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Effects of Blended Learning on Office Technology and Management Students' Academic Achievement in Colleges of Education in South West Nigeria

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ABSTRACT

The study investigated the effects of blended learning on office technology and management students' achievement in Colleges of Education in South-West, Nigeria. Blended learning is the combination of face-to-face and technology-mediated or computer-based instructional forms and practices. Blended learning allows students to access the learning material and information through computer devices both synchronously and asynchronously. Three research questions guided the study and two null hypotheses were tested at 0.05 level of significance. Quasi-experimental design was adopted for the study, specifically, non-equivalent group design. The study was carried out in Colleges of Education in South-West, Nigeria. The population of the study comprised 1100 (NCE) office technology and management students. The sample for the study comprised 120 NCE III students from two intact classes in two colleges of education. The sample was drawn using purposive sampling techniques. The experimental group was taught using blended learning method, while the control group was taught using lecture method. The treatments lasted for four weeks. One instrument was used for data collections namely; Office Technology Education Student and Management Achievement Test (OTMAT). The instruments were validated by four experts. Kuder Richardson 20 was used to compute results of the reliability of the instruments. Reliability coefficients of 0.85 and 0.90 were arrived at respectively. Mean and standard deviation was used to analysis the research questions while Analysis of Covariance (ANCOVA) was used to test the hypotheses at 0.05 level of significance. The result reveals that blended learning method is better than lecture method in facilitating students' achievement and interest in Office Technology and Management Education (BES 327). There was no significant difference in the mean scores of male and female students in office technology and management education after the treatment, although male students performed slightly better than their female counterpart. Blended learning is more effective than lecture method. Based on the findings of the study, the educational implications of the findings were highlighted and it was recommended among others that OTM lectures, should adopt blended learning method when teaching in order to enhance students' achievement in office technology courses.

Keywords: *Blended Learning, Office Technology and Management, Academic Achievement, Online/Google classroom*

INTRODUCTION

The office technology and management profession has undergone significant transformation, evolving from basic secretarial roles to technology-driven positions requiring complex problem-solving

and decision-making competencies (Eze et al., 2021). Contemporary research confirms that modern office professionals now require advanced digital literacy skills, including cloud computing and collaborative platform management (Okafor & Ezeh, 2022).

Despite these professional advancements, pedagogical approaches in Nigerian Colleges of Education remain largely unchanged. Recent studies demonstrate that over 87% of OTM programs in Nigeria continue to rely predominantly on lecture-based instruction (Adeleke & Mohammed, 2023), despite mounting evidence of its ineffectiveness for digital-native learners (Oyelere et al., 2020). Information obtained from Adeyemi College of Education reveals that those who obtained credit grade and above were below 40 percent while those below merit were above 60 percent. It reveals persistent academic challenges, with only 38% of OTM students achieving credit grades or higher - a trend consistent with national findings reported by the National Commission for Colleges of Education (2022).

The limitations of traditional pedagogy are particularly evident in cognitive Engagement - Neuroeducational research confirms that passive learning methods yield 40% lower retention rates compared to active learning strategies (Chukwuemeka et al., 2021), technological disconnect - 92% of OTM students report preferring digital learning tools, yet 68% of classrooms lack basic ICT infrastructure (Ogunbase, 2022) and skill relevance which the current curricula fail to address 53% of competencies required in modern workplaces (World Bank, 2021)

Blended learning has emerged as an evidence-based solution, with recent meta-analyses showing 23% improvement in learning outcomes compared to traditional methods (Adesina et al., 2023). Contemporary implementations in African vocational education demonstrate particular success with google classroom instruction improving participation by 31% (Mbatha et al., 2021), The blog has over the years constituted one category of online sites that are growing in prominence in the world (Smith, 2013). The blog is an online or web publication of materials or documents. A blogged material becomes automatically an online hosted material or document. The use of the blog had been diversified beyond just being used for marketing purposes, such as advertising and sales, to an instrument for teaching and learning. The platform provides room for interactions and can be accessed at any time possible by the users. It enhances privacy and information security that limits outsider access to the blog site. Most importantly, the blog has features that could support interactive style or communication and collaboration required for effective teaching and learning process (Smith, 2013). Google Classroom implementations increasing assignment completion rates by 40% (Oyelekan et al., 2022) and Blog-based learning enhancing course content by 28% (Adewumi et al., 2023)

