



doi 10.5281/zenodo.7806494

Vol. 06 Issue 03 March - 2023

Manuscript ID: #0819

BLENDED LEARNING: A VIABLE TEACHING APPROACH FOR ENHANCING BIOLOGY STUDENTS' ACADEMIC ACHIEVEMENTS IN ADEYEMI COLLEGE OF EDUCATION ONDO DURING POST COVID-19 ERA

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A B S T R A C T

The covid-19 pandemic remains a global health concern, Nigeria inclusive, with the educational sector being one of the most hit sectors. This study examined “the influence of blended learning in enhancing academic achievement of biology students in Adeyemi College of Education Ondo. A descriptive survey research design was adopted for this study. A descriptive survey design was adopted for this study which involved one hundred and fifty (150) respondents from the Departments of Biology, Adeyemi College of Education, Ondo. Two research questions and hypothesis each was answered and tested for acceptance or rejection. A structured and well-validated questionnaire was used to obtain data for this study. The collected data were analyzed using the mean score and Pearson Product Moment Correlation (PPMC). The findings revealed that the application of blended learning in teaching biology students in tertiary institutions during post-Covid-19 enhances their academic achievements. Based on the results, the conclusion was made that “the use of blended learning in teaching biology students will enhance their academic achievement and its importance on the nation’s education cannot be underestimated. One of the recommendations made is “provision should be made by school management and stakeholders in education for the required facilities for implementation of blended learning in a tertiary institution.

KEY WORDS

Blended learning, Enhance, Biology, Academic Achievement.



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Introduction

Corona virus disease 2019 (Covid-19) was firstly identified in Wuhan city, Hubei province, China in December 2019 as a severe acute respiratory syndrome corona virus-2 (SARS-CoV-2). The spread was rapid worldwide, such that world health organization (WHO) announces it as pandemic on March 12, 2020. Governments had to make decisions on ways to curb the spread by putting some measures in place such as travel restrictions, social distancing, ban on public gatherings, self-isolation, schools and business closures.

Globally, Covid-19 pandemic became a major health issue with great and dire impact on education. Nations of the world were on total lockdown, Nigeria inclusive. All schools were shutdown, thereby making face to face delivery of teaching and learning activities impossible. Teaching and learning activities in most schools were therefore shifted to e-Learning. Adeyemi College of Education Ondo also adopted use of e-Learning method, which entails the application of information and communication technologies (ICTs) which greatly transform the effective teaching-learning process in most schools.

The total lockdown and closure of schools due to the threat of covid-19 pandemic which left over 40 million of learners out of formal classroom settings for several months nationwide and this has greatly affect the normal traditional face to face method of teaching and learning process in Nigeria educational system negatively. Schools were to be closed down, therefore traditional face to face teaching and learning could not take place, since the learners are far away from classroom settings. Various educational technological methods of teaching and learning can be used to compliment the failing face to face method, as a response to ease the effect of school closure on educational system nationwide. Ngogi, (2020), stated that long periods of learning would be lost, for as long as the closure lasted. The effectiveness of blended learning in tertiary education during covid-19 lockdown and school closure cannot be underestimated. Blended learning has brought about improvement in academic achievements of students in tertiary institutions.

There is rapid improvement on ICTs as both governmental and non-governmental organization had to adopt its use, education sector inclusive. As a result of those changes, new approaches towards teaching and learning process has come to the fore, blended learning, virtual learning, electronic learning, are some of the legit examples of these new approaches. This prompted educational institutions and experts in curricula to introduced radical changes in their policy and educational planning to respond and align with those changes and development (Chosen & Ghaffari, 2017).

In the late 1990s, blended learning (or Mixed or Hybrid learning) emerged as a new method teaching for distance learning through application of technology and internet to improve teaching and learning process. Najeh, Mold & Saami (2019) emphasized in Volchenkova (2016), that blended learning is a form of learning that combines the best directs classroom learning and learning through the internet by using its applications. Currently, it is an excellent time for educational institutions in Nigeria to recognize what prospect of education would look like and realistic stages towards adopting a blended learning to move education forward. Numerous universities across Africa, including the ones in countries such as Nigeria; Egypt; Ghana; South Africa; Morocco; and Rwanda among others have moved some of their programme to online stages and partner with Telescos to zero rate these platforms (Anifowoshe, Abdullahi, Tolorunloju, Akinjo, & Ogunjemilua, 2020). Blended learning aims at providing effective and efficient learning experience by combining learning environment which suits the students (Chansamrong, 2014).

