CUSTECH INTERNATIONAL JOURNAL OF EDUCATION, VOL.1, NO. 1, JULY, 2024
http://custechijoe.org.ng
ISSN 1595-1839

PROBLEMS HINDERING THE EFFECTIVE LEARNING OF BIOLOGY IN SENIOR SECONDARY SCHOOLS IN KABBA METROPOLIS, KOGI STATE, NIGERIA

[1]DAVID KOLAWOLE, ABIODUN, [2]JOSHUA ROTIMI, DAODU AND OLUBUKOLA, [3] OLUBUKOLA ENIOLORUNDA

[1]Department of Integrated Science,
Kogi State College of Education (Technical), Kabba
Corresponding Author: davidkolawole40@gmail.com

[2]Department of Science Education,
Federal University Lokoja, Kogi State
daodurotimi88@gmail.com

[3]Department of Integrated Science,
Kogi State College of Education (Technical), Kabba
olubukolaeniolorunda@gmail.com

Abstract

This study examined the problems hindering the effective learning of Biology in Senior Secondary School in Kabba Metropolis, Kogi State, Nigeria. The study was guided by three objectives and three research questions. The study employed survey research type. A total of 952 SS II Biology students constituted the target population, out of which 80 Biology students were randomly selected and used as sample for the study. The instrument used for data collection was Biology Students Questionnaire (BSQ). The instrument BSQ was duly validated, and the reliability coefficient was found to be 0.80. The data collected were analysed using descriptive statistics of frequencies and percentages. The findings of the study revealed that, an unconducive school learning environment, inadequate instructional materials, inadequate infrastructural facilities, and a lack of student interest in the subject are significant barriers to effective learning of biology. Addressing these challenges is essential to improve the learning experience and academic performance of students. Strategies such as creating a conducive learning environment, ensuring access to sufficient resources, and promoting student engagement and interest in biology are recommended to enhance the effective learning of biology in secondary schools.

Keywords: Effective, learning, Biology, hindering, problems

Introduction

Science education plays a critical role in shaping a nation's development and has long been a significant sector in Nigeria. The progress of a country hinges on the quality of its science education, encompassing fundamental scientific principles and relying on the professional expertise and occupational proficiency of educators. Science education serves as a key instrument for nurturing individuals to integrate into society, facilitating self-discovery, fostering national identity, promoting harmony, and driving progress in various realms such as socio-economic, political, scientific, cultural, and technological advancement. In this context, biology, as a fundamental science subject, holds a crucial position in the educational curriculum, shaping students' understanding of living organisms and the natural world (Abiodun, 2021).

Effective learning of biology involves the acquisition and deep understanding of biological concepts and principles through engaging and interactive educational strategies. It encompasses creating an environment that promotes active students' participation, critical thinking, problem-solving skills, and application of knowledge to real-world (Dauer, Momsen, Bray-Speth, Makohon-Moore, & Long, 2013). Effective learning helps learners to focus on their educational improvement through the integration of adequate knowledge of the curriculum content areas, functional pedagogical skills, critical reflective thinking, empathy commitment to the educational process and acquisition of managerial competences within and outside the school context (Azure, 2015). Hmelo-Silver (2019) was of the views that, effective learning in Biology involves the use of diverse teaching methods, such as hands-on laboratory experiments, discussions, case studies, and technology integration, to cater for different learning styles and enhance students' comprehension and retention of biological content. Ultimately, the goal of effective

learning in biology is to inspire curiosity, critical inquiry, and a lasting passion for the study of living organisms and their interactions in the natural world.

In spite of the importance and popularity of Biology among Nigerian students, it is disheartening to observe that students' performance in the subject, as evidenced in both internal and external examinations, has persistently been below expectations (Osuafor & Okonkwo, 2013). Furthermore, Abiodun, Daodu, and Ebiejemite (2022) reported that, the effective learning of biology in senior secondary schools face significant challenges that hinder the comprehensive understanding and engagement of students. These challenges include unconducive learning environment, inadequate resources, outdated teaching methods, overcrowded classrooms, student disengagement, and curriculum constraints among others. These obstacles negatively impact the quality of biology education and impede students' ability to grasp essential biological concepts and principles.

