

## **EXTENT OF USAGE OF BLENDED LEARNING FOR TEACHING AND LEARNING OF BIOLOGY IN SECONDARY SCHOOLS IN ABIA STATE, NIGERIA**

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### **Abstract**

*This study investigated the extent of usage of blended learning teaching approach for the teaching and learning of biology in secondary schools. Survey design was utilised. Nineteen biology teachers and 93 biology students, drawn through simple random sampling, served as sample. Researcher-made structured questionnaire was the instrument of data collection. Mean was used to analyse the data. Results showed that biology teachers are not trained for blended learning and the facilities for blended learning are not adequate. Recommendations are made among which is the need to train secondary school biology teachers on the blended learning teaching approach.*

### **Introduction**

The use of technology in educational settings has become inevitable in this information age. Nigeria is still a developing country with low technological development. However, today's youth have to face a fast growing world and meet up with technological demands of the society both locally and abroad. In the latter half of the 20<sup>th</sup> century, it became not only impressive but also persuasive to talk about the "information society", or the "information age" while referring to the impact of information and communication technologies (ICTs) on global economy. According to Gaglardi & Byron (2003), a global society has evolved in which traditional barriers to communication, time and space has been surmounted. The education system has a great role to play in preparing and empowering youths to properly adjust to global competitiveness.

Science education is fundamental to the technological development of any nation. The future therefore depends largely on the performance of students in science but this has consistently been poor in the West African Examinations, the final examinations for senior secondary school students (Aladejana, 2008). For instance, the average performance at credit level in the West African School Certificate Examinations (WASCE) between 2001 and 2005 in Mathematics, Electronics, Biology and Building Construction was 30% credit pass (Owokade, 2006). It becomes therefore very necessary that

more effort should be made to enhance academic performance of students in science. This can be achieved through quality teaching.

Teachers are the main determinants of quality in education especially in a developing nation like Nigeria (Lassa, 2000; Ambasht, 2003 & Jegede, 2003). The National Policy on Education (FRN, 2004) also reported that no education system may rise above the quality of its teachers. It is however worrying to note that many of teachers still clutch to the traditional method of instruction with the teacher acting as repertoire of knowledge and students the dormant recipient. This traditional teacher-centered learning approach often favours passive reception of knowledge. On the other hand interactive technology encourages active learning; hence teaching should no longer center around transfer of content from teacher to student (Aladejana, 2008).

Present day youths get very excited with technology. Technology can therefore be utilised for effective teaching and learning of science especially Biology. Technology has been identified as playing a critical role in curriculum implementation as it has been found that its proper use can enhance teaching and learning (Kulik & Kulik, 1991; Yusuf, 2005 & Mhlolo, 2007). Advocating a total shift to technology-assisted classroom might be unrealistic in most secondary schools in Nigeria. This is as a result of many factors ranging from lack of adequate ICT facilities to staggering power supply. Blended learning can however be a better alternative.

Blended learning can simply refer to combination of different learning techniques. In today's world of e-learning, it is a teaching approach which involves integrating the innovative and technological advances offered by online learning with the interaction and participation offered in the best features of traditional teaching method. It has often been described as a convergence of online and face to face education. Graham (2006) defines blended learning as "the combining of the two different education models, traditional face to face learning and distance learning". Blended learning can also be defined as integrating face to face learning and electronic learning or distance learning, using different learning theories, methodologies and techniques in the same place and supporting the learning with various online technologies during the learning process in the classroom (Rossett, 2002). Throne (2003), on the other hand, defines blended learning as an education model which can integrate e-learning which has improved in parallel new and technologic developments with traditional learning which provides the interaction in classroom.

Secondary school biology curriculum is quite voluminous for meaningful learning to be successfully carried out within the limited time. The ability of computers to present information visually is especially important for the biology course. Well-developed pictures, three-dimensional models,

animations and interactive environments allow easy understanding of the learning objectives. The importance of using the Internet and computers is gradually increasing in biology as a course. Activities carried out during the usual course hour are not sufficiently effective because of time constraints.

With the blended learning model, students are able to carry out multimedia applications which cannot be sufficiently taught during lessons - via the Internet. In addition, ability to see the course content before coming to the class enables students to come to the class prepared for the lesson. Students can discuss important concepts in the Internet environment and establish communication both with their teachers and with other students globally. With the use of the blended learning model in a biology course, students' academic achievement levels and their attitudes are expected to develop. It is therefore the problem of this study to investigate the extent of usage of blended learning teaching approach for biology teaching and learning in secondary schools.

Specifically, this study set out to investigate:

1. The extent of computer/technology literacy for blended learning among secondary school biology teachers and their students.
2. Availability of facilities for blended learning.
3. Extent of utilisation of blended learning approach by biology teachers.