According to Ismail (2009), blended learning is the employment of technological innovation in blending two infrastructural methods of education; i.e. face to face as well as distance education to bring about an interaction between the faculty members being a teacher or a mentor with learner face to face through innovations, which are required to have specific electronic tools or specific quality with the availability of learning resources linked with content and learning activities. There are many definitions of blended learning, but what most have in common is that they point to the combination of virtual and physical environment. In spite of the multiplicity of blended learning definitions, all emphasized that, it is learning strategies that integrate various models of traditional and distance learning and uses multiple form of technology (Akbarov, 2018).

There are two approaches in blended learning: “program overflow model” and “core-and-spoke model” (Bersin, 2004). In the first model, the teacher designs curriculum by integrating some media in the scheduled syllabus. Each step or discussion is the follow-up of the previous discussion. To measure the whole learning, a task or test is given in the end of topic discussion (Bersin, 2004). In the second approach, the instructor gives online class or web based course. Usually, the instructor gives particular activities such as delivering materials, interactivity, learning sources, and material assessment. In this approach a task or test may be given, yet not necessarily to be scheduled in the syllabus (Bersin, 2004).

According to Marriot, Marriot, and Selwyn (2004), showed learners expressing their preference for face-to-face due to its facilitation of social interaction and communication skills acquired from classroom environment. Thelal, (2018) in (Graham, 2006), argued that blended learning systems are intended to promote learning by facilitating the integration of visual cues and educational concepts. Blended learning aims at interactive learning, resulting in the blending of maxima of teacher's role in a traditional classroom with that of virtual one. Blended learning also aims at using modern technology in teaching without sideline the usual educational situation and classroom attendance.

The study by Goyal and Tambe (2015), used descriptive statistics to indicate improved learning by use of uploaded syllabus and session plans on Moodle. Improved learning is also noted through sharing study material, submitting assignments and using the calendar. Learners in the study found Moodle to be an effective educational tool. In blended learning set ups, face-to-face experiences form part of the blend and learner positive attitudes to such sessions could mean blended learning effectiveness. Thelal, (2018), stated that blended learning has many benefits including the following, making computers; local and global network of information available to learners; developing teachers' role as leaders and mentors to their students in terms of their expertise in computers and network of local and international information; having the abilities to combine different possibilities for different schools and universities in a productive ways and overcoming the problem of lasting change in the content of educational materials. (Ahmad & Al-Khanjari, 2011), stated that students showed positivity with the use of blended learning as it improved their understanding of course material.

Statement of the problem

The impact of the school's shutdown on the educational system in general cannot be underestimated, as it has harmed traditional face-to-face teaching and learning. To prevent the failing educational system from deteriorating further, immediate action was required. During the post-Covid-19 lockdown era, blended learning (a combination of physical and virtual learning environments) was required to be employed to both limit the transmission of the deadly virus and improve the academic

achievement of biology students in tertiary institutions (Adeyemi College of Education Ondo, as a case study).

Objectives of the Study

The broad objective of this study is to investigate the influence of blended learning on the academic achievement of biology students in tertiary institutions. The specific objectives are;

1. To examine if the application of blended learning in teaching biology students in tertiary institutions during post Covid-19 will enhance their academic achievements
2. To examine if the application of blended learning in teaching aid in revitalizing the effect of school closure on biology students in tertiary institutions

Significance of the Study

This study is of great significance to all stakeholders, governments and schools in educational sector in that;

1. The findings of this study will bring into awareness the importance of blended learning to both teachers and students in tertiary institutions during post Covid-19 era.
2. The findings of this study will show the influence of blended learning on the academic achievement of biology students in tertiary institution.

Research Questions

1. Will the application of blended learning in teaching biology students in tertiary institutions during post Covid-19 enhance their academic achievements?
2. Will the application of blended learning in teaching aid in revitalizing the effect of school closure on biology students in tertiary institutions?

Research Hypotheses.

1. **HO1:** There is no correlation between the use of blended learning and academic achievement of biology students in Adeyemi College of Education, Ondo.

