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Integration of ICTto Learning in Nigerian Universities with Active Pedagogy

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Abstract

Integration of (ICT) and Educational development needs has dramatic and direct influence in all aspect of humanity. Online tools are web-based software's that run in a web-supported programme language and rely on common web browser to render its utilization's. Findings revealed that Nigeria Universities Education Students seldom utilize ICT tools for learning, despite the availability of many social networking tools at the disposal of students. Hence, this study investigated the integration of ICT to enhance quality education in Nigerian Universities with active pedagogy hinged on Theoretical framework of Adapted Unified Theory of Acceptance and Use of Technology Model (AUTAUT) as a panacea. Six research questions with one hypothesis were involved in the study. A descriptive research of survey type was used. The population of University of Nigeria Usukka (Ikere-Ekiti Campus) education students selected was 1,320 and 255 returned completed instruments from the 258 distributed. The Multi-stage sampling procedure was used in selecting samples with (182 females, 73 male students). Descriptive statistics were used to answer research questions while the hypothesis was tested using inferential statistics of Analysis of Variance (ANOVA) Bonferonis' post-hoc analysis was used to locate sources of difference where significant differences were established. Findings revealed that: students had active pedagogy, relevant ICT competency and positive attitude towards integration of (AUTAUT) for learning with weighted means of 2.53, 3.17 and 3.13, respectively as 2.50 was set as bench mark; students' gender had no influence on integration of ICT tools but area of specialization and Academic Level influenced active pedagogy of (AUTAUT) with (ANOVA F =0.024 and MANOVA F= 0.000 and where p< 0.05 respectively). The study concluded that students' active pedagogy usage of UTAUT could be a panacea to integrating ICT tools, and it was recommended that (AUTAUT) could be incorporated into learning process in Nigeria Universities.

Keywords: *ICT, Pedagogy, Integration, Attitude, Competency-skill.*

Introduction

Quality education in the 21st Century is measured in terms of effective learning which is universally and broadly understood as learning that is well focused on students and their learning opportunities. Therefore, excellent and competent teachers are often perceived as those who know how to motivate their learners, how to convey concepts and how to help students overcome difficulties in learning experiences. With the advent of Information Communication Technologies ICT, there is a common understanding that the world has become globalized and knowledge is shared and distributed with relative ease. Actually, the evolution of computers and media in education has forced the re-examination of what is

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worth knowing and by extension, how to share and integrate the knowledge with others particularly in the education industry. (Heinich, Molenda, Russell and Smaldino, 2002).

Research findings indicate in (Ajayi,2017) that learning process and curriculum design need to be focused on meeting students' future needs, implying the development in students of generic capabilities such as critical thinking, teamwork and communication skills. Therefore, the relevance of what is learned must be established by using real-life, current or even local instructional examples and by relating theory to practice. Hence a competent teacher need to use active pedagogues as relevant with ICT integration in the learning process which is a model of learning that highlights minimal teacher lecturing or direct transmission of factual knowledge, multiple small group activities that engage learners in self-discovery or problem solving and frequent learners' questions, self-pace and discussions. The World-wide education reformers are at tandem to active learning methodologies in the hope of improving the quality of learning and education industry.

ICT can actually make meaningful shift by ensuring that students do not learn the way lecturers are taught in the traditional style, rather students can learn using the new computer technological devices.

Researchers have varyingly proposed theories, ideas and models on the integration of technology in learning process, for instance, Taylor and Todd (2001) in their own submission extended, integrated and compared the TAM with two variations of the Theory of Planned Behaviour (TPB) to determine which model is the most helpful in understanding the technology usage while (Venkatesh, Moris and Davis 2003) expanded TAM, by building a new model known as Unified Theory of Acceptance and Use of Technology (UTAUT). Technology Acceptance Model (TAM) has proven to be a theoretical model in helping to explain and predict users' behaviours towards information technology (Legris, Ingbam and Cotterette, 2003) in Samuel (2014) submitted that it is superior to Diffusion of Innovation Theory and Idea (DITI) and Theory of Reasoned Action (TRA).

The UTAUT contains four core determinants variables of intention and usage. These are performance expectancy, effort expectancy, social influence and facilitating conditions. UTAUT also defined another four moderator variables that influence the core determinants variables which are gender, age, experience and voluntariness of use thus, in this work, the researcher is of the opinion that adhering to the generic TPB, DITI, TAM & UTAUT might occasioned to inconsistent outcomes as shown in figure 1.

