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**IMO WEB 2.0 TECHNOLOGY AND ACADEMIC PERFORMANCE OF YEAR 2 EDUCATION
STUDENTS IN THE UNIVERSITIES IN SOUTH – SOUTH ZONE OF NIGERIA: THE CASE OF
VIDEO CLIPS**

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ABSTRACT

This paper is titled Imo Web 2.0 Technology and Academic Performance of Year 2 Education Students in the Universities in South – South Zone of Nigeria: The case of Video Clips. It made an attempt to compare instruction using video clips and the face – face method of teaching. Two questions and two hypotheses guided the study. Quazi experimental design was used for the study. The population of the study consist of 1,327-year 2 biology education students in state universities of South-South Zone Nigeria during the 2021/2022 academic session. A total of 489 biology education students were used for the study, 164 students were used for the experimental group and the control group had 162 students in an intact class. They were selected using purposive sampling techniques. ANCOVA statistical analysis was used for testing the hypotheses. The result revealed that there is significant difference in the academic performance of Biology Education students taught using IMO Web 2.0 Technology and those taught using expository learning method. It was recommended that Lecturers should strive to use innovative instructional strategies in teaching Biology as this will help to concretize learning and hence facilitate academic achievement of students.

Key words: Imo Web 2.0 Technology. Year 2 Education Students, Video Clips.

Introduction

The evolution of the Internet has changed the way information is shared, stored and retrieved. The Internet has greatly enhanced man's life; it is the vehicle that drives information. With the internet, man can now send and receive messages virtually and instantaneously via the electronic mail, instant messaging etc. without a postage stamp. Mingle and Adam (2015) mention that in the Internet are a number of web technologies that have emerged which have helped the speed at which information is now retrieved and shared; amongst these technologies is the web 2.0 technology which is making wave as regards communication and information sharing.

The term Web 2.0 is used to describe web applications that are designed to be user centered and to aid the instructiveness of information sharing and collaboration on the World Wide Web which has created the social media platforms that are highly interactive. According to Yun-Jo and William (2010), Web 2.0 is a social revolution that makes it possible for people to participate through open application and services. Social media sites and social networking are examples of Web 2.0 technologies.

IMO, otherwise known as IMO Video Chat and Instant Messenger app (IMO VC and IM App), is a web startup that was founded and funded by ten of the first Google employees (Ba Juyo, 2010). It is a social media (SM) Application designed to help people perform a combination of activities, it is an app built for both computer and mobile platforms, and thus, it is sometimes called a Mobile App. The features of IMO apps are capable of helping students in their learning of biology.

The teaching and learning of biology deals with a lot of graphics (drawing). Students can video laboratory processes like dissections and any form of practical work to be watched later as well as pictures can be taken and shared. The processes of learning biology in our university are supported by the features of IMO IM app if students and lecturers use the app in teaching and learning processes. Students who were absent in class will not miss out as they can get the recorded pictures and videos of the lesson from their colleagues as the app encourages and enhances collaboration among the students, fosters good relationship, increased learning and academic performance of the students in their examinations.

Students can transfer their Web 2.0 skills and knowledge to the context of formal education if the Web 2.0 tools are incorporated in teaching and learning processes in our universities. Popescu, (2010) asserts that high majority of students showed willingness and were enthusiastic towards the large-scale introduction of Web 2.0 tools in their instructional processes. One of the features of IMO app is the ability to post Video Clips.

Video clip is usually a small part or portion of a larger video presentation. It is made up of a series of video frames that run in quick succession producing a very short, animated video which can be used over the web (Russell, 2016). Video clips bring theories to life, they help to clear abstract concepts and promote discussions. The Science Education Resource Centre (2012) explains that learners learn new and abstract concepts more easily if they are presented in both verbal and visual forms. Video clip can be used by teachers in the classroom, they help students to gain attention and also maintain their interest. Students can also reflect on their learning after class lessons (Blog Business fall.com, 2016). Video clips make learning very enjoyable and students can learn anywhere using their mobile devices which can be laptops, tablets, smart and android phones.

