BIOLOGY TEACHERS' AWARENESS AND APPLICATION OF BLENDED LEARNING APPROACH: IMPLICATION FOR ENTREPRENEURSHIP DEVELOPMENT

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Abstract
The study adopted a descriptive survey design to examine biology teachers' awareness and level of application of blended learning approach in classroom instruction. The population consisted of 93 biology teachers which were considered manageable to be the sample because the size was small. The study was conducted in Nsukka Education zone of Enugu State. Four research questions guided the study. Date was collected using a structured questionnaire tagged: Biology Teachers Blended Learning Skills Questionnaire (BTBLSQ). Analysis of data was done using real limit of numbers. The results revealed that: biology teachers used for the study had low level of awareness to blended learning approach, applied blended learning to a low extent in classroom instruction and updating their through in- service training on blended learning were to a low extent. The result also revealed that the extent of challenges encountered by biology teachers in application of blended learning was high. The study recommended that Education Authorities and non- Governmental organizations should take part in providing good condition of service, such as adequate incentive to teachers to enable them afford laptop of their own as poor payment of salaries and other allowances has resulted to teachers' low interest in effecting blended learning in their teaching. Updating the teacher's knowledge is important to equip biology teachers' effectively incorporates blended learning into their teaching.

Keywords: Blended Learning Approach, Biology Teachers, Awareness, Application and Entrepreneurship Development.

Introduction

Blended learning is an approach to education that combines online educational materials and opportunities for interaction online with traditional place-based classroom methods (Wikipedi). These learning methods are about more than adding computers or tablets into a classroom and are about changing the way both teachers and students approach learning. When applied to e- learning, blended learning is again circumstance independent, but usually involves: A portion of the learning occurs online, with the students being able to manage the pace at which they learn (Wikipedia).

Blended learning uses technology to combine in-class and out-of-class learning, maximizing the educational impact for students as a result. Urdan and Weggtens (2000) defined e-learning as the delivery of learning materials, packages or opportunities (i.e. the content) through various forms of electronic media, including the internet, internets, extranets, satellite broadcast, audio-video tape, interactive Television and CD-ROM. A 2008 study, commissioned by the United State (US) Department of Education to explore distance education in the U.S., defined blended learning as a combination of online and in-class instruction with reduced in class seat time for students (Lewis & Parsad, 2008). Using the definition, the study found that 35 percent of higher education institutions offered blended courses, and 12 percent of the 12.2 million documented distance education enrollments were in blended courses.

Although learning outside of the classroom is something that students have always been encouraged to do, the recent explosion in digital technology has meant that teaching can be far more-engaging. Exploring how blended learning is being used inside and outside of today's classrooms, the 2017 New Media Consortium Horizon Report found that blended learning designs were one of the short term forces driving technology adaption in higher education in the next 1-2 years (Adams, Cummins, Davis, Freeman, Hall , & Ananthanary , 2017). Also, blended learning is one of the key issues of teaching and learning in the EDUCAUSE learning initiatives 2017 annual survey of higher education (EDUCAUSE, 2017). EDUCAUSE is a learning initiative for knowledge and career advancement connecting colleagues through online and face-to-face learning using information technology in the classroom.

Technology works best when it supports the true essence of education and aids teachers in helping students assimilate skills. As institutions begin to examine blended learning instruction, there is a growing research interest in exploring the implications for both faculty and students. This modality is creating a community of practice built on a singular and pervasive research question, "how is blended learning impacting the teaching and learning environment?" That question continues to gain traction as investigators study the complexities of how blended learning interacts with cognitive, affective and behavioural components of students behaviour, and examine its transformation potential for the academy. Those issues are so compelling that several volumes have been dedicated to assembling the research on how blended learning can be better understood (Picciano, Dziuban, & Graham, 2014; Picciano & Dizuban, 2007; Bonk & Graham 2007; Kitchenham ,2011; Jean-Francois .2013; Garrison &Vaughan, 2013) and at least one organization, the online learning consortium, sponsored an annual conference solely dedicated to blended learning at all levels of education and training (2004-2015). True blended learning requires highly rational active and inquiry oriented programmers, both online and offline as well as using digital tools to empower students.