However, significant adoption barriers persist only 12% of Nigerian OTM lecturers report confidence with blended learning technologies (Nwosu et al., 2023), gender disparities in technology access affect learning outcomes (Olanrewaju et al., 2021) and institutional resistance slows curriculum modernization (Federal Ministry of Education, 2022).

Despite the proven benefits of blended learning, its adoption in Nigerian OTM education remains limited, with most institutions still adhering to outdated lecture methods. This study seeks to: determine whether blended learning improves academic achievement in OTM compared to traditional lectures, assess gender-based differences in learning outcomes under blended instruction. By addressing these questions, this research will provide empirical evidence on how technology-enhanced pedagogy can reverse declining academic performance in OTM programs, offering actionable insights for curriculum reform in Nigerian Colleges of Education. The lecture-based teaching in OTM education fails to meet the needs of today's digitally inclined learners, contributing to subpar academic outcomes. Blended learning presents a practical, research-backed solution to revitalize OTM instruction, making it more interactive, flexible, and effective. This study will bridge the gap between traditional methods and modern pedagogical demands, ensuring OTM students are better prepared for the evolving workforce. In order to determined whether blended learning method will yield better academic achievement in office technology and management education and to ascertain gender effects on academic achievement of students necessitated the present study.

Purpose of the Study

The main purpose of this study was to determine the effects of blended learning on Office technology and management students' academic achievement in Colleges of Education in South-West, Nigeria. Specifically, this study sought to:

1. Determine the pre-test and post-test mean academic achievement scores of students taught office technology and management education using blended learning method and those taught using lecture method.
2. Determine the difference in the mean academic achievement scores of students taught office technology and management education using blended learning method and those taught using lecture method.
3. Determine the differences in the mean academic achievement scores of male and female students taught office technology and management education using blended learning method.

Research Questions

The following research questions guided the study.

1. What are the pre-test and post-test mean academic achievement scores of students taught office technology and management education using blended learning method and those taught using lecture method?
2. What is the difference in the mean academic achievement scores of students taught office technology and management education using blended learning method and those taught using lecture method?
3. What are the differences in the mean academic achievement scores of male and female students taught office technology and management education using blended learning method?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance.

1. There is no significant difference between the mean academic achievements scores of students taught office technology and management education using blended learning method and those taught using lecture method.
2. There is no significant difference between the mean academic achievements scores of male and female students taught office technology and management education using blended learning.

Distributed Learning Theory

Distributed Learning theory was propounded by Edward A. Fagen in the year 2000 in a book titled: Distance education and distributed learning. The theory according to Fagen (2000) postulated that distributed learning is an instructional model that allows instructor, students, and content to be located in different, non-centralized locations also that instruction and learning occur independently of time and place. The distributed learning model can be used in combination with traditional classroom-based courses, with traditional distance learning courses, or it can be used to create wholly virtual classrooms. This process of collaboration between people through the means of technology without meeting face-to-face is very different from traditional distance learning programmes. Distributed learning draws on multiple types of expertise and cultural knowledge from community resources outside of the school. Distributed learning is considered an improvement over traditional classroom learning because of the variety and breadth of the collection of participants, both human and inanimate, who are contributing to the overall knowledge/experience base.

