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Effect of Blend Space Teaching Package as Tools for Students' Meta-Cognitive Improvement and Retention Abilities in Secondary Schools within Akwa Ibom State.

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ABSTRACT

This study investigated the effect of blendspace teaching Packages as tools for students' meta-cognitive improvement and retention abilities in secondary schools within Akwa Ibom State. Three research hypotheses were formulated to guide the researchers. The study adopted a quasi-experimental research design. A total number of one thousand five hundred and eighty (1580) biology students formed the sample size. The sample size was drawn using stratified simple random sampling technique. Instrument for data collection was biology achievement test (BAT). After treatment using different instructional packages with the different groups, the test was administered and the data generated from the field was analyzed using mean, standard deviation and independent t-test statistical tool at 0.05 significant level. The analysis and the result showed how effective teaching packages for the teaching of waste and its prospect in secondary schools Biology within Akwa Ibom State. It was concluded that there exist a significant difference in the mean scores of students when taught with video and picture blendspace teaching packages. The result of the finding indicated a positive performance among students taught with video blendspace as well as male students performing better than the female counterpart. It was also concluded that students who were taught with video blendspace retained better than its counterpart. Based on the result of the findings, it was recommended among others that teachers should make use of blendspace as such improved students metacognitive performance and retention of biology concepts in secondary schools.

Keywords: Blendspace, Video Blendspace, Picture Blendspace, Biology Students

INTRODUCTION

Background to the study

Science is one of the most valuable area of studies of which in secondary school level it is learnt under Chemistry, Physics ,physical and health education, Biology, Agricultural science and others as school subjects. Due to its contribution toward the solving of environmental problems affecting human life, science occupies a vast and crucial position in the secondary school curriculum. In Nigeria, according to national policies on education, the secondary school science curriculum is designed to prepare students to acquire adequate scientific skills, laboratory and field skills, relevant knowledge which enable them to apply the said scientific knowledge learnt to solve everyday life problems affecting personal, community, health and agricultural sectors among others (FME, 2013).

In all spheres of human endeavors, sciences play an important role in the field of medicine, pharmacy, health education, biology, chemistry, physics, agricultural science, brewery, geology, nursing among others (Institute of Science, 2013). It was on this ground that Maduabum (2009) highlighted some benefits of studying science to include: helping individuals to identify parts of his/her body with their functions; it helps individual for choice of careers and to inculcate in them the scientific skills and attitudes to solve personal and societal problems.

Knowledge gained from studying sciences enable one to question superstitions due to sustained interest arising from comprehension of the cause of events; understanding and appreciating life; bringing into focus the need to maintain good health as such are fundamental to human wellbeing (FME 2013).

Biology as one of the subjects taught at secondary school level deals with the study of life. With this, Biologists are able to study life and different levels of organization from the molecular biology of a cell to evolution of populations as stated by (Craig, 2014). Biologists with their inquisitive attitudes studied and classified various forms of life, from prokaryotic to eukaryotic organisms such as protists, fungi, plants, and animals as it contribute to the biodiversity of an ecosystem, where they play specialized roles in the recycling of nutrients and energy (Pearce, Tupper and Pudritz, 2018)

In Biology curriculum, contents are arranged in other of simple to complex topics. Some of these biology topics can sometimes be difficult to teach or learnt by the teachers or students respectively especially when describing abstract concepts that cannot be fully comprehended at the first time (Chew, 2014). Some of the topics taught in biology that teachers and students perceived as abstract or difficult to teach and learn respectively include genetics , mitosis , meiosis, waste and its prospect, evolution, physiology, and skeletal system (Afang, Enyibio,and Fredy, 2015). Critically, vigorously and rigorously looking at these contents , the best way to teach these topics perceived as being difficult is through the use of students centered approaches such as demonstration strategy, discussion, field trip, cooperative learning, collaborative learning and the use of blendspace teaching packages among others to promote students' metacognitive academic performance and retention in Biology .

In 2017, 2018, 2019, 2020 and 2021, the percentage passes recorded in Biology were: 38.50%, 35.66%, 51.73%, 56.17% and 47.39% respectively while the percentage failure obtained were; 61.50%, 64.34%, 48.27%, 43.83% and 52.61% respectively (WAEC, 2020). Moreover, the report from the chief examiner, WAEC (2020/2021, academic year) indicated poor performance of students in Biology on genetics , mitosis , meiosis, waste and its prospect, evolution, physiology, and skeletal system concepts. Furthermore, the poor performance of students in Biology can be attributed to factors like poor instructional methods, poor teaching aids, insufficient laboratory facilities, large class size and inadequate time allocated for the subject for the subject and poor utilization of digital applications like Blendspace teaching Packages (Aniaku, 2018).