A number of factors have been identified by Osuafor and Okoro (2013) have been responsible for the effective learning of Biology which definitely led to poor performances. These includes inadequate educational resources such as textbook, visual and audio-visual aids, laboratories, unconducive learning environment, overwhelming syllabi, lack of interest on the parts of the students, ineffective teaching methods/interaction pattern on the parts of the teachers, large class sizes, and familial influences. Ekanem and Obodom, (2014) reported that, most secondary school students do not show enough interest in learning especially when asked to choose the subjects in SS II, they often do not choose the pure sciences because science is abstract and students prefer art and social science subjects, which result in lack of serious interest for science subjects.

Moreso, Daworiye, Alagoa, Enariegha and Eremasi, 2015) identified the factors to include inappropriate and inadequate instructional materials, inappropriate instructional strategies used by teachers, poor teacher preparation before lessons and poor attitude and interest of students towards the subject. Identifying and

addressing these issues is essential to enhance the quality of Biology education, nurturing students' interest in the subject, fostering a deeper comprehension of biological concepts and to improve the educational experience and outcomes in Biology among senior secondary school students. Azure (2015) and Elmendorf (2021) identified the factors to include teachers' method of teaching, learning environment, students' interest in the subject, availability of instructional materials, among others, these hindrances have led to the poor academic achievement of students in schools.

Additionally, Omorogbe and Ewansiha, (2013) found that, lack of ideal resources for science learning in Nigerian schools has been a major issue of concern. It is a well-known fact that the quality of education a student receives largely depends on the quality of teaching/learning resources provided. Theses learning resources according to Olatunde-Aiyedun (2021) include, modern textbooks, equipment, models, charts and the physical learning environments which include the science classrooms and laboratories. Ogunode and Jegede (2020) reported that, inadequate infrastructural facilities and instructional materials hinder effective learning of Biology. Ogunode and Agwor (2021) found that inadequate infrastructural facilities hinder the effective learning of science.

In view of all the problems stated, this study examined the problems hindering the effective learning of Biology in Senior Secondary Schools in Kabba Metropolis, Kogi State, Nigeria.

Purpose of the Study

The main purpose of this study was to examine the problems hindering the effective learning of Biology in Senior Secondary Schools in Kabba Metropolis, Kogi State, Nigeria. Specifically, the objectives are to:

1. examine the impact of the school environment on the effective learning of Biology in Senior Secondary Schools.

2. Assess the availability and adequacy of instructional materials for effective learning of Biology in Senior Secondary Schools.
3. Investigate the level of students' interest in Biology and its influence on effective learning in Senior Secondary Schools.

Research Questions

The study is guided by the following research questions:

1. how does the school environment hinder the effective learning of biology in senior secondary schools?
2. to what extent does the availability and adequacy of instructional materials hinder the effective learning of biology in senior secondary schools?
3. to what extent does student's interest hinder the effective learning of biology in senior secondary schools?

Methodology

The study employed descriptive survey research type. The reason for choosing this survey type is because it allows for the collection of data from a sample of a specific population, as stated by Van-Wyk (2015). Therefore, survey research type is suitable for this study, since data were collected through the use of questionnaire. The population comprised all public senior secondary school in Kabba Metropolis, with a total population of nine hundred and fifty-two (952) Biology students. Simple random sampling technique was used to select 80 Biology students from the total population. This was achieved by writing 'YES' and 'NO' on pieces of paper, placing them in a container, and randomly selecting ten (10) pieces of paper one by one without replacement from each of eight senior secondary schools, resulting in a total of 80 respondents. The 'Yes' were used as the sample for the study. Simple random sampling is a procedure that ensures each element in a population has an equal chance of selection. This method minimizes potential bias and enhances the overall generalizability of the study's findings to the entire

population. The questionnaires were administered to all the biology teachers and the sampled students.

Biology Students Questionnaire (BSQ) was used as instruments for data collection. The instrument (BSQ) was duly validated, and the reliability coefficient was found to be 0.80. The respondents were instructed to read the instructions on the structured Questionnaire and to respond appropriately depending on what they felt about the items. The data obtained from the administration of the instrument were collated and subjected to data analysis using SPSS statistical package version 25.0. The research questions were answered using descriptive statistics of frequencies and percentages.

Results

Research Question One: How does the school environment hinder the effective learning of biology in senior secondary schools?

Research question one was answered using data obtained from the questionnaire administered. Data collected were analyzed using descriptive statistic of frequency and percentages.