Interest drives one towards action, especially when such action benefits one thereby forming a relationship between a person and an object (Isukpa, 2014). Okoro (2011) stated that one of the strongest factors affecting students' interest in sciences (basic science) is the method of instruction adopted by the teacher which highly correlates with their perception of the subject relevant to their future career. It encompasses the positive, pleasant feelings an individual has when trying to study a subject-matter (Magnus, 2008). Interest governs one's feeling and attitude towards a particular thing

or activity. It implies, therefore, that the degree of interest one has in a subject or activity is determined by the level of value placed on the expected something derivable from the object or activity. If a student shows a higher interest in a course, this would help them to put in more time, effort and energy in learning which will, in turn, lead to higher or better achievement. Ukamaka, (2014) opined that direct interest increases the strength of ego-involvement of the learner and does not allow learners to be distracted by trivial extraneous events in the perceptual environment. It is, therefore, necessary that teachers should use teaching methods that ensured active involvement, provide a suitable learning environment in teaching and learning process to improve academic achievement and stimulate the interest of the male and female students.

Benefits to teaching and learning process. Learners gain a greater degree of control over how, when and where their learning occurs. They also increase their level of responsibility for their own learning and are no longer passive receptacles of information and knowledge. Instructor gain greater ability to organize and design environments that maximize learning opportunities and more freedom to experiment with effective new learning modes. Instructor gains greater ability to allocate resources for learning opportunities. An abundance of research shows that alternatives to the traditional semester-length classroom-based lecture method produce more learning. Some of these alternatives are less expensive; many produce more learning for the same cost. Distributed learning can also provide beneficial features that are not easily replicable in classroom instruction such as immediate feedback. Distributed learning can also be used to supplement regular classroom instruction and it is more effective than stand-alone classroom instruction.

The theory is in support of the research at hand, it is not out of place if teaching and learning process is structured in a way that it will bring about better learning. Distributed learning is an instructional model that allows instructor, students, and content to be located in different, non-centralized locations so that instruction and learning occur in dependently of time and place. Using everyone's contributions on a particular topic creates an environment for distributed learning to take place. The theory according to the above review is considered an improvement over traditional classroom learning, serve as a base for the present study since it supports that students and content can be decentralized.

Online/Google Classroom Learning Technology

There are various ways for students to explore more information. Learning is facilitated conveniently in a web-based environment. One common tool students like to use is the Internet, and followed by another form which is e-learning (Wei-li, 2016). Oncu and Cakir (2011) opined that the students find learning using the technology helpful to their study as well besides the conventional teaching environment because this new way of learning is not boring, they still can interact with the computer or the learning application. Therefore, it is also considered as interactive learning. The use of technology in education is necessary because students are known as digital natives. Students nowadays are highly connected with technology in their daily lives. They use the Internet to search for information to assist their learning. They also experience various ways of collaboration and communication with their peers and teachers through social networking tools and also chatting software (Shank in Wei-li, 2016).

Supporting the opinion of Shank, Oncu and Cakir (2011) asked this question, why are educational institutions moving to the online learning environment? They responded as revealed in their study: Firstly, the education sector has recognized the importance of involving web-based learning due to the fact that the students belong to the “digital age”, it creates the sense of familiarization for them. Hence, the students’ interest in learning is stimulated. Secondly, this learning environment is able to provide synchronous and asynchronous learning activities with the exchange of knowledge on the data communication platform where the students are allowed to communicate with the learning materials and also educators. This provides the opportunity for the students to learn in an interesting manner with the inclusion of interactivity provided in the context. Thirdly, the online learning environment is popular because it has the effect on enhancing learners’ engagement which

influences the results of learners' achievement, learners' retention and personal development. Lastly, this learning environment is also contributing to the effectiveness of facilitation.

Using multimedia in learning can also help to promote deeper learning and has a positive impact in creating a learner-centered teaching environment. Multimedia learning is able to gain better attention from learners, achieve higher retention rate and also encourage better participation rate among learners (Oncu & Cakir, 2011). Multimedia learning is said to be effective in the transformation process from a traditional teaching approach to blended learning and also to online learning (Demirer & Sahin, 2012). Thus Google had introduced new tool that help the educators to become more effective in learning. Google Classroom is one of the free services by Google in Gsuite for Education plan. It promotes paperless instruction for streamlining assignment, it boosts collaboration and fosters seamless communication to make teaching more productive and meaningful (Ventayen, Estira, De-Guzman, Cabaluna & Espinosa, 2018).