The University of Queensland Australia states that the benefits of using video clips for instruction are:

- facilitating with critical thinking and problem solving,
- assisting with mastery learning,
- inspiring and engaging students,
- giving authentic learning opportunities,

- increases Learner Motivations,
- enhances learning experiences,
- helps develop potential for deeper learning of the subject matter,
- develops learner autonomy,
- enhances team work and communication skills and
- ensures the scoring of high marks by students.

The use of video clip and virtual text for instruction is a great and effective combination that aids comprehension. Video clip had been described by Chatterjee et al. (2017) as short extract of longer recording of an instructional program. It is a clip of small section of a larger video presentation. Video clip is a short episode record of compressed digital video selected to create meaningful learning experience for transmission of important motion images over a data network. Such compressed video clips reduce transmission cost. Mangal and Mangal (2014) state that video clips of recorded lessons allow playback for reviewing important aspects of recorded information. It also enhances storage and preservation of important and memorable learning content for continuous learning.

Video clips of instructional programs can be edited at one's convenience and demand for keeping it up-to-date. It promotes technical quality of virtual lesson presentation as well as effective lesson presentation. Kay (2012) opines that video clip of lesson podcasts are more effective in lesson delivery than actual telecasting in terms of their timely and repeated use. He added that video clip of specific learning activities especially during phenomenal learning are captured and stored to promote memory and recall of learning and related events occurred in the natural settings. Short videos of field learning experiences can be placed with short photo text descriptions of the content experiences on the class platform for IMO forum for learners, thus learners can share recorded steps in a biology practical learning and laboratory activities. Short videos enhance lesson understanding as learners watch life experiments and keep the technical know-how preserved in IMO. IMO Web 2.0 instructional strategy allows learners to visually share what is important to them through short compressed videos with their fellow learners as well as to visit daily with live experiences on video. IMO Web 2.0 learners can share Biology Learning experiences through images, short video clips and graphics which make IMO IM App a visual literacy environment (Knibb, 2014). Photographs and other graphics are often used to disseminate lesson contents to IMO learning community.

Research Question

1. What is the difference in the academic performance of Biology education students taught using Imo web 2.0 technology and those taught using lecture teaching method?
2. What is the difference in academic performance of Biology Education students taught using video clips and those taught using lecture teaching method?

Research Hypotheses

HO₁: There is no significant difference in the academic performance of Biology education students taught using Imo web 2.0 technology and those taught using lecture teaching method.

HO₂: There is no significant difference in academic performance of Biology Education students taught using video clip and those taught using lecture teaching method.

Design of the Study

Two groups pre-test post-test Quazi experimental design was used for this study. The structure of the design is as follow:

Q1 x Q2

Q3 C Q4

Where Q1 is the experimental group 1, Q2 is the experimental group 2, X is the treatment and C is control group.

Area of the Study

This study was conducted in South – South geopolitical zone of Nigeria. The South – South zone of Nigeria comprise of six, states namely, Akwa Ibom, Bayelsa, Cross River, Delta, Edo and Rivers.

Population of the Study

The population of the study consist of 1,327-year 2 biology education students in state universities of South-South Zone Nigeria during the 2021/2022 academic session (Course Enrolment files, Head of Department offices of the South-South State Universities 2022). The second-year students were chosen for this work because it is at this level that the course on heredity and cell division is taught as found in the scheme of work for Biology Education. Heredity is studied as BIO 221 in Ignatius Ajuru University of Education Port Harcourt, though the students had studied elementary Heredity as crossbreeding of crops in senior secondary 2 and 3.

Sample and Sampling Techniques

A total of 489 biology education students were used for the study, 164 students were used for the experimental group 1 and 163 students made up experimental group 2 and the control group had 162 students in an intact class. They were selected using purposive sampling techniques. Purposive sampling was used to sample the students because the researcher used only those students who responded to researcher’s invitation to join IMO, while the simple random sampling technique of hat and draw method was used to select three universities from a total of seven universities in the study area. The names of the universities were chosen using the hat and draw method. The researcher picked three from the hat, one after the other, which was used for the study.

61 lecturers were also used for the study. These were sampled using simple random sampling technique. The faculties of education of the seven universities were selected, the biology education departments were then selected which has a total of 321 lecturers from which the biology education lecturers were sampled for the study using the hat and draw method.

