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## EFFECTS OF BLENDED LEARNING APPROACH ON STUDENTS' ACADEMIC ACHIEVEMENTS IN INFORMATION TECHNOLOGY

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### Introduction

Due to rapid advancement in technology, information and communication technology has impacted all field of human endeavour. In Nigeria, Traditional learning method is predominantly used in teaching. This method is a teacher-centred approach in which the teacher dominates the class and students accept what the teacher says without contributing to the lecture; however, the biggest problem is that it fails to allow close tutorial supervision, reducing opportunities for interactive learning (Ya-Wen, Chih-Lung, & Po-Jui, 2017). (Olasedidun, 2014) opined that to address the inadequacies of traditional teaching, an innovative approach to teaching called Blended Learning can be used. The

### Abstract

*The study examines the effect of blended learning approach on students' academic achievements in Information Technology in Federal College of Education (Technical) Gombe. In order to achieve this, two specific objectives, two research questions were raised and two null hypothesis were tested for the study. Quasi-experimental research design using pre-test and post-test was employed. This involves two groups: one experimental (blended learning) and a Control group (Traditional learning). The population of the study consists of 188 Nigeria Certificate in Education II students of Business Education, Federal College of Education (Technical) Gombe, Nigeria. The entire population was used for the study. The instrument adopted for data collection was Information Technology Achievement Pre-Test (ITAPT) and Information*

**T**echnology Achievement post-Test (ITAPT). The instruments consist of 20 objective questions on Information Technology. The instrument was validated by three experts. A reliability coefficient of 0.82 was obtained using Richard Kuderson (K-20 formula). The data collected for the research questions were analysed using mean and standard deviation. The Null hypotheses of the study were tested using Analysis of Covariance at 0.05 significance level. The findings of the study revealed that Blended learning is effective in improving Colleges of education students' academic achievement in information technology and the study equally showed that, there was significant gender effect on the academic achievement of Colleges of Education students taught information technology. Based on the findings, it was recommended that college of education lecturers should be encouraged to adopt blended learning to teach their students. Also, government and appropriate College Education authorities should support and encourage the usage of blended learning in Nigerian Colleges of Education.

**Keywords:** *Blended Learning Approach, Students' Academic Achievements, Information Technology, Colleges of Education, Business Education.*

**P**edagogy of using a Blended Learning Approach is based on the assumption that the learner is engaged in the face-to-face interactions as well as benefiting online platform (Vernadakis, Derri, & Umourtzoglou, 2011). Blended learning brings two different learning techniques together. It requires the physical presence of both teacher and student, with some elements of student control over time. Generally, blended learning aims to employ multi- educational approach to achieve the goal of education. The uniqueness of blended learning is represented by its ability to use refined techniques from both e-learning and traditional method of teaching. It is imperative to know that blended learning enables student to learn at pace and useful for eventful mastery learning.

The National Education policy (Federal Republic of Nigeria, 2004) stipulate that the nation's educational activity should be student centered in order to acquire maximum skills for self development and self fulfillment. The acquisition of these skills is emphasized in practical courses which Information Technology is inclusive. Information Technology is one of the core course offered by Office Technology and Management Education (OTME)

student in Nigeria College of Education. Through amalgamation of traditional and computer mediated learning, learning activities become more appealing and enhancing learners activity. Despite the relevance of information Technology to Nigeria economy, the academic achievement of student is not impressive, with the persistent use of traditional teaching.

Academic achievement indicates the degree to which a student fail or succeed in an academic task at the end of the instructional engagement. Academic achievements are commonly measured through test scores, grade points, as an indicator of class of degree obtained at the end of the programme (Kayii & Dambo, 2018). This variation in academic achievement obtained by students are driven by attributes like literacy skills, method of teaching, learning environment, gender and other students factors that militate against effective learning.

