

## **STUDENTS' VIEWS ON ZOOM INSTRUCTION TECHNOLOGY IN BIOLOGY IN COLLEGES OF EDUCATION IN NASARAWA STATE, NIGERIA: IMPLICATION FOR POST COVID-19 INSTRUCTION**

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### **ABSTRACT**

*This study investigated students' view on zoom instruction technology on the achievement of Biology education students in College of Education Akwanga and Hill College of Education, Gwanje, Akwanga. Four research questions and two hypotheses were developed to guide the study. Descriptive research design was adopted for the study. The population of the study was made up of all Biology Education students in NCE I& II of two Colleges of Education with population of 234 and 110 from the two colleges respectively, totalling 372 students that offer Biology education. Simple random sampling technique was used to select 108 students from the population to respond to the questionnaires. Biology Education Students Zoom Instruction questionnaires (BESZIQ) with 20 items was the instruments used. Cronbach alpha method was used to determine the internal consistency of the instrument that yielded reliability of 0.89. Simple percentage was used to answer the questions while the hypotheses were tested at 0.05 level of significance using independent sample t-test statistics. The result showed that the Biology education students were not sufficiently prepared to use zoom learning platform to learn Biology, there were no sufficient zoom learning facilities available for Biology education students to learn Biology, zoom learning platform was easy and useful to learn Biology and there were more challenges faced in using zoom learning platform to learn Biology. The result further showed that there was no significant difference in the availability of zoom learning facilities and the students' achievement mean scores in Biology education. The following recommendations were made:*

*Firstly government should provide adequate and dependable zoom learning platforms, application software and the necessary technological tools including effective time schedules for students' learning. This will help to promote the teaching and learning in pandemic era. Secondly colleges should have internet connectivity and grant free access to both the lecturers and the students. This will offer a good opportunity in interconnecting all the students and lecturers for zoom learning in the post Covid-19 era.*

**Key words:** *Achievement of biology education students, COVID-19 and Zoom technology.*

### **INTRODUCTION**

COVID-19 pandemic has greatly posed challenges in the teaching and learning process to educationist and the education sector. It has caused social and economic transformation, which the world is still experiencing, that triggered major changes in the educational field that resulted to new ways of learning. All around the world, educational institutions are looking toward online learning platforms to continue with the process of educating students. Biology teaching and learning is not left out of the global pandemic challenges. Online learning strategies need to quickly come into place to complement the face-to-face teaching and learning. Zoom as one of the online learning, has been found to appropriately fit into the sit at home situation. Considering its various advantages, zoom learning modalities encourage student-centered learning and they are easily manageable during lockdown situation.

The outbreak of the COVID-19 forced educationists to switch to organizing classes online. Online instruction is one of the latest teaching/learning media that has developed along with the progress of human civilization. It has become one of the techniques in the learning activities of students through the use of internet tools to network tools on a computer or laptop, phones and other android devices. According to Tamm (2019), online learning is referred to as the acquisition of knowledge which takes place through electronic technologies and media. In other words, it is the type of learning that is enabled electronically. Suardi (2021) opined that online instruction is a learning process that utilizes electronic tool for implementing learning process. The use of electronic media in teaching and learning seems to attract the attention of students thereby, enhancing motivations well as, increase activeness of students in learning activities. In a claim by Bates (2016), online learning is a form of distance education in which a course or programmes is intentionally designed in advance to be delivered fully electronically. Nguyen (2015) asserted that, it has become the largest sector of distance learning in recent years which gives learners the opportunity to learn without their presence in the classroom. Adelina and Brikena (2020), states that, it is a formalized teaching and learning system that is carried out with the help of electronic resources known as E-learning. Cakrawati (2017) opined that e-learning can be carried out irrespective of the geographical location of the individual learner or teacher using computer accessories such as phone/GSM, and laptop with the internet forming its major component. Gilbert (2015) posits that online learning is the type of learning that takes place partially or entirely over the Internet. Arkorful (2014) opines that online learning is the use of new multimedia technologies and the Internet to increase learning quality by easing access to facilities and services as well as distant exchanges and collaboration. One of the new multimedia technologies is the zoom technology.

