at the field of education reveals what appears to be an 'uncanny' lack of influence of ICT and far less changes when compared to other fields of endeavour.

The term ICT covers a whole range of applications, techniques and systems; this broad field encompasses computer, communication equipment and the services associated with such. The implication of this is that ICT is not limited to being considered as applications and systems; rather, it also includes skill-set for efficiency and productivity in life (Clark 2006; Alana and Margaret, 2003 in Adesote and Fatoki, 2013, p. 2156).

3 ICT AND THE CHANGING PARADIGM

There has been a significant shift in the perceived role Information and Communication Technology plays in Education over the decades; ICT has had three positions in the Educational curriculum and these include: learning about ICT, learning with ICT and learning through ICT. The first position refers to ICT concept as a subject of learning in the School curriculum while the second position is concerned with the use of ICT as a medium to facilitate learning, training and education (Akudolu 2007 in Adesote and Fatoki, 2013, p. 2155).

ICT can be an instructional medium or a source for learning. It can also be integrated into the learning process so that learning takes place through the learner's interaction with facilities. It has been suggested that Information and Communication Technologies (ICT) can play a number of roles in education and as such, developing the kind of graduates and citizens required in an ever growing Information society and improving the quality of teaching and learning (Wagner 2001 in Adesote and Fatoki, 2013, p. 2155)

Yusuf, Afolabi and Loto (2012, p. 177) are of the opinion that ICT is an essential part of the contemporary world such that culture and society have to be adjusted to meet the growing challenges of the Information age. ICT has contributed immensely to the quality of teaching, learning and research in traditional and distance education institution.

An example of the significant contribution of ICT to learning is E-Learning. E-learning is the learning that is mediated by an open set of various technologies. The list is inconclusive because new technologies are yet to come. E-learning is the use ICT which include computer, communication, networks and mobile technologies to enhance and extend learning. These technologies help to deliver education and information to whoever needs them by making them easily accessible (Iloanusu and Osuagwu, 2006, p. 78)

4 ICT, THE VIRTUAL CLASSROOM AND INTERACTIVE EDUCATION

One major role of ICT is to eliminate geographical boundaries. Hence, by using the Internet as a resource, students are aided to access information located at a distance, thereby enabling learning anytime and everywhere (Matyokurehwa, 2013, p. 709). This would also aid learning at the desired pace and time of the recipients. Furthermore, being technologically-aware is a plus in a competitive and ever-growing Global village. ICT is a major facilitator aimed at preparing students to adapt classroom knowledge to work-life, thus increasing their productivity.

The absorption of ICT into education will enhance the teaching and learning experience through added dynamic, interactive and engaging user-friendly features. ICT and other computer-mediated technologies, if massively adopted, have the potential to enrich the outcome of classroom endeavours as well as accelerate and deepen learnt skills whilst motivating students to relate school experiences to industry practice later in the work setting. The effect of this is the creation of economically viable workers. This will also create a straight line connection between lectures received in the classroom and the demands of the corporate world (Yusuf, Afolabi and Loto, 2013, p. 178).

The absorption of ICT into education has the potential to make the activities at school more efficient and productive. This is done by organising a variety of tools to enhance and facilitate teachers' professional activities. Theirer (2000 in Yusuf, Afolabi and Loto, 2013, p. 178) observe that the role of Information Technology in education is becoming widely discussed in contemporary education policies. If Information Communication Technology (ICT) is properly used, it portends great improvement in teaching and learning.

5 ADAPTATION TO NEW ICTS

Peerar (2005 in Oye, Salleh and Iahad, 2011, p. 21) reveals some of factors serving as a draw-back for the integration of ICTs into teaching practice. They include availability of required ICT skills, confidence to use computer, infrastructure, and availability of hardware and software. Some of the barriers to effective ICT-Educational integration are the inadequacy of technical support, gender and age of teacher, insufficient knowledge, as well as absence of motivation to new knowledge. He adds that enthusiasm of teacher towards the usage of ICT, ICT policies, budget, educational management and skill training also play important roles in the effectiveness of this integration process (Toro and Joshi, 2012, p. 23).

Oye, Salleh and Iahad (2011, p. 22) highlight that increased funds for Education in order to face the challenges of e-learning in Nigerian University education by the Government will result in increase training, motivation and awareness programs for successful implementation of e-learning in Higher Institution.

Toro and Joshi (2012, p. 23), in a research conclusion, assert that institutional and sector-wide higher education ICT policy and planning should identify the specific role ICT plays in enhancing research outputs. Furthermore, teachers have to adapt to the changing times to realise continuous professional development in the use of technology for educational purposes. Teachers have to be ready to make use of the possibilities that the ICT-Education integration will offers. These possibilities include different learning context, more focus on the student, increased degree of control over learning pace and time, adapting to their personal interest, promoting collaboration tasks, and developing autonomy in their work and study.