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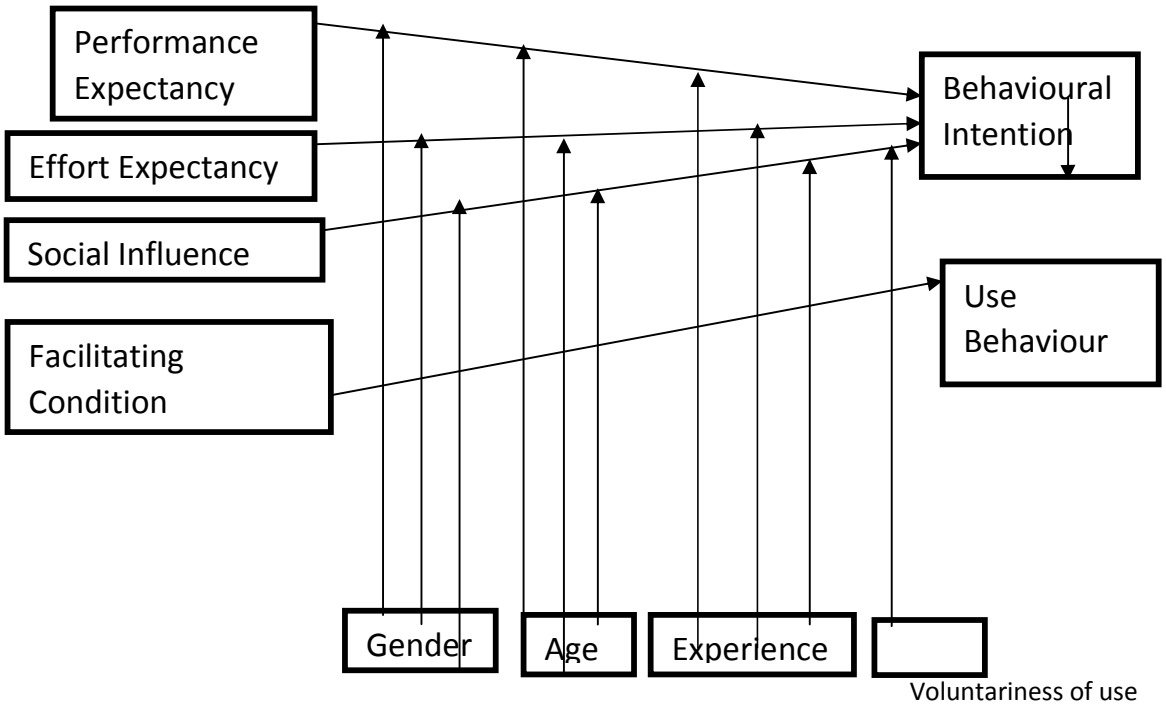

Source: Venkateshet .al (2003) in Ajayi (2017)

Figure 1: Unified Theory of Acceptance and Use of Technology (UTAUT)

and Use of Technology (AUTAUT) Model in ICT integration of online tools can make the learning more exciting, enterprising and enjoyable while at the same time securing successfully learning outcomes in shorter time frames (Ajayi, 2017).

The innovation of active pedagogy would serve as panacea to the integration of online tools for possible learning in Nigeria among the University Education students and fill the gap of integrating ICT in learning process as technology is conscious innovation integration's of processes and products as shown in figure 2.