Zoom is one of the different tools of technology used to carry out online learning. It is a technology that enables representative real-time remote learning which an interactive audio and video program is based on Cloud technology (Kim, 2020; Guzacheva, 2020). According to Adelina and Brikena (2020), zoom combines video conferencing, online meetings and in-conference group, chat info is one easy-to-use tool that is ideal for online class, and group work. The zoom platform is a tool that makes the teaching process easier and gives the opportunity to teachers and learners to expand their knowledge better. Many institutions in different countries use zoom to increase students' motivation and interest for better achievement. Zoom Cloud Meetings, according to Suardi (2021) is an application that is operated via computer and android so that teachers and learners can make the learning process effective and efficient, easy to use anywhere and anytime. It is believed that people are rapidly adapting zoom technologies to facilitate teaching and learning which leads to the widespread popularity of distance learning. Zoom instruction comes as a solution for educational researchers who are constantly trying to develop innovative means to enhance the interactivity of the learning process so as to stimulate students' motivation and engagement in discussions for knowledge exchange, which also lead to developing general medium for learning (Ayoub, 2019). In an assertion by Walker (2020), Zoom is a cloud-based service that offers meetings and webinars allowing content sharing and video conferencing capabilities.

Adelina and Brikena (2020), comparing zoom with other tools such as Viber or WhatsApp, teachers find more difficulties during online teaching because, these tools could not offer the opportunities for teaching as zoom platform would do. Zoom platform allows teachers to present their lesson content in a variety of ways and can give teachers a great opportunity to develop students' intercultural skills by sharing interesting materials such as videos and articles, and presentations (Guzacheva, 2020). On the other hand, Robert and Lewis (2020) revealed that there are disadvantages of using zoom because teachers have difficulties to assess and evaluate learners in an appropriate manner. Some of the learners are not interested in working with zoom or using technology in general because they are shy, and they are not able to perform their knowledge through online teaching and learning. Sometimes Zoom lessons can be hindered by technological

difficulties such as network failure and data availability and Bandwidth. This fact, according to Anderson (2019) is a general drawback of web-based technologies and does not, necessarily, indicate a fault of zoom video communications.

Bandwidth must be sufficient for zoom instruction to be effective. Without sufficient bandwidth, the sound drops in and out, forcing students and instructors to ask each other to repeat themselves. This is a potential problem for students from, or temporarily residing in locations with fewer infrastructures. Other challenges associated with zoom instruction can be summarized as: ZOOM app has limited capacity to accommodate more participants during the teaching and learning process; lack of good network connection; power outages; lack of technological knowledge; high bundle consumption; and lack of devices for online learning such as smart mobile phones, computers, tablets, desktop, and smart televisions.

### **Aim and Objectives of the Study**

The aim of this paper was to investigate students' views on zoom instruction technology on achievement of Biology education students in College of Education Akwanga and Hill College of Education, Gwanje, Akwanga in Nasarawa state. Specifically, this study sought students' views on the:

1. Extent to which Biology education students are prepared to use zoom learning platform to learn Biology.
2. Availability of zoom learning facilities for Biology education students to use in learning Biology.
3. Extent to which Biology education students find zoom learning platform easy and useful to learn Biology.
4. Challenges of using zoom learning platform for Biology instruction.

### **Research Questions**

The following research questions guided the study:

1. To what extent are the Biology education students prepared to use zoom learning platform to learn Biology?
2. To what extent are the facilities for zoom classes available for the Biology education students?
3. To what extent have the Biology education students found zoom learning platform easy and useful to learn Biology?
4. What are the challenges of using zoom learning platform in Biology instruction?

### **Hypotheses**

1. There is no significant difference in the mean scores of the students' preparedness and their achievement mean scores in Biology education.
2. There is no significant difference in the mean scores of the availability of zoom learning facilities and the students' achievement mean scores in Biology.