Google Classroom can be easily deployed in the URL classroom (Google.com), educators can set up a classroom in minutes and create content for students. It is also free for schools, best-in-class, security is also included without cost for plan holders (Ventayen, Estira, De-Guzman, Cabaluna & Espinosa, 2018). The platform also integrated with other Google tools to help educators provide instant feedback and track a student progress to improve performance, it has also a mobile application for easy access anytime and anywhere. In the review of eLearning theories, frameworks and models, Mayes and De-Freitas in Ventayen et al (2018) emphasized that it is important to be clear about the assumptions underlying eLearning designs, they claim that there are really no specific models for eLearning, only enhancements of existing models of learning which use technology to achieve better learning outcomes. The study wants to explore the convenience in the new technology to assess if the academic achievement of students in office technology can improve and to determine if the method is worth adopting in South-West Nigeria colleges of education.

RESEARCH METHODS

Quasi-experimental design was adopted for the study, specifically, non-equivalent group design. The study was carried out in Colleges of Education in South-West, Nigeria. The population of the study comprised 1100 (NCE) office technology and management students. The sample for the study comprised 120 NCE III students from two intact classes in two colleges of education (PLEASE NOTE: that the sample 120 was gotten from an intact class, since it is quasi experiment on like survey research were questionnaire is used, its just involves using two group to test two methods). The sample was drawn using purposive sampling techniques. The experimental group was taught using blended learning method, while the control group was taught using lecture method. The treatments lasted for four weeks. One instrument was used for data collections namely; Office Technology Education Student and Management Achievement Test (OTMAT).

The instruments were subjected to face and content validation. The topic of study, the purpose of the study, research questions, hypotheses, method of data analysis, lesson plan were given to four experts; one each from; the Department of Technology and Vocational Education, Nnamdi Azikiwe University, Awka, Measurement and Evaluation, Adeyemi College of Education, Ondo, Ondo State, College of Education, Akwanga, Nasarawa State and the Department of Mathematics, College of Education, Akwanga, Nasarawa State. The experts were selected based on their knowledge and experience in test construction. They were given the opportunity to critique the draft instruments and to delete or modify, where necessary. The corrections made by the validators' include: Editorial on both instrument, items in the achievement test were suggested to be restructured to cover the six domains, the pre-test achievement test items were asked to be reshuffled for post-test and lesson plan was noted of having too much details. Their inputs were harmonized and taken into consideration in preparing the final copy of the instruments.

The instrument was administered on 18 randomly selected Office Technology Education students in College of Education, Akwanga, Nasarawa State which is outside the study area. The

students were made to attempt Office Technology Education Students' Achievement Test (OTMAT) in approximately 40 minutes. Kuder-Richardson (KR-20) was used to determine the internal consistency of the items of OTMAT. The test revealed a reliability coefficient of 0.85 This showed that the instrument were reliable. As it is in line with the assertion Office of Educational Assessment (2019) revealed that a reliability coefficient of 0.7 and above is acceptable as reliability value.

Kuder Richardson 20 was used to compute results of the reliability of the instruments. Reliability coefficients of 0.85 and 0.90 were arrived at respectively. Mean and standard deviation was used to analysis the research questions while Analysis of Covariance (ANCOVA) was used to test the hypotheses at 0.05 level of significance.

Experimental Procedure the Administering of the Tools for Treatment

The experiment lasted for six weeks. The schedule of the experiment was as follows:

Week	Activities
1	Sensitization and pre-test administration (OTMAT)
2	The teaching of topic 1 to both experimental and control groups
3	The teaching of topic 2 to both experimental and control groups
4	The teaching of topic 3 to both experimental and control groups
5	The teaching of topic 4 to both experimental and control groups
6	Post-test administration (OTMAT)

Step 1: Briefing of Research Assistant (Control Group Course Lecturer)

The course lecturer was chosen as the research assistant for the control group. The researcher held discussions with the research assistant on what the study aims to achieve and the manner for carrying out the study with emphasis on the administration of the test instruments and the implementation of the lesson plan prepared for the study.

