Teacher's ICT awareness and competence as determinants of electronic examination adoption disposition in secondary schools, Ogun State

[1]Joshua O. Adeleke, [2]Kolawole A. Olotu, [3]Emily OluyemisiAdeniji

[1&2]Institute of Education, University of Ibadan, Ibadan

[3]Federal College of Education, Osiele, Abeokuta

Abstract

This study focused on Information and Communication Technology Awareness and Competence as determinants of electronic examination adoption disposition of secondary school teachers. A non-experimental research design was used with an adoption of survey research type. The sample for the study included 240 secondary school teachers from all 20 local government areas in Ogun State. Data was collected using academic staff ICT disposition questionnaire (ASIDQ) having 5 sections (r = 0.79, 0.79, 0.94, 0.92). Data collected were analyzed using Pearson Product Moment Correlation and One-way ANOVA. There is a significant relationship between teachers' length in service and readiness for electronic examination [p = 0.001(<0.05)]. Electronic examination readiness of staff differ on their level of ICT competence [$F_{(2, 237)} = 13.41, p<0.05$]. Also, electronic examination readiness of staff differ on their level of ICT awareness [$F_{(2, 237)} = 9.06, p<0.05$]. Post-hoc result showed that teachers with high competence and high awareness have better readiness for electronic examination than other groups. It was therefore concluded that teachers should make judicious use of ICT training opportunities no matter their age and also endeavour to adopt ICT in teaching and assessment in a bid to bridge the digital divide inherent in education.

Keywords: *Information and Communication Technology, Awareness, Competence, Electronic Examination Adoption Disposition*

Introduction

Electronic examination which can also be referred to as e-assessment, online examination or computer-based testing is the adoption of information technology for assessment in various areas like the educational assessment, health assessment, psychiatric assessment and psychological assessment. Such mode of assessment mostly embraces an expansive activities ranging from the use of a well simplified word processor to user friendly on-screen testing. It usually makes use of an online computer which is well connected to a network either via wire or wireless connection mode. Some specific types of e-assessment are multiple choice, online/electronic submission, computerized adaptive testing and computerized classification testing. Different types of online assessments contain elements of one or more of the foregoing, with respect to the original purpose for which such assessment was put in place which is either formative, diagnostic or summative (Plessis, 2012). Of great precedence in global education is the adoption of Information and Communication Technology (ICT). Nigeria, as an active member of the world system, is not extrinsic to this digital development. The Federal government of Nigeria in the National Policy on Education (FRN, Revised 2014) recognizes ICT as a product of technological change and as an outright innovation in education. This recognition is not unconnected with the reason Computer Education was set up as an essential part of ICT in the educational system of Nigeria. The purpose was geared towards the attainment of computer literacy and ICT skills needed in all aspects of human endeavour which is in vogue in this contemporary dispensation. This gradually led to the change in the curriculum from the old 6-3-3-4 system to a new one which fully accommodates the child in their first 9

years in school as designed by the Nigerian Educational Research and Development Council (NERDC). The development of the new curriculum by NERDC includes ICT, computer education, basic technology and creative thinking among others. The new curriculum as pointed out by Obioma (2007) is ICT-driven with strong emphasis on pragmatic, practical and concrete activities as well as hands-on experiences. Teachers who are the instructors and their students being the recipients of the instructions should attain better curriculum outcomes while adopting ICT resources.

Despite the fact that there is a proliferation of studies in developed countries which detail the use of ICT in education, there appears to be paucity of information on the integration of ICT into schools in developing countries (Beukes-Amiss and Chiware, 2010). Notwithstanding, teachers are encouraged to devise the means whereby educational use of ICT can be fully implemented in the classroom in an era where conventional or didactic teaching methods are gradually phasing out. It is in the light of this that teachers need to improve their ICT skills as it relates to all subjects of interest. It is important teachers and government see the need for skills acquisition to effectively use the technology created by multimedia in the assessment process. The pedagogy of teachers needs to be improved to enhance the use of many new teaching-learning styles. This underpins the importance of a teacher playing a vital role in the adoption of ICT in classrooms. Giwa (2011) made it clear that teachers do not really have the luxury of time and ample chance to absolutely evaluate the educational strengths and weaknesses of a considerably portion of existing curriculum materials, texts and software even before their utilisation.