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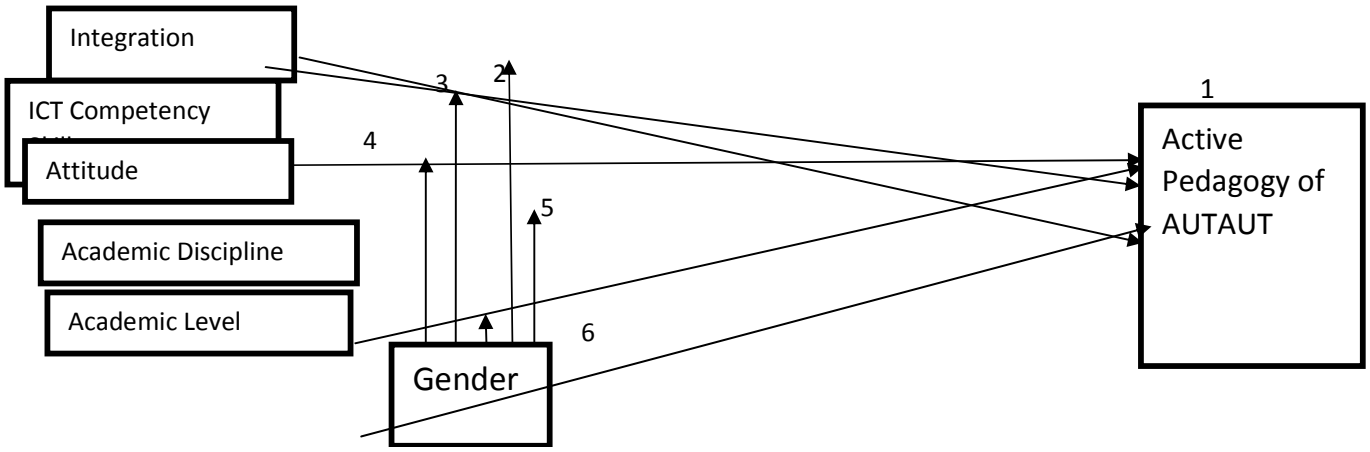

Figure 2 Adapted Unified Theory of Acceptance and Use of Technology Model (AUTAUT).

Related Literature Reviewed

Relevant literature were reviewed on the following; Theoretical framework on students' access and integration of online tools for learning purpose, An overview of teacher education in Nigeria, Trend of ICT in education in the 21st century Nigeria, Integration and Benefits of online tools access and integration in learning with the concept, types and relevance of online tools in Nigeria University Education students. Literature establish that online tools are relevant to learning and learning environment due to the ubiquity of web browsers, and the convenience of using the web browser as a client, sometimes called a thin client (Jane, 2013, Ajayi, 2017). The availability, strength to update and maintain web integration without distributing and installing software on variety of client computer-based hardware such as mobile technologies is a key reason for their relevance to education particularly for students in among Nigerian University Education students (Gambari, 2012 AND Joshua, 2014).

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Computer based strategies in integration of online tools have been identified as one of the latest media which technology has brought for the use of mankind (Ajayi, 2017). Therefore, computer access and skill are required in almost all aspects of learning as required in the 21st century.

Objectives of the Study

(I) What is the level of accessibility of ICT online tools for UNN students learning'
(II) To find if UNN students' have access to online ICT tools integration to learning.
(III) Find the ICT competency skillfulness of UNN education students' to online tools to enhance learning.
(IV) Find out attitude of UNN students towards the integration of ICT online tools for learning.
(V) Seek if UNN students' area of specialization and the integration of ICT online tools affects learning.
(VI) Find out the influence of UNN students' academic level on the integration of ICT online tools

Research Questions

The following research questions were answered in the study:

1. How accessible are the ICT online tools for learning by UNN students?
2. What is the level of UNN students' access to ICT online tools integration for learning?
3. What is the ICT competency skills' level of UNN education students to online tools to enhance learning?
4. What is the attitude of UNN students towards the integration of ICT online tools for learning?
5. What is the influence of UNN students' area of specialization and the integration of ICT online tools?
6. What is the influence of UNN students' academic level on the integration of ICT online tools for learning?

Research Hypothesis

The only null hypothesis tested was that:

Ho_1: There is no significant difference between UNN students' academic level and the integration of ICT online tools for learning.

Methodology

A descriptive research of survey type was used. The population of University of Nigeria Usukka (Ikere-Ekiti Campus) education students selected was 1,320 and on the sample size, the sampled size for the study falls within the range of 5,000, using 90% Cohen,

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Manion& Morrison (2007) table of sample size with confidence levels and confidence intervals of 10% for randomization the sample selected was 258 with only 255 respondents returned completed instruments. The Multi-stage sampling procedure was used in selecting samples with (182 females, 73 male students). Descriptive statistics were used to answer research questions while the hypothesis was tested using inferential statistics of Analysis of Variance (ANOVA) Bonferonis' post-hoc analysis was used to locate sources of difference where significant differences were established.

Instrumentation

Two types of instruments were used by the researcher: (i) a researcher designed questionnaire for students and (ii) a self-rating scales on 25 ICT online tools regularly used based on Nigeria local content for learning purposes for all respondents from the eight categories of online tools.