The following Research Questions guided the study:

1. To what extent are biology teachers and students computer/technology literate for blended learning approach?
2. To what extent are facilities for blended learning teaching approach available and accessible for use by biology teachers and students?
3. What is the extent of utilisation of blended learning teaching approach by biology teachers?

## **Method**

The study utilised survey design. Through simple random sampling, 93 secondary school biology students (58 females and 35 males) and 19 biology teachers (11 females and 8 males) from 3 coeducational public secondary schools in Umuahia Education zone of Abia State, served as sample. Questionnaire was the instrument for data collection. A total of 23 item and 19 item close ended modified four-point likert scale questionnaires for teachers and students respectively, were used. The Response modes were Very High Extent (VHE), High Extent (HE), Low Extent (LE) and Very Low Extent (VLE). The data were analysed with mean and Standard Deviation. Mean value above 3.00 is interpreted as 'VHE', 2.50 – 2.99 is HE, 1.50 – 2.49 is LE, while a mean value less than 1.50 is VLE.

## Results

**Table 1:** extent of computer/technology literacy of biology teachers for blended learning

Item	N	Mean	Std. deviation	Remarks
I can operate the computer very well	19	2.95	1.079	<b>HE</b>
I can prepare and present my lessons with PowerPoint	19	2.47	.841	<b>LE</b>
I can browse very well with the computer	19	2.68	.946	<b>HE</b>
I have a functioning e-mail	19	2.53	1.020	<b>HE</b>
I check my e-mails on my own	19	2.32	1.003	<b>LE</b>
I can operate the Interactive Whiteboard(IWB)	19	2.11	.875	<b>LE</b>
I have undergone training on blended learning approach	19	2.26	.933	<b>LE</b>

**Key: VHE= Very High Extent**                      **HE = High Extent**  
**LE = Low Extent**                                      **VLE= Very Low Extent**

Results on Table 1 show that the biology teachers are literate in operating computer very well browse very well and have a functional e-mail to a high extent. The teachers possess literacy for preparing and presenting lessons with PowerPoint, check their e-mails, operate IWB to a low extent.

**Table 2:** Extent of Computer/Technology Literacy of Biology Students for Blended Learning

Item	N	Mean	Std. deviation	Remarks
I can operate the computer very well	93	2.48	.951	<b>LE</b>
I can download information from the internet	93	2.86	1.069	<b>HE</b>
I have a functioning e-mail	93	1.85	1.010	<b>LE</b>
I check my e-mails on my own	93	2.04	1.073	<b>LE</b>

Results on Table 2 show that the Biology students can download information from the internet to a high extent. They can also operate computer, have a functional e-mail and can check their e-mails to allow extent out of the four computer/technology literacy skills noted in the items.

**Table 3:** Biology Teachers' Mean Responses on Extent of Availability and Accessibility of Resources For Blended Learning

Item	N	Mean	Std. deviation	Remarks
I have my own computer with internet access	19	2.95	1.026	<b>HE</b>
My school has regular electricity supply	19	1.84	.898	<b>LE</b>
Even when there is power failure, there is standby generator readily available	19	2.32	1.003	<b>LE</b>

There is a computer laboratory in my school with enough computers to go round students	19	2.00	.816	<b>LE</b>
Teachers and students have regular access to the school computers	19	2.00	.943	<b>LE</b>
My school has adequate internet access	19	1.95	1.026	<b>LE</b>
My school has most of the facilities necessary for blended learning approach	19	2.11	.875	<b>LE</b>
Online biology materials are readily available for my use	19	2.05	.780	<b>LE</b>

Table 3 shows that the facility for blended learning available and accessible to the Biology teachers to a high extent is their personal computer with internet access. Others are only available and accessible to a low extent.

**Table 4:** Biology Students' Mean Responses on Availability of Resources For Blended Learning

<b>Item</b>	<b>N</b>	<b>Mean</b>	<b>Std.deviation</b>	<b>Remarks</b>
I have my own computer with internet access	93	1.71	1.017	<b>LE</b>
My school has Interactive Whiteboard available for biology lessons	93	1.54	.927	<b>LE</b>
My school has regular electricity supply	93	2.01	1.166	<b>LE</b>
Even when there is power failure, there is standby generator readily available	93	2.38	1.285	<b>LE</b>
There is a computer laboratory in my school with enough computers to go round students	93	1.35	.686	<b>LE</b>
Teachers and students have regular access to the school computers	93	1.59	.947	<b>LE</b>
My school has adequate internet access	93	1.44	.758	<b>LE</b>
My school has most of the facilities necessary for blended learning approach	93	2.08	.969	<b>LE</b>
Online biology materials are readily available for my use	93	2.41	1.218	<b>LE</b>

Table 4 shows that the responses of Biology students indicate low extent with regards to items on availability and accessibility of blended learning resources.