Training, as suggested by Ya'acob (2010), should be continuously given to teachers instead of a one-off approach so as to solidify and consolidate their ICT knowledge and competence. This is in consonance with previous studies which found teachers' familiarity and attitude towards computer as a strong precursor in predicting the frequency of technology use (Becker, 2005; Zhao and Frank,

2007).The finding equally alligns with the findings of previous studies which concluded that teachers who are more competent in the use of computer have also more favorable attitudes towards computer (Sa'ari and Jegede, 2005; Jegede, 2007).Experience has shown that teachers with a high level of computer competence will be more capable of using the computer and will have what it takes to endure the impediments and hurdles involved with the adoption of ICT in the classrooms so as to facilitate teaching and learning. Similarly, according to Ozcelik and Kurt (2007), it was discovered that teachers who are so apt in the use of computer have more likelihood to utilize the tools more frequently in performing classroom tasks.

Statement of the Problem

An indispensable role is being played by ICT in education, and this role is one that enables both teachers and students to be abreast of the latest trend in learning and to navigate through the digital divide capable of rendering an individual almost useless in this digital age. It is worthy of note that most teachers that are supposed to be givers of knowledge lack basic knowledge and requisite adeptness in the parlance of ICT. Of great concern and grave consequence in education are the seeming sheer ignorance and the inability of teachers to demonstrate ICT competence needed in their pedagogical approach.

This invariably affects the professional development of teachers and also has the tendency to limit the ability of the students as they will not be able to compete with their mates in other states, not to talk of other developing and developed countries of the world. Some important public examinations are now written using Computer Based Test (CBT) approach and it appears that most of the students that have incompetent teachers in ICT have difficulty in operating the system being used for such examinations and this has the potency of producing undesirable result from the students.
As a result of the foregoing, the study investigated the impact of ICT awareness and competence of secondary school teachers on their electronic examination adoption

disposition.

Research Questions
1. What relationship exists between teachers' length in service and electronic examination adoption disposition?
2. Does any significant difference exist in the ICT competence level of staff on their electronic examination adoption disposition?

3. Does staff level of awareness of ICT facilities significantly affect their electronic examination adoption disposition?

Methodology
Research Design
The study adopted a non-experimental design of survey research type. Descriptive survey was used as it helped to explore a representative opinion of the respondents so that adequate generalization was made from the findings from the respondents.

Population
The population for this study comprised all Senior Secondary School teachers in Ogun State. **Sampling Technique and Sample**
A probabilistic approach of simple random sampling technique was used to select the sample. All twenty (20) local government areas in the state were used and three (3) secondary schools were randomly selected each. Four (4) teachers were randomly selected from all the selected schools making a total of 240 teachers.

Instrument/Instrumentation
For the purpose of this study, the researchers used Academic Staff ICT Disposition Questionnaire (ASIDQ) to elicit responses from the respondents. The instrument was made up of five sections. The first section provided information on the respondents' demographic information and it has the following items; name of teacher, gender, local government, school location, number of computer systems in school, teacher's qualification, among others. Section B comes with 9 items that looked into staff level of ICT awareness, section C consists of 12 items that measured staff level of awareness to ICT facilities, section D which consisted of 6 items measured ICT competence level of staff, meanwhile section E looked into electronic examination adoption disposition of staff and it has 15 items. The instrument was given to three (3) experts in research instrument construction for proper vetting and verification of the face validity. It was validated by the researcher on a similar sample of thirty (30) respondents. The internal consistency of the instrument was established via Ordinal Alpha which yielded 0.79, 0.79, 0.94 and 0.92 for the sections respectively excluding Section A. These coefficients clearly ascertain the reliability of the instrument.

