Acceptance and Usage of ICT by University Academicians Using UTAUT Model:
A Case Study of University of Port Harcourt, Nigeria

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ABSTRACT

The role of information and communication technology acceptance and usage in universities has been the focus of IS researches. Universities in Nigeria require adequate ICT facilities to augment face to face teaching. Acceptance has its models, and the most current is UTAUT. This study investigates the acceptance and usage of ICT by the University of Port Harcourt (Unipart) academic staff, using Unified Theory of Acceptance and Use of Technology (UTAUT) model and other TAM constructs. One hundred questionnaires were administered and collected. The data collected was runned by SPSS version 17. The UTAUT model theory was verified using regression analysis to understand the behavioral intention of the university academic staff towards acceptance and use of ICT in their workplace. The objectives are to examine the factors associated with ICT acceptance and usage and to measure the most influential factors. Five null hypotheses were stated. The result shows that the most influential UTAUT construct is Effort expectancy (EE), which is related to perceived ease of use (PEOU). The most influential construct outside UTAUT model is Attitudes towards use of technology (ATUT). The paper certifies that anxiety about ICT does have an impact on the academicians. The study confirms the validity of the UTAUT model in the field situation of a developing country's educational system. The knowledge obtained from the research is beneficial to university administrators, university academicians and the Nigerian ICT policy makers.

Keywords: *Acceptance, ICT, Behavioral intention, TAM, Usage, UTAUT Model*

1. INTRODUCTION

The world is in the global era; therefore so much is expected from the universities in terms of researches, innovation, knowledge dissemination, creative teaching and translation of research product to human needs. Globalization is the networking of the world through the global network, to develop global economy. Hence people around the globe are more connected to each other than ever. Undoubtedly, the use of ICT is inevitable and ICT skills are very necessary to participate in the knowledge societies and economies. Certainly, ICT is replacing traditional information and communication. Higher education institutions in Nigerian now are currently facing the challenges of globalization and information age. Nigeria has no precise and clear expressed policy on ICT. The national policy on education has no guideline on school technology plan. The national policy on education is unable to completely accommodate the demand of the Nigerian educational system. The Nigerian national policy on education should be reviewed to cut across learning about ICT and learning through ICT [1]. Nigerian universities require adequate ICT facilities to augment face-to-face teaching. Students are expected to have academic networking with their student counterpart across the globe. Excellent and current learning materials are required from academic staff to promote the quality of education and their product. Nigerian university academic staff should be able to compete globally with their colleagues. However the concern is whether university academic staff are prepared to integrate the technology that is feasible to them into effective lessons for their students. [2, 3].The challenges facing Nigerian Public Universities

pertaining ICT acceyahooptance and usage for teaching and learning is primarily lack of commitment by the government in terms of funding, staff training and stable power supply[4, 5]. The higher education institutions around the globe have increasingly adopted ICT as tools for teaching, curriculum development, staff development, and student learning [6, 7].

[8] argue that, "the integration of ICT into our classrooms is determined by key factors, such as the contexts in which teachers interact, their beliefs, and their attitudes towards teaching and learning" (p80). The stage of enlightenment on which ICT could be use in education is still low. Many lecturers hardly comprehend the benefit of ICT in education. Most of the lecturers acknowledged the fact that internet could be browsed as a point of supply of teaching materials. [9, 10], investigated the level and depth of use of computers by university staff. From the survey, in Nigeria, 58.5% use computers for word processing, 32.2% use it for spreadsheet and data processing and 20.5% use it for programming. 66.9% use it for e- mail/Internet while 9.4% use the computer for other purposes apart from the aforementioned. [11] stated that 90% of Nigerian educational institutions are in the emerging phase of ICT, 7% in the applying phase, and 3% in the infusing and transforming phases. ICT is therefore in its' infancy in Nigeria. Nigeria though, has a great advantage because there are many Nigerian ICT experts in the Diaspora. However, no concerted and win-win effort have been made to harness this potential to accelerate and sustain ICT development in Nigerian educational settings. [12],in a case study of Federal University of Technology Yola (FUTY), Adamawa state, Nigeria, shows that the

application of ICTs is already changing many higher learning institutions in most developing counties due to many socio-economic and technological circumstances. However in the case of FUTY, the ICT infrastructure is more tilted to the management of schools (faculties) than to the departments, lecture halls and the student hostels. This is the partial e-learning that exist in most Nigerian HE institutions. Hence this paper is proposing a move from partial e-learning to holistic e-learning research focus.

