

**THE AVAILABILITY AND THE USE OF INSTRUCTIONAL MATERIALS IN
TEACHING BIOLOGY IN PUBLIC SECONDARY SCHOOLS IN OREDO LOCAL
GOVERNMENT AREA**

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FACULTY OF EDUCATION,
UNIVERSITY OF BENIN,
BENIN CITY, NIGERIA**

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**A PROJECT SUBMITTED TO THE DEPARTMENT OF CURRICULUM AND
INSTRUCTIONAL TECHNOLOGY, FACULTY OF EDUCATION, UNIVERSITY
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ON THE AWARD OF THE BACHELOR OF SCIENCE EDUCATION (B.Sc.Ed)
DEGREE IN BIOLOGY**

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CERTIFICATION

We, the undersigned, certify that the research work was carried out by Jemilatu MOHAMMED in the Department of Curriculum and Instructional Technology, Faculty of Education, University of Benin, in partial fulfillment of the requirement on the award of the Bachelor of science Education Degree(B.Sc. Ed) in Biology.

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DEDICATION

This Research work is dedicated to God Almighty for his grace, wisdom, and strength throughout the period of study. It is also dedicated to my beloved parents Mr and Mrs Mohammed for their unwavering support, encouragement, and prayers throughout this academic journey.

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ABSTRACT

The availability and use of instructional materials are essential for improving the teaching and learning of Biology in secondary schools. This study investigated the availability and use of instructional materials in teaching Biology in public secondary schools in Oredo Local Government Area of Edo State. The research examined the extent to which instructional materials are available, the types of instructional materials that are available, the challenges affecting their effective use and how it affects students' academic performance.

A descriptive survey design was adopted, and data were collected from forty (40) Biology teachers using a structured questionnaire. The data obtained were analyzed using frequency counts and percentages. The results revealed that although some instructional materials such as charts, models, and specimens were available, many vital materials including laboratory equipment and audiovisual aids were inadequate. Findings also showed that teachers use available instructional materials moderately due to factors such as lack of funds, poor maintenance, lack of trained teachers and overcrowded classrooms.

The study concludes that instructional materials greatly enhance effective teaching and learning of Biology, but their inadequate availability and inconsistent use limit students' understanding of biological concepts. It recommends that the government and school administrators should provide adequate instructional materials, train teachers on their

effective use, and ensure regular supervision to promote improved Biology teaching and learning outcomes.

CHAPTER ONE

INTRODUCTION

Background to the Study

Science is a systematic way of learning about the natural world through observation and experimentation, aiming to understand how and why things work. It is a systematic discipline that builds and organizes knowledge in the form of testable hypotheses and predictions about the universe. According to Wikipedia, Modern science is typically divided into three major branches: the natural sciences, the social sciences and the Applied sciences. Natural science studies the physical world and it includes physics, chemistry and biology. The social sciences study individuals and societies e.g. economics, psychology, and sociology, while Applied sciences are disciplines that use scientific knowledge for practical purposes which includes engineering and medicine. In the context of education, science not only equips students with the knowledge of how the world works but also develops their critical thinking, problem-solving, and analytical skills. It fosters curiosity and encourages inquiry, which are essential for the intellectual development of students.

Biology, as a branch of science, plays a crucial role in helping students understand the structure and functioning of living organisms and their interactions with the environment. According to Wikipedia, Biology is the natural science that studies life and living organisms,

encompassing their structure, function, growth, evolution, and distribution. Solomon, Breg, and Martin(2019) also define Biology as a scientific discipline that studies life in its many forms and phenomena. Biology education is crucial in shaping students' understanding of life processes and their impact on the environment, preparing them for future careers in medicine, research, environmental conservation, and more. It is a tool for developing students' critical thinking and problem-solving abilities. It encourages inquiry and fosters an understanding of the natural world by connecting scientific concepts to students' everyday lives. A key goal of Biology education is to help students appreciate the interdependence of living organisms and the importance of biodiversity for sustaining life on Earth (Bishop and Denley, 2016). The teaching of Biology also equips students with the knowledge needed to address contemporary global challenges, such as climate change, diseases, and conservation efforts. Biology education also prepares students to make informed decisions that can positively affect their communities and the world at large. In secondary schools, effective teaching of Biology does not involve only the knowledge based on the teachers alone but requires the use of relevant teaching materials in order to make the subject interesting and easy to understand. Instructional materials are educational materials used by teachers to support the delivery of lessons and to make learning experience more effective, engaging and meaningful to students (Egbule 2018). Khalid and Hussain, (2023)also defined Instructional materials as "all the resources, both tangible and digital, that are deliberately used by teachers to facilitate students' learning and understanding of subject content" This includes charts, laboratory

equipment, updated textbooks etc. This tool helps to enhance teaching and learning and not only that it helps to enhance understanding and retention, stimulates interest and motivation and encourages active participation of the learners.

