NIGERIAN ONLINE JOURNAL OF EDUCATIONAL SCIENCES AND TECHNOLOGY
nojest.unilag.edu.ng
nojest@unilag.edu.ng

BIOLOGY EDUCATION STUDENTS' ACCEPTANCE AND PREFERENCE OF ONLINE LEARNING IN NIGERIAN UNIVERSITIES

KAREEM, Adedamola Aderoju
Department of Science and Technology Education
University of Lagos, Nigeria.
damroj14@gmail.com; aakareem.unilag.edu.ng

To cite this article:
Kareem, A., A. (2022). Biology students' acceptance and preference of online learning in Nigerian Universities. *Nigerian Online Journal of Educational Sciences and Technology (NOJEST)*, 4 (1), 91-99

Nigerian Online Journal of Educational Sciences and Technology (NOJEST)
Volume 4, Number 1,2022

BIOLOGY EDUCATION STUDENTS' ACCEPTANCE AND PREFERENCE OF ONLINE LEARNING IN NIGERIAN UNIVERSITIES

Kareem A. A

Article Infor

Article History

Received:
10 November 2021

Accepted:
23 May 2022

Keywords
Online Learning, biology education, students, preference, acceptance

Abstract

The study investigated the biology education students' preference and acceptance of online learning in Nigerian Universities. The study adopted descriptive survey research design. The population for the study was 630, while sample for the study consisted of 412 biology education students randomly selected from 100 to 400 Levels within the Department of Science and Technology Education of University of Lagos. The instrument used for data collection was Online Learning Biology Education Students Questionnaire (OLBEQ) (r = 0.75). The data collected was analysed using descriptive statistics (mean and standard deviation. Findings of the study revealed that most of the participants have previous experiences with online learning and moderate level of Information Technology (IT) skills. In addition, the findings also showed that the biology education students have positive opinion with online learning, accept it, but do not prefer it to face-to-face learning. Based on the findings of the study, it is therefore recommended that biology education students should attend workshops and seminars on online learning. They should also visit internet to aware knowledge on the best way to learn online. These may improve their preference for online learning than fac-to-face.

Introduction

The development of a country in the twenty first century in recent times is characterized with the development of technology. Technology has taken over all sectors. Education is part of this development, especially the classroom. This can be observed in the online classroom or environment which has gained popularity in the teaching of learners and its gradually replacing the physical classroom. The application of online learning environment is reflected at every level of education (primary, secondary, and tertiary).

Online learning offers technology – based instructional environment. It includes instructional environments and approaches. Singh & Thurman (2019) and Dhawan (2020) defined online learning as a type of learning experiences using different devices (such as mobile phones, laptops, etc) with internet access where learners can learn independently from anywhere and interact with instructors and other learners. Online learning is learning with no physical location in which the instructors or facilitators are separated by space. It allows the sharing of learning materials with the learners via the web or internet. Tamm (2020) described online learning as the acquisition of knowledge which takes place through electronic technology and media. Pappas (2015) stated that there are three types of online learning. These are asynchronous, synchronous and hybrid online learning. Asynchronous online learning involves the learners being provided with contents and assignments, then given a time frame to complete the coursework. There is no class meeting time. Interactions in this type of learning take place through blogs, wikis, discussion boards, etc.In synchronous online learning, the lecturer and all the learners interact online simultaneously. The learners could participate in the interactions from a distance in real time. The hybrid online learning is also known as blended. It allows for both online and in-person interactions.

According to Dhull & Sakshi (2017), online learning is made up of a range of technologies such as worldwide wide web, email, chat, new groups and text, audio and video conferencing delivered over computer networks to impact education. In online learning, the instructor act as facilitator rather than transmitter of content knowledge and Information and Communication Technology is regarded as resource that enhances the learning experiences of learners. Learning in this context requires a great deal of resources and careful planning. In online teaching and learning, the individual learners access the learning materials and process the learning experiences.