2. TECHNOLOGY ACCEPTANCE MODEL

The *Technology Acceptance Model* or TAM [13-16] is one of the most profound frameworks frequently used in studies to predict and explain the use of computer based applications and solutions. The model asserts that the adoption of a technology is determined by the user's intention to use, which in turn is influenced by his or her attitudes towards the technology. It is very likely that the variability in these attitudinal and behavioral constructs depends on the user's perceptions — *perceived usefulness* (PU) and *perceived ease of use* (PEOU). While PU indicates the extent to which the use of the technology is promising to advance one's work, PEOU represents the degree to which the technology seems to be free of effort [16]. This model posits that attitudes and behavioral intention mediate the effects of PU and PEOU, the two constructs of extrinsic motivation. With the ongoing development of ICT and the diversification of the fields it affects, various theoretical studies have been carried out in order to ensure better understanding concerning its diffusion, adoption, acceptance, and usage [16-21].

3. UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY (UTAUT)

UTAUT has condensed the 32 variables found in the existing eight models into four main effect and four moderating factors. The combinations of the constructs and moderating factors have increased the predictive efficiency to 70%, a major improvement over previous TAM model rates. Self efficacy has been shown to influence choices of whether to engage in a task, the effort expended in performing it, and the persistence shown in accomplishing it. The greater people perceived their self efficacy to be, the more active and longer they persist in their efforts [22-26] . Computer anxiety has been defined as a fear of computers (ICT) when using one, or fearing the possibility of using ICT [27, 28].[29], opined that attitudes towards computer are very critical issues. Monitoring the users' attitudes towards computers (ICT) should be a continuous process if ICT is to be used for effective training and learning [30, 31].
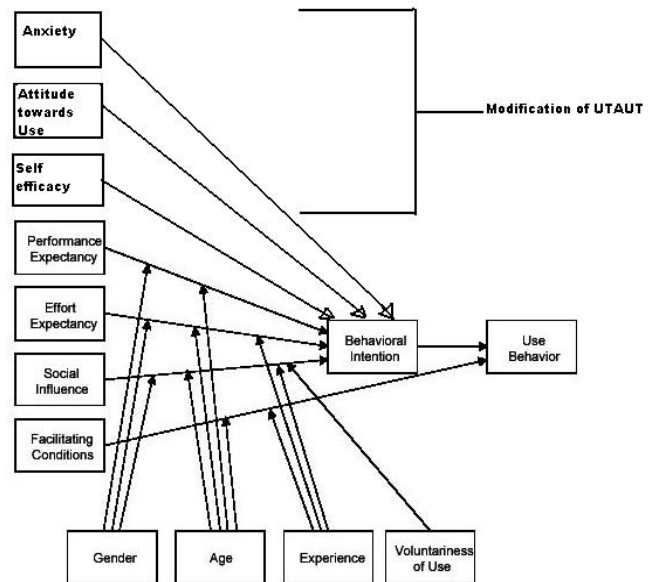
Figure1: UTAUT Model

- PE - is the extent an individual believes the system will help them do their jobs better.(PU)
- EE - relate to how ease an individual believes the system is to use.(PEOU)
- SI - relate to whether or not important others' influence an individuals' intention to use the system.
- FC - whether individual have the personal knowledge and institutional resources available to use the system.
- AX-Anxiety- related to fear of computer (ICT) when using one
- ATUT- Attitude towards using technology. Related to monitoring the users' attitudes towards computers (ICTs)
- SE- Self Efficacy- related to an individuals' confidence in his/her ability to perform the behavior required to produce specific outcome.