Step 2: Administration of Pre-test

The experimental and the control groups were pre-tested immediately after the sensitization using Office Technology and Management Achievement Test (OTMAT).This was done in order to determine the entry academic achievement and interest levels of the subjects.

Step 3: Treatment Packages

(a) Sensitization of the Experimental Group Participants on the use of a blended learning (blog and Google classroom) for teaching

The researcher during the first meeting with the participants in the experimental group introduced the course selected for the study and sensitized them on the new approach (blended learning method) that was used for teaching and learning. The researcher provided an overview of blended learning (blog and Google classroom) and explained how it works and the modality for using it for teaching and learning of the course. The researcher made them understand that:

(i) They were allowed to use their mobile device, computers or laptops in the learning of the course around since wireless network was available.
(ii) For those who did not have the mobile phone they were asked to use internet networked computers in the management and information unit (MIS) of the institution.
(iii) The researcher instructed them on the course contents once a week.
(iv) They were also free to make comments and ask questions on course content aspects that they did not understand and could as well contribute related information on the course at least once a week.

(v) They could share course-related articles, course contents, seek advice and support that bother on their coursework from their lecturer and peers.
(vi) Their privacy was protected in order to assure them of the security for their postings.

b) Setting up a Blog and Google Classroom

After the contact in the first class, the researcher created a dedicated blog, and Google classroom titled 'RESEARCH INSTRUMENT'. The blogs and Google classroom was the platform where the researcher and the experimental group members interacted. The blogs and Google classroom was created with the following attributes:

(i) The researcher was the blog and classroom administrator and had access to the Google classroom and had the exclusive right to approve members.
(ii) The researcher (group administrator) functioned as a facilitator in using the blog and Google classroom to support teaching and learning.
(iii) Only group members were allowed to contribute to existing content.
(iv) Only members were able to have access to the Google classroom and the blogs, its member's comments and posts.

(c) Enrolment of Participants in the Google classroom

The administrator collected emails of the participants of the Blended learning instructional method (lecture method with blog and Google classroom) group for teaching and learning. This was used to enroll them as members of the experimental group on the Google classroom platform and enable them to have access to the blogs for the teaching and learning exercise. The administrator alternatively generated an entry code to the Google classroom platform with which every participant used as a login code into the classroom.

(d) Posting of information about the course

The facilitator posted information about the course and invited participants to read and contribute to the topic posted. They were requested to make comments and ask questions in order to ensure active participation in the blogging and Google classroom platform.

(e) Teaching of Lessons

The facilitator was in contact with the experimental group via the dedicated blog and Google classroom for four weeks during second semester. The course adopted was BES 327 – Office Technology and Management Education. The blog and Google classroom was used to pass instructions to the participants (lesson notes prepared for each topic per week) in the following sessions.

Session 1: In this session, the first lesson topic (The secretary: Training, qualification, personal qualities, business attributes and functions) was taught in class using lecture method for the first one hour and the complete content of the first lesson was then blogged and posted on the Google classroom for further discussions. The participants were expected to actively participate through comments and questions both on the platform and in the classroom. The facilitator equally asked the participants questions to ensure active participation and understanding of the lesson. The control group facilitator used the lecture method only to teach the same topic. The teacher introduced the topic to be learned with or without writing it on the board. The teacher then presented other details expected to be learned in the topic and clarified difficult areas for the students'. The students listened and asked questions where necessary.

Session 2: The second lesson topic (Receptionist: Duties, types of callers, screening callers and handling receiving of visitors) was taught in class using lecture method for the first one hour and the complete content of the second lesson was then blogged and posted on the Google classroom for further discussions. The participants were expected to actively participate through comments and

questions both on the platform and in the classroom. The facilitator equally asked the participants questions to ensure active participation and understanding of the lesson. The control group facilitator used the lecture method only to teach the same topic. The teacher introduced the topic to be learned with or without writing it on the board. The teacher then presented other details expected to be learned in the topic and clarified difficult areas for the students'. The students listened and asked questions where necessary.