In most public schools, instructional materials are not always available or are not frequently used. Many public schools lack up-to-date textbooks, laboratory equipment, focusing on the theoretical aspects of Biology lessons neglecting the practical aspects. In some cases, when the materials are available, the teacher may not effectively use them due to the time allocated to the lesson, large class sizes, lack of professional training and poor management skills. Lack of effective use of instructional materials may lead to a teacher-centered approach of teaching thereby making the Biology lessons boring and difficult for the student to understand which may result in poor academic performance or achievement of the students. Instructional materials also play a vital role in shaping how well students perform academically, especially in subjects like Biology. When these materials are readily available and effectively used during teaching, they make difficult topics easier to understand and help students retain information better. However, when such resources are missing or poorly applied, students may struggle to grasp key ideas, which often leads to lower academic achievement.

This study, therefore, seeks to investigate the availability and the use of instructional materials in public secondary schools in Oredo Local Government Area. It will also find out

what types of instructional materials are in use, how often teachers use them, and the problems they face when using them.

Statement of the Problem

Instructional materials is a vital tools or instruments for effective teaching of Biology. In an effective Biology learning environment, instructional materials like charts, laboratory equipment are supposed to be readily available in schools and properly utilized by teachers to enhance students' understanding of the subject. Despite the recognized importance of teaching materials, many public schools most especially in Nigeria face significant challenges in utilization of the resources effectively. In public schools, teachers base on markerboard and teacher-centered methods only, neglecting the practical aspect, making the students lose interest in the subject and also have difficulty in understanding the subject. Research has shown that public schools often lack sufficient materials, and even when materials are available, they are not regularly used by teachers due to lack of training, large class sizes, poor infrastructure, lack of funding by the government which hinders effective teaching and learning. (Isma'il and Lukman, 2022). The lack of availability and poor use of instructional materials has led to multiple negatives consequences which led to lack of understanding of the core subject, making the Biology lesson less interesting there by leading to poor performance of the students. Various efforts have been undertaken to tackle the challenges related to the availability and use of instructional materials. Government policies have been

revised to prioritize hands-on, activity-based learning and to encourage the use of relevant teaching aids. In some areas, professional development workshops have been held to enhance science teachers' skills in utilizing instructional tools (Khalid and Hussain, 2023). Organizations like UNESCO and National Agencies for Science Education have supported schools by providing laboratory equipment and encouraging the integration of digital learning tools into teaching (Adeyemi and Udo, 2023). Despite this effort the problem still persists, especially in public secondary schools in Oredo Local Government Area. This study, therefore, seeks to investigate the availability and the use of instructional materials in public secondary schools in Oredo Local Government Area, how they are effectively used, and what challenges teachers and students face in using them for Biology instruction.

Research Questions

The following questions were raised for the study:

1. To what extent are instructional materials used by Biology teachers in public secondary schools in Oredo Local Government Area?
2. What types of instructional materials are available to teachers for teaching Biology in public secondary schools in Oredo Local Government Area?
3. What challenges do Biology teachers face in accessing and using instructional materials in public secondary schools in Oredo Local Government Area?

4. To what extent does the availability and use of instructional materials affect students academic performances in Biology?

Purpose of Study

The purpose of this study is to investigate the availability and the use of instructional materials in teaching Biology in public secondary schools in Oredo Local Government Area.

Specifically, the study intends to:

1. Find out the extent instructional materials are used by teachers in public secondary schools in Oredo Local Government Area.
2. Identify the types of instructional materials available in public secondary schools in Oredo Local Government Area.
3. Identify the challenges faced by teachers in using instructional materials in Oredo Local Government Area.
4. Find out to what extent does the availability and the use of instructional materials affect the student's academic performance in Biology in Oredo Local Government Area.

Significance of the Study

The findings of this study will provide significant benefits to students, teachers, school administrators, curriculum planners and Educational researchers.

The findings of this study will help the students improve their understanding and interest in biology and also boost their academic performance. It also helps the teacher to become more aware of the importance of teaching materials and also helps them improve their teaching by incorporating the available material effectively.