Gender refers to those characteristics of males or females which are biologically determined (Gambari, Shittu, Ogunlade, & Osunlade, 2017). This definition implies that gender determine the role in which one plays in relation to general, cultural, social, political and economic system of the society. In 21<sup>st</sup> century, the question about the effectiveness of traditional learning and online learning has generated a lot of concern and interest in education. It is on this premise that the study seeks to investigate the effect of blended learning on Students' Academic Achievement in Information Technology

### **Problem Statement**

Due to increase in student enrolment and class classize. The traditional teaching method, which is teacher centered is faced with challenges that need to be overcome such as

lack of close supervision, overcrowded classroom, limitations in visual aids and materials that the instructor can use in the class session, traditional face - to - face methods do not offer activities to direct students to think, research and opportunities to use knowledge, to solve problems, focused on intellectual and disregard experimental learnings among others. In recent times, It is observed that students' academic achievement decline despite rapid explosion of information and communication technology in education. The problem of low academic achievement could be student centered, teacher centered, school environment and family centered. In most cases, the

teachers faced the problem of overcrowded classroom to the extent that the teacher spent more time on classroom management rather than teaching. Hence, traditional method of teaching may not be suitable for individual requirement (Gambari, Shittu, Ogunlade, & Osunlade, 2017). Hence there is need for innovative techniques to cater for individual difference in learning styles. These could be mobile learning, online learning, blended learning and so on. With blended learning, the problem could be averted since the techniques combines both advantage of traditional and online learning. the learning styles of different people require different learning methodologies. In a classroom situation where student differs in terms of intellectual using mixed or hybrid learning could improve student academic achievement. The foregoing problems prompt the researcher to carry out the study in order to identify loopholes with the aim of suggesting possible solutions using empirical evidence.

### **Aim and Objectives of the study**

The study seeks to investigate the effects of blended learning on students' academic achievement in information Technology with particular reference to Federal college of education(Technical) Gombe and the specific objectives are to:

- i. Examine the effect of blended learning on students' academic achievement in Information Technology.
- ii. Establish the difference between the academic achievement of male and female students' taught Information Technology using blended learning

### **Research Questions**

The questions that the study addressed were:

- i. What is the effect of blended learning on academic achievement of students' taught information technology?
- ii. What is the difference between the academic achievement of male and female students' taught information technology using blended learning?

### **Research Hypotheses**

The following hypotheses were formulated and tested at 0.05 level of significance:

H<sub>01</sub>: Blended learning has no significant effect on the academic achievement of students' taught information technology and those taught using traditional method.

H<sub>02</sub>: Gender has no significant effect on the academic achievement of students' taught information technology using blended learning.

### Conceptual and Theoretical Review

Blended learning refers to mixed learning, hybrid learning, mixed-model learning and integrative learning. The term implies practice of combining traditional and online learning. According to (Torrissi-Steele & Drew, 2013) blended learning refers to enriched student centered learning experiences made by possible by the harmonious integration of various strategies, achieved by combining face to face interaction with Information and Communication Technology (ICT). Other researchers have described Blended learning as a mixed of multi-modality of teaching and learning approaches that combine online activities and face-to-face (f2f) instruction in order to support the learning interaction between instructor-student-content (Dzakiria, Wahab, & Abdul RahmanH, 2012); (Yapici & Akbayin, 2012). In addition (Feras, 2015) refer Blended Learning as a learning environment that combines electronic and traditional learning which enables student-teacher interaction, or student- content interaction, or student- student interaction through direct dialogue or discussion in order to overcome the obstacles of electronic and traditional learning environments and develops students' knowledge and skills effectively. In the current study blended learning took the form of a combination of face-to-face classroom teaching with lecture and class formats and the use of an asynchronous online classroom.

Traditional Learning (Lecture method), on the other hand, involves a teacher, a brick and mortar facility (usually a school) and a group of students that gather at this facility during specific periods of the day to learn from the teachers (Easy, 2019). Lecture method is one of the teaching methods that make up face-to-face (traditional) used in the classroom usually directed an audience which is very large.