The title of the students' Questionnaire is Students Integration of Online Tools for Learning, structured into sections A, B, C and D. Section A of the students' questionnaire sought for basic demographic information about gender, academic level while section B asked questions to gather data on Students' access to online tools, computer competency skills, attitude and academic discipline as they affect access to online tools for learning. The ICT competency skills subsection contained 10 items and a modified four points Likert response mode of Very Competent (VC) Competent (C), Under Guidance (UG) and Not Competent (NC) were used while strongly Agree (SA) Agree (A), Disagree (D) Strongly Disagree (SD) were used for subsections C and D which focused on integration and attitude.

The second instrument for this study was a self-rating scale of 25 ICT online tools regularly used for learning purposes selected from the 100 online tools arranged by world standard ranking in usage for learning for all respondents on online tools accessibility and integration for learning purposes.

Validation of Research Instruments

The research instruments (questionnaires) and self-rating scale were subjected to test the extent to which it measures what it is designed to measure. The validation test area included face and content validity assessment strategies such as giving the draft to five experts from Library and Information Science Department and Educational Technology Department respectively for scrutiny, regularity of online tools uses and value reviews. The various suggestions received from the experts were prioritized in presenting the final copy for the respondents.

Result of Findings

Research Question One

How accessible are the ICT online tools for learning by UNN Education students?

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Table 1: Access to Online Tools by Students

S/N	Items	Students	
		Mean	SD
1.	I have access to online tools at home	3.21	.768
2.	I have access to online tools in my university	2.45	1.045
3.	The ICT infrastructure are provided to support online tools usage for learning in my university	2.21	1.234
4.	I have access to a computer with adequate software at the campus (e.g. Microsoft Word, Power Point, Adobe Acrobat)	2.38	1.000
5.	Electricity power supply is available adequately to support online tools integration in my university	2.05	1.567
6.	I check my e-mail at least once a week.	3.03	0.876
7.	My university has adequate support services for the online tools integration	2.40	1.092
8.	Electricity power supply is available adequately to support online tools integration in my campus	2.56	.996
9.	I have access to a computer with adequate software at home (e.g Microsoft Word, Power Point, Adobe Acrobat)	2.82	1.010
10.	I use online tools to do assignments given by my lecturers	2.24	1.211
	Grand Mean on Access	**2.53**	**0.434**

Table 1 presents the results on the access to Online tools by students. The results revealed mean score on students' access to online tools, using a bench mark of 2.50 for each item. It is therefore deduced that students have no access to online tools at home with mean score of 3.21. However, Students have limited access to online tools on the campus with mean score of 2.45. Most of the students check their e-mail at least once a week with mean score of 3.03, Electricity power supply is available adequately to support online tools integration on the campus with mean score of 2.56 and students had access to a computer with adequate software at home (e. g Microsoft Word, Power Point, Adobe Acrobat) with mean score of 2.82.

However, students disagree that the ICT infrastructure are provided to support online tools usage for learning on their campus with mean score of 2.21. Majority of the students had no access to a computer with adequate software/program at the campus (e. g Microsoft Word, Power Point, Adobe Acrobat) with mean score of 2.38 and Electricity power supply is unavailable adequately to support online tools integration in students' campus with mean score of 2.05. Most students have low adequate support services for the online tools integration with mean score of 2.40 and students occasionally use online tools to do assignments given by lecturers with mean score of 2.24. With a grand mean score of 2.53 and grand variance of standard deviation of 0.434 which is a bit higher than the 2.50 benchmark, it can be concluded that students have moderate access to online tools.

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Research Question 2

What is the level of UNN students' access to ICT online tools integration for learning?