Technological innovations provide new possibilities to transform the teaching and learning programmes. It is important that teacher education programmes should not only add courses that teach about integrating technology, but must also essentially become a movement for comprehensive programmatic change. The change should reflect the transformation in teaching methodology to influence teaching approach (Sessoms, 2008, p. 86).

6 EXPECTATIONS FOR THE NEW PARADIGM

Teacher education programmes must begin to focus on developing teachers with an interactive style that promotes the implementation of interactive learning with the aid of digital teaching tools. Several tools are already existent that can support the interactive teaching/ learning template. Sessoms (2008, p. 86) opines, however, that due to some level of technological exposure that may be lacking, teachers may use the technology to support a traditional teacher-oriented paradigm that fails totake advantage of the interactive potentials of the technologies.

The absorption of ICT into Tertiary Education is supported by several scholars, considering the high impact it affords education if handled effectively (Toro and Joshi, 2012, p. 23; Matyokurehwa, 2013, p. 709). Sessoms (2008) advocates the following to aid the adoption of this new paradigm:

A major setback experienced here is that ‘teachers were not trained to think about learning and teaching as an interactive process’ that encourages the use of ICTs. Traditional model of teaching emphasized a teacher-centred approach; however, with new technology there is a changing paradigm to transform teacher-centred approach to student-centred approaches which requires technologies supports (p.87).

The author further states that:

- If the goal of teaching with technology is to transform the teaching and learning process, it must, therefore, be integrated as foundation into the teacher preparation programme.
- Innovation has provided new capabilities that can transform the process of teaching and learning. Transforming the process of teaching and learning will mean that teachers create fundamentally different learning environments that promote interactivity.
- New ways of teaching will be accomplished through the enhancement of the skill of ‘veteran’ teachers and that of new teachers too.

Since it has become practically impossible to do anything without some aid of technology, absorbing new technologies into teaching becomes inevitable. Interestingly, students relate with these same technologies that are yet to be adopted everywhere else aside the classroom.

Tinio (2002 in Nawaz, 2011, p. 38) is of the opinion that “education is the biggest user of computer software”. Zainally (2008, p. 25), in a research, attempts to provide answers to why the resistance to new technology still exists in tertiary education. These include a feeling of insecurity and possibly lack of technological experience/expertise by teachers.

7 ICT-EDUCATION: A CASE STUDY

The non-availability of some of these technologies in some quarters is a major setback. A research was carried out by Aniedi and Effiom (2009) on *ICT in University Education: Usage and Challenges*

among Academic Staff. The findings revealed that only 52.5% of academic staff of Cross River State University in Nigeria had personal computers (PC). That factor on its own accounted for a low level of exposure (2009, p. 408). In assessing their accessing to the internet, a larger percent (91%) had access to the internet, but through Cybercafés. This implies a low frequency of exposure as very limited hours of meaningful learning can be done over the internet in a Cyber cafe every week; only 5% and 3% indicated they had these technologies at home and at school respectively.

Considering the immense benefits the availability of the internet has afforded members of the Academia, Aniedi and Effiom (2009, p. 408) reports that 60% and 87.5% of the Academic force found ICTs useful in publications and research respectively. Nevertheless, 90% found ICT helpful in the areas of self development and upgrading knowledge. As important as ICT has remained in the spheres of education, it is still faced with staggering challenges of Infrastructure (such as low internet coverage, financial constraints, epileptic power supply) and limited access to existing facilities (Aniedi and Effiom, 2009, p. 409; Oyovwe-Tinuoye and Adogbeji, 2013, p. 25; Toro and Joshi, 2012, p. 23; Oye, Salleh and Iahad, 2011, p. 22). Okwudishu (2005), and Gambari and Okoli (2007) also agree that the non-availability of some ICT resources in schools hamper educators utilization of ICT in teaching.

Onasanya, Shehu, Oduware, and Shettu, (2010) also observes that several lecturers of tertiary institutions in Nigeria lack adequate pedagogical knowledge for effective utilization of ICT resources to teach. It is unfortunate but common to see Nigerian graduates, whether in the field of business or even computer, enroll in computer centres to acquire skills in ICT, which they could have acquired in their tertiary institutions. There is, no doubt, a gap between practical skills as regards the ICT resources utilization competencies and the present teaching in our institutions. The studies carried out by Bolaji (2007) and Kelly (2004) reveals that the application of ICT in tertiary institutions fall below expectation.

