

## Factors influencing students' acceptance of Electronic Examination at the University of Maiduguri

Gambo Yusufu<sup>1</sup>, Pur Hamsatu<sup>2</sup> and Kellu Maigana Gadzama<sup>2</sup>

<sup>1</sup>Department of Computer Science, Adamawa State University, Mubi

<sup>2</sup>Department Education, University of Maiduguri

Corresponding Author: [Yusufu.gambo@gmail.com](mailto:Yusufu.gambo@gmail.com). +2348035343548

---

### Abstract

Assessment has been identified to be an important component of a learning process. The method of evaluating learners goes a long way in determining the quality of the learning products. With the growing population of students in most Nigerian Universities, there is need for an automatic means of assessment. E-examination approach is believed to offer such automatic evaluation. The arguments on its applicability in some courses call for this research effort to investigate its adoption in this domain based on a survey study underpinned by the modified Technology Acceptance Model (TAM) as the research framework. In this paper, the factors that can predict adoption of e-examination mode for undergraduates' courses in the department of education, University of Maiduguri is investigated in a survey study involving 222 students. The four dimensions used in the study are Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Perceived performance (PP) and Perceived Fairness (PF) all predict the adoption and thereby recommended to be considered in adoption study of this nature.

**Keywords:** Assessment, Evaluation, Technology Acceptance Model, e-Examination,

---

### Introduction

Information and Communication Technology (ICT) has become, within a very short time, one of the basic building blocks of modern society, and has successfully changed the social, economic and political sphere globally. Through globalization, ICTs have reduced the world to a global clan, and globalization has assumed a cyclopean force driving human civilization by the scruff (Imhonopi, & Urim, 2013). Similarly, ICTs have enabled the globalized world become greatly interconnected, interdependent and without borders (Salawu, 2008).

E-examination in higher education in Nigeria is no a longer news, many

established institutions in Nigeria opted for e-Examination (e-exam) as a means of assessing performance and employment, entrance examinations etc. ICT has had its merits and merits; it depends on where and how the innovation is deployed and used. Although the definition of Wikipedia is that e-assessment is related to e-examination. E-assessment in its broadest sense is the use of information technology for any assessment related activity, and that e-examination reduces the large proportion of workload on examination, training, grading and reviewing, thus bringing the ability of the institution to release examination results in good time. For instance lecturer would spend weeks marking scripts

manually, while e-exam could mark and grade the students as soon as they finish their examinations.

Examinations worldwide are means of assessing or evaluating the entire teaching and learning processes especially as they relate to the learners' performance. Originally, examinations appraise not only the performance of learners but also teachers' effectiveness in achieving the stated instructional objectives, overall effectiveness of the teaching methods, the instructional materials used and the final assessment of the learner's achievement, usually leading to a formal qualification or certification of a skill or simply a change in the learners' behavior. However, some of these parameters could be compromised for the electronic examinations because of their peculiarities and special operations (Davies, 2014).

The University of Maiduguri has made efforts in deploying ICT services ranging from dedicated internet café, ICT training, virtual private network for faculties, data centre, online registration etc. Recently, the University has adopted and implemented e-examination. E-examination is not without its merits and demerits, with many students and Staff having diverse opinions on its adoptability, administration and viability (Hamsatu, Gambo & Habib, 2016).

The research question this study attempting to address is "what are the factors influencing students' acceptance of e-examination in the University of Maiduguri?" This study seeks to explore these factors with a view to make appropriate recommendations for a better

decision making about its administrations and adoption.

### ***I. Related Studies***

A number of concepts and studies on e-examination abound. Fowles & Adams, (2005) viewed electronic examination (*e-exam*) system as a software to carry out the examination at the computer, usually the exam is in a form of one or multiple choice test. The application may be a standalone (desktop) program enriched with multimedia content and other features like time measurement or a choice of questions in a random manner. Furthermore, Fowles & Adams (2005) opined that due to the rapid development of internet technology, *e-exams* are more and more often implemented as distributed applications that use public telecommunication network, with web browser based user interface of World Wide Web (WWW service). *E-exam* module is often a part of *e-learning* platforms, increasingly used by private and public schools and training centers for assessments.

Trotter (2001) opined that computers become increasingly available in educational settings; teachers make use of it to administer exams; and electronic examination helps to develop new assessment methods by combining flexible technical possibilities with elaborated understanding of how to assess various forms and levels of knowledge, it allows students to check their own progress through self-assessment. Furthermore, Trotter (2001) stated that it is used for examining lower-order skills (such as knowledge, understanding and application) and

higher-order skills so as to improve students' analysis, synthesis and evaluation skills. Moreover, Raikes & Harding (2003) stated that the uses of computers are well known and apparent in teaching and learning process, but its integration in exams has not been fully utilized. Similarly, Liao & Ho, (2010) opined that with the development of technologies, computer has evolved as a tool that can improve the accuracy and efficiency of exams, and transformed the way exams are being conducted over the years, and it has been used to administer examinations since the 1970s).