Table 1 defines the root constructs of the four UTAUT constructs (Venkatesh et al.,2003).

In the UTAUT model, PE and EE were used to incorporate the constructs of perceived usefulness and ease of use in the original TAM. PEOU can be expected to be more noticeable only in the early stages of using a new technology. UTAUT also addresses how individual differences determine the acceptance and use of technology. Precisely speaking, the connection between PU, PEOU, and intention to use can be moderated by age, gender, and experience For instance, the strength between PU and intention to use varies with age and gender such that it is more significant for male and young workers. Again the effect of PEOU on intention is also moderated by gender and age such that it is more significant for female and older workers, and the effect decrease with experiences. The UTAUT model accounted for 70% of the

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variance in usage intention, better than any of TAM studies alone.

4. RESEARCH OBJECTIVES

(i) To examine the factors associated with ICT acceptance and usage in the university of Port Harcourt using UTAUT model.

(ii) To measure the most influential factors for the acceptance and usage of ICT by Uniport academic staff.

4.1 Methodology

The University of Port Harcourt (Uniport) Nigeria is used as the case study. From each department, selections were based on proportional allocation to obtain unbiased or skewed responses to the required information of the research work. 100 questionnaires were administered and collected. Using regression analysis, the paper want to verify the influence of the four constructs of UTAUT (PE,EE,SI, and FC) and other variables like anxiety, self efficacy ,and attitudes towards use of technology on the behavioral intention of the university academicians, towards the acceptance and use of ICT for teaching and learning (See Figure 1). These findings will be used to accept or reject the stated null hypotheses:

H0$_1$: The academic staff of Uniport rejects acceptance and usage of ICT in their workplace.

H0$_2$: UTAUT do not predict the successful acceptance and use of ICT by the Uniport academic staff.

H0$_3$: Computer self efficacy does have impact on Uniport academic staff to accept and use ICT.

H0$_4$: Uniport academicians' attitudes towards ICT influence their acceptance and use of the technology.

H0$_5$: Anxiety about computer use does have an impact on Uniport academic staff acceptance and use of ICT.

Table 2a: Reliability Analysis
Case Processing Summary

		N	%
Cases	Valid	100	100.0
	Excluded	0	.0
	Total	100	100.0

a. List-wise deletion based on all variables in the procedure.

Table 2b: Reliability Statistics

Cronbach's Alpha	N of Items
.681	49

Generally reliability numbers greater than 0.6 are considered acceptable in technology acceptance literature.[32]. As summarized in the table 2b, a reliability analysis was conducted, for the 49 items using Cronbach's Alpha. The UTAUT constructs appears to have a good degree of reliability of .7

Table 1: Definitions and Root Constructs for the Four Constructs [6, 20]

Construct	Definition	Root Constructs
Performance expectancy	The degree to which an individual believes that using the system will help him or her to attain gains in performance. (P.447)	'Perceived Usefulness 'from TAM and C-TAM-TPB, 'extrinsic motivation' from MM, 'Job-fit' from MPCU, 'relative advantage' from IDT, and 'Outcome expectations' from SCT.
Effort expectancy	The degree of ease associated with the use of the system (P.450)	'Perceived ease of use' from TAM, 'Complexity' from MPCU, and 'ease of use' from IDT
Social influence	The degree to which an individual perceived that important others believe he or she should use the new system(P.451)	'Subjective norm' in TRA, TAM2, TPB and C-TAM-TPB, 'social factors' in MPCU, and 'Image' in IDT.
Facilitating conditions	The degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system.	'Perceived behavioral control' from TPB, C-TAM-TPB, 'facilitating conditions' from MPCU, and 'Compatibility' from IDT.