Online Learning (E-Learning) refers to an innovative approach for delivering electronically mediated, well designed, learner-centered and interactive learning environment to any one, anytime by utilizing the internet and digital



technologies in relation to instructional design principles (Ayanda, Eludiora, Amassoma, & Ashiru, 2011). In addition, (Talenlms, 2018) refers e-learning as a computer based educational tool which allows one to learn anywhere and at any time.

### **Empirical Reviews**

Kayii and Dambo (2018) investigate the effect of blended learning approach on students' achievement in business education in rivers state university. The study employed quasi-experimental with non-randomized pretest-posttest control design using 365 first year student of business education in river state university. The data obtained from the sample were analyzed using mean for research question and F-test to test the hypothesis and the findings reveals that experimental group taught blended learning achieved higher than the control group taught with lecture method. In addition, (Lin, Tsen, & Chiang, 2017) examine the influence of blended learning pedagogy on junior high school student learning achievement and attitudes toward mathematics using a sample of 234 students purposively drawn from the population in National Kaohsiung University, Taiwan. To investigate the outcomes of the combination of Moodle online learning platform and traditional instruction, a quasi-experimental was conducted using pre-test and post-test control group. The data obtained were analyzed using ANCOVA and MANCOVA and the findings reveals that blended learning benefitted students in the experimental group by having a positive effect not only on the learning outcomes, but also on their attitudes toward studying mathematics in a blended environment. (Chang, Shu, Liang, Tseng, & Hsu, 2014) investigate the effects of blended e-learning on electrical machine performance of 11<sup>th</sup> grade student in department of electrical engineering in a vocational school taiwan. The study employ employ quasi experimental. The population were randomly assign into thirty three (33) experimental group and thirty two control group. The data obtained were analysed using independent t- test and the findings reveals that blended e-learning did not significantly affect students' achievement test scores, but significantly affected their self-assessment scores. Moreso, (Gambari, Shittu, Ogunlade, & Osunlade, 2017) investigate the effectiveness of blended learning and E-learning modes of instruction on the performance of undergraduate in kwara state university. The study employed quasi experimental using pre test and posttest control

group design. The population for the study were randomly assign into 30 undergraduate student in experimental group 1, 30 undergraduate in experimental group 2 and 25 undergraduate in control group from three universities in kwara state and the data obtained were analyzed using ANCOVA to test hypothesis, the findings reveals that there was significant difference in the performance of the three groups in favour of Experimental group 1 and no significant difference exist in the performance of male and female undergraduates exposed to experimental group.

## **Methodology**

### **Research Design**

The study adopt quasi-experimental using pre-test, post test control design. Quasi- experimental designs identify a comparison group that is similar as possible to the treatment group in terms of baseline (pre-intervention) characteristics. The study involves experimental group (blended learning) and control group (traditional learning). The independent variables in the study are the teaching methods and dependent variable is the post-test academic achievement in the two groups.

### **Population of the study**

The population for the study comprises of all the one hundred and eighty-eight (188) NCEIII business education registered students in 2018/2019 academic session in Federal College of Education (Technical) Gombe.

### **Sample size and Sampling technique**

There was no sampling because the total population was used for the study. However, the students were randomly assigned to experimental groups (blended learning) and control group (traditional learning)

### **Instrument for Data Collection**

The instrument that was used for the study is Information Technology Achievement Pre- Test (ITAPT) and Information Technology Achievement Post-Test (ITAPT). ITAPT is a cognitive tool which is a researcher-developed multiple-choice objective test, it was constructed based on topics outlined in the course titled "Information Technology". On the scoring of the multiple-

choice items, '1' mark was awarded for each correct answer and '0' for each wrong answer

### **Validation of the Instrument**

The instrument was validated by three Business Education experts from Department of Business Education, Federal College of Education Kano. The experts assessed the face and content validity of the test instrument in relation to the course content of information technology. The experts also examined all the items in instrument with reference to clarity of the items, simplicity of vocabulary and relevance of items to the study. The comments and corrections made by validates were used to improve the instrument

### **Pilot Study**

A pilot study was conducted at College of Education Billiri, Gombe State using 40 students. This college of education is not part of the population of the study, but the choice was influenced by the location and they has Business Education department where students offer Information Technology similar to the study area.