Hochlehnert, Brass, Moeltner, & Juenger (2011) states that Electronic examination automates time consuming task, marking and monitoring progress and it enables easier control and editing of exam items, gives room for better incorporation of exams into the learning environment using specific feedback. Furthermore, they opined that the use of Electronic examination combines advantages with respect to content (integration of other media, favourable presentation of pictures, and possibility of other examination formats) with rapid data analysis. E-examination reduces a large proportion of workload on examination, training, grading and reviewing, thus bringing the ability for the institution to release examination results in record time. This is because where ordinarily, the lecturer would spend weeks marking scripts manually, the computer would grade the students as soon as they finish their exams (Iwuchukwu, 2014).

Many previous studies on e-exams are abound. Adeniyi, Olugbenga, & Inegbedion (2011) carried out a research on perception of learners on electronic examinations in open and distance learning institutions using National Open University of Nigeria as a case study, and reported that the difference in students' perception is based on the reduction of examination malpractice, wide coverage of the scheme of work, students' academic performance, and inadequate facilities. More studies trend has also led to so many research works on e-examination as well as web-based studies, not only in Nigeria, but also globally. Ricketts and Wilks (2001) investigated the appropriateness of using electronic examinations system for teaching numeracy and statistics on two hundred first year Biology students in higher education, they discovered that students' performance was poor when online assessment was used and students had difficulty in interacting with computer screen. Similarly, Daly and Waldron (2002) used TAM for electronic examinations systems to examine the factors that enable computer science students pass the programming exams despite low level skill in problem solving abilities using survey of hundred students in the class, they Study found out that adoption and acceptance depended on their perceived performance in their exams.

## ***II. Theoretical Framework***

This study was based on the extended technology acceptance model (TAM). The TAM was proposed by Davis (1989) based on how individuals reason before acting and explains and predicts user

behaviour when a certain technology is introduced; This tries to explain and predicts whether an individual will accept or decline to adopt a technology based on the individual's perceptions about the technology. Furthermore, based on the theory, perceived ease of use and perceived usefulness have a high relation to the acceptance of any technology. Perceived usefulness as put by Davis is a belief that the user expects that his/her efficiency would be improved by the adoption and use of a certain technology. Perceived ease of use is the user's belief that the technology will not require the user to put too much effort in operating it. The TAM according to Davis assumes that there are some external factors that influence perceived usefulness and perceived ease of use. These factors also intervene in the effect of external variables on user's attitude towards using a certain technology. The model therefore provides a basis for explaining the adoption process of the technology and the reasons behind or hindering any adoption. TAM adapted theory of reason action (TRA) by replacing several of its measures with two key constructs: perceived usefulness (PU) and perceived ease of use (PEOU).

The TRA was developed by Fishbein and Ajzen (1975) which suggests that one's behavioural intention depends on his or her attitude about the behaviour and subjective norms. If an individual intends to do behaviour then it is likely that the person will do it. Attitude towards the behaviour means that an individual will judge whether or not to perform the intended behaviour.

Pinho & Soares, (2001) in their study on Behavioural factors influencing students to adopt social networking for education using online survey of 500 participants, they opined that in the technology acceptance model, though perceived ease of use and perceived usefulness are the major elements in the determination of an individuals or institution's acceptance, adoption and usage on ICTs, there are other factors about the technology that influence the decision. These factors include the environment within which the decision is being made, transparency of the process, features of the technology and the characteristics of users who are being targeted.

Therefore, this study used TAM as the theoretical framework for this study because the model has been widely used to access and determined factors influencing users to adopt and used a new technology. This study is justified in using this model as it has been used successfully in various past studies including a study on English learning (Chang, Yan & Tseng, 2012) using experimental study to determine the behaviour intention of four hundred Chinese students in higher education to adopt mobile learning, and concluded that perceived enjoyment and ease of use affect them to use mobile learning. Tai & Ting (2011) on electronic learning adoption using online study using survey instrument on final year students in mathematics course, and concluded that transparency and ease of used are among factors influenced them to use e-learning; Roca & Gagne (2008) on determining factor affects distance learning student in Bangladesh to adopt eLearning as a

blended learning using survey instrument on Three hundred students in higher education, and concluded that perceived enjoyment and ease of use are most significant factors influenced them. According to Tselios, Daskalakis & Papadopoulou (2011) on their study to determine factors influencing teachers' acceptance of e-examination, five hundred selected teachers in South India using a survey instrument were used. They concluded that ease of use is the most significant factors influenced them to adopt it in their teaching and learning context. Adeniyi and Olugbenga (2013), on Perception of Learners on Electronic Examination in Open and Distance Learning at National Open University of Nigeria (NOUN) Lagos using a simple survey to obtain the opinion of six hundred users. They concluded that most of the participants opined that e-Exam will reduce exam malpractices.