Table 3: Regression Analysis Summary Outcome (UNIPORT)

Table	Independent Variables	Dependent Variables	R	R^2	Significant
3	PE 1-10	BI(1)	.453	.206	.019
4	PE 1-10	BI(2)	.462	.213	.014
5	PE 1-10	BI(3)	.342	.117	.315
6	PE 1-10	BI(4)	.296	.087	.581
7	PE 1-10	BI(5)	.515	.265	.001
8	EE 1-8	BI(1)	.426	.182	.016
9	EE 1-8	BI(2)	.465	.216	.004
10	EE 1-8	BI(3)	.403	.163	.034
11	EE 1-8	BI(4)	.442	.196	.009
12	**EE 1-8**	**BI(5)**	**.579**	**.356**	**.000**
13	ATUT 1-6	BI(1)	.339	.115	.071
14	ATUT 1-6	BI(2)	.461	.212	.001
15	ATUT 1-6	BI(3)	.326	.106	.099
16	ATUT 1-6	BI(4)	.436	.190	.003
17	**ATUT 1-6**	**BI(5)**	**.572**	**.328**	**.000**
18	SI 1-6	BI(1)	.418	.175	.006
19	SI 1-6	BI(2)	.243	.059	.445
20	SI 1-6	BI(3)	.393	.155	.014
21	SI 1-6	BI(4)	.423	.179	.005
22	SI 1-6	BI(5)	.546	.299	.000
23	FC 1-5	BI(1)	.389	.151	.008
24	FC 1-5	BI(2)	.490	.240	.000
25	FC 1-5	BI(3)	.435	.189	.001
26	FC 1-5	BI(4)	.246	.061	.309
27	FC 1-5	BI(5)	.479	.230	.000
28	AX 1-4	BI(1)	.304	.093	.053
29	AX 1-4	BI(2)	.434	.189	.000

30	AX 1-4	BI(3)	.217	.047	.327
31	AX 1-4	BI(4)	.109	.012	.886
32	AX 1-4	BI(5)	.279	.078	.099
33	SE 1-5	BI(1)	.310	.096	.089
34	SE 1-5	BI(2)	.337	.113	.042
35	SE 1-5	BI(3)	.243	.059	.324
36	SE 1-5	BI(4)	.360	.130	.021
37	SE 1-5	BI(5)	.393	.154	.007

"$p<0.05$"

The regression analysis summary outcome is the influence of the independent variables on the dependent variable Behavioral Intention (BI). Tables 3-7: shows the influence of Performance Expectancy (PE 1-10) on the Behavioral Intention (BI 1-5) of the University academic staff to accept and use ICT for teaching and learning. Tables 8-12: shows the influence of Effort Expectancy (EE 1-8) on the Behavioral Intention (BI1-5) of the University academic staff to accept and use ICT for teaching and learning. Tables 13-17: shows the influence of Attitudes towards using Technology (ATUT 1-6) on the behavioral Intention of the academic staff to accept and use ICT for teaching and learning. Tables 18-22: shows the influence of Social Influence (SI 1-6) on the Behavioral Intention (BI1-5) of the academic staff to accept and use ICT for teaching and learning. Tables 23-27: shows the influence of Facilitating Conditions (FC1-5) on the Behavioral Intention (BI1-5) of the academic staff to accept and use ICT for teaching and learning. Tables 28-32: shows the influence of Anxiety (AX 1-4) on the behavioral Intention of the academic staff to accept and use ICT for teaching and learning. Tables 33-37: shows the influence of Self Efficacy (SE 1-5) on the behavioral Intention of the academic staff to accept and use ICT for teaching and learning.

5. DISCUSSION ON THE HYPOTHESES [UNIPORT]

H0_1: The academic staff of Uniport rejects acceptance and usage of ICT in their workplace.

PE is the extent an individual believes the ICT system will help them do their jobs better (PU). EE is related to how ease an individual believes the system is to use (PEOU). From table 3, (7) shows that (PE 1-10) is significant with p-value, .001. Hence it has positive influence on BI(5). Again Table3 (12) shows that (EE 1-8) is highly significant with p-value .000. This implies that Uniport academic staff believes that ICT is useful and easy to use. This influence their acceptance and use of ICT in their workplace. Therefore we reject the null hypothesis (H0_1) and accept the alternative (H_1) which states that; Uniport academic staffs do not reject ICT acceptance and usage in their workplace.