Methodology

This study was descriptive in nature. The sample consisted of one hundred and fifty respondents, in which twenty five respondents were randomly selected from the Departments of Biology, Adeyemi College of Education Ondo. The questionnaire titled, “enhancing student’s academic achievement in biology education through blended learning”. The questionnaire was built around a four-point likert scale (Strongly Agree, Agreed, Disagreed, and Strongly Disagreed). Two test and measurement specialists verified the research instrument, and the kuder-richardson 20 reliability test yielded a coefficient of 0.72. (KR20). Mean score and Person Product Moment Correlation were used to examine the data (PPMC).

Discussion of findings

Research question 1: Will the application of blended learning in teaching biology students in tertiary institutions during post Covid-19 enhance their academic achievements?

Table 1: Frequency, percentage and mean score showing results on extent to which, application of blended learning in teaching biology students in tertiary institutions during post Covid-19 enhance their academic achievements.

S/N	ITEMS	SD	D	A	SA	MEAN	REMARKS
1	Application BL in teaching biology concept enhance students achievements in class assessment	19 12%	30 20%	40 27%	61 41%	2.95	Accepted
2	The use of BL in teaching biology students enhances their competitive ability.	99 66%	21 14%	19 13%	11 7%	1.61	Rejected
3	The use of BL in teaching biology students improve their rate of assimilation	20 13%	38 25%	25 17%	67 45%	2.93	Accepted
4	The use of BL aid better understanding of biologyconcepts	45 30%	64 43%	20 13%	21 14%	2.11	Accepted
5	The use of BL teaching biology increase students' interest in learning.	14 9%	30 20%	73 49%	33 22%	2.83	Accepted
	Total	197 26.3 %	183 24.4 %	177 23.6 %	193 25.7 %	2.49	Accepted

The table 1 reveals the response of the respondents' perception on 'Application of blended learning in enhancing academic achievement of biology students in tertiary institutions during post Covid-19 era'. On item (1) which states that, Application BL in teaching biology concept enhance students' achievements in class assessment 19(12%), 30(20%), 40(27%), 61(41%) were obtain for strongly disagreed, disagreed, agreed and strongly agreed, respectively, while the mean is(\bar{x} =2.95). On item (2), which states that, the use of BL in teaching biology students enhances their competitive ability. 99(66%) of the responses of the respondents were for strongly disagreed, 21(14%) was for disagreed, 19(13) was for agreed, while 11(7%), strongly agreed and the mean is (\bar{x} =1.61).

On item (3), which states that, the use of BL in teaching biology students improve their rate of assimilation. The respondents' responses indicated 20(13%), 38(25%), 25(17%), 67(45%) for strongly disagreed, disagreed, agreed and strongly agreed respectively, while the mean is (\bar{x} =2.93). On item (4), which state that, the use of BL aid better understanding of biology concepts, 45(30%) responses was obtain for strongly disagreed, 64(43%) for disagreed, 20(13%) for agreed, and 21(14%) was obtained for strongly agreed, while the mean is (\bar{x} =2.11).On item (5) which state that, the use of BL teaching biology increase students' interest in learning. 14(9%) of the responses from the respondents was for strongly disagreed, 30(20%) for disagreed, 73(49%) was for agreed and 33(22%) was for strongly agreed, while the mean is (\bar{x} =2.83).

Finally, the table 1 above shows the Average mean of the total respondents as (\bar{x} =2.49) which makes it to be accepted that, application of blended learning in teaching biology students in tertiary institutions during post Covid-19 enhance their academic achievements. This attested to Mugeyi, Chang & Edmond (2017), that efficient use of learning management system and its tools improves learning outcomes in e-learning and blended learning environments'.

Research question 2: Will application of blended learning in teaching aid in revitalizing the effect of school closure on biology students in tertiary institutions.

Table 2 : Frequency, percentage and mean score showing results on the extent to which, application of blended learning in teaching can be used to revitalize the effect of school closure on biology students in tertiary institutions.