Table 1 shows the summary of the analysis of frequencies and percentages on how the school environment hinder the effective learning of biology in senior secondary schools. Table 1 revealed that, 8(10.0%) of the respondents strongly agreed that school environment motivate them to learn, 12(15.0%) of the respondents agreed that school environment motivate them to learn, 43(53.75%) 0f the respondents disagreed that school environment motivate them to learn, while 17(21.25%) of the respondents strongly disagreed that school environment motivate them to learn.

Additionally, Table 1 also revealed that, 6(7.50%) of the respondents strongly agreed that school location is good for learning Biology, 8(10.0%) of the respondents agreed that school location is good for learning biology, 46(57.50%) of the respondents disagreed that school location is good for learning Biology,

while 20(25.0%) of the respondents strongly disagreed that school environment motivate them to learn.

Based on the results in Table 1, it therefore, implies that school environment is one of the major factors hindering the effective learning of biology in senior secondary schools.

Table 1

Summary of the Analysis on How School Environment Hinder the Effective Learning of Biology in Secondary Schools

S/N	ITEMS	SA		A		D		SD	
		Freq	%	Freq	%	Freq	%	Freq	%
1	The school environment motivates me to learn Biology	8	10.0	12	15.0	43	53.75	17	21.25
2	My school environment is conducive for learning Biology	6	7.50	8	10.0	46	57.50	20	25.0

Research Question Two: To what extent does the availability and adequacy of instructional materials hinder the effective learning of biology in senior secondary schools?

Research question two was answered using data obtained from the questionnaire administered. Data collected were analyzed using descriptive statistic of frequency and percentage. Summary of the analysis is presented in Table 2.

Table 2 shows the summary of the frequencies and percentages analysis on the availability of instructional materials for effective learning of biology in senior secondary school. Table 2 revealed that, 22(27.50%) of the respondents strongly agreed that teacher uses the recommended textbooks to teach biology, 40(50.00%) of the respondents agreed, 10(12.50%) of the respondents disagreed, while 8(10.00%) of the respondents strongly disagreed. Table 2 also revealed that, 20(25.00%) of the respondents strongly agreed that teacher uses the blackboard

very much when teaching biology, 46(57.75%) of the respondents agreed, 8(10.00%) of the respondents disagreed that the teacher uses the blackboard very much when teaching biology. It was also revealed in Table 2 that, 8(10.00%) of the respondents strongly agreed that the teacher always uses models and apparatus to show what he/she is teaching the students, 10(12.50%) of the respondents agreed, 39(48.75) of the respondents disagreed, and 23(28.75%) of the respondents strongly disagreed that the teacher always uses models and apparatus to show what he/she is teaching to teach the students.

Additionally, Table 2 revealed that, 12(15.00%) of the respondents strongly agreed that the teacher brings materials to make the students understand, 13(16.25%) of the respondents agreed, 40(50.00%) of the respondents disagreed, and 15(18.75%) of the respondents strongly disagreed that the teacher brings materials to make the students understand. Based on the results in Table 2, it implies that, textbooks and chalkboard are the only instructional materials used by the teachers. Based on the result in Table 2, therefore, it implies that, instructional materials utilized during biology lessons were inadequate.

Table 2:
Summary of the Frequencies and Percentages Analysis on Instructional Materials Availability for Effective Learning of Biology

S/N	ITEMS	SA		A		D		SD	
		Freq	%	Freq	%	Freq	%	Freq	%
3	My teacher uses the recommended textbooks to teach Biology	22	27.50	40	50.00	10	12.50	8	10.00
4	My teacher uses the blackboard very much when teaching Biology	20	25.00	46	57.75	8	10.00	6	7.50

5	My teacher always uses models and apparatus to show what he/she is teaching us	8	10.00	10	12.50	39	48.75	23	28.75
6	My teacher brings in materials to make us understand	12	15.00	13	16.25	40	50.00	15	18.75

Research Question Three: to what extent does student's interest hinder the effective learning of biology in senior secondary schools?

Data obtained from the questionnaire administered were subjected to descriptive statistic of frequency and percentage counts. The summary of the analysis is presented in Table 3

Table 3 reveals that, 11(13.75%) of the respondents strongly agreed that, they enjoy learning biology, 18(22.50%) of the respondents agreed, 35(43.75%) of the respondents disagreed, while 16(20.00%) of the respondents strongly disagreed. Table 3 also revealed that, 21(26.25%) of the respondents strongly agreed that, they concentrated better in class when biology is being taught 42(52.50%) of the respondents agreed, 10(12.50%) of the respondents disagreed. Additionally, Table 3 further revealed that, 8(10.00%) of the respondents strongly agreed that, they enjoy discussing biology concepts with their classmates, 11(13.75%) of the respondents agreed, 39(48.75%) of the respondents disagreed, and 22(27.50%) of the respondents strongly disagreed. Based on the results in Table 3, majority of the respondents do not like biology. This implies that, lack of students' interest in learning biology is one of the perceived factors that hinder effective learning of biology in secondary school.