Instrumentation

Two researcher developed instruments tagged Biology Education Performance Test (BEPT) and Lecturers Frequency of Utilization of IMO Web 2.0 Questionnaire was used for data collection. The BEPT contained 50 items of 25 items each for the experimental groups with 4 options. While the LUIWQ has 10 items on a 4-point rating scale.

Answering of Research Questions

Mean and Standard Deviation were used for answering the research questions.

Research Question One: What is the difference in the academic performance of Biology education students taught using Imo web 2.0 technology and those taught using expository learning method?

Table 1: Mean and standard deviation of the difference in the academic performance of Biology education students taught using Imo web 2.0 technology and those taught using expository learning method

Instructional Strategy	N	Pre-test		Post-test		Mean Difference
		Mean	SD	Mean	SD	
Imo web 2.0 technology	327	43.16	8.06	70.13	9.46	26.97
Expository	162	43.38	9.16	54.78	11.30	11.40

Source: Researcher's Field data (2022).

The result in Table 1 reveals the pre-test and post-test means of treatment group (those taught with the Imo web 2.0 technology) of 43.16 and 70.13 and their respective standard deviations of 8.06 and 9.46 respectively. The result further shows the pre-test and post-test means of control group (those taught with the expository strategy) of 43.38 and 54.78 and their respective standard deviations of 9.16 and 11.30 respectively with a mean difference of 15.57 between the treatment group and the control group. This difference in mean implies that there is difference in the academic performance of Biology students taught using Imo web 2.0 technology and those taught using expository learning method.

Research Question Two: What is the difference in the academic performance of Biology education students taught using video clip and those taught using expository learning method?

Table 2: Mean and standard deviation of the difference in the academic performance of Biology education students taught using video clip and those taught using expository learning method.

Instructional Strategy	N	Pre-test		Post-test		Mean Difference
		Mean	SD	Mean	SD	
Video clip	164	42.60	8.00	70.60	9.03	28.00
Expository	162	43.38	9.16	54.78	11.30	11.40

Source: Researcher's Field data (2018)

The result in Table 2 reveals the pre-test and post-test means of treatment group 1 (those taught with the video clip) of 42.60 and 70.60 and their respective standard deviations of 8.00 and 9.03 respectively. The result further shows the pre-test and post-test means of control

group (those taught with the expository strategy) of 43.38 and 54.78 and their respective standard deviations of 9.16 and 11.30 respectively with a mean difference of 16.6 between the treatment group 1 and the control group. This difference in mean implies that there is difference in the academic performance of Biology students taught using video clip and those taught using expository learning method.

Testing of Hypotheses

Hypothesis One: There is no significant difference in the academic performance of Biology education students taught using Imo web 2.0 technology and those taught using expository learning method ANCOVA statistical analysis was used for testing this hypothesis, the result of the analysis is presented in Table 3.

Table 3: Result of ANCOVA analysis of the difference in the academic performance of Biology education students taught using Imo web 2.0 technology and those taught using expository learning method

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	27665.59 ^a	2	13832.80	139.30	.000
Intercept	60217.46	1	60217.46	606.40	.000
Pre-test	950.27	1	950.27	9.57	.002
Instructional strategies	26828.98	1	26828.98	270.17	.000
Error	53425.09	538	99.30		
Total	2404409.00	541			
Corrected Total	81090.68	540			

a. R Squared = .341 (Adjusted R Squared = .339)

Source: Researcher’s Field data (2022)

The result in Table 3 reveals that the calculated F value of 270.17 is greater than the critical F value of 3.86 at 1 and 539 degrees of freedom and at .05 level of significance. With this result, the null hypothesis was significant. This implies that there is significant difference in the academic performance of Biology students taught using Imo web 2.0 technology and those taught using expository learning method.

Hypothesis Two: There is no significant difference in the academic performance of Biology education students taught using video clip and those taught using expository learning method. ANCOVA statistical analysis was used for testing this hypothesis, the result of the analysis is presented in Table 4.

Table 4: Result of ANCOVA analysis of the difference in the academic performance of Biology students taught using video clip and those taught using expository learning method

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	20902.556 ^a	2	10451.278	101.259	.000
Intercept	39703.102	1	39703.102	384.672	.000
Pre-test	506.876	1	506.876	4.911	.027
Instructional strategy	20646.316	1	20646.316	200.036	.000
Error	33337.800	323	103.213		
Total	1337572.000	326			
Corrected Total	54240.356	325			

a. R Squared = .385 (Adjusted R Squared = .382)

Source: Researcher's Field data (2018).