Procedure for Data Collection
The researchers engaged five research assistants who were trained for a day on how to handle administration of the research instrument effectively. The Academic Staff ICT Disposition Questionnaire was responded to by teachers. Data collected were analysed using Pearson Product Moment Correlation and One way ANOVA.

Result and Discussion
Research Question One: What relationship exists between teachers' length in service and electronic examination adoption disposition?

Table 1: Correlation Matrix Table of teachers' length in service and electronic examination adoption disposition

Variables		Length in Service	Disposition
Length in Service	Pearson correlation	1	-0.209
	Sig. (2-tailed)		0.001
	N	240	240

Table 1 shows that there is a significant relationship between teachers' length in service and their disposition in adopting electronic examination because the significant value is 0.001 (< 0.05). This implies that the number of years a teacher has spent in service will determine his readiness for electronic examination. Interestingly, teacher with lesser length in service have greater readiness for electronic examination. This is because the Pearson Correlation co-efficient is estimated at -0.209 (negative correlation).

Discussion: Result showed that there is a significant relationship between teachers' length in service and their electronic examination adoption disposition. The year of experience of teachers has the potency of affecting their disposition to computer-based examination. Teachers with lesser length in service take it a responsibility to better adapt to using ICT in assessment exercise. These findings appear logically not out of place as younger teachers have a better understanding and disposition to the use of computer in their attempt to tread an uncharted territory educationally. The findings here is in consonance with that of Russell and Bradley (1997) which found that younger teachers who have less experience in teaching but more experience in ICT are more confident and ready to adopt its usage in schools. In the same vein, Teo (2008) also found out that the number of years teachers have spent in operating computer is positively correlated with their level of computer confidence.

Research Question Two: Is there any significant difference in the ICT competence level of staff on their electronic examination adoption disposition?

Table 2: One-way Anova of staff ICT Competence on electronic examination adoption disposition

	Sum of Squares	df	Mean Square	F	Sig
Between Groups	356.920	2	178.460	13.412	.000
Within Groups	3153.576	237	13.306		
Total					

Table 3: Post-hoc Result

(I) RECODED COMPETENCE	(J) RECODED COMPETENCE	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
LOW COMPETENCE	MODERATE COMPETENCE	-1.737*	.590	.014	-3.19	-.28
	HIGH COMPETENCE	-2.850*	.555	.000	-4.22	-1.48
MODERATE COMPETENCE	LOW COMPETENCE	1.737*	.590	.014	.28	3.19
	HIGH COMPETENCE	-1.112	.598	.179	-2.58	.36
HIGH COMPETENCE	LOW COMPETENCE	2.850*	.555	.000	1.48	4.22
	MODERATE COMPETENCE	1.112	.598	.179	-.36	2.58

*. The mean difference is significant at the 0.05 level.

It is shown in Table 2 that there exists a significant difference in the ICT competence level of staff on electronic examination adoption disposition: F $(2, 237)$ = 13.41, p<0.05. This implies that the three levels of ICT competence do not have equal adoption readiness for electronic examination. The post-hoc test in table 3 gives a pair-wise comparison among the groups indicate that teachers that are highly competent have greater adoption disposition than the moderately and low-competent teachers in that order.