### **Reliability of the Instrument**

The reliability of the instrument was established by using scores that were obtained from the pilot study. Split half method of reliability was employed after which Kuder-Richardson (KR-20) was used to determine the reliability co-effiecient of the instrument. reliability coefficient of 0.82 was determined.

### **Method of Data Collection**

The study was conducted in course of regular school semester. Before the treatment, the research subjects was given as pretest, the result of the pretest was used to determine the students initial knowledge of the topic and to determine the comparability of both experimental and control group. The experimental group were taught with Blended learning while the control group was taught traditional learning. After the treatment, the posttest was administered on the subjects (both control and experimental groups). The scripts was marked by the researcher and the scores were recorded.



## Method of Data Analysis

The research questions was analyzed using mean and standard deviation, Analysis of Covariance (ANCOVA) was used to test the null hypothesis at 0.05 significance level with pre-test serving as covariates.

## Results

**Research Question1:** What is the effect of Blended Learning on academic achievement of student taught information technology?:

### Mean and standard deviation of the effect of blended learning on students' academic achievement in information technology

GROUP	Experimental Group (Blended learning)			Control Group (Traditional Method)		
	N	$\bar{X}$	SD	N	$\bar{X}$	SD
PRE-TEST	188	28.40	6.1	188	21.01	5.9
POST-TEST	188	41.30	8.7	188	29.12	8.8
MEAN & SD DIFFERENCE		12.9	2.6		8.11	2.9

**Source:** Field experiment, 2020

The data presented in the table above shows that the treatment group taught information technology with blended learning had a pre-test mean score of 28.40 and a mean score of 41.30 in the posttest with standard deviation of 6.1 and 8.7 for the pre-test and posttest respectively. The result gave a pre-test, posttest mean gain of the treatment group taught with blended learning to be 2.6. the low standard deviation difference (2.6) shows that the scores of students in both pre-test and post-test are clustered around their respective mean scores. The traditional method had a mean score of 21.01 and standard deviation of 5.9 in the pre-test and a mean score of 29.12 and standard deviation of 8.8 in the post-test, giving a pre-test post-test gain the control group taught blended learning to be 8.11. with this result, it is observed that students' academic achievement in information technology for the two groups was improved after being exposed to the two instructional approaches. It is however observed from the table that the experimental group had a greater gain than the control group which means that the

Blended learning method improves students' academic achievement in information technology than the traditional (lecture) method.

**Research Question2: Mean of post-test of male and female students taught information technology with blended learning method**

GENDER	N	Blended Learning Group	
		$\bar{X}$	SD
Male	58	38.16	7.73
Female	42	40.76	5.39
Mean & SD Difference		2.6	2.3

**Source:** Field experiment, 2020

The data presented in the table below indicates that male students' taught information technology with blended learning had a mean score of 38.16 and standard deviation of 7.73 while female students taught information technology with blended learning had a mean of 40.76 and standard deviation of 5.39. This results revealed that female students taught information technology with blended learning had higher mean score than male students. Hence gender has effect on academic achievement of students taught information technology using blended learning.

**Test of Hypotheses**

The null hypotheses for the study were tested using Analysis of Covariance (ANCOVA) at 0.0 significance and the summaries are presented in tables below:

**Hypothesis 1**

H<sub>01</sub>: Blended learning has no significant effect on the academic achievement of students taught information technology

**Summary of Analysis of Covariance (ANCOVA) for Test of Significance of Blended Learning effect on academic achievement of students in information Technology**

Source	Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	3636.673 <sup>a</sup>	2	1818.336	63.703	0.000	0.408

Intercept	3991.607	1	3991.607	139.840	0.000	0.403
Treatment	233.061	1	121.01	40.844	0.003	0.402
Pretest	3176.361	1	3176.361	111.279	.000	0.376
Error	5280.646	185	28.544			
Total	329554.000	188				
Corrected Total	8917.319	187				
a. R Squared = 0.402 (Adjusted R Squared = 0.400)						

Significant @ sig<0.05

The data presented in the table above showed F- calculated values for the effect of blended learning on students academic achievement in information technology. The table revealed that there was significant treatment effect of blended learning on the academic achievement of students in information technology ( $F(1,185) = 40.844$ ;  $P=0.05$ ;  $\eta^2=0.402$ ). Hence, the null hypothesis was therefore rejected. This implied that the treatment given to the students produce significant improvement on their academic achievement. This indicates that blended learning have significant effect on federal college of education students exposed to information technology.