The findings of this study will help to guide the school administrators on what types of materials are most needed and effective in teaching biology and also help them to prioritize budget and resources allocated to teaching materials.

The findings of the study help curriculum planners gain an insight to the current state of teaching materials in schools. The findings can influence decisions about curriculum development and teacher training programs.

Lastly, The Findings of this study will help educational researchers, serve as a reference for further research on instructional materials and biology teaching and contribute to the body of knowledge in the field of science education.

Scope and Delimitation of the Study

The study is focused on the investigation of the availability and the use of instructional materials in public secondary schools in Oredo Local Government Area. The study is delimited to public secondary school teachers in Oredo Local Government Area.

Definition of Terms

The following terms were operationally defined:

- **Teaching material:** These are tools, instruments, resources used by the teachers that help to facilitate teaching and learning processes.
- **Availability:** This means the extent to which something is sufficient and accessible for use
- **Public secondary schools:** These are schools that are funded by the government.
- **Teacher centered method:** Teacher-centered method is an instructional approach in which the teacher plays the central and active role in delivering content, while students are passive recipients of knowledge.
- **Utilization:** Utilization refers to the act of making practical and effective use of something for a specific purpose.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter reviews literature as it relates to the study. The review of related literature will be presented under the following subheadings:

- Theoretical Framework
- Concept of Biology
- Concept of Instructional Materials
- Types and uses of instructional materials
- Importance of instructional materials
- Challenges teachers face in using instructional materials
- Possible Solutions to the Challenges Faced by Biology Teachers in the Use of Instructional Materials.
- Summary of reviewed literature.

Theoretical Framework

Bruner's Constructivist Theory of Learning (1960)

Jerome Bruner, a cognitive psychologist, proposed that learning is an active process in which learners construct new ideas or concepts based on their current and past knowledge. He emphasized the importance of structure in learning and the role of teaching materials in helping students grasp complex concepts. Bruner identified three key modes of representation that are important in the learning process. They are:

Enactive representation (Action based): This is Learning through physical activity or manipulation.

Iconic representation (Image based): This is Learning through visual and pictorial means.

Symbolic representation (Language based): This is learning through symbols, formulas, and language.

In relation to Biology teaching, instructional materials such as models, charts, videos, specimens, and interactive digital tools help learners move through these three stages effectively. For instance;

In the Enactive stage Specimens, models and conducting Experiments help students in allowing hands-on exploration. If materials like microscopes, plant/animal samples, or lab

apparatus are lacking, students cannot interact physically with the content. This leads to shallow learning and reduced engagement.

Charts, diagrams, and videos support the iconic stage, where students visualize abstract biological processes like photosynthesis or digestion. Without visual materials such as diagrams, charts, videos, or animations, students may struggle to develop clear mental images of complex Biology concepts like cellular respiration or ecological system which leads the students to cramming the concepts without clear understanding.

Textbooks and written instructions assist in the symbolic stage, reinforcing the concepts through formal language and terminology. While symbolic representation involves language and abstract thinking, it must be supported by prior hands-on and visual experiences. When these are absent, students struggle to understand abstract biological terms or processes described in textbooks, leading to cognitive overload and poor academic performance.

By using appropriate instructional materials that align with Bruner's stages of representation, Biology teachers can simplify complex scientific concepts, enhance retention, and support meaningful understanding.

Concept of Biology

Biology is the scientific study of life and living organisms. It aims to understand the structure, function, development, origin, evolution, and distribution of life forms on Earth (Eldra Pearl

Solomon, Charles Martin, and Diana Martin, 2020).According to Wikipedia, Biology is the natural science that studies life and living organisms, encompassing their structure, function, growth, evolution, and distribution. Studying Biology is essential because it provides insight into how living things operate and how they interact with one another and their surroundings.Biology is an interdisciplinary science that integrates knowledge from related sciences such as chemistry, physics, and mathematics to explain the mechanisms of life. It promotes scientific inquiry by encouraging observation, experimentation, and evidence-based reasoning (Jean B. Reece, Lisa A. Urry, Michael L. Cain, Steven A. Wasserman, Peter V. Minorsky, & Robert B. Jackson, 2020).Biology plays a vital role in enhancing our understanding of life and improving the quality of human existence. It provides explanations for the structure, function, behavior, and interactions of living organisms, thereby contributing to advances in health, agriculture, environmental conservation, and industry (Eldra Pearl Solomon, Charles Martin, and Diana Martin, 2020).In the medical field, Biology has played a crucial role in the development of antibiotics, vaccines, and diagnostic tools, as well as in deepening our understanding of diseases at both the genetic and molecular levels. It serves as the foundational science for disciplines like genetics, immunology, microbiology, and pharmacology, all of which are vital for the prevention and treatment of illnesses. Similarly, in agriculture, Biological knowledge is applied to boost crop productivity, create pest-resistant plant species, and improve livestock management. Practices such as genetic

modification, selective breeding, and biotechnology are all grounded in biological principles and support efforts to achieve food security globally.