Technologically, the rapid growth of science in the field of education to due to several digital applications like blendspace, simulations and others are made to promote students science process skills (Droui and Hajjami, 2014) .Conceptually, Blendspace is teaching tool that offer educators who wish to create online lessons for their learners an activity-based learning platform.

.Blendspace offers flexible motivated environment for learners to build and execute lessons in their spare time . With the inclusion of blendspace teaching package in the teaching and learning process , educators have the ability to plug-and-play with videos, PDFs, PowerPoints, websites, files, images, text and videos which are placed in an organized, easy-to-follow grid. With the use of video or picture blendspace, lessons are easy to create, share and edit learning packages. Learners can access lessons with a wifi connection (Odysseyware, 2018). According to (Droui and Hajjami, 2014) educators with the use of blendspace can create classrooms, add their students to those spaces and track the progress made by the students . All content for each lesson is collected in one place, in easy-to- follow blocks

According to En.wikipedia.org (2020), some benefits of blendspace or blended learning are;

i) Educators use online elements to create their lesson plans and have developed their own digital resources to develop their lesson with a short time frame..

ii) learners can control their learning atmosphere as they can review the content as they want

iii) it can contain as much as possible content mean for student to lear.

iv) Blendspace encompasses text, images, files and PDFs, all without the requirement to click outside of the platform.

v) It creates critical thinking skills among students and also fosters a constructive approaches, pulling from the know to and unknown concepts for learning

vi) There is no cost for educators to use the Blendspace platform educational resources for the teaching and learning processes.

It was on this notion that Alexander (2010) analyzed the students' academic performance by comparing the blended learning environment and traditional learning environment in Diyarbakir Anatolian High School in 2017-2018 academic year first semester biology courses as two quantitive courses sections have been selected among the classes formed by secondary school senior students. Cluster analysis has been conducted to provide the objectivity when forming the experiment and control groups. The study used 54 participants, 19 males and 8 females for the experiment group and 18 males and 9 females for the control group. The result favoured the blended group of students, and in most cases gender friendly.

James-Inyang and Akpanda (2019) conducted a research on the effect of blended learning on student's academic performance in chemistry among secondary school in Ibesikpo Asutan , Akwa Ibom State. He adopted pretest posttest quasi experimental research design. .A sample size of the study was seven hundred and forty three chemistry students. After treatment giving to the control and experimental group independent t-test was used to analyzed the data collected. The result had it that blended classroom as the experimental group performed better than its counterpart and on gender bases , male students outshined the female in academic performance and retention . It was on the review of this literature that the researcher tends to find out if blendspace teaching Packages could improve students' academic achievement and retention in biology.

Statement of the Problem

Nigeria as a country aiming to become a develop nation pinpoint science as a road map toward such development. Much effort has been put in place to ensure that her educational goals are achieved .with this, many researchers undergo findings to promote the ways and approaches scientific concepts should be taught in secondary schools. Some researchers discovered that environmental factors, family background, teachers' gender, motivation for teachers and students and poor instructional methods and strategies among others contributed a lot toward students poor performance in external examinations like West African Extermination Councils (WAEC) and National Examination council (NECO). It was on this notion that the researcher tends to find out if blendspace teaching package could promote students metacognitive abilities and retention among biology students in secondary schools within Akwa Ibom state, Nigeria .

Purpose of the project

The purpose of the project were to;

1. examine the effect of video-blendspace and picture -blendspace on students' academic achievement in Biology among selected secondary schools in Akwa Ibom State.

2. examine the effect of video-blendspace on male and female students academic achievement in Biology among selected secondary schools in Akwa Ibom State.

3. examine the effect of video-blendspace and picture -blendsapace on students' academic retention in Biology among selected secondary schools in Akwa Ibom State.

Hypotheses of the study

The following hypotheses of the study were stated to guide the research as thus;

1. There is no significant effect of video-blendspace and picture-blendspace teaching package on students' academic achievement in biology among selected secondary schools in Akwa Ibom State.

2. There is no significant effect of video-blendspace teaching package on male and female students academic achievement in biology among selected secondary schools in Akwa Ibom State.