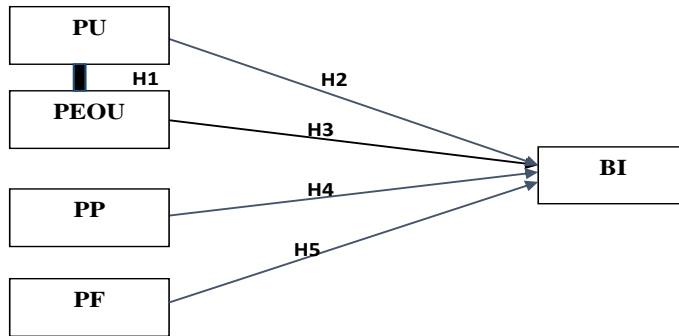
These previous studies revealed that the technology adoption model can be effectively applied to explain and predict investment in, adoption and acceptance of technology systems, and electronic examination in higher education is not an exception.

### ***III. Research Model***

This study used the Technology Acceptance Model (TAM) to explain students' attitude toward adopting electronic examination in the University of Maiduguri.

TAM has been widely used to predict user adoption and use, based on perceived usefulness and ease of use (Davis, 1989; Davis et al., 1989). In addition, Davis developed TAM by adapting the Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) to understand the causal chain linking external variables to information technology (IT) usage intention and actual use in a workplace.

Many Information Technology (IT) studies have replicated TAM or used TAM instrument (which has empirically proved to have high validity) extensively to investigate a range of issues in the area of user acceptance (Vainny, 2008). He further concluded that the TAM is one of the simplest, easiest to use, and most powerful computer usage models. Davis (1989) stated that the constructs in TAM, PU and PEU are primary motivational factors for adopting and using new technologies. In addition, more construct can be added or remove to suits researchers' studies. Therefore the model was extended with additional new constructs (Perceived Performance, PP) and (Perceived Fairness, PF). Figure 1 shows the hypotheses research model employed to determine factors influencing students to adopt e-Examination in higher education.



**Figure 1:** Research Model

Where

PU: Perceived Usefulness in adopting e-Exams

PEOU: perceived Ease of Use of e-Exams

PP: Perceived performances in using e-Exams

PF: Perceived Fairness in using e-Exams

BI: Behavioural intention to adopt and use e-Exams

#### **IV. Research Hypotheses**

The following hypotheses attempts to address the research questions on whether the constructs of TAM is influencing students' acceptance of e-examination in the University of Maiduguri Thus:

- i. Perceived usefulness(PU) has a positive impact on perceived ease of use(PEOU) of e-exam
- ii. Perceived usefulness(PU) has a positive impact on Behavioural Intention(BI) to use e-exam
- iii. Perceived ease of use(PEOU) has a positive impact on Behavioural Intention(BI) to use e-exam
- iv. Perceived performance(PP) has a positive impact on Behavioural Intention(BI) to use e-exam

- v. Perceived Fairness(PF) has a positive impact on Behavioural Intention(BI) to use e-exam

#### **Methology**

This research was carried out among the 100-400 level in the department of education, University of Maiduguri using quantitative approach. Survey questionnaires (developed based on the research model) were administered to a sample of 250 students using stratified random sampling technique. The returned questionnaires were 235 which indicate a response rate of about 98%. Data analysis was done quantitatively using SPSS version 16.