Teaching Biology at the secondary school level plays a significant role in shaping students' academic development and scientific understanding. It helps students explore the principles of life, understand the interdependence between organisms and their environment, and develop skills necessary for scientific inquiry and reasoning (Eldra Pearl Solomon, Charles Martin, & Diana Martin, 2020). Furthermore, Studying Biology helps students develop essential skills such as logical reasoning, analytical thinking, and a sense of curiosity about living systems and their surroundings. It motivates learners to ask questions, create experiments, make observations, and interpret results based on evidence. These abilities are not only valuable for scientific careers but also play an important role in making informed choices in daily life and contributing responsibly to society.

Concept of instructional materials

According to Obasi and Lawal, (2022) "Instructional materials refer to resources intentionally selected or created to meet learners' diverse needs and learning styles, promoting active engagement and self-directed learning". It could also be defined as tools used by teachers to transmit knowledge and information to students in a systematic way, aiding comprehension

and making the teaching-learning process more effective.(Abidoeye, Florence Omosholape; Abidoeye, Adekunle Abiodun; and Malik, Shuaib Opeyemi (2023). Isma'il, Abdullahi and Lukman, Omolola M. (2022) also defined instructional materials as all the physical, visual, or digital resources used to support instruction and improve students' understanding, including textbooks, charts, models, audiovisual tools, and computer-based media. These materials (charts, laboratory equipment) are essential tools that help both teachers and students achieve educational goals effectively.

Types of instructional materials

According to various scholars and recent research findings (e.g., Abidoeye, Olagunju, and Adebayo 2019; Jeptoo and Mogeni, 2024), instructional materials can be classified into several types, depending on their mode of delivery and function in the classroom. This include

Print materials: These are textbooks, workbooks, handouts, journals, and study guides, posters They provide structured content and serve as reference materials for both teachers and students. Abidoeye, Olagunju, and Adebayo (2019) emphasized that print materials such as textbooks and handouts are still essential resources in the Biology classroom, especially where digital infrastructure is limited.

Visual materials : These include charts, diagrams, maps, posters, photographs, and drawings used to present information visually. According to Abidoeye, Olagunju, and Adebayo (2019), visual materials such as charts, posters, and models help simplify abstract Biology concepts and enhance learner retention.

Audio materials: These are materials that depend on sound to deliver educational content. These include radio broadcasts, recorded lectures, podcasts, and audio tapes. In Biology teaching, audio materials can be used to explain complex terms, provide step-by-step instructions, or support revision through recorded lessons. According to Jeptoo and Mogeni (2024), while audio materials are less commonly used than visual aids, they remain effective, especially in resource-limited settings.

Audio- visual materials: These are materials that combine both sound and visuals to create a more interactive and engaging learning experience. These include videos, animations, documentaries, PowerPoint presentations with voiceovers, and digital science simulations. In Biology, Audio-visual materials are useful for breaking down complex and abstract topics like cell division, respiration, and genetics by presenting them in a clear and visually appealing way.

Realia materials: These refers to real life objects used in the classroom to enhance learning by providing students with hands-on experiences. These include specimens of plants and

animals, laboratory equipment, soil samples, preserved organs, or even leaves and seeds used during practical sessions.

Effiong and Igiri (2015) explored the “Impact of Instructional Materials in Teaching and Learning of Biology in Senior Secondary Schools in Yakurr LGA, Cross River State.” The researchers employed a descriptive survey design and collected data from teachers and students in five selected schools. Their findings showed that the use of instructional materials improved students’ understanding and academic performance in Biology. Despite infrastructural limitations, teachers who incorporated charts, models, and real-life specimens in their lessons reported more engaging and effective classes. This supports the idea that instructional materials can be powerful tools even in resource-limited environments, which may be the case in some schools in Oredo LGA.