Table 2: Students' Access Level to Online Tools Integration for Learning

S/N	ONLINE TOOLS	ACCESSED FOR LEARNING			
		Yes		*No*	
A	**Status broadcast Tools**	***---F***	***%***	***-F---***	***%***
1	Twitter	*76*	*29.8*	*179*	*70.2*
2	Facebook	135	52.9	120	47.0
3	FriendFeed	84	32.9	171	67.0
B	**Blogging Tools**	------		-------	
1	WordPress. Com	40	15.7	215	84.3
2	Blogger	37	14.5	218	85.5
3	Typepad	78	30.6	177	69.4
C	**Real-time chat and Instant messaging Tools**	-----		------	
1	Adobe Connect	49	19.2	206	80.8
2	WhatsApp	130	51.0	125	49.0
3	Skype	88	34.5	167	65.5
D	**Document and File Sharing Tools**	-----		-------	
1	Google Drive/Docs	57	22.4	198	77.7
2	SlideShare	55	21.6	200	78.4
3	Microsoft® Office 365	62	24.3	193	75.7
E	**Social Networking Tools**	-----		------	
1	PodCast	57	22.4	198	77.7
2	MySpace	43	16.9	212	83.1
3	LinkedIn	71	27.9	184	72.2
4	Instagram	76	29.8	179	70.2
F	**Wikis Tools**	------		--------	
1	WikiSpace	44	17.3	211	82.8
2	Google Sites	118	46.3	137	53.3

Research question 2 proffer answers to the level of access of Students to Online Tools integration for learning. It indicated that 135 (52.9%) students apply Facebook and 130 (51%) of the students apply WhatsApp for learning. But only 76 (29.8%) students apply Twitter for their learning. Also, 84 (32.9%) students apply FriendFeed, 40 (15.7%) students apply WordPress. Com, Blogger 37 (14.5%), Typepad 78 (30.6%), Adobe Connect 49 (19.2%), Skype 88 (34.5%), Google Drive/Docs 57 (22.4%), SlideShare 55 (21.6%), Microsoft® Office 365 62 (24.3%), PodCast 57 (22.4%), MySpace 43 (16.9%), LinkedIn 71 (27.9%), Instagram 76 (29.8%), WikiSpace 44 (17.3%) and 118 (46.3%) students apply Google Sites for learning.

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Research Question 3

What is the ICT competency skills' level of UNN education students on the access to online tools to enhance learning?

Table 3: ICT Competency Skills' Level of Students

S/N	Items	Mean	Std. Deviation
1.	I can set up a computer and its peripherals	2.84	.759
2.	I am capable of using computer keyboard	3.38	.670
3.	I can use mouse to navigate the net	3.32	.614
4.	I can create file by myself	3.16	.736
5.	I can edit file by myself	3.21	.760
6.	I can create folders	3.11	.768
7.	I can save and move files to the folder	3.18	.716
8.	I can locate and use files on computer	3.19	.655
9.	I perform basic internet surfing skills e.g. chats, e-mail	3.51	.607
10.	I can set up projector screen and link computer to run power point	2.84	.718
	Grand Mean	**3.17**	**.535**

The ICT competency skills of students were analyzed in Table 3. The results revealed that students can set up a computer and its peripherals; students are capable of using computer keyboard; and students can use mouse to navigate the net with mean scores of 2.84, 3.38 and 3.32 respectively. Students can create file by themselves with mean score of 3.16. With a mean score of 3.21 it can be deduced that students can edit file by selves. Furthermore, students can create folders and they can save and move files to the folder with mean scores of 3.11and 3.18 respectively. Also, students can save and move files to the folder; students can locate and use files on computer; and students perform basic internet surfing skills e.g. chats, e-mail with mean scores of 3.18, 3.19 and 3.51 in that order. Finally, with a mean score of 2.84, students can set up projector screen and link computer to run power point. However, with a grand mean score of 3.17 and grand variance of standard deviation of 0.535, Students possess good computer competency skills on the application of online tools to enhance learning with respect to the bench mark of 2.50 selected earlier.

Research Question 4

What is the attitude of UNN students towards the access and integration of ICT online tools for learning?

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Table 4: Attitude of UNN Education Students towards access and integration of ICT Online Tools.