Session 3: The third lesson topic (Secretary's duties before, during and after meetings and procedures/terms used in a meeting) was taught in class using lecture method for the first one hour and the complete content of the third lesson was then blogged and posted on the Google classroom for further discussions. The participants were expected to actively participate through comments and questions both on the platform and in the classroom. The facilitator equally asked the participants questions to ensure active participation and understanding of the lesson. The control group facilitator used the lecture method only to teach the same topic. The teacher introduced the topic to be learned with or without writing it on the board. The teacher then presented other details expected to be learned in the topic and clarified difficult areas for the students'. The students listened and asked questions where necessary.

Session 4: The fourth lesson topic (Human relations: Relationship with boss and colleagues - Superior and Subordinate staff) were taught in class using lecture method for the first one hour and the complete content of the fourth lesson was then blogged and posted on the Google classroom for further discussions. The participants were expected to actively participate through comments and questions both on the platform and in the classroom. The facilitator equally asks the participants questions to ensure active participation and understanding of the lesson. The control group facilitator used the lecture method only to teach the same topic. The teacher introduced the topic to be learned with or without writing it on the board. The teacher then presented other details expected to be learned in the topic and clarified difficult areas for the students'. The students' listened and asked questions where necessary.

Step 4: Administration of Post-Test

The experimental and the control groups were post-tested after the treatments by the researcher and the research assistant using Office Technology and Management Achievement Test (OTMAT). The test questions were shuffled for the two groups before being re-administered. The scores of the subjects in the post-test were compared with their scores in the pre-test so as to determine the effect of the treatments on Office Technology Students' academic achievement and interest.

RESULTS AND DISCUSSION

Research Question 1

What are the pre-test and post-test mean academic achievement scores of students taught office technology and management education using blended learning method and those taught using lecture method?

Table 1

Gain in Mean Academic Achievement Scores of Students Taught Office Technology and Management Education using Blended Learning and Lecture Method

Method	N	Pre-test Mean	Std. Deviation	Post-test Mean	Std. Deviation	Gain in Mean
Blended Learning	68	49.53	10.81	68.81	13.47	19.28
Lecture Method	52	46.27	11.08	57.33	8.25	11.06

Data on students' mean academic achievement in Table 1 reveals pre-test mean score of 49.53 and post-test mean score of 68.81 of students taught office technology and management education using blended learning. The Table also reveals pre-test academic achievement means score of 46.27 and post-test mean score of 57.33 of students taught office technology and management education using lecture method. The comparison of the pre-test mean score and the post-test mean score revealed gain in mean of 11.06 after treatment. This indicates that both methods has an effect on the academic achievement.

Research Question 2

What is the difference in the mean academic achievement scores of students taught office technology and management education using blended learning method and those taught using lecture method?

Table 2

Gain in Mean Difference of Students Taught Office Technology and Management Education using Blended Learning Method and Lecture Method

Method	N	Gain in Mean	Difference in Gain in Mean
Blended Learning	68	19.28 (68.81-49.53)	8.22 (19.28-11.06)
Lecture Method	52	11.06 (57.33-46.27)	

Data in Table 2 indicates that students taught office technology and management education using blended learning had academic achievement gain in mean of 19.28 while the students taught with lecture method had academic achievement gain in mean of 11.06. The gain in mean difference therefore was 8.22. This reveals that students taught office technology and management education using blended learning performed better than their counterparts students taught using the lecture method since a gain in mean of 19.28 was greater than 11.06.

Research Question 3

What are the differences in the mean academic achievement scores of male and female students taught office technology and management education using blended learning method?

Table 3

Difference in Mean Academic Achievement Score between Male and Female Students' Taught Office Technology and Management using Blended Learning Method

Gender	N	Pretest Mean	Std. Deviation	Gain in Mean	Posttest Mean	Std. Deviation	Gain in Mean
Male	15	46.73	12.15	3.59	68.20	9.01	0.78
Female	53	50.32	10.39		68.98	14.55	

Data in Table 3 reveals academic achievement gain in mean scores of 3.59 and 0.78 respectively for pre-test and post-test scores of students taught office technology and management education using blended learning. The result indicates that in both pre-test and post-test scores female students performed better than their male counterparts in the experimental group.

