Online Learning Adoption in Nigeria: A Structural Modeling Approach

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Abstract: This study examined the influence of perceived ease of use, perceived usefulness, and self-efficacy on intention to adopt online learning among the students. To gathered the data of the study, 200 questionnaires were administered on the respondents, and 141 representing 71% was found useable for the, study. The reliability and validity of the instrument was computed and the normality of the data was inspected with Kurto is and Skewness. AMOS 16 was finally used for data analyses using structural equation modeling approach. The result of the study showed a significant influence of computer self-efficacy on intention to adopt online learning. In fact, the influence stands to be the strongest among the construct of the study. It also revealed the significant influence of computer self-efficacy on perceived usefulness and ease of use as well as the positive influence of perceived ease of use on perceived usefulness. However, the study revealed negative influence of perceived usefulness and ease of use on intention to adopt online for learning activities. The study suggests among others the continuous use of online resource to facilitate student learning and create more enabling environment to make online resources useful and easy to use for the students

Keywords: Perceived Usefulness, Ease of Use, Self-Efficacy and Intention to Adopt Online

Introduction

Online learning is growing rapidly in the contemporary learning environment. Higher institutions everywhere in the world are taking advantage of information technology (IT) and the invention of the Internet to leverage instruction to students irrespective of their population and where they are located. Online learning involves the deployment of Internet resources as a medium of instructional delivery. According to Fidani and Idrizi (2012) the uses of information technology resources have provided several benefits to educational organization. Among the benefit of IT is that, it provides students with the opportunities to access the course materials sent by their instructors; the students are able to interact with their instructors and their colleagues' which results into significant improvement in their academic performance (Wang, Vogel, & Ran, 2011).

The establishment of National Open University of Nigeria in 1982 marks a turning point in the increment of higher education opportunity to teaming populace of Nigerian yearning for higher degree. As normal of an institution of this nature, the Open university of Nigeria is required to provide distance education through the deployment of the online resources which is the best practice for this kind of education. As global interest in the use of online learning continue to grow due to the advantages inherent in its use, some of which are:

the use of a range of electronic media via the Internet, Intranet, audio/video, CD-ROMs, interactive TV, and many other benefits which include synchronous/asynchronous content delivery system (Chang & Tung, 2008). Many educational institutions are using internet medium vis-à-vis face to face method for curriculum implementation. In-line with global practice, the National open University of Nigeria as part of its mandate are required to use online resources for, teaching, and yet adoption of online resources for teaching and learning are influenced by so many factors (Wang et al. 2011).Since there are fewer studies on adoption of online learning in Nigeria and specifically the population sample, the study therefore becomes imperative to understand the factors that may influence or hinder acceptance of online resources for teaching/learning in order to be able to make prediction about the outcome of student's performance if they are taught through the medium.

The result of this study would not only be beneficial to instructors in the Open University, but it will benefit the government who is the sole financial of the institution, the management and lastly, the result would be a theoretical contribution and validation of Technology acceptance model (TAM).

Literature Review and Theoretical Framework

Online learning also known as e-learning have been subjected to a lot of research in the recent time, and there are stream of studies that have proposed a model to explain student intention to adopt/accept online learning (Fidani & Idrizi, 2012). Literature have shed light to several factors that have direct or indirect influence on online learning, some of which are related to technical, human, instructor, the system itself, students and cultural factors (Al-Ammary& Hamad, 2012). Also, Selim (2007) further added information technology and university support as part of factors affecting online learning aside instructor and student factors. Ndubisi (2004) identified students' attitude and perceived usefulness, perceived ease of use, security and subject norm as part of factor influencing acceptance of information technology system. For the purpose of this study, technology acceptance model (TAM) was adopted as the conceptual model of the study and computer self-efficacy was included to extend the original TAM developed by Davis (1989) to explain factor influencing intention to accept online learning in the cultural set-up of this study.

Like many studies of technology adoption, the adoption of online learning among student in the Open University of Nigeria may be understood through Technology Acceptance Model (TAM). In the model, it was of the view that perceived ease of use (PEU), that is how easy a user perceived a technology and perceived usefulness (PU) perception of the benefit derived from using a technology will combine together to determine users' intention toward adoption and final use of a technology.
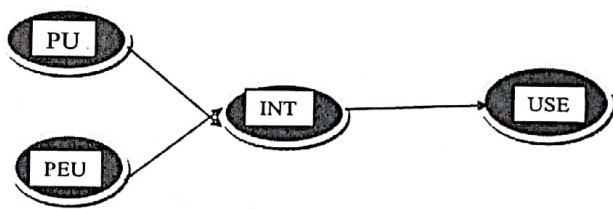
Fig 1. The original Technology Acceptance Model

The technology acceptance model (TAM) developed by Davis (1989) has been considered to be the most influential model employed for understanding adoption of technology by students. In fact, TAM has been used, tested and modified to study adoption of a number of different technologies in the last decade (Masrom & Hussein, 2008; Venkatesh & Davis, 1996; Lucas &Spitler, 1999; Wu, Chang & Guo 2008; Islam, Ahmad,

Zubairi & Nordin 2011). According to Davis (1989), perceived usefulness is the degree to which a person believes that using a particular system will enhance his/her job, while perceived ease of use is the degree to which a person believes that using particular system would be free from effort.