### **METHOD**

This study adopted the descriptive survey research design. The design involved the use of questionnaire to collect data from the students on the ease, usefulness and availability of zoom facilities for Biology instruction. The population of the study was made up of all Biology Education students in NCE I & II of two Colleges of Education (Nasarawa State College of Education Akwanga with the population of 234 students offering Biology education and Hill College of Education Gwanje with the population of 108 students offering Biology education) all in Nasarawa State, Nigeria. Therefore, the total population was 372. Simple random sampling technique was used to select 75 students from the 234 population and 35 from 108 population, totalling 110 students from the two targeted colleges to respond to the questionnaires. The instrument for data collection was Biology Education Students Zoom Instruction Questionnaires (BESZIQ), made up of two sections, namely,

section A and section B. Section A contained students' personal information while section B contained 20 item structured on four-point scale namely: Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) with 4,3,2, and 1 points assigned to them respectively. The weighting of the responses was computed using the options of; Very High (VH) = 4 points; High (H) = 3 points; Low (L) = 2 points and Very Low (VL) = 1 point. The instrument was face validated by two experts from the department of Measurement and Evaluation and two experts from the department of Science and Technology Education, all from the Faculty of Education, University of Jos. The experts after examining and scrutinizing the instrument, made some corrections which were effected. The instrument were trial tested on ten students of University of Jos who were not in the area of study. The data collected were computed using Cronbach alpha technique. The Cronbach alpha formula that was used to determine the internal consistency of the instrument yielded reliability of 0.89. Hence, the questionnaire was considered suitable for the main study. The duly completed questionnaires were retrieved same day they were administered, thereby ensuring 100% percent return. Data gathered from the administered questionnaires were analyzed using simple percentage to answer the research questions while the hypotheses were tested at 0.05 level of significance using independent sample t-test statistics.

## RESULTS

The results were presented according to the research questions and hypotheses on tables as follows:

### Research Question One:

**Table 1: To what extent are biology education students prepared to use zoom learning platform to learn biology?**

S/N	Items	N	A (%)	D (%)	Decision
1.	I am prepared to continue to study Biology using zoom	108	19 (17.6%)	89 (82.4%)	Disagree
2.	Zoom package is convenient for me	108	31 (28.7%)	77 (71.3%)	Disagree
3.	Zoom package do not have serious demand on my time	108	52 (48.1%)	56 (51.9%)	Disagree
4.	Zoom classes offer me the opportunity of hands-on-experience	108	43 (39.8%)	65 (60.2%)	Disagree
5.	I lack face-to-face interactions with other students when using zoom	108	40 (37.0%)	68 (63.0%)	Disagree
<b>Total Percentage (%)</b>			<b>37 (34.3%)</b>	<b>71 (65.7%)</b>	<b>Disagree</b>

Table 1 above shows the total percentage responses of 71 (65.7%) disagreed that they are prepared while the total percentage responses of 37 (34.3%) agreed. This shows that the Biology education students were not sufficiently prepared to use zoom learning platform to learn Biology.

**Research Question Two:**

**Table 2: To what extent are the facilities for zoom classes available for the Biology education students?**

S/N	Items	N	A (%)	D (%)	Decision
1.	I have enough accessibility to zoom facilities	108	42 (38.9%)	66 (61.1%)	Disagree
2.	Using zoom package for learning Biology is cheaper	108	34 (31.5%)	74 (68.5%)	Disagree
3.	I have phone/laptop that will enable me use zoom platform	108	46 (42.6%)	62 (57.4%)	Disagree
4.	There is steady power supply to charge/power my phones/laptop	108	33 (30.6%)	75 (69.4%)	Disagree
5.	There is free accessibility to the internet networks for zoom classes	108	51 (47.2%)	57 (52.8%)	Disagree
<b>Total Percentage (%)</b>			<b>41.2 (38.1%)</b>	<b>66.8 (61.9%)</b>	<b>Disagree</b>

Table 2 above shows the total percentage responses of 66.8 (61.9%) disagreed that there are no sufficient zoom learning facilities available while the total percentage responses of 41.2 (38.1%) agreed. This shows that there are no sufficient zoom learning facilities available for biology education students to learn Biology.