The result in Table 4 reveals that the calculated F value of 200.04 is greater than the critical F value of 3.87 at 1 and 324 degrees of freedom and at .05 level of significance. With this result, the null hypothesis was significant. This implies that there is significant difference in the academic performance of Biology students taught using video clip and those taught using expository learning method.

Findings

The findings of the study revealed that:

- i. There is significant difference in the academic performance of Biology students taught using IMO Web 2.0 technology and those taught using expository learning method.
- ii. There is significant difference in the academic performance of Biology students taught using video clip and those taught using expository learning method.

Discussion of Findings

Difference in the Academic Performance of Biology Education Students Taught using IMO Web 2.0 Technology and those taught using Expository Learning Method

The result of the analysis of the difference in the academic performance of Biology Education students taught using IMO Web 2.0 Technology and those taught using expository learning method revealed that there is significant difference in the academic performance of Biology Education students taught using IMO Web 2.0 Technology and those taught using expository learning method. This finding supports the observation of Yan (2014) that students constantly use Web 2.0 Technology for their daily communication and to access information for their personal use as they send SMS and IM text to friends and colleagues, take pictures and post them online every day. Students belong to online communities. They have friends from all over the world. They share information, video, audio, chat and network with the people they met online.

These abilities can be put to use in teaching Biology, other subjects and courses in our universities and can lead to improved academic performance. The result also supports Chimo (2012) who found that there was increased collaboration among the treatment group, increased active participation in interactive lessons that utilized Web 2.0 technologies and in-

depth discussion and research work. The findings further support Sarker (2017) who found that IMO app instructional strategy is strongly impactful on the learning behavior of students that use IMO for academic work.

Difference in the Academic Performance of Biology Students taught using Video Clip and those taught using Expository Learning Method

The result of the analysis of the difference in the academic performance of Biology Education students taught using video clip and those taught using expository learning method revealed that there is significant difference in the academic performance of Biology students taught using video clip and those taught using expository learning method. These findings support the observation of Kay (2012), that video clip of lesson podcasts is more effective in lesson delivery than actual telecasting in terms of their timely and repeated use. The source added that video clip of specific learning activities especially during phenomenal learning are captured and stored to promote memory and recall of learning and related events that occurred in the natural settings.

The findings of the study support that of Ontoy (2012) that integrating video clip in instructional delivery of science has a positive influence on the academic achievement of pupils. The findings contradict Dushane (2013) that stated that students indicated that they enjoyed watching the video but had very low interest in engaging in academic conversation with their peers. The results also did not show a marked increase in student achievement due to the viewing of the video clips coupled with academic conversations.

Summary of the Study

The population of the study consisted of 1,327-year 2 biology education students in State Universities of South-South Zone Nigeria during the 2021/2022 academic session. A sample size of 489 biology Education students was used for the study. They were selected using purposive sampling techniques. A researcher developed instrument tagged "Biology Performance Test (BEPT) on heredity and cell division was used for data collection. Mean and standard deviation were used for answering research questions while analysis of covariance (ANCOVA) was used to test the hypotheses. All hypotheses were tested at .05 level of significance. The result of the analysis revealed that:

- i. There is significant difference in the academic performance of Biology Education students taught using IMO Web 2.0 Technology and those taught using expository learning method.
- ii. There is significant difference in the academic performance of Biology Education students taught using video clip and those taught using expository learning method.

Conclusion

Based on the findings of the study, it was concluded that IMO Web 2.0 Technology do enhance academic performance of Biology Education students in Universities of South-South Nigeria hence should be used in teaching Biology Education students.

Recommendations

Based on the conclusion of the study, the following recommendations were made:

- i. Lecturers should strive to use innovative instructional strategies in teaching Biology as this will help to concretize learning and hence facilitate academic achievement of students.
- ii. Lecturers should be dynamic in their approach to knowledge and skills acquisition and their utilization of resource materials in the teaching process.
- iii. Lecturers should create a friendly, sociable environment and be tactful and patient in the task of facilitating students learning and also to develop positive attitude in them towards the learning of Biology.

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