Empirical evidence has supported the influence of perceived usefulness and ease of use on acceptance of information technology. It is even stated that the decision by a user to accept any new technology can best be explained by the underlying intention. Several studies have reported the parsimony of technology acceptance model put forward by Davis in 1996. Yet, there is inconsistence on reasons advance by user for accepting or rejecting a specific technology (Hu, Clark & Ma, 2003). For instance, Hu et al, (2003) study on technology acceptance, reported that PU & PEU significantly influence teacher intention to deployed Microsoft PowerPoint for teaching in Hong Kong.

Similarly, Shroff, Deneen and Ng (2011) study on student acceptance of e-portfolio system in Hong-Kong institute of education revealed that student perceived ease of use as a determinant of usefulness and attitude towards usage of e-portfolio. On computer self-efficacy, Sharp (2006) conducted a study to extend TAM with self-efficacy on information system acceptance. The study showed that educators found computer self-efficacy to be a determinant of perceived ease of use. Evidence from Lewis, Agarwal, and Sambamurthy (2003), Chan and Lu, (2004) demonstrated that computer efficacy only had a significant influence on ease of use, but not on perceived usefulness. In contrary to that, Slylianoa and Jackson (2007) in Al-Haderi (2013) study revealed that self-efficacy influence technology usage for long time, selection of technology and its perceived usefulness. Also, Teo (2009) study on model development for predicting the level of technology acceptance among pre-service teacher in a teacher training institute in Singapore, found out that computer self-efficacy has a direct influence on perceived ease of use and user intention. The study further revealed that computer self-efficacy has higher impact on perceived usefulness than perceived ease of use. Similarly, the study of Wu, Chang, and Guo (2008) on science teacher acceptance of information system, reported that self-efficacy statistically influence science teacher intention to use IT for teaching related activities. In this study, we try to understand the influence of the following factors (perceived usefulness, ease of use, and self-efficacy on intention to accept online learning in Nigeria. To increase the critical mass of the study the effect of

self-efficacy on perceived usefulness and ease of use will be observed, hence the formulation of the conceptual framework use to guide the study in fig 2.
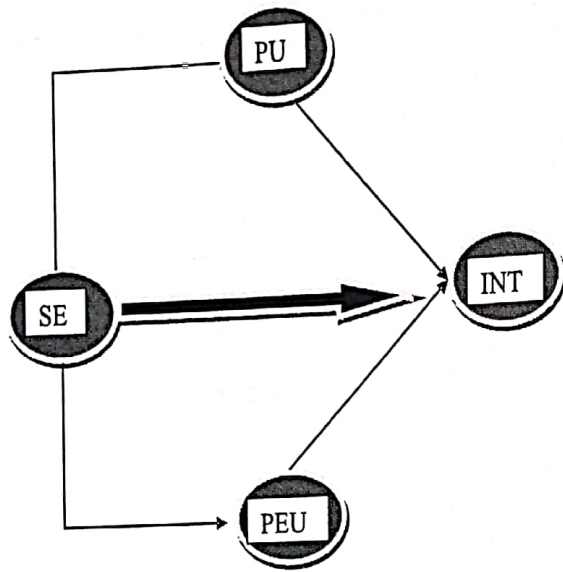
Fig. 2: Conceptual framework of the study
SE: Self-efficacy, PEU: Perceived ease of use,
PU: Perceived usefulness, INT: Intention to use
In line with conceptual framework in fig 2, the following hypotheses were generated to prosecute the study

Hypotheses of the study

H_{A1}: There is a positive relationship between self-efficacy and perceived usefulness of online class among the students

H_{A2}: There is a positive relationship between self-efficacy and perceived ease of use of online class among the students

H_{A3}: There is a positive relationship between self-efficacy and behavioural intention of student to adopt online class

H_{A4}: There is a positive relationship between perceived usefulness and behavioural intention of student to adopt online class

H_{A5}: There is a positive relationship between perceived ease of use and behavioural intention of student to adopt online class

H_{A6}: There is a positive relationship between perceived ease of use and perceived usefulness of student to adopt online class

Methodology

Survey method was employed to prosecute this study. An adapted questionnaire was used to gather the data of the study. Each item was measured on 7-point scale from "strongly agree" to "strongly disagree". The items used were pilot tested prior to final administration of the instrument. The data collected was analyzed with SPSS, this enable the validation and confirmation of the reliability of the research instrument. The statistical test confirmed high reliability of the instrument of the study. The final data of the study was analyzed with structural equation modeling (SEM) with AMOS 16 statistical package, which enable the observation and test of the hypotheses of the study. The use of SEM for the analysis was because of it robustness in analyzing any path analysis that involve exploration of casual relationship among sets of variables. According to Schumacker and Lomax (2004), Bryne, (2010) and Al-Haderi (2013), SEM can be used to test a variety of theoretical model, and it is also good for exploring relationship among different variables.