**Research Question Three:**

**Table 3. To what extent have biology education students found zoom learning platform easy and useful to learn biology?**

S/N	Items	N	A (%)	D (%)	Decision
1.	Using zoom package in learning biology will enable me to complete my course demand more quickly	108	86 (79.6%)	22 (20.4%)	Agree
2.	Zoom package will improve my achievement and productivity	108	69 (63.9%)	39 (36.1%)	Agree
3.	Zoom package will increase the effectiveness and productivity of my teacher	108	68 (63.0%)	40 (37.0%)	Agree
4.	Using zoom package is easy and flexible for me to learn Biology	108	60 (55.6%)	48 (44.4%)	Agree
5.	Using zoom package make me understand Biology better	108	71 (65.7%)	37 (34.3%)	Agree
<b>Total Percentage (%)</b>			<b>70.8 (65.6%)</b>	<b>37.2 (34.4%)</b>	<b>Agree</b>

found zoom learning platform easy and useful to learn biology while the total percentage responses of 37.2 (34.4%) disagreed. This shows that zoom learning platform was found easy and useful to learn biology.

**Research Question Four:****Table 4. What are the challenges of using zoom learning platform in learning Biology?**

S/N	Items	N	A (%)	D (%)	Decision
1.	There is challenge with power supply to charge/power my phones/laptop	108	92 (85.2%)	16 (14.8%)	Agree
2.	My Biology teachers are not trained and competent in zoom operations	108	51(47.2%)	57 (52.8%)	Disagree
3.	There is no free accessibility to the internet networks for zoom classes	108	71(65.7%)	37 (34.3%)	Agree
4.	I usually pay very high cost for my studies using zoom compared to the conventional method	108	94 (87.0%)	14(13.0%)	Agree
5.	Zoom package is not very flexible for learning Biology	108	49 (45.4%)	59 (54.6%)	Disagree
<b>Total Percentage (%)</b>			<b>71.4 (66.1%)</b>	<b>36.6 (33.9%)</b>	<b>Agree</b>

Table 4 shows the total percentage responses of 71.4 (66.1%) agreed that there were more challenges of using zoom learning platform to learn Biology while the total percentage responses of 36.6 (33.9%) disagreed. This shows that there are more challenges faced in using zoom learning platform to learn Biology.

**Hypothesis One:****Table 5. There is no significant difference in the mean scores of the students' zoom learning preparedness and their achievement mean scores in Biology education**

Variation	N	X	SD	DF	t-cal	t-crit	Decision
Students' preparedness	108	3.27	0.83	106	0.48	1.980	Ho <sub>1</sub> Accepted
Students' achievement		3.01	0.69				

The independent sample t-test in this table 5 showed that t-calculated was 0.48 while t-critical was 1.960 at 0.05 level of significance. The t-calculated value of (0.48) is less than the t-critical value (1.980). We, therefore, fail to reject but accept the null hypothesis. Hence, the hypothesis that, state that there is no significant difference in the mean scores of the students' preparedness and their performance mean scores in Biology education was retained.

**Hypothesis Two:****Table 6. There is no significant difference in the mean scores of the availability of zoom learning facilities and the students' achievement mean scores in Biology education**

Variation	N	X	SD	DF	t-cal	t-crit	Decision
Availability of zoom learning facilities	108	3.05	0.72	106	1.09	1.980	Ho <sub>2</sub> Accepted
Students' performance		3.00	0.57				

The independent sample t-test in this table 6 showed that t-calculated was 1.09 while t-critical was 1.960 at 0.05 level of significance. The t-calculated value of (1.09) is less than the t-critical value (1.980). We, therefore, fail to reject but accept the null hypothesis. Hence, retain that hypothesis that there is no significant difference in the mean scores of the availability of zoom learning facilities and the students' performance mean scores in Biology education.