Importance of Instructional materials

Boost academic performance among students: A quasi-experimental study in Abak Local Government Area, Akwa Ibom State, found that students taught Biology using locally available instructional materials significantly outperformed those without such aids. The intervention stimulated critical thinking, reduced abstraction anxiety, and resulted in statistically significant academic gains (Etop, E. E., Iboro, G. I., and Obogo, I.I 2023). According to Abidoye, Adekunle, and Malik (2022), the use of Biology instructional materials in Ilorin West, Kwara State, significantly improved students’ academic

performance across genders and class levels. Abidoye, Adekunle, and Malik (2023) conducted a study titled “The Effect of Biology Teaching Materials on the Academic Performance of Senior Secondary School Students in Ilorin West, Kwara State.” The researchers adopted a descriptive survey design and collected data from 120 senior secondary students using a structured questionnaire. Their findings showed that the use of instructional materials had a statistically significant positive impact on students’ academic performance. The study also revealed that there was no significant difference in achievement based on gender, suggesting that instructional materials benefit all learners equally. This supports the current study’s focus on improving Biology education outcomes through adequate material use. Okafor and Mbadiwe (2021) carried out a quasi-experimental study in the Onitsha Education Zone of Anambra State titled “Effect of Utilisation of Instructional Materials on Senior Secondary School Students’ Achievement in Biology.” The study involved 268 SS2 students divided into treatment and control groups, with pre- and post-tests used to measure achievement. The results indicated that students in the treatment group who were taught using instructional materials performed significantly better than those in the control group. The study concluded that instructional materials enhance comprehension and retention of biological concepts. This finding aligns with the purpose of the present study, which is to determine how the use of such materials affects learning in Oredo LGA.

Encourages Hands-On Learning and Critical Thinking: Nwankwo, Ugwu, and colleagues (2025) found that students taught with hands-on instructional materials and problem-based learning strategies performed better than those taught with lecture methods.

Makes Abstract Concepts Concrete: According to Etop, Iboro, and Obogo (2023), the use of locally available instructional materials helped simplify abstract Biology topics like respiration and photosynthesis and improved student comprehension.

Increases Student engagement and Motivation: According to Osamor and Odebisi (2019), students exposed to instructional materials such as charts, models, and diagrams showed more interest and motivation in Biology lessons.

Reduces Fear of Science ("Abstraction Phobia"): According to Etop, Iboro, and Obogo(2023), instructional materials helped reduce fear and confusion in learning abstract Biology concepts, especially among low-performing students.

Challenges Teachers Face in using instructional materials

Despite the growing awareness of the value of instructional materials in teaching Biology, several factors still prevent their effective use in public secondary schools. Some of these factors are:

Inadequate Funding: According to Eniayeju, P. A. (2019), inadequate funding is one of the most critical barriers to the effective use of instructional materials in science teaching. Many schools, especially public schools, suffer from insufficient funding. They lack the funds needed to purchase essential instructional materials such as laboratory equipment, models, and charts.

Large Class Sizes: According to Ibe and Okonkwo (2018), large student populations hinder hands-on learning and limit individual interaction with instructional tools. Overcrowded classrooms make it difficult for teachers to use materials effectively, especially in practical lessons. Tools meant for hands-on learning, such as models or lab instruments, cannot be adequately shared among students. Disciplines.ng (2022) emphasized that overcrowding often leads to passive learning experiences and reduces the impact of visual and manipulative materials.

Poor Maintenance and Storage of Materials: According to Abidoye, F. O., Adekunle, A. O., and Malik, S.(2022), many Biology instructional tools are lost due to a lack of proper storage facilities in schools. Instructional materials are often poorly stored, leading to damage, theft, or decay.

Time Constraints in Lesson Preparation and Delivery: Many Biology teachers face heavy workloads and a congested school timetable, leaving them with little time to prepare instructional materials or integrate them meaningfully into lessons. WritersKing (2023)

highlighted that the pressure to cover the syllabus often forces teachers to prioritize lecture-based methods over resource-based instruction.

Lack of Teacher Training and Skills: According to Ofoha (2020), poor teacher preparation is a significant barrier to instructional material usage. Many teachers lack training on how to effectively integrate instructional materials into their lesson plans.

Lack of Awareness and Familiarity with Modern Instructional Aids: Many teachers still rely on traditional teaching methods, often due to limited exposure to or understanding of modern instructional tools. As observed by WritersKing (2023), teachers who are not adequately oriented to the use of materials such as simulations, interactive charts, or multimedia tools are unlikely to integrate them effectively into classroom instruction.