Participants

A total of two hundred 200 questionnaire was administered on the participants whom comprises of students from National Open University of Nigeria. Out of these questionnaires, one hundred and forty-one 141 representing 71% was appropriately filled, returned, and used for the study. The participants consisted of 46.1% male and 53.9% female. They comprise of student studying various programmes (Education 14.9%, Science 39.0%, Engineering 4.3%, Social Science 19.5%, Law 15.6%, and Arts 6.4%). The majority of sample of the study were undergraduate students 92.0%, with 7.1% postgraduate students. The sample were at various level of study, with first year student 78.0% being the majority of those who voluntarily participated in the study, while the fifth year students 1.4% were the least of the sample of the study

Table 1
Characteristic Distribution of the Sample of the Study

Characteristic	Frequency	%
Gender		
Male	65	46.1%
Female	76	53.9%
Faculty		
Education	21	14.9%
Science	55	39.0%
Engineering	6	4.3%
Social Science	28	19.5%
Law	22	15.6%
Arts	9	6.4%
Level of Study		
Undergraduate	131	92.0%
Postgraduate	10	7.1%
Year of Study		
1Yr	110	78.0%
2ndYrs	15	10.6%
3rdYrs	9	6.4%
4thYrs	5	3.5%
5thYrs	2	1.4%

Data Analysis

Prior to analysis of the data with structural equation modeling (SEM), the normality of the data was inspected through the analysis of Skewness and Kurtosis. The result showed that the entire variable fell below the threshold point of 3.00 for both the values of Skewness and Kurtosis. The internal consistencies of the 17 items used in the final analysis were 0.776 indicating an acceptable value of 0.70 and above as recommended by Hair et al. (1998). Similarly, we computed for the mean and standard deviation of each of the items. Table 2 below show the distribution of the final selected items used for the study.

Table 2

Mean, Standard Deviation, and Normal Distribution of the selected variables of the study

	Mean Statistic	Standard Deviation	Skewness Statistic	Kurtois Statistic
PU1	3.52	1.19	-1.059	.157
PU2	3.75	1.02	-1.145	1.025
PU3	3.57	1.17	-1.166	.417
PU4	3.56	1.04	-.888	.155
PU5	3.67	1.11	-1.202	.821
PEU1	3.56	1.05	-.910	.185
PEU2	3.52	1.18	-.729	-.388
PEU3	3.69	4.42	-1.65	1.019
PEU4	3.34	1.15	-.584	-.527
PEU5	3.47	1.11	-.916	.000
PEU6	3.38	1.27	-.670	-.654
SE1	3.29	1.32	-.551	-.962
SE2	3.37	1.24	-.598	-.669
SE3	3.47	1.21	-.599	-.627
INT1	3.39	1.25	-.620	-.665
INT2	3.62	1.14	-.819	-.158
INT3	3.91	1.06	-1.19	1.055

Result of the Hypothesized model of the study

The study employed a multivariate statistical analysis method with AMOS 16 package to test the hypotheses of the research. The use of SEM in this study arise from it robustness for testing a variety of theoretical model as it was found suitable for a research that involves the exploration of relationship that exist among different variables (Bryne, 2010).The result of the output in (fig 3) demonstrated the adequacy of the model of the study in terms of fit; Chi-square, x^2 (df=29) =435.727; p = 0.001; RMSEA = 0.084; CFI=0.957; TLI=0.934. The parameter estimates of the model were free from offending estimate. Most paths yielded a coefficient that is statistically significant with exception of the paths between perceived usefulness, ease of use on intention to adopt online learning that yielded negative values. The effect size of self-efficacy → perceived usefulness was .69, (ii) self-efficacy → perceived ease of use was 1.54, (iii) self-efficacy → intention to use online was 2.34, while perceived usefulness and perceived ease of use → intention were -.25 and -.56 respectively.
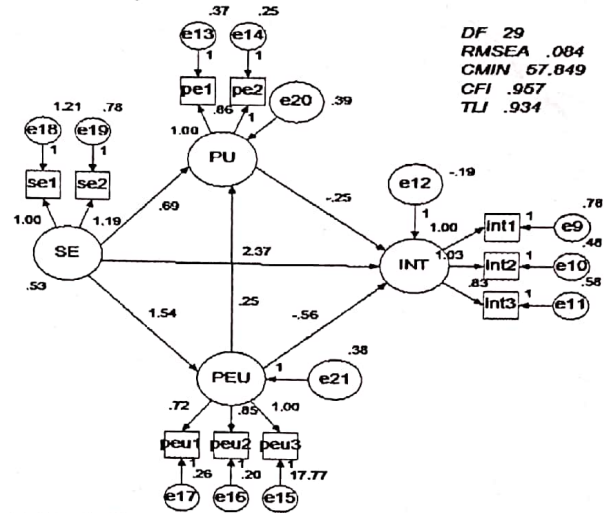