## Results

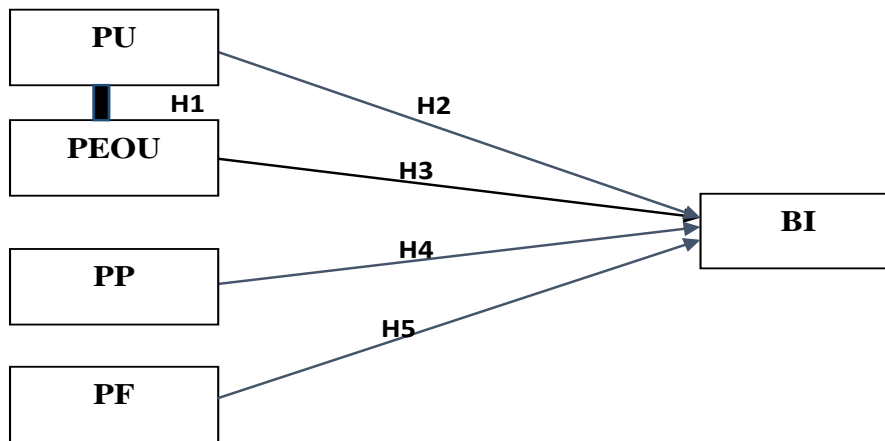
The following tables present the results of the analysis

**Table 1:** Constructs Analysis

<b>Hypotheses Variable</b>	<b>Dépendent variable</b>	<b>Independent variable</b>	<b>Finding of Coefficient determination(<math>R^2</math>)</b>
<b>Ho<sub>1</sub></b>	PEOU	PU	$R^2 = 0.23$ i.e. 23% of the variance in PU is explained by PEOU Standard coefficients beta value 0.48 was obtained with (sig < 0.05)
<b>Ho<sub>2</sub></b>	PU	BI	$R^2 = 0.30$ i.e. 30% of the variance in BI is explained by PU Standard coefficients beta value 0.55 was obtained with (sig < 0.05)
<b>Ho<sub>3</sub></b>	PEOU	BI	$R^2 = 0.10$ i.e. 10% of the variance in BI is explained by PEOU Standard coefficients beta value 0.31 was obtained with (sig < 0.05)
<b>Ho<sub>4</sub></b>	PF	BI	$R^2 = 0.120$ i.e. 12% of the variance in BI is explained by PF Standard coefficients beta value 0.36 was obtained with (sig < 0.05)
<b>Ho<sub>5</sub></b>	PP	BI	$R^2 = 0.130$ i.e. 13% of the variance in BI is explained by PP Standard coefficients beta value 0.36 was obtained with (sig < 0.05)

**Table 2:** Finding of Hypotheses

Hypothesis		R	Standardized Beta Coefficient @ Sig. <0.05	Remark
H1: PEOU	PU	0.23	0.48 @ Sig. < 0.05	Accepted
H2: PU	BI	0.30	0.55 @ Sig. < 0.05	Accepted
H3: PEOU	BI	0.10	0.31 @ Sig. < 0.05	Accepted
H5: PP	BI	0.12	0.35 @ Sig.< 0.05	Accepted
H4: PF	BI	0.13	0.36 @ Sig.< 0.05	Accepted



**Figure 2:** Final result showing the values of regression coefficients for each constructs

**Discussion**

In general, from the results of the hypotheses testing, it was discovered that all the constructs influences students to adopt e-Exam, this is in confirming with studies by Daly & Waldrone (2002) and Yusuff et al., (2013) which indicates that perceived usefulness, perceived ease of use, perceived fairness and perceived performance influences students to accept e-exam among undergraduate students. There might other factors such interface design, nature of the question, institutional policies etc. that might influences students, this study added a confirmatory factors that influences students.

**Conclusion**

The electronic Examination in higher education in Nigeria is no a longer news, many established institutions in Nigeria opted for e-Examinationas as means of assessing performance and employment, entrance examinations. This innovative use of ICT has had its merits and merits, it depends on where and how the innovation is deployed and used.Examinations are means of assessing or evaluating the entire teaching and learning processes especially as they relate to the learners’ performance. Originally, examinations are appraise not only performance of the learners but also teachers’ effectiveness, achievement of the stated instructional objectives, overall



effectiveness of the teaching methods, the instructional materials used and the final assessment of the learner's achievement, usually leading to a formal qualification or certification of a skill or simply a change in the learners' behavior.

Since e-learning is becoming more popular and accepted in the Nigeria school system, the importance of e-examinations is not negotiable and cannot be overemphasized. The e-examination is a welcome innovation because the conventional examination is plagued with several pitfalls such as examination leakages, impersonations, inadequate supervisors, demand for gratification by markers so that results can be influenced, bribe taking by supervisors or invigilators, and the most devastating of these is the delay and/or in many cases, non-release or delay of examination results. There are other factors which might be influencing students to adopt e-exams; hence this study is limited on the use of the constructs, students' population and sample used.

### **Limitations of the Study**

This study has a number of limitations. The study used stratified random sampling to select representative of students, these representative does not reflect the overall opinions of the undergraduate students in the department of education., Furthermore, the study only used department of education, thus it cannot be used as the general opinion of the undergraduate students in the university of Maiduguri,

therefore the study should be caution in generalization.