S/N	Items	Mean	SD
3.	I am willing to use electronic learning Software in daily learning tasks	3.33	.603
4.	Online tools could make learning more interesting	3.50	.560
5.	I prefer face-to-face lessons with my lecturers	2.89	.759
6.	I believe that self-development in technology may strengthen my learning task	3.49	.588
7.	Online tools integration could increase my daily productivity in learning	3.33	.564
8.	Integration of online tools eliminate eye contact and reduce learners' seriousness	2.98	.856
9.	I am skillfully ready to use online tools for learning	3.11	.601
10.	I use variety of online tools for specific purpose in learning	2.70	.680
11.	My integration of online tools has enhanced my learning communication competency	2.90	.559
12.	The integration of online tools has increased my reasoning ability	3.00	.599
	Grand Mean	**3.13**	**.367**

Table 4 revealed that majority of the respondents believe that online tools could make learning more interesting with mean score of 3.50, and they also believe that self-development in technology may strengthen active pedagogy with mean score of 3.49. also with mean score of 3.33 lecturers are willing to use electronic learning software/programs. Students are skillfully ready to use online tools for learning and the integration of online tools had increased students' reasoning ability with mean scores of 3.11 and 3.00 respectively. A mean score of 2.98 established that the integration of online tools eliminates eye contact and could reduce learners' seriousness. Also, the integration of online tools has enhanced students' active pedagogy in communication competency through mean score of 2.90. However, few students still prefer face-to-face lessons with lecturers with a mean score of 2.89. Students use variety of online tools for specific purpose in learning with mean score of 2.70. Convincingly, with a grand mean score of 3.13 and grand variance of standard deviation of 0.367, students have positive attitude towards the integration of online tools for learning.

Research Question 5

What is the influence of UNN students' area of specialization on their access and integration of ICT online tools?

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Table 5: Students' Area of Specialization and their Access to ICT Online Tools

Area of Specialization	Mean	N	Std. Deviation	Variance
Arts and Social Sciences	0.26	49	.2464020	.061
Education	0.21	58	.2249456	.051
Languages	0.35	40	.2280005	.052
Library	0.21	3	.3319588	.110
Sciences	0.31	84	.2184857	.048
Vocational and Technical Education	0.19	21	.2051814	.042
Total	**0.26**	**255**	**.2408217**	**.061**

The influence of student areas of specialization on the integration of ICT online tools were investigated as presented in Table 5. It showed that Arts and Social Sciences had a mean score of 0.26, Education with 0.21, Languages 0.35, Library 0.21, Sciences 0.31 and Vocational and Technical Education was 0.19. The grand variance on all the items was 0.61. This showed that students' area of specialization influenced their application of online tools.

Research Question 6

What is the influence of UNN students' academic level on the access and integration of ICT online tools for learning?

Table 6: Students' Academic Level and their Access to ICT Online Tools.

Students'Academic Level	Mean	N	Std. Dev.	Variance	Min.	Max.
Less than 1 year	.266885	34	.2377269	.057	.0000	.8519
200 Level	.242886	83	.2334841	.055	.0000	.8519
300 Level	.281239	100	.2293197	.053	.0000	.8519
400 Level	.312169	35	.2294197	.053	.0000	.7037
Above 4 years	.238367	3	.1771506	.031	.0370	.3704
Total	0.268309	255	0.22142	0.0498	.0000	.8519

Table 6 presented the analysis on students' academic level on the integration of online tools for learning. The grand mean on their integration of online tools was 0.27. The result revealed that 400 level students utilize online tools most with a mean score of 0.31. Next to it are 300 level students who utilize online tools with a mean score of 0.28. Students with less than 1 year of academic level utilize online tools with a mean score of 0.27. Also, student at 200 level utilize online tools with a mean score of 0.24, while, students with 4 years and above utilize online tools the least with a mean score of 0.24. It can be deduced that 400 level students mostly integrate online tools with a variance of 0.053 while students with 4 years and above integrate online tools least with a variance of 0.031. It can be established that students' academic level has influence on the integration of online tools for learning.

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Hypothesis

Ho_1: There is no significant difference between UNN students' academic level and the integration of ICT online tools for learning.

Table 7: Descriptive Statistics on students' academic level and ICT Integration	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Less than 1 year	2.538	.066	2.409	2.667
200 Level	2.412	.042	2.329	2.495
300 Level	2.604	.038	2.529	2.679
400 Level	2.611	.065	2.484	2.739
Above 4 years	2.600	.221	2.165	3.035

Table 7 presents the descriptive analysis on students' academic level and their ICT integration to online tools for learning. Students at 400 level had the highest mean of 2.611. Next to it are 300 level students with mean score of 2.604 and students that have spent 4 years and above had mean score of 2.600. Others are students with less than 1 year on campus with mean score of 2.538 and students at 200 level with mean score of 2.412. However, the hypothesis on students' academic level and ICT integration to online tools was tested using ANOVA and presented in table 13.