Fig 3: The output of the hypothesized model of adoption of online learning

Results

H$_{A1}$: There is a positive relationship between self-efficacy and perceived usefulness to accept online class among the students

The result of the study supported the hypothesis. There is positive relationship between self-efficacy and perceived usefulness of online class among the sample of the study. The effect size showed a beta (β=0.69, p ⬜005).

H$_{A2}$: There is a positive relationship between self-efficacy and perceived ease of use to accept online class among the students

The result of the study supported the hypothesis. There is positive relationship between self-efficacy and perceived ease of use of online class among the sample of the study. The effect size showed a beta (β=1.54, p ⬜005).

H$_{A3}$: There is a positive relationship between self-efficacy and behavioural intention of student to adopt online class

The result of the study supported the hypothesis. There is positive relationship between self-efficacy and intention to adopt online class among the sample of the study. The effect size showed a beta (β=2.37, p ⬜005).

H$_{A4}$: There is a positive relationship between perceived usefulness and student behavioural intention to adopt online class

The result of the study does not support the hypothesis. The finding showed that there is negative relationship between perceived usefulness and student intention to adopt online class among the sample of the study. The effect size showed a beta (β= -.25, p □005).

H$_{A5}$: There is a positive relationship between perceived ease of use and behavioural intention of student to adopt online class

The result of the study does not support the hypothesis. The finding showed that there is negative relationship between perceived ease of use and student intention to adopt online class among the sample of the study. The effect size showed a beta (β= -.25, p □005).

H$_{A6}$: There is a positive relationship between perceived ease of use and perceived usefulness for student to adopt online class

The result of the study supported the hypothesis. There is positive relationship between perceived ease of use and perceived usefulness of online class among the sample of the study. The effect size showed a beta (β=0.25, p □005).

Discussion and Conclusion

The major objective of this study is to determine the predictive power of the following exogenous variables (self-efficacy, perceived usefulness, ease of use) on endogenous variable (intention to adopt online learning). The findings of the study revealed that self-efficacy stood to be the strongest predictor of student intention to adopt online learning. The finding underscored the finding of Wu et al. (2008) who found a statistical relationship between computer self-efficacy and intention to use information system among science teachers. Similarly, the finding was supported by Teo (2008) study on model development for predicting technology acceptance among pre-service teachers in Singaporean institute of education. In that study, computer self-efficacy was found to significantly influence student teacher intention to use information system.

Another important finding of this study was that self-efficacy significantly influenced both perceived usefulness and ease of use of online learning among student. This result was equally in line with Teo (2008) finding who reported the significant influence of self-efficacy on both ease of use and perceived usefulness of Information technology among student teachers.

However, this study found out that there is negative relationship between both perceived ease of use and perceived usefulness on intention to accept online learning among the student. The finding was not in tandem with previous study, for example, Hu et al. (2009) study who reported a significant influence of PU and PEU on teacher intention to deployed Micro-soft PowerPoint for teaching in Hong-Kong. The study also do not support the finding of Davis (1989) who posited that acceptance to use IT is a function of its ease of use and usefulness for implementing a specific tasks.

In conclusion, this study has provided insight to factors that may influence students' intention to adopt online learning. The study has revealed the predictive power of computer self-efficacy on intention to accept online instruction, it also show the indirect influence of self-efficacy on student intention through perceived usefulness and ease of use. With these finding, it can be concluded that student computer literacy would enable them to perform satisfactorily in online learning. The study has shown that student may not encounter much difficulty in online learning if the mode is fully used for their instruction. The study, therefore, suggest the use of different online resources to promote student learning. It also suggests that the instructors should continue to update their knowledge on the effective use of different online platform for teaching function.

Limitation of the Study

Finally, the limitation of the study needs to be acknowledged in term of generazability of the findings. The study sample only students in a study Centre, therefore, the finding cannot be generalized to all the entire student of Open University in the country. Nonetheless, the findings from this study have implications for online instructors and other future researchers who may wish to replicate the model for other online related studies.

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