Isma'il and Lukman (2022) examined "Availability and Utilization of Instructional Materials in Teaching and Learning of Biology in Senior Secondary Schools in Talata Mafara, Zamfara State." Using a descriptive survey design, the researchers gathered data from heads of science departments and Biology teachers across public and private schools. The results revealed that while instructional materials such as charts, specimens, and models were available in some schools, they were not effectively used due to challenges such as lack of funds, large class sizes, and inadequate teacher training. These findings are particularly relevant to the present study as they reflect challenges that may also exist in schools within Oredo Local Government Area.

Solutions to the Challenges Faced by Biology Teachers in the Use of Instructional Materials

Biology teachers in Nigerian public secondary schools face numerous challenges in using instructional materials. However, several recent studies have proposed practical solutions to minimize these difficulties:

Provision of Adequate Instructional Materials by the Government: Umeohana (2024) emphasizes that the lack of instructional materials in many public secondary schools can be resolved through increased government provision of multimedia and laboratory resources

Regular ICT Training for Biology Teachers: Abidoye and Adekunle (2020) found that many Biology teachers lack adequate ICT skills for using modern instructional materials. They recommend regular in-service training and workshops focused on integrating ICT tools such as PowerPoint, simulations, and online resources into lesson delivery.

Active Involvement of Stakeholders and NGOs: Umeohana (2024) and Isma'il and Lukman (2022) both emphasize the role of stakeholders such as Parent-Teacher Associations, NGOs, and alumni bodies in supporting the supply of instructional materials. These collaborations can help bridge the funding gap in public schools.

Encouragement of Improvisation Using Locally Available Materials: Ibrahim, Garba, and Datti (2021) suggest that teachers should be trained and encouraged to improvise

instructional materials using items available in their environment. This approach can be a cost-effective alternative when standard materials are not accessible. Aishatu, Y. (2016) Conducted a research titled " Effect of improvisation on academic achievement of biology students in Dala Local Government Area, Kano State, Nigeria". The quasi-experimental study showed that training teachers to improvise using locally available materials significantly improved students' test scores in biology. It demonstrates that teacher-led improvisation can be an effective solution to shortages of standard instructional materials.

Timely Supply and Monitoring of Instructional Resources: Abidoeye, Jimoh, and Adegoke (2022) argue that even when materials are provided, poor logistics and lack of follow-up from education authorities affect their utilization. They recommend a structured and monitored supply system to ensure resources are delivered and used effectively.

Summary of Reviewed Literature

The reviewed literature highlights that instructional materials are essential tools for improving how Biology is taught and understood in secondary schools. These materials include realia, audio, visual, and audiovisual aids, helps students grasp complex scientific ideas more easily. Theoretical support from Bruner's learning theory emphasizes the importance of active and visual learning, reinforcing the role of teaching aids.

Studies carried out in different Nigerian states consistently show that instructional materials boost student performance and engagement. Even when resources are improvised, they still improve learning outcomes. However, barriers such as inadequate funding, limited supply, and untrained teachers continue to limit their effective use.

The literature reviewed shows a clear connection between the availability and use of instructional materials and successful Biology education—supporting the relevance of this study in public secondary schools within Oredo Local Government Area.

CHAPTER THREE

METHODOLOGY

This chapter explains the methods and procedures that were used to conduct the study. It was organized under the following subheadings:

- Design of the Study
- Population of the Study
- Sampling and Sampling Techniques
- Research Instrument
- Validity of the Instrument
- Reliability of the Instrument
- Method of Data Collection
- Method of data analysis

Design of the study

The study adopted a descriptive survey design. This design is considered appropriate because it enables the researcher to collect information from a defined population to determine the

availability and use of instructional materials in teaching Biology in public secondary schools in Oredo Local Government Area. The descriptive survey design allows for the gathering of factual information from a sample of respondents, which can be used to make generalizations about the larger population. The dependent variable for the study is the teaching of Biology in public secondary schools while the independent variable is the availability and types of instructional materials used for teaching Biology, such as charts, models, laboratory equipment, textbooks, and multimedia resources. The intervening variables include factors such as teachers' qualifications, years of teaching experience, class size, and school location, which may influence the relationship between the availability of instructional materials and their use in teaching Biology.

Population Of the study

The population of the study consisted of all Biology teachers in public secondary schools in Oredo Local Government Area of Edo State.