**DISCUSSION OF FINDINGS**

Table 1 shows the total percentage responses of 71 (65.7%) disagree that they are prepared while the total percentage responses of 37 (34.3%) agree. This shows that the Biology education students are not sufficiently prepared to use zoom learning platform to learn Biology. This is in line with the finding by Dhawan (2020) who revealed that students were found to be poorly prepared for several e-learning competencies and academic-type competencies and there is a low-level preparedness among the students concerning the usage of online learning. The researcher further state that students were found to be not sufficiently prepared for balancing their work, family, and social lives with their study lives in an online learning environment. Also, research conducted by Sharadgah and Sa'di (2020) revealed that with regard to preparedness, students were not ready for zoom online learning. Table 2 shows the total percentage responses of 66.8 (61.9%) disagree that there are no sufficient zoom learning facilities available while the total percentage responses of 41.2 (38.1%) agree. This shows that there are no sufficient zoom learning facilities available for Biology education students to learn biology. This confirms the finding by Carey (2020) that most students are faced with the challenges of the availability of zoom learning and other online learning facilities. This is not far fetch from the facts that students from low-income background do not have sufficient facilities to use the online learning platform.

The result of the finding in table 3 showed the total percentage responses of 70.8 (65.6%) agree that Biology education students find zoom learning platform easy and useful to learn Biology while the total percentage responses of 37.2 (34.4%) disagree. This shows that zoom learning platform is easy and useful to learn Biology. This is in agreement with Elise (2020) that teaching and learning with Zoom can be a highly effective tool for learners around the world. Furthermore, in their separate studies, Anderson (2019); Guzacheva (2020); Adelina and Brikena (2020) find out that student reported that zoom learning platform provides easy-to-use video conferencing for the average user and, by doing so, increases inclusivity for those far removed from the instructor. The result of finding in table 4 showed the total percentage responses of 71.4 (66.1%) agreed that there are more challenges of using zoom learning platform to learn biology while the total percentage responses of 36.6 (33.9%) disagreed. This shows that zoom learning platform is easy and useful to learn Biology. This shows that there are more challenges faced in using zoom learning platform to learn Biology. This finding is in conformity with findings of Ifeakor and Anekwe (2013) who found that internet connectivity and granting of access to them were some of the strategies for the improvement of virtual classrooms' learning. Also, Anekwe (2017) posited that all the listed

items like; more computers/laptops, internet connectivity, free accessibility to internet networks and steady power supply were the areas to be improved for effective learning.

Table 5 shows that that t-calculated was 0.48 while t-critical was 1.960 at 0.05 level of significance. The t-calculated value of (0.48) is less than the t-critical value (1.980). Hence, the hypothesis that state that, there is no significant difference in the mean scores of the students' preparedness and their achievement mean scores in Biology education was retained. This finding agrees with Alharbi and Drew (2014) who found that readiness and preparedness of students towards usage of zoom learning was positive and that students' willingness and preparedness to use the zoom learning package in teaching and learning resulted in positive performance. The result in table 6 showed that accept the null hypothesis was accepted also. Hence, it read there is no significant difference in the mean scores of the availability of zoom learning facilities and the students' performance mean scores in biology education. This is in conformity with the finding by Sharadgah and Sa'di (2020) revealed that a higher percentage of the respondents agreed with the usefulness of zoom learning and that availability of zoom learning facilities is valuable in improving and progressing the teaching and learning process.

### **RECOMMENDATIONS**

Based on the findings of this study, the following recommendations were provided:

1. The government should provide adequate and dependable zoom learning platforms, application software and the necessary technological tools including effective time schedules for students' learning. This will help to promote the teaching and learning in pandemic era.
2. The colleges should have internet connectivity and grant free access to their usage by both the lecturers and the students. This will offer a good opportunity in interconnecting all the students and lecturers for zoom learning.
3. Intensive training should be organized for both the students and teachers/lecturers, even the school management in order to implement ZOOM learning appropriately and efficiently.
4. There should be a reduction in cognitive load and increased interactivities during zoom online teaching and learning.

### **CONCLUSION**

In view of the findings of this study, the following conclusions are drawn, that the zoom instruction is one of the online learning technology that has been found to appropriately fit into the educational challenge posed by Covid-19 pandemic. That zoom instruction is appropriate for all levels of education as has the potential to increase effectiveness and productivity of teacher and learners.

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