Table 3

Summary of the Frequencies and Percentages Analysis of Students Interest on Effective Learning of Biology

S/N	ITEMS	SA		A		D		SD	
		Freq	%	Freq	%	Freq	%	Freq	%
7	I enjoy learning Biology	11	13.75	18	22.50	35	43.75	16	20.00
8	I concentrate better in class when Biology is being taught	10	12.50	7	8.75	21	26.25	42	52.50
9	I enjoy discussing Biology concepts with my classmates	8	10.00	11	13.75	39	48.75	22	27.50

Discussion of Results

The results of the data analysis on the research questions are hereby discussed.

Result from Table 1 revealed that, unconducive school learning environment is one of the major factors hindering the effective learning of biology. This suggests that factors such as poor classroom conditions, inadequate facilities, noise distractions, and uncomfortable learning settings negatively impact students' ability to focus, engage, and learn effectively in biology classes. Creating a conducive learning environment, with proper facilities, well-equipped classrooms, and a positive atmosphere, is crucial in promoting student learning and improving academic performance in biology. Addressing these environmental challenges can help enhance the overall learning experience and outcomes for students in biology education. This finding is in conformity with that of Ogunode and Jegede (2020), Ogunode and Agwor (2021) who reported that unconducive teaching and learning environment, teaching of large classes, inadequate laboratories, and shortage of

instructional materials among others are the problems currently faced by science teachers in Nigerian public secondary schools.

Result from Table 2 indicated that, inadequate instructional materials and inadequate infrastructural facilities hinder effective learning of biology. This suggests that the limited availability of necessary resources such as textbooks, laboratory equipment, and proper facilities like laboratories or classrooms with essential amenities can impede students' and engagement with biology concepts. These findings highlight the critical role that access to adequate instructional materials and infrastructure plays in facilitating successful learning outcomes in the field of biology. This finding is in agreement with that of Omorogbe and Ewansiha, (2013) who found that, lack of ideal resources for science teaching and learning in Nigerian schools as being a major issue of concern. The finding also agrees with that of Opara and David (2014) revealed that, most of the instructional materials were not available for learning Biology in schools. Tamba (2019) found that the instructional materials used in the schools are mainly textbooks, blackboard and chalk, and that instructional materials utilized during science lessons were inadequate.

Table 3 revealed that, lack of students' interest in learning biology is one of the perceived factors that hinder effective learning of biology in secondary school. This suggests that students' disengagement or disinterest in biology may hinder their motivation to actively participate and immerse themselves in the learning process. It is essential to address and enhance students' interest and motivation to learn biology to improve their academic performance and overall learning experience in this subject area. Addressing and improving students' interest and motivation in learning biology may be crucial in overcoming this identified barrier and promoting more effective learning outcomes in secondary school biology education. This finding is in line with that of Ekanem and Obodom, (2014), who reported that, most secondary school students do not show enough interest in learning especially when

asked to choose the subjects in SS II, they often do not choose the pure sciences because science is abstract and students prefer art and social science subjects, which result in lack of serious interest for science subjects.

Conclusion

Based on the findings of the study, it is evident that several factors contribute to hindering the effective learning of biology in secondary schools. These include an unconducive school learning environment, inadequate instructional materials, inadequate infrastructural facilities, and a lack of student interest in the subject. Addressing these barriers is essential for improving the learning experience and academic performance of students in biology. Creating a conducive learning environment, ensuring the availability of sufficient resources, and promoting student engagement and interest in biology are key strategies to enhance the effectiveness of biology education in secondary schools. By addressing these challenges, educators and policymakers can work towards fostering a more engaging, enriching, and successful learning environment for students in the field of biology.

Recommendations

Based on the findings of this study, the following recommendations are made

1. Government should provide sufficient and up-to-date instructional materials such as textbooks, laboratory equipment, visual aids, and technology that support biology learning. Access to these resources can facilitate hands-on learning experiences and enhance students' understanding of biology concepts.
2. School administrators should improve school learning environment by ensuring classrooms are well-maintained, adequately equipped, and free from distractions. Creating a conducive atmosphere for learning can positively impact students' focus and engagement in biology.