H0_2: UTAUT do not predict the successful acceptance of ICT by the academic staff in the University of Port Harcourt.

From table 3 which is the regression analysis summary outcome, (7) shows that (PE 1-10) is significant with p-value .001. Hence it has positive influence on BI, Again (12) shows that (EE 1-8), is significant with p-value .000. This also have positive influence on BI. (22) Shows that SI 1-6, is also significant with p-value .000, which is also having positive influence on BI(5). Finally (27) shows that (FC 1-5) is significant with p-value .000; again this is having positive influence on BI(5). Since the four UTAUT constructs have significant relation with BI(5), we therefore reject the null hypothesis (H0_2) and accept the alternative (H_1), which states that, UTAUT do predict successful acceptance of ICT by the academicians in the University of Port Harcourt.

H0_3: Computer self efficacy does have impact on Uniport academic staff to accept and use ICT.

From the regression analysis summary outcome, (37), shows that SE 1-5 have positive influence on BI(5), which states that I would use ICT in my class frequently. This is significant with p-value .007. Therefore self efficacy which is related to an individuals' confidence to perform the behavior required, have positive influence on the Uniport academicians. Hence we accept the null hypothesis (H0_3).

H0_4: Uniport academicians' attitudes towards ICT influence their acceptance and use of the technology.

From table (17), (AT 1-6) is highly significant

to BI(5) which is the behavioral intention to accept and use ICT. Precisely BI(5) talks on the intention to use ICT in my class frequently. The p-value is .000. This shows that attitudes towards the use of ICT by the academic staff have positive influence on their BI(5) behavioral intention to accept and use the technology. Therefore we accept the null hypothesis (H0$_4$).

H0$_5$: Anxiety about computer use does have an impact on Uniport academic staff acceptance and use of ICT.

From the regression summary outcome, Table (29) shows that (AX 1-4) have positive influence on BI(2) which is the behavioral intention to accept and use ICT. Anxiety which is related to fear of computer (ICT) when using one is highly significant to BI(2) with p-value .000. Therefore we accept the null hypothesis (H0$_5$). This shows that some Uniport academicians are still having fear of using ICT for teaching and learning.

6. CONCLUSION

The paper mainly focuses on the intentions of academic staff to accept and use ICT in the Nigerian University of Port Harcourt. Given that the academicians are the key to effective use of information technologies in the university education system, it is important to understand academicians' behavioral intention towards IT and the factors that influence these intentions. The result shows that the behavioral intention to accept and use ICT by the academic staff is a function of various concepts including the understanding that educational ICT is useful, and it is not difficult to use. The study confirms that the most influential UTAUT constructs influencing the behavioral intention of the academic staff to accept and use ICT is Effort expectancy (EE) in UNIPORT. Again it shows that the most influential constructs outside UTAUT model influencing the behavioral intention of the academicians to accept and use ICT is attitudes towards use of technology (ATUT. UTAUT model predict successful acceptance and use of ICT in the university. The study also certifies that some of the academicians are still having the fear of using ICT for their teaching and learning. Therefore anxiety about ICT does have an impact on the academicians; however the university academicians do not reject ICT acceptance and usage in their workplace. The Bar graphs further confirms the findings. (See Appendix A).

The study approves the validity of the UTAUT model in the field situation of a developing country's educational system. The knowledge obtained from the research is beneficial to university administrators, university academicians and the Nigerian ICT policy makers. Recommendations made were that, all employed teachers in Federal, State and private universities in Nigeria, should undertake mandatory training and retraining on ICT programme. This is to provide them with practical and functional knowledge of computer; internet and associated area of ICT to improve

effectiveness and efficiency. The training programmes must recognize the real-world context within which individual teachers are working. The government should develop ICT policies and guidelines that would support lecturers in their academic work.