$H_{02}$ : Gender has no significant effect on the academic achievement of students' taught information technology using blended learning.

### Summary of Analysis of Covariance (ANCOVA) for test of significance of gender effect on academic achievement of students taught information technology with blended learning

Source	Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected model	3736.539 <sup>a</sup>	2	1868.270	66.714	.000	.419
Intercept	4085.515	1	4085.515	145.889	.000	.411
Pretest	3062.176	1	3062.176	109.317	.000	.371
Gender	332.927	1	332.927	11.888	.001	.060
Error	5180.708	185	28.004			
Total	329554.000	188				
Corrected Total	8917.319	187				
a. R Squared = .419 (Adjusted R Squared = .417)						

Significant @ sig<0.05

The data presented in the table shows F-calculated values for gender effect of treatment(Blended learning) on federal college of education(Technical) students' academic achievement in information technology. The table revealed that there was a significant gender effect on the academic achievement of federal colleges of education students taught information technology with blended learning ( $F_{(1, 185)} = 11.888; P < 0.05; n = 0.060$ ). Hence, the null hypothesis, which states that gender has no significant effect on the academic achievement of federal college of education(Technical) students taught information technology with blended learning was therefore rejected. This implied that gender has effect on the academic achievements of students in information technology. This means male and female students do not performed alike

### Discussions of Findings

The study revealed that college of education students exposed to blended learning mode of instruction performed better than those in traditional teaching method. This finding is in agreement with that of (Gambari, Shittu, Ogunlade, & Osunlade, 2017) and which reported significant difference among the blended learning, e-learning and traditional teaching method in favour of the blended learning mode. It also agrees with that of (Kayii & Dambo, 2018) which revealed that blended learning group was more successful than traditional teaching method on students' achievement. The outstanding performance of students exposed to blended learning over those taught using E-learning and traditional teaching method confirmed the fact that using blended learning was a better approach for teaching college of education students in Nigeria. The influence of blended learning modes on male and female college of education revealed that gender had no influence on the performance of college of education students. This implies that the treatment improved the performance of the undergraduates exposed to blended learning irrespective of gender. This finding is in agreement with the that (Chang, Shu, Liang, Tseng, & Hsu, 2014) which reported no significant difference between female and male students' performance in blended learning.

### Conclusion

This study examine the effects of blended learning modes on academic achievement of students in information technology. The study revealed that blended learning mode of instruction was effective for learning information

technology concept. The students exposed to using blended learning mode of instruction performed better than their counterparts taught using traditional teaching method. However, no significance difference between male and female students exposed to blended learning was also found. This implies that blended learning modes of instructions can bridge the gap between gender disparities in academic performance.

### Recommendations

Based on the findings of this study, the following recommendations were made:

1. The Teaching methodology in Nigerian colleges of education should not rely only on traditional method of teaching, instead other strategy of teaching such as Blended learning and E-Learning should be introduced, where the presence of the lecturer is complimented by E-Learning mode of instruction which improves students' achievement in information technology
2. Students should explore the opportunities offered by blended learning. Since blended learning could be utilized to complement other method of teaching and learning as well as for individual learning.
3. Regular Computer trainings should be conducted for lecturers from time -to-time to update and get acquainted with latest technological innovations like blended learning. This will enable them to develop, modify and maintain latest online learning technologies like, blended learning
4. Government and appropriate college of education authorities should embrace and support the use of blended learning platform in institutions as this could enhance students 'performance their programmes

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