Technology is the branch of knowledge that deals with the creation and use of technical means and their interaction with life, society and the environment, drawing upon such subjects as industrial arts, engineering, applied science, and pure science. 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 (Yusuf, 2005; Mhlolo, 2007; Kulik & Kulik, 1991 and Ndirika, 2018). Over the years, technology has revolutionized our world. Technology has created amazing tools and resources, putting useful information at our fingertips. It has changed how we live in and outside of our homes. It has been embraced by people in such a way that it enhanced and become an important part of daily life. In modern technology, we get all source of information in a second. We use technology on a daily basis to accomplish specific task. Technology has also become a great way to improve communication and computation, especially in the business world. Technology has also increased the productivity of almost every industry in the world. Research is simplified enabling students and academics easy access to research writing using tools such as Mendeley, search engines and other electronic resources. Today technology is a significant driver behind change, and sometimes plays an important role in innovations, in educational design and delivery (Olabisi et al. 2006 & Nwagbo, 2017). There are immense possibilities for greater and wider-spread change with the use of present day technological advancement as well as with implementation of innovative educational programmes which lead to entrepreneurship development.

Entrepreneurship development is the process of improving the skills and knowledge of entrepreneurs through various training and classroom programs. The whole point of entrepreneurship development is to increase the number of entrepreneurs. By doing this, the pace at which new business or ventures are made gets better. On a wider level, this makes room for employment and improves the economy of a business or country. Entrepreneurship helps the economy of country grow and creates new jobs. UN Industrial Development Organization (UNIDO, 2019) emphasized that many young people in developing countries lack access to modern education on business development and the use of information and communication technologies (ICTs). This makes it hard for the growing numbers of youth to successfully compete in the job-market and to contribute to their countries economic development (Omole & Ozoji, 2014). Entrepreneurship Curriculum Programme (ECP) introduces practical entrepreneurship curricula at secondary and vocational training institutions, particularly targeting the development of entrepreneurial skills among young people before they enter into the workforce. This is enriched through elements of Information and Communication Technology training combining the basics of entrepreneurship with practical experiences in the use of new technology, and thus preparing young people for key labour market requirements and an increasingly networked information society. Entrepreneurship Education equips students with the additional knowledge, attribute and capabilities required to apply these abilities in the

context of setting up a new venture or business. This is because technology is constantly evolving with changing times due to varying consumer preferences and startups are slowly becoming an excellent example to showcase and promote same (Punet, 2016). As a result, business is no longer just about buying and selling of goods and services, but how technology can be used to assist and expand those services. People can now access any service they desire off the internet. Many businesses which began as startups have become successful after gaining customers mostly through their online presence (Abdullahi, 2018). In this information age, the use of technology in educational system becomes inevitable. Most students of this age are in love with the use of technologies, they are internet literate. Educational materials are stocked in the internet. Biology teachers can have access to useful information not just within the classroom but also in their various homes. Students spend a major part of their day fiddling with mobile phones, laptops and other technological devices, viewing and interacting with frivolities on the internet (Njoku, 2004). In universities, students are contributing more content of their own, both for collaborating with each other, for doing projects and for assessment purposes. "As so much of modern work is now digital, it is increasingly important that students learn how to be digital creators"(Keri Beckingham,2019). The use of blended learning for teaching biology will ensure that the teachers occupy the students meaningfully both within and outside of the classroom. When students show they understand different concepts, they are able to progress to the next idea. Students who are struggling are given more attention and time to catch-up with the class while Students who are exceeding expectations are given new challenges to learn. Secondary school biology curriculum is quite volumininous for meaningful learning to be successfully carried out within a limited time. The ability of modern technology to present information is very important. Activities carried out during, the usual course hour are not sufficiently effective because of time constraints. Involving the use of blended learning approach, students are able to carry out multimedia activities which cannot be sufficiently taught during conventional classroom teaching-learning process. Therefore, this study focuses on Biology teachers' awareness and their level of application of blended learning which is an innovative instructional strategy that could be adopted to improve the teaching and learning of biology at post basic schools.

Awareness refers to knowledge that something exists, or understanding of a situation or subject at the present time based on information or experience (Cambridge English Dictionary). Robinson (2006) pointed out that to raise awareness is to inform and educate people about a topic or issue with the intention of influencing their attitudes, behaviors and beliefs towards the achievement of a defined purpose or the goal. The researchers' belief that biology teachers awareness of blended learning involves creating knowledge, understanding, values, attitudes, skills and abilities towards the issue of innovative instructional delivery for attaining a better

quality education. It is important to understand the level of knowledge possessed by the biology teachers in Nsukka Education zone regarding blended learning approach.

The study also investigated the challenges these biology teachers encounter in utilizing blended learning in classroom instruction.