Table 8: ANOVA on students' academic level and integration of online tools

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	1.948[a]	4	.487	3.333	.011
Intercept	394.236	1	394.236	2698.617	.000
Academic Level	1.948	4	.487	3.333	.011
Error	36.522	250	.146		
Total	1675.510	255			
Corrected Total	38.470	254			

a. R Squared = .051 (Adjusted R Squared = .035)

Analysis of Variance on UNN students' academic level and integration of online tools are presented in Table 8. The results revealed that $F(4, 255) = 0.011$, $p < 0.05$ on the difference between students' academic level and the integration of online tools for learning. The hypothesis was rejected. Therefore, it implies that there was significant difference among students' academic level and the integration of online tools for learning. Bonferroni post hoc analysis further showed the direction of the differences between students' academic level and the integration of online tools in Table 9.

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Table 9: Bonferroni post hoc analysis on UNN students' academic level and integration to ICT online tools

(I) Academic Level	(J) Academic Level	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Less than 1 year	200 level	.126187	.0778255	1.000	-.094228	.346602
	300 level	-.065765	.0758788	1.000	-.280666	.149137
	400 level	-.073193	.0920362	.019	-.333855	.187469
	Above 4 years	-.061765	.2302017	1.000	-.713734	.590205
200 level	Less than 1 year	-.126187	.0778255	1.000	-.346602	.094228
	300 level	-.191952*	.0567537	.008	-.352688	-.031216
	400 level	-.199380	.0770328	.102	-.417550	.018789
	Above 4 years	-.187952	.2246246	1.000	-.824126	.448222
300 level	Less than 1 year	.065765	.0758788	1.000	-.149137	.280666
	200 level	.191952*	.0567537	.008	.031216	.352688
	400 level	-.007429	.0750655	1.000	-.220027	.205169
	Above 4 years	.004000	.2239575	1.000	-.630285	.638285
400 level	Less than 1 year	.073193	.0920362	.019	-.187469	.333855
	200 level	.199380	.0770328	.102	-.018789	.417550
	300 level	.007429	.0750655	1.000	-.205169	.220027
	Above 4 years	.011429	.2299349	1.000	-.639785	.662642
Above 4 years	Less than 1 year	.061765	.2302017	1.000	-.590205	.713734
	200 level	.187952	.2246246	1.000	-.448222	.824126
	300 level	-.004000	.2239575	1.000	-.638285	.630285
	400 level	-.011429	.2299349	1.000	-.662642	.639785

Based on observed means.
The error term is Mean Square(Error) = .146.
* The mean difference is significant at the .05 level.

The post hoc analysis on UNN students' academic level and integration to online tools was presented in Table 9. It revealed that there was significant difference between students with less than 1 year in the University and 400 level students in their integration to online tools with p = 0.019. Also, significant differences existed among students with less than 1 year and 300 level students in their integration of online tools with p = 0.008.

Conclusions

The study found that UNN students have access to ICT online tools for learning with grand mean of 2.53 as 2.50 was set as benchmark with standard deviation of 0.434; students possess positive ICT competency skills on the integration of online tools to enhance learning with grand mean at 3.17 with standard deviation of 0.535; students have positive attitude towards the integration of ICT online tools for learning with grand mean of 3.13 with standard deviation of 0.367; students' area of specialization influenced their integration of online tools with grand variance of 0.61; students' academic level has influence on the integration of ICT online tools for learning with grand mean of 0.270; students' gender had

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no influence on their integration of ICT online tools for learning as the mean score of female is 0.28 and mean score of male is 0.26 with standard deviation of 0.236; furthermore there is no significant difference between female and male students' ICT competency skill as the p value = 0.54 which is greater than alpha value of 0.05 while there is significant difference between students' academic level and the integration of ICT online tools for learning as the ANOVA p value = 0.11 is greater than alpha value of 0.05.

Recommendations

Recommendations were proffered based on the findings: University ownership should make adequate provisions of ICT facilities with adequate online tools affordable for students in Nigerian. This will improve education students learning; constant seminars and workshop on the relevance of ICT online tools in the use of active pedagogical strategies in the integration of AUTAUT Model in integrating ICT for active pedagogy and for learning to be ensured with up to date knowledge acquisitions and the lacuna of gender differences in the use of online tools for learning should no longer be encouraged.

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