S/N	ITEMS	SD	D	A	SA	MEAN	REMARKS
1	The use of BL in teaching biology students makes them too relax and lazy	91 61%	33 22%	16 11%	10 6%	1.63	Rejected
2	The application of BL in teaching improves the students' interactive skills.	19 12%	27 18%	37 25%	67 45%	2.95	Accepted
3	Teaching biology practical through BL aid easy identification of specimen.	15 10%	29 19%	25 17%	81 54%	3.15	Accepted
4	Students drawing skills can be enhanced through the use of BL in teaching practical.	23 15%	58 39%	37 25%	32 21%	2.52	Accepted
5	Biology students' field and laboratory skills will be enhance through the use of BL.	7 5%	32 21%	74 49%	37 25%	2.94	Accepted
	Total	155 26.6 %	179 23.9 %	189 25.2 %	227 30.3 %	2.64	Accepted

The table 2 reveals the response of the respondents' perception on Application of blended learning in revitalizing the effect of school closure on biology students in tertiary institutions, On item (1), which state that, The use of BL in teaching biology students makes them too relax and lazy. 91(61%) of the responses from the respondents was strongly disagreed, 33(22%) was for disagreed, 16(11%) was for agreed and 10(6%) was for strongly agreed, while the mean is (\bar{x} =1.63).

On item (2), which state that, the application of BL in teaching improves the students' interactive skills. 19(12%) of the responses from the respondents was strongly disagreed, 27(18%) was for disagreed, 37(25%) was for agreed and 67(45%) was for strongly agreed, while the mean is (\bar{x} =2.95). On item (3), which state that, teaching biology practical through BL aid easy identification of specimen? 15(10%) of the responses from the respondent was for strongly disagreed, 29(19%) was for disagreed, 25(17%) was for agreed, and 81(54%) was for strongly agreed, while the mean is (\bar{x} =3.15).

On item (4), which state that, Students drawing skills can be enhanced through the use of BL in teaching practical? 23(15%) of the responses from the respondents was for strongly disagreed, 58(39%) was for disagreed, 37(25%) was for agreed and 32(21%) was for strongly agreed, while the mean is (\bar{x} =2.52). On item (5), which state that, Biology students' field and laboratory skills will be enhance through the use of BL. 7(5%) of the responses from the respondent was for strongly disagreed, 32(21%) was for disagreed, 74(49%) was for agreed and 37(25%) was for strongly agreed, while the mean is (\bar{x} =2.94). Finally, the table 2 above shows the Average mean of the total respondents as (\bar{x} =2.64) which makes it to be accepted that application of blended learning in teaching will aid in revitalizing the effect of school closure on biology students in tertiary institutions. This attested to Loukis, Georgious and Pazalo (2007), they noted that 'learners' measuring of a system's quality, reliability and ease of use leads to learning efficiency and can be so in blended learning'.

Research Hypotheses

HO1: There is no correlation between the use of blended learning and academic achievement of biology students in Adeyemi College of Education Ondo.

Table 3: Pearson Product Moment Correlation showing the relationship between the use of blended learning and academic achievement of biology students in Adeyemi College of Education, Ondo.

S/N	Variables	Response	DF	r-table	r-critical	Remarks
6	Blended learning	SD/D/A/SA	10	0.576	0.985	Rejected
	Biology students' Academic achievements					

The table 3 shows the analysis of the collected data for testing null hypotheses 1: The formulated null hypotheses 1 which stated that “There is no correlation between the use of blended learning and academic achievements of biology students in Adeyemi College of Education Ondo” was rejected. This implies that “there is correlation between the use of blended learning and academic achievement of biology students in Adeyemi College of Education Ondo”. This was confirmed by Kenney & Newcombe (2011), who conducted a comparison to determine effectiveness in terms of grades and discovered that blended learning had a higher average score than non-blended learning (i.e. only face to face environment).

Conclusion

According to the findings of the study, using a blended learning strategy in the teaching-learning process improves learning outcomes. Learning is more effective, entertaining, and precise, according to the majority of responders; they concluded that when blended learning is used, both theoretical and abstract components of the course work are better understood than when standard teaching methods are used. As a result, the relevance of blended learning in the nation's educational system during the post-Covid-19 era cannot be underestimated. The reason for this is that conventional face-to-face communication cannot be used effectively during the post-Covid-19 period to prevent the spread of the disease.

Recommendations

The following recommendations were made based on the conclusion of the findings from the collected data for this study.

1. The infrastructure required for blended learning should be provided by the school administration and education stakeholders.
2. Educators should be prepared to develop their educational technology knowledge in order to promote effective teaching while employing blended learning by participating in in-service ICT training.
3. Teachers and students are to encourage into adapting to this new teaching-learning approach and using it to their advantage in order to achieve better academic results.
4. The facilities (ICTs) used in blended learning should be properly maintained.

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