Table 1: List of public schools in Oredo Local Government Area

S/N	NAME OF SCHOOLS
1.	ANGLICIAN GIRLS COLLEGE
2.	EDO COLLEGE
3.	EDOKPOLOR GRAMMAR SCHOOL
4.	EMOTAN COLLEGE
5.	IDIA COLLEGE
6.	IHOGBE COLLEGE
7.	IMAGUERO GIRLS COLLEGE
8.	NEW ERA GIRLS COLLEGE

-
9. IYEKOGBA COLLEGE
 10. OBA AKENZUA SECONDARY SCHOOL
 11. OBA EWUARE SECONDARY SCHOOL
 12. OGBE SECONDARY SCHOOL
 13. OREDO GIRLS COLLEGE
-

Source: Edo state Secondary Education Board

Sampling and Sampling Techniques

The sample size for the study consisted of 40 Biology teachers drawn from 5 selected public secondary schools in Oredo Local Government Area. The purposive sampling technique will be used to select the schools due to financial constraints. This approach will ensure that schools that are accessible and relevant to the objectives of the study are chosen.

TABLE 2: SAMPLE SIZE OF THE STUDY

S/N.	School Name	Number of Teachers used
1.	Imaguero girls college	10
2.	Oredo Girls college	8
3.	Edo college.	7
4.	Idia girls college.	8
5.	Emotan college.	7
	Total:	40

Research Instrument

The instrument for data collection was a structured questionnaire developed by the researcher titled “**Availability and Use of Instructional Materials Questionnaire**” (AUMIQ). The questionnaire consisted of two sections: Section A Consist of Demographic information such as gender, years of teaching experience, and qualification. Section B Contained 24 items designed to elicit information from the respondent on research questions raised from the

study using a modified likert format of four scale response modes of **Strongly Agree (SA), Agree(A), Disagree(D), Strongly Disagree(SD)**.

Validity of the Instrument

The instrument for the study was validated by the researcher's supervisor and two other lecturers in the Department of Curriculum and Instructional Technology (CIT), Faculty Of Education, University Of Benin, Benin City to read and ensure face and content validity. Corrections and modifications were incorporated into the instrument to produce the final instrument.

Reliability of the Instrument

The reliability of the questionnaire was determined using the test–retest method. The instrument was first administered to 10 Biology teachers from schools outside the study area. After a two-week interval, the same questionnaire was administered to the same group of teachers. The two sets of scores were analyzed using the Pearson Product Moment Correlation Coefficient (PPMC). A reliability coefficient of 0.85 ($r = 0.85$) was obtained, indicating high reliability.

Method of Data collection

The researcher personally visited each sampled school to administer the questionnaires to the Biology teachers. Respondents were given time to complete the questionnaire and were assured that their responses would be treated with utmost confidentiality. The completed questionnaires were retrieved immediately to ensure a high response rate.

Method of Data Analysis

The data collected were analyzed using simple percentage and frequency count.

CHAPTER FOUR

PRESENTATION OF RESULTS AND DISCUSSION OF FINDINGS

This chapter presents the results obtained from the questionnaire administered to biology teachers in public secondary schools. The data were analyzed using frequency counts and percentages in line with the research questions raised in this study. A total of forty (40) teachers participated in the study, and their responses are presented in the research questions.

RESEARCH QUESTION 1: To what extent are Instructional materials used by Biology teachers in public secondary schools in Oredo Local Government Area?

Table 3: Extent to use of instructional materials

S/ N.	ITEMS.	SA.	A.	D.	SD.
	DECISION	(F).	(F).	(F).	(F)
		(%).	(%).	(%).	(%)
1.	Instructional materials are used.	7.	24.	6.	3. Accepted

In Biology classes.	18.	60.	15.	7	
2. I use Instructional materials in	10.	16.	11.	3.	Rejected
Every Biology lessons.	25.	40.	28.	7	
3. Instructional materials are well.	10.	20.	7.	3.	Accepted
integrated into Biology lessons	25.	50.	17.	3	
4. Biology teachers depend more on.	6.	12.	16.	6.	Rejected
verbal teaching than instructional	15.	30.	40.	15	
Materials					
5. Instructional materials are used	11.	21.	4.	4.	Accepted
during both theory and practical	27.	53.	10.	10	
Lessons					

6. Teachers are consistent in using	5.	17.	12.	6. Rejected
instructional materials for Biology	13.	42.	30.	15
Lessons				
7. Instructional materials are used in.	13.	18.	7.	2. Rejected
line with scheme of work.	32.	45.	18.	5.0

Benchmark: 50.0

Table 3 with a benchmark of 50.0 shows the extent to which instructional materials are used in teaching Biology in public Secondary schools. Item 1, 3 and 5 findings revealed that instructional materials are regularly used in class. Item 2, 4, 6 and 7 disagreed that instructional materials are used regularly in class. This result suggest that instructional materials are fairly well-utilized in Biology teaching across public secondary schools, though over reliance on verbal teaching methods remain a challenge.