Gautam (2020) states that online learning offers efficient way to deliver lectures to learners, since learners are allowed to attend lectures at any location instead of being restricted to formal four walls of classroom. Online learning reduces financial costs which learners would have spent on papers, transportation, etc. Hence, it is more affordable, flexible, and convenient. Since online learning can be taken from home or learners' choice of location, there are more chances of learners' attendance of lectures, as such learners' learning could be personalized. However, online learning has some weaknesses. These include the problem of internet connectivity. Consistency and speed of internet is a problem in most locations in Nigeria. This could be a challenge to learners to attend lecture online. In an online learning, there are minimal physical interactions between learners and lecturers. This may encourage sense of isolation of individual learners. Another challenge of online learning is learners' ability to stay focus on the screen throughout the lecture hours without being distracted by social media. It also requires self-discipline on the part of the students to stay motivated and continue to learn online when it is required and not to spend too much time in front of a computer screen which may pose health hazards. However, all these challenges could be taken care of to improve learning online.

Despite the weaknesses of online learning, it has become popular among institutions of higher learning. Its growth has been steadily exponential especially in the post COVID – 19 pandemics. During and after the global lockdown, most higher institutions of learning have embarked on online learning to ensure continuation of learning. In support of this statement, Khan, et al (2021) reported that online learning has gained immense popularity among university students. The University of Lagos, Nigeria is not left out of this move and development in education.
The University organized online learning for students with the establishment of Learning Management System (LMS). This system which is institution based is used to reach the university students by lecturers (facilitators) online. The LMS is used for teaching and learning of students online. The LMS is made up of list of courses students registered for, gives the lecturers and students the opportunity and access to activities and resources such as assignment, attendance, book, chat, external tool, feedback, file, folder, forum, glossary, quiz, URL, Wiki, workshop, etc. The LMS was used for online teaching and learning for all students at all levels in all the Departments in the different Faculties. The biology education students were inclusive.
The biology education students are students in training and being prepared to teach biology at Senior Secondary School. These students are given adequate training through the exposure to various course works which will enable them to teach biology effectively at secondary school.
Biology is the study of life. It is concerned with our connection with the world and interconnectedness with all other life forms. Biology is a science subject which deals with the composition, structure, and properties of matter as well as changes to undergo during chemical reactions in the body. The study of biology gives students opportunities to learn how to make informed decisions about their own health. Based on the importance of learning biology, teachers who will teach the subject need to be adequately trained and prepared. In view of this, biology education program at the University involves integration of many courses from different departments such as Chemistry, Physics,

Mathematics, Botany, Zoology, Cell Biology, Marine Science and Fisheries and Computer science. This gives the biology education students the opportunity to be exposed to different learning experiences/contents and many lecturer/facilitators during online teaching and learning. Therefore, students' opinions on their experience in the exposure to online learning is germane. Their views on its preference and acceptance to face-to-face learning are equally important.

Students' opinion means students' beliefs based on experience from students' time spent on a particular situation. In this study, it is students' beliefs and judgement based on experience with online learning in their different courses. After the biology education students have been exposed to online experience in teaching and learning, it is important that the students make their opinion known. This will provide an opportunity to know students' preference and acceptance or otherwise against face-to-face learning.

Statement of the Problem

In the recent times, online learning has become popular in this technology age. Online learning has become popular at every level of education (i.e from primary to tertiary institution). Its popularity became more relevant in the recent post COVID – 19 pandemics. This was to be able to reach the students despite the lockdown. This made the University of Lagos to officially pronounced and undertook online teaching and learning for the first time. This was done with the establishment of Learning Management System (LMS) where students learn as the lecturers taught through this medium.
However, students' perception about the new method of learning is critical. Biology education at the University is a program in which students are exposed to course works from different departments. The students are exposed to different courses and lecturers who use the LMS to teach the courses. In view of this, the study attempted to investigate biology education students' opinions, preference, and acceptance of online learning.

Objective of the Study

The purpose of this study is to find out biology education students' opinion, preference, and acceptance for online learning and level of Information Technology skills.

Research Questions

1. Do biology education students have perceived previous experience with online learning?
2. How do biology education students describe their perceived Information Technology (IT) skills?
3. What is biology education students' opinion about online learning?
4. What is biology education students' preference for online learning to face to face learning?
5. Do biology education students accept online learning?