Discussion: It was gathered from the result that there is significant difference in teachers' ICT competence in their electronic examination adoption disposition, thus giving proper credence to the fact that a teacher will be fully ready to adopt electronic examination if he is vast in the use of computer as you cannot give out what you do not possess. The result is in tandem with Russell, Finger and Russell (2000) findings as it was shown that teachers see themselves as competent in the basic use of computer but few are confident in demonstrating the said competence in an advanced mode. The study revealed that teachers do not have the same technological competence associated with the use of internet, Microsoft word, excel, Corel draw, power point and graphics. Most teachers, as categorically stated by some researchers, have positive attitude electronic examination but just few of them consider themselves competent enough to employ its use (Berger and Carlson, 1988; Davis, 1992; Duane and Kernel, 1992; Odabasi, 2000; and Sadker and Sadker, 2003). Since the world is fast revolving towards ICT holistically, it really behooves teachers to be sound in the use of computer so as to be updated themselves and to also help the students cross the digital divide.

Research Question Three: Does staff level of awareness of ICT facilities significantly affect their electronic examination adoption disposition?

Table 4: One-way Anova of staff level of ICT awareness on electronic examination adoption disposition

	Sum of Squares	df	Mean Square	F	Sig
Between Groups	249.350	2	124.675	9.061	.000
Within Groups	3261.146	237	13.760		
Total	3510.496	239			

Table 5: Post-hoc Result

(I) RECODED AWARENESS	(J) RECODED AWARENESS	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
LOW AWARENESS	MODERATE AWARENESS	-1.683[*]	.618	.026	-3.21	-.16
	HIGH AWARENESS	-2.257[*]	.550	.000	-3.61	-.90
MODERATE AWARENESS	LOW AWARENESS	1.683[*]	.618	.026	.16	3.21
	HIGH AWARENESS	-.573	.635	.666	-2.14	.99
HIGH AWARENESS	LOW AWARENESS	2.257[*]	.550	.000	.90	3.61
	MODERATE AWARENESS	.573	.635	.666	-.99	2.14

[*]. The mean difference is significant at the 0.05 level.

It is shown in Table 4 that there is a significant difference in staff level of awareness of ICT and its facilities on their electronic examination adoption disposition: $F(2, 237) = 9.06$, $p<0.05$. This implies that the three levels of ICT awareness do not have equal adoption disposition for electronic examination. The post-hoc result in table 5 shows us that teachers that have high ICT awareness tend to develop better adoption disposition towards electronic examination.

Discussion: In the same vein, result also showed that there exists a significant difference in teachers' level of ICT awareness on their disposition towards electronic examination. This result aligns with some findings that discovered that teachers' awareness level and an outright lack of the technical know-how in the usage of computers was not unconnected with the reason the adoption of computers in teaching-learning and assessment process is not successfully implemented in schools (Winnans and Brown, 1992; Ely, 1995; Fisher, 1996; Morton, 1996; Pelgrum, 2001; Aduwa-Ogiegbaen and Iyamu, 2005; Jones, 2004). It is then imperative for teachers to be vast in the knowledge, understanding, skills, attitude and operation of computer; and have a sense of readiness and preparedness so as to co-opt computers in the process of teaching as well as assessment practice. Researchers such as Wells and Anderson (1995), Myhre (1998), Halpin (1998), Hadley and Sheingold, (1993) Akif and Akdemir (2008) and Charoula-Angeli (2004) concluded that increased familiarity with and awareness to ICT facilities allow teachers to have a better disposition and enhance their interest in the pragmatic use of technology.

Conclusion and Recommendation
From the findings of this study, it is observed that there is a significantly moderate and inverse relationship between teachers' length in service and their electronic examination adoption disposition. Teachers that are highly competent in ICT have greater adoption disposition towards electronic examination than the moderately and low competent teachers. In the same development, it was also discovered that teachers that have high level of awareness in ICT

have greater adoption disposition towards electronic examination than teachers that have moderate and low awareness. In the light of the foregoing, it is recommended that government should organize in-service programs, workshops, seminars and conferences where teachers can be taught the nitty-gritty of what they need to know when making use of the computer to teach and employing ICT facilities for computer based examination. Teachers should endeavour to attend ICT training programs no matter their age and background. They should attend the workshop massively with a teachable mind so that it can profit them immensely. This can even properly place those teachers as facilitators in the schools they come from.

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