The blended learning approach is mastery based. It offers a way to meet Net generation student expectation for a more technologically enhanced and pedagogically diverse learning environment. In order to promote an effective teaching and learning of biology in post basic education, there is need for innovative method of teaching. Example of such innovative method of teaching is the use of blended learning to study technology. Students learn best when they are actively engaged and can construct their own knowledge (Laurillard, 2012). Teachers and learners both play roles in this process. It is the teachers' responsibility to lower the barriers for learning by clearly outlining details of the assessments and the sequence of topics and related learning activities and ensuring that the content, learning activities and that assessments are aligned to the learning outcomes (Gleadow, Kadigespy & Handasyde 1993). Blended learning approach helps students to stay engaged with content and changes the approach to learning to focus on all students rather than just the middle of the pack. Troha (2003) suggested that students should be able to perform required tasks online with little or no prompting by the instructor. Of course, teachers should guide their students along, but when a student can accomplish a task online with limited assistance, that student encounters a learning experience that is deeper and more rewarding. Since the intent of blended learning is to enhance learning by combining the best of both worlds- elements of the outline that appear to lend themselves to self-study online should be highlighted. Such elements tend to include easy-to-interpret, straightforward information that is relatively easy for the student to accurately grasp on his or her own. However, many teachers at the post basic schools do not struggle to seek self improvement such as attending conferences, workshops and other professional training. It was against this neglect that this study investigates the effectiveness of in-service training for biology teachers' expertise in application of blended learning approach in Nssuka Education zone of Enugu State. Thus, examining biology teachers' awareness and the application of blended learning approach is paramount.

Statement of the Problem

The world is undergoing rapid change in development due to continuous and accelerated scientific and technological advancement. This rapid development has changed the way people live their lives including processes of knowledge acquisition. The quality of the products of Education depends largely on the quality of classroom interactions between the teacher and the learner. Wasagu (2009) opined that there is need for a transformation in what we teach, how we teach it and the manner in which it is assessed is crucial as the major knowledge and attitude changes.

Maintaining quality and high standard of learning and the nature of the changes caused by Education on the individual are dependent on the quality of teachers and the effectiveness of their teaching in the classroom (Rabi, Yusha'u and Lawal 2019) moreover, teachers must be prepared to face these challenges by modifying their teaching strategies in order to develop in the students creative ability and as well as to have real understanding of the world around them.

Therefore, there is need to determine biology teachers awareness and application of blended learning approach for innovative instructional delivery.

Research Questions

The following research question guided the study:

1. What is the level of awareness of biology teachers on the use of blended learning approach in classroom instruction?
2. What is the extent to which biology teachers apply blended learning approach in classroom instruction?
3. What is the influence of in-service training on Biology teachers' awareness of blended learning for teaching purposes?
4. What is the challenges biology teachers experience in applying blended learning approach in teaching secondary school students?

Research Methodology

Design of the Study

The study adopted a descriptive survey design to examine biology teachers' awareness and application of blended learning approach in teaching their students, and challenges facing them in applying this approach in teaching biology. Descriptive survey research design according to Nworgu (2015), is one in which large or small population is studied by collecting and analysing data from the group through the use of questionnaire or interview for the purpose of generalizing the findings to the population. The design was therefore considered suitable for this study since it solicited information using questionnaire, and findings could be generalized to the population.

Population of the Study

The population of the study comprised 93 biology teachers in the senior secondary schools in Nsukka education zone of Enugu State (Post Primary Schools Management Board 2019).

Sample and Sampling Technique

No sample were drawn, the whole population was used because 93 was a manageable size. After distribution of the instrument, 76 were returned and that became the sample for the study.

Instrument for Data Collection

Data were collected using a structured questionnaire, tagged: "Biology Teachers Blended Learning Skills" (BTBLS). The instrument was organized in four - point Likert type rating scale which sought teachers opinions. The respondents were asked to indicate their level of agreement with items in the questionnaire by ticking one of the options and values were assigned as follows:

Strongly agree (SA) / High extent (HE) /often - 4 points ; Agree (A) / Moderate extent (ME)/ Sometimes – 3 points ; Disagree (D) / Low extent (LE) / Rarely – 2 points and Strongly agree (SD) / Not application (NA) / Never – 1 point **.**With the help of research assistants, copies of questionnaire were distributed and collected on the spot.

Validation of the Instrument

The instrument was presented to specialists in the department of Science Education (Measurement and Evaluation) University of Nigeria Nsukka for validation. The specialists advised the researchers to arrange the items into full fledged questionnaire instrument that is administrable on the teachers to elicit information on their awareness and extent of application of blended learning in the classroom.

Method of Data Analysis

Data for the study was presented in tables and analyzed using real limit of numbers to rate the mean:

0.5 – 1.49 = SD/ NA/ Never
1.5 – 2.49 = D /LE/ rarely
2.5 – 3.49 = A/ME/ sometimes
3.5 – 4.00 = SA/ HE/ often.