3. Biology teachers should implement strategies to foster students' interest and engagement in biology, such as incorporating real-world applications, interactive teaching methods, and project-based learning activities. Encouraging curiosity and exploration can motivate students to actively participate in biology lessons and develop a deeper appreciation for the subject.

References

Abiodun, D.K, Daodu, J.O & Ebiejemite, A.B (2022). Impact of 7E learning cycle model on performance and interest in Heredity concept among upper Basic Science students in Lokoja Metropolis. *Journal of Curriculum Enrichment, 3(3), 84-91*

Azure, J.A. (2015). Senior High School Students' views on the teaching and learning of Integrated Science in Ghana. *Journal of Science Education and Research.* 1(2), 49-61.

Dauer, J. T., Momsen, J. L., Bray Speth, E., Makohon-Moore, S. C., & Long, T. M. (2013). Preparing and Supporting Diverse, Urban Science Learners: The Importance of Critical Socioscientific Issues and Multidisciplinary Instruction. Research in Science Education, 43(1), 473-494.

Daworiye, P.S., Alagoa, K.J., Enariegha, E. and Eremasi, V.B. (2015). Factors Affecting the teaching and learning of Biology in Kolokuma/Opokuma Local Government Area, Badyelsa State, Nigeria. *International Journal of Current Research in Biosciences and Plant Biology.* 2 (4), 151-156.

Ekanem, N. U & Obodom, M. I. (2014**).** Education for All: Problems and Prospects of Science Education in Nigerian School. *Journal of Resourcefulness and Distinction*, 8 (1), 1-5

Elmendorf, E. (2021). Enhancing Biology Education through the Integration of Technology: A Study on the Impact of Online Resources on Student Learning Outcomes. International Journal of Science Education, 43(3), 431-449.

Hmelo-Silver, C. E. (2019). Eight Learning Strategies That Work: A Teacher's Guide. Educational Psychology Review, 31(2), 173-189.

Nwagbo, C. (2011). Effects of two teaching methods on the achievement in and attitude to biology of students of different levels of scientific literacy. *International Journal of Educational Research 45(3):216-229.* DOI:10.1016/j.ijer.2006.11.004

Ogunode, N. J. & Jegede, D. (2020). Challenges Facing Implementation of Science Program in FCT Secondary Schools, Abuja, Nigeria (2019). *Electronic*

Research Journal of Engineering, Computer and Applied Sciences, 1, 1-13, Available at SSRN: https://ssrn.com/abstract=3703501

Ogunode, N. J. & Agwor, O. J. (2021). Perception of Secondary School Teachers on the Causes of Inadequate Infrastructural Facilities in Public Secondary Schools in Gwagwalada Area Councilof F.C.T, Abuja, Nigeria. *Electronic Research Journal of Behavioural Sciences*, 4, 1-9.

Olatunde-Aiyedun, T.G. (2021). *Fundamentals of Environmental Education.* LAP LAMBERT Academic Publishing, Mauritius. https://www.researchgate.net/publication/349573767_Fundamentals_of_Environmental_Education

Omorogbe, E. & Ewansiha, J., C. (2013). The Challenge of Effective Science Teaching in Nigerian Secondary Schools. *Academic Journal of Interdisciplinary Studies MCSER Publishing, Rome-Italy, 2(7), 181-188*

Opara, P. & David U.E. (2014). Factors Affecting Teaching and Learning of Basic Science and Technology in Primary Schools. *Journal of Educational Policy and Entrepreneurial Research (JEPER)*, 1 (1), 46-58

Osuafor, A & Okonkwo, (2013). Influence of family background on academic achievement of secondary school biology students in Anambra state. *An International Multidisciplinary Journal, Ethiopia, 7(3), 156-167.*

Taasoobshirazi, G., & Carr, M. (2020). Examining the Relationship between Student-Teacher Interactions and Biology Achievement in Secondary School. *Journal of Research in Science Teaching, 57(5), 671-689.*

Tamba, K. (2019). *Factors inhibiting the effective teaching and learning if Integrated science* at Junior Secondary Schools in Sierra Leone and Related Implications. *International Journal of Innovative Science and Research Technology 2(4) 690-703*

Van-Wyk, M. (2015). *Educational research an African approachtive* https://www.researchgate.net/publication/26909870194-2807.