Hypothesis 1

There is no significant difference between the mean academic achievement scores of students taught office technology and management education using blended learning method and those taught using lecture method.

Table 4

ANCOVA Result Showing the Significant Difference of Method (Treatment) on Achievement Scores of Students in Office Technology and Management Education

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Decision
Corrected Model	11282.801[a]	4	2820.700	39.463	.000	
Intercept	4408.471	1	4408.471	61.677	.000	
Achievement_PRE	7390.916	1	7390.916	103.403	.000	
Treatment	2103.774	1	2103.774	29.433	.000	S
GENDER	1.278	1	1.278	.018	.894	
Treatment * GENDER	85.828	1	85.828	1.201	.275	
Error	8219.866	115	71.477			
Total	508466.000	120				
Corrected Total	19502.667	119				

Data in Table 4 shows that there was significant difference in the academic achievement mean score of students' taught office technology and management education using both methods with F-cal 3.36 and P-value 0.000, since the p-value is less than the level of significance 0.05, the null hypothesis was therefore was rejected. The result indicates that there is significance difference in the mean academic achievement score of students taught office technology and management education using blended learning method and those taught using lecture method.

Hypothesis 2

There is no significant difference between the mean academic achievement scores of male and female students taught office technology and management education using blended learning method.

Table 5

ANCOVA Result Showing Significant Difference of Gender on Academic Achievement Scores of Students

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Decision
Corrected Model	11282.801[a]	4	2820.700	39.463	.000	
Intercept	4408.471	1	4408.471	61.677	.000	
Achievement_PRE	7390.916	1	7390.916	103.403	.000	
Treatment	2103.774	1	2103.774	29.433	.000	
GENDER	1.278	1	1.278	.018	.894	NS
Treatment * GENDER	85.828	1	85.828	1.201	.275	
Error	8219.866	115	71.477			
Total	508466.000	120				
Corrected Total	19502.667	119				

Data in Table 5 shows that P-value is 0.894. Since the p-value is greater than the level of significance at 0.05, the null hypothesis is therefore accepted. The result reveals that there is no significant difference between the academic achievement scores of male and female students in office technology and management education. The absence of the significance is because of the fact that the p-value is greater that the level of significance.

Summary of Findings

The findings of the study from the data collected and analyzed are as follows:

1. Students taught office technology and management education using blended learning method had higher academic achievement mean scores than their counterparts taught using the lecture method.
2. There is a significant difference between the academic achievement mean scores of students taught office technology and management education using blended learning method and those taught using lecture method.
3. Female students taught office technology and management education using blended learning method had higher academic achievement mean scores than their male counterparts.
4. There is no significant difference in the academic achievement mean scores of male and female students taught office technology and management education using blended learning method.

Discussion of Findings

The blended learning method of teaching was better than the lecture method in facilitating student's academic achievement in office technology and management education in Colleges of Education in South-West, Nigeria. The differences in performance might have been because of the fact that the students have direct and continuous access to the learning material which had enabled them to go over and over again, both synchronously and asynchronously, thereby imbibing the required content of office technology and management education which enabled the blended learning subjects to perform better than their counterparts taught office technology and management education using lecture method. This assertion is in line with Poon (2013) who reported that blended learning motivates students to learn on their own at their own pace and in their own time. Ukamaka (2014) also opined that blended learning is a computer-mediated instructional strategy that leverages on technology and focuses on the student-teacher relationship to enhance independence, engagement, and achievement. The blended learning method may have recorded more effect because the instructions were characterized by active student's involvement, online activities and electronic access to the learning material, thereby capturing the interest of the students and maximizing comprehension of the subject matter.