Methodology

This study employed descriptive survey design. All biology education students at the University of Lagos which is 630 made up the population for the study.
Table 1:

Biology education students' population based on levels

Level	Population of students	Sample for the students
100	114	88
200	191	106
300	160	127
400	165	99
Total	630	412

As shown in Table 1, the population of biology education students are 114, 191, 160 and 165 for 100, 200, 300 and 400 Levels respectively while the samples randomly selected from all the levels of biology education students were

88, 106, 127 and 99 for 100, 200, 300 and 400 Levels respectively. In all 412 students participated in the study. This is because all the levels were exposed to complete online learning for a whole semester according to the University directive. The students were exposed to total or complete online learning without the traditional face to face learning for a whole semester. Thereafter, the researcher administered the instrument (Biology Education Students' Online Learning Questionnaire - BESOLQ) with reliability value r = 0.75 on the students through their WhatsApp groups platforms for collection of data for the study. The instrument sought for the students' opinion, preference, and acceptance of online learning in biology education program.

Results

The result of the study is presented according to the research questions raised.

Research Question One: Do biology education students have perceived previous experiences with online learning?
Table 2:

Biology Education Students' Perceived Previous Experiences with Online Learning

	Frequency	Percentage	Cum. Percentage
No	120	29.1	29.1
Yes	292	70.9	100.0
Total	412		

Table 2 above revealed that 120 (29.1%) of the participants have no previous knowledge with online learning while 292 (70.1%) have previous knowledge with online learning. It could be concluded that biology education students who have previous experience with online learning before the commencement of the institutions' compulsory online learning are more than those who do not have the experience.

Research Question Two: How was biology education students' perceived Information Technology (IT) Skills described?
Table 3

Description of Biology Education Students' IT Skills

Skill	Frequency	Percentage	Cum. Percentage
Low	41	10.0	10.0
Moderate	321	77.9	87.9
High	50	12.1	100.0
Total	412	100.0	

Table 3 showed that 41 (10.1%) of the participants described the possession of their IT skills as low, 321 (77.9%) participants described their IT skills as moderate while 50 (12.1%) described it as high. From the result it could be concluded that the IT skills of many biology education students is moderate.

Research Question Three: What is biology education students' opinion about online learning?
Table 4

Biology education students' opinion about online learning

S/N	Statement	Mean ($\overline{X}$)	Std. Dev.
1.	There is continuous access to online materials	2.92	.67
2.	Learning opportunity is at students' pace	2.81	.84
3.	Gives ability to stay at home to learn	3.01	.74
4.	There is interaction and inter activity among students	2.14	.81
5.	Students can record a lecture	2.50	.85
6.	All environment is comfortable for online learning	2.60	.83
7.	Interactions with lecturers are reduced	3.18	.69
8.	Internet problems disrupt learning	3.55	.68
9.	The learning condition at home is poor	2.91	.87
10.	Most students do not possess self-discipline required for online learning	3.07	.74
11.	Learning how to teach can easily be explained by the lecturer	2.71	.82
12.	Teaching skills can be acquired with ease	2.42	.76
	Grand Mean	2.82	

Benchmark for decision making is 2.50. When the mean score of an item is less than 2.50, it shows that biology education students are not in agreement with the statement but when mean score is more than 2.50, it indicates that the students agree with the statement.

Table 4 showed that 'there is continuous access to online materials' has a mean score of 2.92, 'learning opportunity is at students' pace' has a mean score of 2.81, 'gives ability to stay at home to learn' has a mean score of 3.01 and 'students have the ability to record a lecture' has a mean score of 2.50. Also, the mean scores for: 'all environment is comfortable for online learning' is 2.60, 'interaction with lecturers are reduced' is 3.18, 'internet problems disrupt learning' is 3.55, 'the learning condition at home is poor' is 2.91, 'most students do not possess self-discipline required for online learning' is 3.07, 'learning how to teach can easily be explained by the lecturer' is 2.71. All the values indicated above are higher than the benchmark of 2.50. The implication is that participants are in agreement with the statements. Meanwhile, the mean score for 'interaction and inter activity among students' is 2.14. This indicates that the participants are not in agreement with the statement.