**Table 5:** biology teachers’ mean responses on extent of utilisation of blended learning for teaching biology

<b>Item</b>	<b>N</b>	<b>Mean</b>	<b>Std.deviation</b>	<b>Remarks</b>
I utilise blended learning in my biology lessons	19	2.05	1.026	<b>LE</b>
I occasionally take my students to the computer laboratory to learn some biology concepts	19	1.95	.780	<b>LE</b>
In addition to face-to-face, I occasionally prepare lesson activities in line with prepared CD on biology concepts	19	2.21	.976	<b>LE</b>
I give my students assignments involving use of Biology websites	19	2.58	1.017	<b>HE</b>
In addition to teaching with the blackboard, I also teach biology with the interactive whiteboard	19	2.37	.955	<b>LE</b>
I also sometimes prepare my biology lessons on PowerPoint and present in an interactive manner to my students	19	1.89	.809	<b>LE</b>
I sometimes carry out computer based laboratory experiments in biology for students	19	1.89	.809	<b>LE</b>
My biology lessons are very interactive	19	2.37	1.065	<b>LE</b>

Results on Table 5 show that with regards to utilisation of blended learning, Biology teachers only give students assignments involving use of biology websites to a high extent, .

**Table 6:** biology students’ mean responses on extent of utilisation of blended learning by biology teachers

<b>Item</b>	<b>N</b>	<b>Mean</b>	<b>Std.deviation</b>	<b>Remarks</b>
My teacher utilises blended learning approach in my biology lessons	93	2.32	1.095	<b>LE</b>
I occasionally use the computer laboratory to learn some biology concepts	93	1.52	.802	<b>LE</b>
In addition to face-to-face teaching, I also learn biology with ICT tools	93	1.85	1.021	<b>LE</b>
I do biology assignments involving use of Biology websites	93	2.56	1.137	<b>HE</b>
In addition to using the blackboard, the teacher also teaches biology with the interactive whiteboard	93	1.69	.897	<b>LE</b>
I sometimes learn biology lessons, in an interactive manner, with PowerPoint projections	93	2.06	1.159	<b>LE</b>

Results on Table 6 show that with regards to utilisation of blended learning, Biology students affirmed that the biology teachers give students assignments involving use of biology websites to a high extent.

### **Discussion**

Results on Tables 1 and 2 show the mean responses of teachers and students on extent of computer/technology literacy respectively. The teachers agree to being competent in operating and browsing with the computer and having a functional e-mail. The students on the other hand are only able to download information from the internet. Majority of both teachers and students cannot check their e-mails themselves. Most of the teachers can not present lessons with PowerPoint and cannot operate the Interactive Whiteboard. From all indications most of the biology teachers used in this study teach only with the blackboard and do not integrate useful technology in teaching.

Tables 3 and 4 show results of responses of teachers and students on availability and accessibility of resources for blended learning. For the biology teachers, the only resource available for majority of them is their personal computers with internet access. Considering their mean below 2.50, all other resources such as Interactive Whiteboard, well equipped computer laboratory, adequate power supply are not available making the utilisation of blended learning impracticable for both teachers and students. This situation presents a poor preparation of both the biology teachers and their students for global competitiveness in this information age.

Tables 5 and 6 show results of mean responses of teachers and students on extent of utilisation of blended learning for teaching biology. From the results on Table 5, teachers only agree to sometimes giving students assignment involving the use of biology websites. The responses of students as shown on Table 6 also confirms this fact as this is the only item the students agree to. From the results on the two tables, biology teachers used in this study do not utilise blended learning teaching approach in teaching biology. This could be as a result of not being trained in blended learning teaching approach and lack of resources necessary for its utilisation.

### **Conclusion**

The results of this study show clearly that most secondary school teachers are not equipped with resources and knowledge of blended learning. Biology as a course will be made more exciting and more meaningful with blended learning teaching approach. In this information age, it becomes inevitable to utilise technology in educational settings. Students of this age are in love with operating technologies. Most students of this age are internet literate. The internet is rich with educational materials for young learners.

Biology students can have access to useful information not just within the classroom but also in their houses and during the holidays. Students spend a major part of their day fiddling with mobile phones and other technological devices viewing and interacting with frivolities on the net. Utilising blended learning for teaching Biology for instance will ensure that the teacher occupies the student meaningfully both within and outside the classroom. Blended learning offers a way to meet Net Generation student expectations for a more technologically enhanced and pedagogically diverse learning environment.

### **Recommendations**

Based on the results of this study, the following recommendations are made:

- School administrators of secondary schools should organise regular trainings on the use of blended learning teaching approach for secondary school biology teachers
- Computer science in secondary schools should be taught more practically to afford students opportunity to practise with the computer.
- Government should equip computer laboratories in schools with enough computers.
- School administrators of secondary schools should ensure adequate and regular power supply to encourage the use of technologies by biology teachers.
- Government should equip secondary school classrooms with Interactive Whiteboard Technology and organise trainings on its use for teachers.

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