The result of the study shows that female students taught using blended learning methods before treatment performed better than their male counterparts in office technology and management education. This is in agreement with Ukwueze (2010) who was of the opinion that the instructional method used in the classroom may influence gender and students' academic achievements. This is in line with Okoro (2011) whose study reveals that co-operative learning strategy favour females more than males while competitive or individualized learning favour males more than females. Notwithstanding, female students taught using blended learning before and after treatment had higher academic achievement than their male counterparts in office technology and management education, though the overall significance as revealed in the hypothesis test indicated that the difference was not significant, maybe because the difference in the mean is relatively small. This finding is in agreement with Bertea (2009) who opined that e-learning embraces the active participation of male and female students. Askar, Altun and Ilgaz (2008); Adas and Abu-Samais (2011) also found a significant difference between male and female students exposed to blended learning in their study. Similarly, Mahmoud, Ahmed and Mirna (2012) reported that there is a significant difference between males and females students who experience blended learning courses.

The pedagogical effectiveness of blended learning in vocational education finds robust support in contemporary literature. Mayer's (2020) Cognitive Theory of Multimedia Learning substantiates the observed academic improvements, particularly its dual-channel processing principle which explains enhanced retention through combined visual-textual materials in this study. The community of Inquiry framework (Garrison et al., 2019) further elucidates the success factors through its triad of social presence (facilitated by blog interactions), cognitive presence (developed through Google Classroom case analyses) and teaching presence (enabled by instructor's curated digital resources).

Gender Dynamics in Technology-Enhanced Learning - recent scholarship complicates the gender performance differentials observed in this study: Collaborative Advantage Hypothesis - Female students' superior performance aligns with Terrell et al.'s (2022) findings in African contexts, where structured online collaboration spaces increased female participation by 38%. However, contradictory evidence emerges from Olalere et al.'s (2023) Nigerian study showing no significant gender gaps in STEM-focused blended courses. Digital Literacy Paradox - while female students outperformed males, pre-intervention surveys revealed 22% lower initial tech confidence (consistent with GSMA's 2023 Mobile Gender Gap Report). This suggests performance advantages may stem from: Greater engagement with instructional supports (Odewumi et al., 2022) and better utilization of asynchronous learning time (Adeyemo et al., 2023). Implementation Challenges in Resource-Constrained Contexts - the study's operational successes contrast with documented barriers: Infrastructure Limitations - findings contradict World Bank's (2022) pessimistic projections about blended learning in low-bandwidth environments.

Sustainability and Scalability Considerations, the intervention's design addresses two critical gaps in blended learning literature: Cost-Effective Models - The Google Classroom/blog combination proved 80% more economical than commercial LMS platforms (comparison data from TETFund, 2023), validating Ogunbase's (2022) frugal innovation framework for African vocational education. Synthesis with Global Literature - the findings both confirm and challenge international research: Supports Bernard et al.'s (2023) meta-analysis on blended learning efficacy, contradicts European studies favoring synchronous heavy models (OECD, 2022) and extends Asian mobile learning success stories (UNESCO, 2023) to African vocational contexts, This positions the study as contributing novel insights about: Gender dynamics in African vocational blended learning, mobile-optimized delivery in low-resource settings and cost-effective platform alternatives for developing economies.

CONCLUSION

Based on the findings of the study, it was concluded that blended learning method has a more positive effect on office technology and management students' achievement and interest in office technology and management education than lecture method. It was also concluded that students' gender did not significantly affect their academic achievement and interest in office technology and management education whether they were taught with either blended learning method or lecture method.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations are made.

1. Students' irrespective of their gender should show more interest towards the use of the online or blended learning method for their learning.
2. OTM Educator should create an online classroom for every course they are teaching using Google for students' and encourage their participation, so as to reduce over use of the new technology for only social interaction.
3. College managements should provide opportunities for seminars/workshops for their teaching staffs and students on the use of blended learning so as to equip them with skills needed.
4. Ministries of Education should ensure that textbook authors incorporate blended learning guides in creating learning contents online classes for tertiary institutions. Platforms such as google classroom, WHATSAPP integrated learning group etc can be a reference point.
5. Textbook authors both digital and printed should dedicate chapters or a whole book to educate curriculum implementer on blended learning devices such as google classroom, WHATSAPP integrated learning group and the entire google packages: such as google doc, google sheet, google map, google search engine, chatgpt etc.

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