Real limit of numbers was considered efficacious in considering the extent of awareness and application of blended learning approach by biology teachers in post basic schools.

Results

Table 1: Mean Responses and Standard Deviation of Biology Teachers' Level of Awareness on Blended Learning Approach

S/N	Items	Mean ($\bar{x}$)	SD	Decision
1	Boot a computer	3.18	1.51	High awareness
2	Operate a computer	3.29	1.42	High awareness
3	Getting information on the internet	3.13	1.57	High awareness
4	Word processing skills	2.66	1.22	High awareness
5	Typing skills	1.71	1.00	Low awareness
6	Access data from computer	2.89	1.28	High awareness

7	Operate overhead projector, CD ROMs and Other electronic devices	2.62	1.21	High awareness
8	Draw a diagram using modern technology	2.08	1.11	Low awareness
9	Present information using PowerPoint	1.61	0.89	Low awareness
10	Interact with others using internet	1.66	1.98	Low awareness
11	Create web pages	2.13	1.08	Low awareness
12	Write a program	1.83	0.97	Low awareness
13	Develop a data base	1.66	0.97	Low awareness
	Cluster mean ($\bar{x}$)	**2.09**		**Low awareness**

Findings in table 1 shows that the mean responses on the items indicated that biology teachers used for the study were aware of booting a computer, operating a computer, able to get information on the internet, have word processing skills, can access data from a computer and are able to operate overhead projector, CD ROMS and other electronic devices to a high extent while their level of awareness of drawing diagram using modern technology, presenting information using power point, interacting with others using internet, creating web pages, developing a data base and writing a programme were to a low extent. Therefore, having the cluster mean of 2.09 indicated that the level of awareness on blended learning approach was low.

Table 2: Mean Responses and Standard Deviation of Biology Teachers on the extent of Application of Blended Learning Approach

S/N	Items	($\bar{x}$)	SD	Decision
1	Booting a computer	2.01	0.76	LE
2	Operating a computer	2.68	1.00	GE
3	Getting information on the internet	2.71	1.01	GE
4	Word processing skills	3.08	1.46	HE
5	Typing skills	3.45	1.59	HE
6	Accessing data from computer	1.74	1.17	NA
7	Operating overhead projector, CD-ROM Video & other electronic devices	1.92	1.07	LE
8	Creating web pages	1.66	1.09	LE
9	Developing a data base	1.49	1.01	NA
10	Writing a program	1.34	0.95	NA
11	Draw diagramme using modern technology	2.18	1.13	LE
12	Presenting information using PowerPoint	1.05	0.49	NA
13	Interacting with others using internet	1.72	0.99	LE

	Cluster Mean ($\bar{x}$)	**2.08**	**LE**

Findings in table 2 shows that biology teachers used for the study were able to boot a computer, create web pages ,draw diagram using modern technology, interact with others using internet, operate overhead projector, CD-ROMs and other electronic devices to a low extent while the teachers were able to operate a computer and get information on the internet to a great extent. The table also shows that these teachers have word processing and typing skills to a higher extent but were not able to: access data from computer, develop a data base and present information using power point. The cluster mean of 2.08 indicated that the biology teachers level of application of blended learning approach were to a low extent.

Table 3: Mean Responses and Standard Deviation of Biology Teachers' In-service Training Attendance on Awareness 0f Blended Learning Approach.

S/N	Items	($\bar{x}$)	SD	Decision
1	Attendance to workshops	1.92	0.82	LE
2	Attendance to seminars	2.09	0.95	LE
3	Attendance to conferences	2.29	0.89	LE
4	Attendance to enlightenment programmes	2.32	0.82	LE
5	Attendance to orientation programmes	2.16	2.52	LE
6	Training for PowerPoint Presentation	2.05	2.34	LE
	Cluster mean ($\bar{x}$)	**2.14**		**LE**

Findings in table 3 shows that the responses of biology teachers' in - service training on blended learning were to a low extent indicating that these teachers do not properly update their knowledge on the use of blended learning which becomes obsolete over time.

Table 4: Mean Responses and Standard Deviation of Challenges Encountered by Biology Teachers in Applying Blended Learning Approach

S/N	Items	($\bar{x}$)	SD	Remark
1	Lack of working facilities	3.05	2.28	HE
2	Unconducive working environment	2.79	1.01	HE
3	Instability in school calendar	3.01	1.09	HE
4	Inadequate instructional materials	2.92	1.07	HE
5	Lack of incentives to teachers	3.45	0.91	HE
	Cluster means ($\bar{x}$)	**3.04**		**HE**

Findings in table 4 shows that the responses on the challenges facing the biology teachers were to a high extent indicating that their schools were not equipped

with working facilities such as computer, regular power supply and internet. The table also shows that the teachers receive poor incentives and deliver their lessons in an unconducive environment. Having a cluster mean of 3.04, indicated that the challenges faced by the biology teachers in applying blended learning approach were to a high extent.