However, the Table shows a grand mean is 2.82 which is higher than 2.50. This is an indication that the participants generally have a positive opinion about online learning.

Research Question Four: What is biology education students' preference for online learning to face-to-face learning?
Table 5

Biology Education Students' Preference for Online Learning

S/N	Statement	Mean ($\bar{X}$)	Std. Dev.
1.	Ability to master learning contents is more effective online	2.61	.68
2.	Effective teaching of practical activities is preferable online	2.06	.85
3.	Acquisition of practical skills is more effective during online class	2.20	.81
4.	Mastering of learning objectives is preferred in online learning	2.63	.69
5.	Possession of social competence needed for learning is more achieved online.	2.53	.73
	Grand Mean	2.41	

Table 5 revealed that 'ability to master learning contents is more effective online', 'mastering of learning objectives is preferred in online learning' and 'possession of social competence needed for learning is more achieved online' have mean scores of 2.61, 2.63 and 2.53 respectively. The mean scores are higher than the benchmark of 2.50. This implies that the participants agreed to the three statements. But the mean scores for 'effective teaching of practical activities online in class is preferable' and 'acquisition of practical skills is more effective during online classes' are 2.06 and 2.20 respectively. The mean scores are lower than the benchmark of 2.50. The implication of this is that the participants are not in agreement with the statements.
Meanwhile, the grand mean score is 2.41. This indicates that biology education students generally do not prefer online learning to face-to-face learning.

Research Question Five: Do biology education students accept online learning?
Table 6

Biology Education Students Acceptance of Online Learning

S/N	Statement	Mean ($\bar{X}$)	Std. Dev.
1.	With online teaching, students are motivated to learn	2.22	.80
2.	Online learning is interesting to students	2.33	.84
3.	Online teaching and learning are boring	2.82	.83
4.	Online teaching can improve students' achievement	2.40	.80
5.	Most students missed cooperative learning with friends in online learning	3.11	.78
	Grand Mean	2.58	

Table 6 showed that biology education students are not motivated to learn with online teaching (Mean = 2.22), do not agree that online learning is interesting to students (Mean = 2.33) or online teaching can improve students' achievement (Mean = 2.40). The mean scores of the three statements have mean scores less than 2.50 the benchmark, which indicates the participants' disagreement. However, the participants agreed that online teaching and learning is boring (Mean = 2.82), most students missed cooperative learning with friends in online learning (Mean = 3.11). The grand mean which is 2.58 is higher than the benchmark. This is an implication that the participants generally accept online learning.

Discussion

The findings of the study revealed that biology education students have positive opinion about online learning. This result is corroborated by Mamattah (2016) and Almahasees, Mohsen & Amin (2021) who reported that university students have positive and optimistic opinions about online classes. This finding contradicts Olasunkanmi (2020) who found that university students are not in favour of online teaching and learning. The claim was that students did not find fun in learning through uploaded videos and other online channels. Nasution & Ahmad, (2020) also reported students' negative beliefs about online learning which are due to poor internet access difficulty communicating with lecturers
However, it was also found from the result that the participants do not prefer online learning to face-to-face learning. This finding is in tandem with Olasunkanmi (2020) report that university students learn more from face-to-face approach than from online. This is against the findings of Nemetz, Eager & Limpaphayom (2017) who claimed that students show no preference to either online learning or face-to-face learning. This may be because the students are science students whose courses are mainly science courses which involve experiments and practical activities. The participants may prefer to learn practical activities better in face-to-face learning. This is in line with the submission of Kinney, Liu & Thornton (2012) who reported that science and engineering students claimed that theoretical courses can be taught online while teaching of practical are less effective online and should be conducted in the laboratories. But, Khan, et al (2021) study revealed preference of students for online learning.
The result of the findings also showed biology education students acceptance of online learning. This is in accordance with the findings of Teo, et al (2011) and Ngampornchа & Adams (2016) who reported tertiary education students' acceptance for e-learning to be prudent and average. The students' acceptance of online may be due to the students'

perception that online learning platforms are easy to use. Zalat, Hamed & Bolbol, (2021) also confirmed the acceptance of online learning among university students.