8 RELEVANT FOUNDATIONS FOR ABSORBING NEW TECHNOLOGIES

In providing relevant balance to the quagmire of teaching without exposure and lack of readiness to absorb relevant Information and Communication Technologies in education, Aniedi and Effiom (2009, p. 410) suggest training and retraining in all the required areas. With respect to their findings, they emphasize that “the result is rather worrisome, given that the Academic Staff/ Instructors still lack skill and require training in basic ICT areas such as use of basic Office applications and making use of internet facilities”. The authors add that additional reason for the low absorption of new technologies into education and teaching is low funding of such facilities. Oye, Salleh and Iahad, (2011, p. 22) support this, stating that in an attempt to operate within the budget constraints, there is a greater desire by University Policy makers to give priority to hardware and software procurement over efforts directed at training Academic Staff in using the acquired Technologies, which is equally important.

Oyovwe-Tinuoye and Adogbeji (2013, p. 25) advocate for more efforts from the Government and other educational governing bodies to thrust in more efforts into training and retaining of Academic staff to be more acquainted with the relevant ICTs for classroom usage whilst providing alternative solutions to infrastructure and power supply.

9 METHODOLOGY

This study design is based on a survey study carried out on randomly selected tertiary institutions within Ogun State consisting of both private and public institutions. The main source of data is basically primary data from the survey institutions. The instrument for the study is a multi-choice questionnaire made up of closed and open ended questions. This was broadly divided into two parts. The first part consists of information on the demographic distribution of the respondents based on the department, age category, gender distribution, level of education, and marital status. This part also addressed issues on teachers' absorptive capacity for new technologies in teaching, availability of the new technologies in the tertiary institutions and the level of teacher-student engagement in teaching and learning process using the new technological devices. The second part focuses on structured items validating the need for this study and test of hypothesis based on e-learning process with sub sections on students-teachers interaction, facilitation of institutional thought courses and technological innovation and usage. The questionnaire was randomly administered on both students and staff of the selected institutions. A total of one hundred and fifty (150) questionnaires were administered, from which one hundred and thirty-two were analyzed with a response rate of 88

percent. Descriptive and regression analysis were utilized in the process of data analysis and test of study hypothesis.

10 OBJECTIVES

This study is focused on evaluation of teachers' capacity in absorbing new technologies for teaching students in tertiary institutions, thus

Other objectives includes to

- ❖ Determine the relationship between teachers' absorptive capacity and new technology adoption in class room teaching
- ❖ Ascertain the level of new technology adoption in students-teachers interactions in Nigerian tertiary institutions and
- ❖ Evaluate the impact E-learning process and technological innovation and usage on course facilitation and teaching process in Nigerian tertiary institutions.

11 DESCRIPTIVE ANALYSIS

11.1 Reliability of Instrument

The reliability of the research instrument was tested as shown in table 1 below, with the Cronbach's alpha statistic for twenty-three (23) items measured in the questionnaire. The result of the test (0.916) indicates a high measure of internally consistent response observations from the survey study.

Table 1. Reliability Statistics

Cronbach's Alpha	N of Items
.916	23

From table 2 below, this study shows that majority of the respondent 56 (42.4%) were between the ages of 26-35 years. The gender distribution indicates that the male 88(36.4%) respondents constitute the greater proportion of the sampled participants. The result from the survey indicates that majority 84(63.6%) of the participant were married while 92(69.7%) were from the post graduate category.

Table 2. Demographic Distribution of respondents

Variables	Category	Frequency	Percentage
Age	18-25 years	20	15.2
	Between 26-35 years	56	42.4
	36-45 years	32	24.2
	45 years and above	24	18.2
	Total	132	100.0
Gender	Male	88	66.7
	Female	44	33.3
	Total	132	100.0
Marital status	Single	48	36.4
	Married	84	63.6
	Total	132	100.0
Education	Undergraduates	40	30.3
	Postgraduates	92	69.7
	Total	132	100.0

Source; Survey Report, 2015

12 DISCUSSION OF STUDY RESULT

The result in table 3 shows that a higher proportion of the respondents 120(90.9%) believed that the teachers in their institution has capacity for absorbing new technologies for teaching students. The result from this study shows that majority of the participants 129(97.7%) attested to the fact that the new technologies for teaching students are not always available in most of the tertiary institutions in Nigeria though 100(75.8%) of the total respondents agree that they do employ new technological device to facilitate class room learning.

Table 3 Teachers' absorptive capacity for new technologies

	Yes		No	
	FQ	%	FQ	%
Teachers in this institution has capacity for absorbing new technologies for teaching students	120	90.9	12	9.1
The new technologies for teaching students are always available?	3	2.3	129	97.7
Have you engaged students in class using any new technological devices?	100	75.8	32	24.2

13 TEST OF HYPOTHESES

13.1 Hypothesis I

H_0 : There is no relationship between teachers' absorptive capacity and new technology adoption as a teaching technique

H_1 : There exists a relationship between teachers' absorptive capacity and new technology adoption as teaching technique.