3. There is no significant effect of video-blendspace and picture -blendsapace on students' academic retention in biology among selected secondary schools in Akwa Ibom State.

Research Methodology

Design of the Study

The design of the study is quasi-experimental. Specifically, the study applied non-randomized pre/post-test control group design. Quasi-experimental design was considered appropriate for the study because intact classes were used to avoid disruption of normal class lessons.

Area of the study

The area of the study was Akwa Ibom State. Akwa Ibom is a state in Nigeria. It is located in the coastal southern part of the country, lying between latitudes 4°32′N and 5°33′N, and longitudes 7°25′E and 8°25′E. The state is located in the South-South geopolitical zone, and is bordered on the east by Cross River State, on the west by Rivers State and Abia State, and on the south by the Atlantic Ocean and the southernmost tip of Cross River State. AIt has an area of about 7,081 km 2 (2,734 sq mi) which is ranked 30 of 36.

The Population as at the year 2016 was a Total of 5,450,758 which was ranked 15 of 36 with human density of 770/km 2 (2,000/sq mi) Akwa Ibom is one of Nigeria's 36 states. The state was created on September 23,1987 by Ibrahim Babangida from the former Cross River State and is currently the highest oil- and gas-producing state in the country. The state's capital is Uyo , with over 500,000 inhabitants. Akwa Ibom has an airport and two major seaports on the Atlantic Ocean with a proposed construction of a seaport at Ibaka, Oron. The state also has a 30,000-seat sports complex which is shaped like the Allianz Arena stadium. Akwa Ibom state is also home to the Ibom E-Library , an information centre. In addition to English , the main spoken languages are Ibibio , Annang , Ekid , Oro and Obolo . No central government existed among the people of what is now Akwa Ibom State prior to the British invasion in 1904. Instead, the Annang , Oron, Efik , Ibonos and Ibibio were all autonomous groups. Although several Scottish missionaries arrived in Calabar in 1848, and Ibono in 1887, the British did not firmly establish control of the area until 1904. In that year, the Enyong Division was created encompassing the area of the current state of Akwa Ibom, with headquarters at Ikot Ekpene , an Annang city described by the noted Africanist Kaanan Nair, as the cultural and political capital of Annang and Ibibio. The main occupation of the Akwa Ibomites are civil servant, fishing , politics , farming and trading .

Population of the study

The populations of the study consisted of 5,950 Biology students drawn from the public Secondary Schools in the study area.

Sample and sampling technique

A sample size of one thousand five hundred and eighty Biology students formed the sample of the study. The students were drawn using stratified simple random sampling in order to cover the three senatorial district of the state at equal ratio of students.

Instrumentation

Instrument for data collection was Biology achievement test that contain 20 items multiple choice tests with four options.

Reliability

The reliability of the instrument was calculated using split-half method and Pearson product moment correlation and the reliability coefficient of 0.70 was obtained meaning that the instrument was reliable.

Validation

Content and face validation was achieved using two experts; one from Biology department and the other from test and measurement department.

Research procedure

The achievement test was administered to the Biology students before and after treatment of the experimental group (Video blendspace) and the control group (Picture blendspace). The researcher taught each group for six weeks based on the assigned treatment before posttest. In one week interval after the post test, the researcher gave the same set of students the mixed test item to determine their retentive abilities with respect to the different treatment and groups .

Data Analysis

Method of Data Analysis

The scores obtained from the test were analyzed using ,mean, standard deviation and independent t-test statistical tools

Result Presentation and Discussion of findings

Ho_1 There is no significant mean score difference between students taught with of video

blendspace and picture blendspace teaching package on ' academic achievement in biology

***Table one**: Mean , standard deviation and independent t-test analysis of students' scores taught with video blendspace and picture blendspace teaching package*

Teaching package	**N**	$\bar{x}$	**Sd**	**t-cal**	**t-crit**	**Df**	**Decision**
video blendspace	1000	17. 92	6.23	4.88	1.66	1578	Ho_2 rejected
Picture blendspace	580	13.60	4.23				

The summary of the result in table one above shows that the mean score difference between the two independent groups .Also that the t-calculated value of 4.88 obtained was obtained with the critical value of 1.66. Since the critical value of 1.66 was less than 4.88, The null hypothesis 1 is rejected. Hence, video blendespace promote students' academic achievement in Biology than its counterpart. This result is Inlined with the finding made by James-Inyang and Akpanda (2019)

Ho_2 Thereis no significant effect of video blendspace on male and female Biology students' academic achievement.