ACKNOWLEDGMENT

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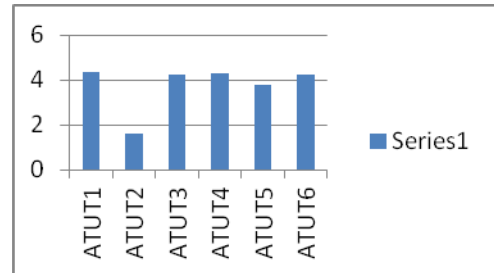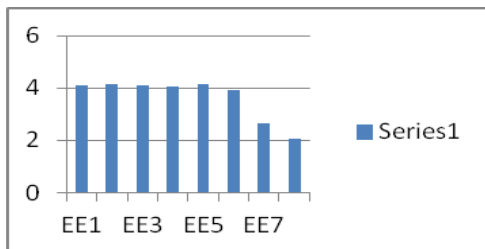
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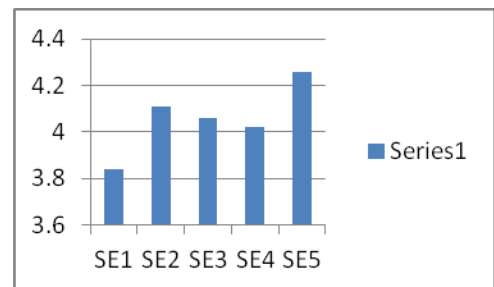
Uniport Bar Graphs

PERFORMANCE EXPECTANCY
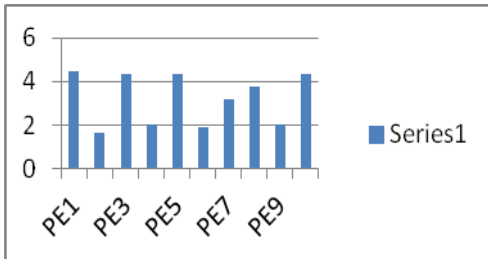
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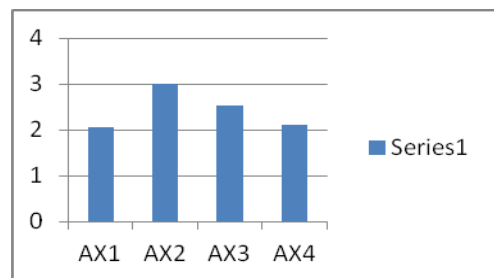

EFFORT EXPECTANCY

SELF EFFICACY

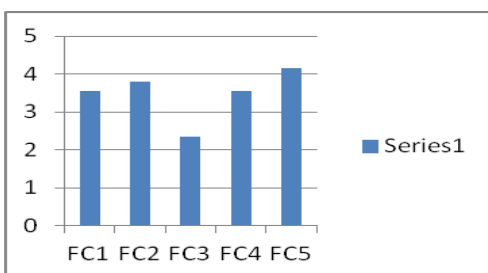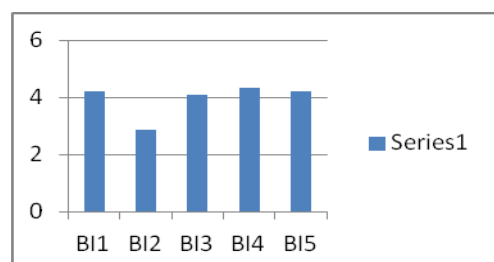### SOCIAL INFLUENCE
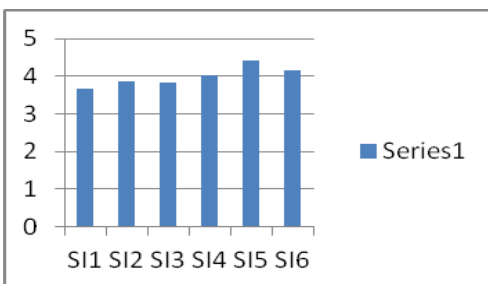
ANXIETY

FACILITATING CONDITION

BEHAVIORAL INTENTION

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