Recommendations

Based on the findings of this study, the following are recommended:

1. students should visit internet and engage themselves on how to acquire knowledge on the best way to learn online. These may improve their preference for online learning than fac-to-face.

2. biology education students should attend workshops and get exposed to and acquire necessary skills needed on how to learn both theory and practical biology concepts when they are taught online and learn how to teach at secondary school as well.

References

Almahasees, Z., Mohsen, K & Amin, M. O. (2021). Faculty's and students' perceptions of online Learning during COVID – 19. *Front. Edu*. 6.638470. https://doi.org/10.3389/fedu.2021

Carmi, G. & Bouhnik, D. (2013). *Computer skills and prior experience with e-learning courses as Factors that affect development of intellectual thinking dispositions in online learning* In Multicultural awareness and technology in higher education: Global Perspectives IGI Global. Tomayess Issa, Pedro Issa & Piet Kommers (Ed)

Deshmukh, V., Sufian, F. & Anuradha, J. (2012). The role of E-learning in science education vis-à-vis teacher training institute in Middle East. *US – China Education Review* A. 2. 142 – 148

Dhawan, S. (2020). Online learning: A panacea in the time of COVID -19 crisis. *Journal of Educational Technology Systems*

Harsha, T. S. (2017). Learning science through distance education – a challenge at Katnataka state open university. *The Journal of Distance Education and E-learning*. 5(1).62 -65

Gautam, P. (2020). Advantages and disadvantages of online learning. https://learningindustry.com/advantages-disadvantages-online-learning

Khan, M. A., Virek, Nabi, M. K., Khojah, M. & Tahir, M. (2021). Students' perceptions towards E-learning during COVID – 19 pandemic in India: An Empirical study. *Sustainability 2021*, 3 (57), 1 – 14. https://dx.doi.org/10.3390/su13010057

Kinney, L., Liu, M. & Thornton, M. A. (2012). Faculty and student perceptions of online Learning in engineering education. *Proceedings of the ASEE Annual Conference and Exposition, Conference,* (Washington, DC: American Society for Engineering Education)

Littlefield, J. (2018). The differences between synchronous and asynchronous distance learning. https://www.thoughtco.com/synchronous-distance-learning-asynchronous-distance- learning-1097959

Mamattah, R. S. (2016). Students' perceptions of E-learning. Linkoping University, Department Behavioural Sciences and Learning, Master program, adult learning and global change

Nasution, A, P. & Ahmad, N. Q. (2020). Student perceptions of online learning during the COVID- 19 pandemic. *Jurnal As-Salam* 4(2). 195 – 204. Doi: 10.37249/as-salam.v4i2.219

Nemetz, P. L., Eager, W. M. & Limpaphayom, W. (2017). Comparative effectiveness and Student choice for online and face-to-face classwork. *Journal of Education for Business,* 92(5), 210 – 219. DOI: 10.108008832323.2017.133199

Ngampornchai, A. & Adams, J. (2016). Students' acceptance and readiness for E-learning in Northern Thailand. *International Journal of Educational Technology in Higher Education* 13(34). https://doi.org/10.1186/s41239-016-0034x

Olasunkanmi, I. (2020). Nigerian university students find online learning painful: here's why *the conversations .com*

Pappas, C. (2015). The top elearning statistics and facts for 2015 you need to know http://elearningindustry.com/elearning-statistics-and-facts-for-2015

Singh, V. & Thurman, A. (2019). How many ways can we define online learning? A systematic Literature review of definitions of online learning (1988 – 2018). *American Journal of Distance Education* 33(4), 289 -306

Tamm, S. (2020). What is E-learning? E-students.org/what-is-e-learning.

Teo, T., Luan, W. S., Thammetar, T., & Chaittiwat, W. (2011). Assessing e-learning acceptance University students in Thailand. *Australasian Journal of Educational Technology*, 27(8). 1356 1368

Zalat, M. M., Hamed, M. S. & Bolbol, S. A. (2021). The experiences, challenges and acceptance of e-learning as a tool for teaching during the COVID – 19 pandemic among university medical staff. PLoS ONE 16(3): e0248758.doi:0.1371/journal.pone.0248758