***Table two**. Analysis of male and female scores when taught with video blendspace in Biology students' academic achievement.*

***Table two**: Mean , standard deviation and independent t-test analysis of male and female students' scores taught with video blendspace teaching package in biology*

video blendspace	**N**	$\bar{x}$	**Sd**	**t-cal**	**t-crit**	**Df**	**Decision**
Male	198	16. 22	2.22	2.06	1.66	998	Ho_2 rejected
Female	800	13.10	1.67				

The summary of the result in table two above shows that the mean score difference between the two independent groups that is, the male and the female students differs. Also , the calculated t- value of 2.06 obtained was obtained with the critical value of 1.66. Since the calculated t-value of 2.06 was greater than the critical value of 1.66, The null hypothesis 2 is rejected. Hence, video blendespace promote male students' academic achievement in Biology than its female counterpart. This result is not Inlined with the finding made by Alexander (2010).

Ho_3 There is no significant effect of video blendspace and picture blenspace teaching package on students' retention abilities in Biology.

***Table three**: Mean , standard deviation and independent t-test analysis of students' retention scores taught with video blendspace and picture blendspace teaching package*

retention	N	$\bar{x}$	Sd	t-cal	t-crit	Df	Decision
video blendspace	1000	14.34	3.78	2.67	1.66	1578	Ho_2 Rejected
Picture blendspace	580	12.10	1.65				

The summary of the result in table two above shows that the retention mean score difference between the two independent groups .Also that the . t-calculated value of 2.67 was obtained with the critical value of 1.66. Since the critical value of 1.66 was less than 2.67, The null hypothesis 3 is rejected. Hence, video blendespace promote students' retention abilities in Biology than its picture blendspace counterpart. This result is Inlined with the finding made. Zhang and Du (2020)

DISCUSSION OF FINDINGS

Effect of video-blendspace and picture -blendspace on students' academic achievement in Biology among selected secondary schools in Akwa Ibom State.

The difference in the mean achievement scores of students observered when teaching with video blendspace and that of the picture blendspace could be attributed to the fact that video blend space stimulated more than one sense organ that is the the eyes and the ears than the picture blendpace which stimulated only the eye.

Effect of video-blendspace on male and female students academic achievement in Biology among selected secondary schools in Akwa Ibom State.

The difference observed between the performance of male and female learners could be attributed individual differences . it is believe that there are other factors the lead to such outcome between the male and female gender toward their academic achievement of the concept in biology..

Effect of video-blendspace and picture -blendsapace on students' academic retention in Biology among selected secondary schools in Akwa Ibom State.

The difference in the mean achievement scores of students observered when teaching with video blendspace and that of the picture blendspace could be attributed to the fact that video blend space stimulated more than one sense organ that is the the eyes and the ears than the picture blendpace which stimulated only the eye. With this, it is necessary to retain better than the group taught with only picture blendspace which stimulated just the eye.

SUMMARY OF THE FINDING

The study investigated the effect of blendspace teaching Packages as tools for students' meta-cognitive improvement and retention abilities in secondary schools within Akwa Ibom State. Three research hypotheses were formulated to guide the researchers. The study adopted a quasi-experimental research design. A total number of one thousand five hundred and eighty (1580) biology students formed the sample size. The sample size was drawn using stratified simple random sampling technique. Instrument for data collection was biology achievement test (BAT). After treatment using different instructional packages with the different groups, the test was administered and the data generated from the field was analyzed using mean, standard deviation and independent t-test statistical tool at 0.05 significant level. The analysis and the result showed how effective teaching packages for the teaching of waste and its prospect in secondary schools Biology within Akwa Ibom State.

CONCLUSION

From the results obtained in the three tables above, it has a clear mark that video and picture blend space teaching packages promote students' academic performance in Biology. With this , it was concluded that there exist a significant difference in the mean sores of students when taught with video and picture blendspace teaching packages. The result of the finding indicated a positive performance among students taught with video blendspace as well as male students performing better than the female counterpart. It was also concluded that students who were taught with video blendspace retained better than its counterpart.

RECOMMENDATION

Based on the result of the findings , it was recommended among others that teachers should make use of blendspace , that is, video and picture blendspace teaching package in the teaching and learning process. It was suggested that, teachers should create more video blendspace teaching packages to actualize students career choice making and academic goals

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