Discussion of the Findings

The findings of the study reveals that biology teachers used for the study were aware of booting a computer, operating a computer, able to information on the internet, having word processing skills, accessing data from a computer, operating overhead projector, CD-ROMs and other electronic devices to a high extent. This was observed as shown in the mean responses of biology teachers' level of awareness on blended learning. The findings also reveals that these teachers levels of awareness of drawing diagrams using modern technology, presenting information using powerpoint, creating web pages, developing a data base and writing a programme were to a low extent indicating that these teachers were not efficiently updated professionally through in-service training. Again, the findings reveals that the biology teachers in applying blended learning in teaching can boot a computer, draw diagrams using modern technology, create web pages, operate overhead projector and CD-ROMs to a high extent but can access data from the computer, develop a data base, present information using PowerPoint to a low extent. The reason may be that these teachers lack the skills or experiences to integrate new technologies in teaching their students. This is in line with Wong, Goh, Hanafi and Osman (2015), the success of integrating technology in classroom practices depends strongly upon the engagement of teachers. It may be that technologies are not frequently used by the teachers which make them inefficient in the use of blended learning.

Furthermore, the findings revealed that high level of challenges faced the teachers in applying blended learning approach in teaching. The reason may be that the schools do not have facilities necessary for easy blended learning application or that the teacher's find the use of blended learning time wasted. Other reasons may be lack of incentives to teachers by the governing bodies. As a result, the teachers' cannot afford to buy laptops of their own which makes them lag behind in applying blended learning to classroom instruction.

Conclusion

Blended learning is a teaching method that combines traditional face-to-face instruction with technology. Its models extend the reach of the instruction beyond the classroom through the use of digital resources. From the findings of the study, a lot of biology teachers consider the issue of blended learning time wasting due to overloaded syllabus and expectation from administrative bodies for clinical supervision on timely coverage of the syllabus. This makes the teachers to stick to the

method they have already devised in order to cover the syllabus. There is need for teachers to adopt innovative methods of teaching that will help improve the attitude and achievement of biology students. The effective application of this innovative method advocated here can help improve the attitude and achievement of biology students.

Moreover, most biology teachers were not adequately motivated by the governing bodies in terms of good remuneration. As a result, they cannot afford to buy laptops of their own. Even when they would like to utilize modern technology in teaching, irregular power supply may not support such technology. This has resulted to many teachers not having interest in effecting blended learning in classroom instruction. In the same vein, advancement in technology has become one of the major contributing factors in expansion and success of many business ventures. Having an online presence can greatly influence the reach of entrepreneurial ventures and help accelerate their growth. Integrating blended learning approach in teaching post basic students will help to expose these students to the basic skills that will enable them to create wealth after schooling: harvesting them from the scratch or cradle.

Recommendations

Despite prevailing challenges in the application of blended learning, biology teachers can still make biology learning meaningful in this era of technological advancement. Based on the findings, the following recommendations were made:

1) Education Authorities and Non-Governmental organizations should take part in providing good condition of service such as: adequate incentive to teachers to enable them afford laptop of their own as poor payment of salaries and other allowances has resulted to many teachers not having interest in effecting blended learning in their teaching. Again, provision of in-service training to update the teachers' knowledge is important to equip biology teachers effectively incorporate blended learning into their teaching.
2) The Education Authority should Provide adequate working facilities, such as steady power supply, and internet facilities in schools to enable the teachers easy access to online information. Irregular power supply may result to many teachers not having interest in effecting blended learning.
3) Biology teachers should make their teaching meaningful by utilizing useful websites such as
   www.biology-resources.com, www.cellbiol.com/edcuation.php, www.nabt.org and https://www.biologycorner.com

   As a result, the biology teachers gather and record information to access how the instructional materials can help in the achievement of set objectives.
4) Biology teachers should understand that innovative teachers strive to get going because times are changing and changing fast. The teachers should not rely on

technologies which are not readily available. Therefore, there is need for integration of technology as a tool in the biology classroom with the overall aim of increasing the effectiveness of teaching and improving students learning.

5) Education Authorities (including school principals, proprietors and proprietresses) should organize workshops and seminars to popularize the use of blended learning approach and acquaint science teachers especially biology teachers on how to use blended learning effectively in schools.

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