Table 4 below shows a significant but inverse relationship between e-learning process (ELP) and institutions capacity for absorbing new technology for teaching students. This suggests that the nature of e-learning process in most tertiary institutions do not offer significant support for teachers' absorption of new technologies for teaching students. Further analysis of the result shows that course facilitation and training (CFT) and technological innovation and usage (TINU) suggests no significant relationship with teachers' absorptive capacity of new technologies for teaching students. Given the significant Wald test result (2.972) for e-learning process in table 4 the null hypothesis is of no relationship between teachers' absorptive capacity and new technology adoption in class room teaching is rejected.

Table 4 Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
ELP	-.762	.442	2.972	1	.085	.467
CFT	-.259	.556	.216	1	.642	.772
TINU	.291	.541	.290	1	.591	1.338
Constant	.292	1.736	.028	1	.866	1.340

a. Variable(s) entered on step 1: TABC, CFT, INCR.

13.2 Hypothesis II

H_0 : New technology adoption by tertiary institutions has no significant influence on level of technology usage in learning process.

H_1 : New technology adoption by tertiary institutions has a significant influence on level of technology usage in learning process.

The table 5 shows there is a significant relationship between new technology adoption in teaching students in class and e-learning process, course facilitation, technological innovation and creativity. Further analysis of the result below reveals that e-learning process and teachers' knowledge on technological innovation and usage do significantly affect the level of adoption in class room teaching and learning. The evidence from the result indicates that the use of technology in tertiary institutions for course facilitation and teaching and teaching has significant impact on level of technology adoption in teaching and learning. Hence the null hypothesis that new technology adoption by tertiary institutions has no significant influence on level of technology usage in teaching leading to the acceptance of the hypothesis that New technology adoption by tertiary institutions has a significant influence on level of technology usage in teaching.

Table 5 Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.613	.204		7.899	.000
ELP	-.164	.048	-.351	-3.399	.001
CFT	.157	.062	.254	2.529	.013
TINU	-.106	.063	-.181	-1.679	.096

a. Dependent Variable: Have you engaged students in class using any new technological devices?

13.3 Hypothesis III

H₀: E-learning process and technological innovation and usage has no significant impact on course facilitation and teaching process in tertiary institutions

H₁: E-learning process and technological innovation and usage has significant impact on course facilitation and teaching process in tertiary institutions

The relationship between course facilitation and teaching (CFT) e-learning process (ELP), technological innovation and usage (TINU) were examined in table 6 below. The result of the T-statistic (2.863 and 4.584) supports a significant direct relationship between e-learning process and course facilitation and teaching and technological innovation and usage confirmed at 1 percent significance level. This leads to the acceptance of the hypothesis that e-learning process and technological innovation and usage has significant impact on course facilitation and teaching process in tertiary institutions which invariably connotes the rejection of the null hypothesis which asserts that e-learning process and technological innovation and usage has no significant impact on course facilitation and teaching process in tertiary institutions.

Table 6 Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.760	.244		7.223	.000
1 ELP	.190	.066	.252	2.863	.005
TINU	.381	.083	.403	4.584	.000

a. Dependent Variable: CFT

14 RECOMMENDATIONS

This study evaluates the capacities of teachers absorbing new technologies for teaching students in tertiary institutions based a survey of some selected institutions in Ogun State. From the evidences from the study conducted the following recommendations are put forward:

- ❖ Regular ICT training programs should be organized for teachers on a routine basis to assist them in handling of ICT teaching aids for effective class room teaching and learning
- ❖ Tertiary institutions in Nigeria should make deliberate effort to provide ICT equipments that will enhance learning process. These include the use of projector screens in lecture delivering, audio-visuals and good sound system.
- ❖ Tertiary institutions teachers should endeavor to always make their teaching pattern ICT compliant by introduction of video tapes for illustration of practical scenario or examples that will enhance the understanding of the concepts in the subject-matter where applicable.
- ❖ This study suggests that tertiary institutions should encourage teachers and students to be more ICT compliant by provision of reliable and consistent internet services facilities for easy access to information and functional ICT centers within the academic environment to assist the academic community in dealing with technological issues associated with advancement in new frontiers of knowledge especially in the area of research and projects.

15 CONCLUSION

The new technological advancement in the recent times has made the entire world a global village driven by knowledge economy. This implies that knowledge has become an indisputable capital asset such that the level of knowledge and information at our disposal determines how valuable and relevant such an individual becomes in the society. In the quest for more effective teaching and learning in the tertiary institutions, teachers' readiness to embrace new technologies in the method of teaching plays a significant role in learning process. Therefore the use of ICT for teaching students in the tertiary institutions could be assessed by the level of acceptability, willingness and competence of the teachers in the adoption of ICT as a teaching technique. Also the availability of the new technologies and level of students' engagement in the e-learning process forms the basic criteria in achieving the desired result in advancing the frontiers of knowledge particularly in Nigerian tertiary institutions.

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