The study used survey as the instrument of data collection. E-examination is a new paradigm shift in assessment, there is a need to explore students' opinion through qualitative study or mixed methodology a better result.

### **Recommendations**

Based on this we make the following recommendations.

1. That more study need to undertake to fathom other factors influencing students to accept e-examination
2. The university should encourage academics to use e-learning in the teaching and learning scheme to encourage students to use technology in their learning process
3. That more faculties should be used as sample to improve the validity of the study.
4. The study should be extended to other higher education to find out if the factors considered are valid
5. That e-centers should be increase with more computing facilities to accommodate more students writing the e-examination at the same time.

### **References**

- M. (2005). Performance in e-learning: online participation and student grades, *British Journal of Educational Technology*, 36 (4 ): 657–663
- Fowles D. Adams C. (2005). Does assessment differ when e-marking

- replaces paper-based marking?  
IAEA paper
- Hochlehnert A., Adeniyi, O, Olugbenga, T and Inegbedion, J. (2013), Perception of Learners on Electronic Examination in Open and Distance Learning Institutions: A Case Study of National Open University of Nigeria, Review on Open and Distance Education, Vol.2(3)
- Adewale, O. Oluwal, O. & James T. (2011). Perception of Learners on Electronic Examination in Open and Distance Learning Institutions: A Case Study of National Open University of Nigeria. Formal Education; Quality Issues
- Ayo, C. ., Akinyemi, I. O., Adebisi, A. A. and Ekong, U. O. (2007). The Prospects of e-examination implementation in Nigeria. <https://eric.edu.gov/?id=ED499347> [Assessed 28 November, 2016]
- Davis, F. (1989), Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *Management Information Systems Quarterly*, 13(3), 1989, pp318-339.
- Davies J. and Graff Paul P. and Hang W., (2011). Does Medical Students' Preference of Exams Format (Computer-based vs. Paper-based) have an Influence on Performance? *BMC Medical Education*, 11 (89), doi: 10.1186/1472-6920-11-89.
- Hamsatu Pur, Gambo Yusufu, and Habib A. Mohammed (2016). Teachers' Perceptions and Undergraduate Students' Experience in E-Exam in Higher Institution in Nigeria, *Journal of Education and Practice*, 7(23), Pp. 158-166
- Iwuchukwu Onyeka (2014). The Perception of English Literature Students on E-Xamination and Online (Web- Based) Learning, *Turkish Online Journal of Distance Education-TOJDE* ISSN 1302-6488, 15(11).
- Liao, S.H., and Ho, H. (2010). Investment project valuation based on a fuzzy binomial approach. *Information Sciences*, 180 (11), 2124-2133.
- Park Bertia (2009), Measuring students attitude towards e-learning A case study. Proceedings of the 5th standing conference on e-learning and software for development held in Bucharest from 09-10 April 2009 Bucharist Romania 1-8
- Pinho, J. C. M. R., and Soares, A. M. (2011). Examining the technology acceptance model in the adoption of social networks. *Journal of Research in Interactive Marketing*, 5 (2/3), 116 – 129.
- Roca, J. C., and Gagne, M. (2008). Understanding e-learning continuance intention in the workplace: A self-determination theory perspective. *Computers in Human Behavior*, 24(4), 1585-1604.
- Raikes, N. and Harding, R. (2003). The horseless carriage stage: replacing conventional measures. *Assessment in Education*, 103, 267-77.
- Ricketts, C. and Wilks, S. (2001). Is computer-based assessment good for students? In Myles, D. (Eds.), Computer Assisted Assessment 2002 International Conference,

- University of Loughborough,  
Retrieved from  
<http://caaconference.com> on 2nd of  
June, 2012.
- Trotter, A. (2001). Exams firms see  
future market in online assessment.  
*Education Week on the Web*, 20(4),  
6.
- Tai, Y., and Ting, Y. L. (2011). Adoption  
of mobile technology for language  
learning: Teacher attitudes and  
challenges. *The JALT CALL  
Journal*, 7(1), 3-18.
- Tselios, N., Daskalakis, S., and  
Papadopoulou, M. (2011).  
Assessing the acceptance of a  
blended, Learning university  
course. *Educational Technology  
& Society*, 14(2), 224235.
- Vainny, H. (2008). Assessing the  
Acceptability of Adaptive  
E-Learning System Fifth  
International Conference on e-  
learning for Knowledge-Based  
Society, Held in Bangkok, Thailand  
from 11-12 December 2008. *Special  
Issue of the International Journal of  
the Computer, the Internet and  
Management*, 16 (3), pp1-13