RESEARCH QUESTION 2: What types of instructional materials are available to teachers for teaching Biology in public Secondary schools in Oredo Local Government Area?

Table 4: Availability of instructional Materials

S/N.	ITEMS.	SA.	A.	D.	SD.	DECISION
		(F).	(F).	(F).	(F)	
		(%).	(%).	(%).	(%)	
8.	The school has models like human skeleton and plant Structure	12. 30.	20. 50.	4. 10.	4. 10	Accepted
9.	We have enough laboratory Equipment for practical for	4. 10.	16. 40.	15. 38.	5. 12	Rejected

Biology lessons

10. Multimedia tools like projector. 1. 9. 16. 14. Rejected

are available for Biology 2. 23. 40. 35

teaching.

11. Charts, diagrams and illustration 22. 10. 3. 5. Accepted

are available for Biology lessons 55. 25. 7. 13

12. Textbooks and guides used are. 8. 26. 3. 3. Accepted

up-to-date and sufficient 20. 65. 8. 7

13. Audio-visual materials for teaching 6. 7. 18. 9. Rejected

Biology are provided. 15. 17.5. 45. 23

Benchmark: 50.0

Table 4 with a bench mark of 50.0 shows that Availability of Instructional materials. Item 8,11,12 agreed that some type of instructional materials which includes charts, updated textbooks, diagrams, illustrations, models such as human skeleton and plant structures are available for Biology lessons. Item 9, 10 and 13 stated that modern instructional resources like Audio-visual materials, projectors are not available for Biology lessons. These findings indicate that while traditional instructional materials such as textbooks, charts, diagrams are fairly available, modern technological teaching aids such as projectors, Audio-visual materials are still lacking in public secondary schools which may restrict the effectiveness of teaching methods in Biology.

RESEARCH QUESTION 3: What challenges do Biology teachers face in accessing and using instructional materials in public Secondary schools in Oredo Local Government Area?

Table 5: Challenges in Accessing and using instructional materials

S/N.	ITEMS.	SA.	A.	D.	SD.	DECISION
		F.	F.	F.	F	
		%.	%.	%.	%	
14.	Most Biology instructional Materials are outdated or Damaged	11.	16.	11.	2.	Rejected
		28.	40.	27.	5	
15.	Teachers are not trained on how to use instructional materials	8.	14.	16.	2.	Rejected
		20.	35.	40.	5	
16.	Some Instructional materials are Too complex to use effectively.	6.	21.	12.	1.	Accepted
		15.	53.	30.	2	

17. Overcrowded classrooms make 29. 8. 3. 0. Accepted

using some instructional materials 73. 20. 7. 0

difficult.

18. Shortage of laboratory technicians. 20. 17. 3. 0. Accepted

affects use of practical materials 50. 43. 7. 0

Benchmark: 50.0

Table 5 reveals several challenges associated with accessing and using instructional materials. Item 16, 17 and 18 agreed that overcrowded classrooms, shortage of laboratory technicians and complex materials make Instructional materials difficult to use. On the other hand, items 14 and 15 were rejected, meaning fewer than half of the teachers agreed that materials are outdated or that they lack training on usage.

These findings demonstrate that some Instructional materials may be available, their effective use is severely constrained by poor conditions, limited training and inadequate support staff.

RESEARCH QUESTION 4: To what extent does the availability and use of instructional materials affect student's academic performance in Biology?

Table 6: Effect of instructional materials on students performance

S/N.	ITEMS	SA.	A.	D.	SD.	DECISION
		F.	F.	F.	F	
		%.	%.	%.	%	
19.	Practical activities help students.	25.	15.	0.	0.	Accepted
	relate Biology to real-life issues.	63.	37.	0.	0	
20.	Instructional materials increase.	23.	16.	1.	0.	Accepted
	classroom participation.	58.	40.	2.	0	
21.	The use of instructional materials	19.	21.	0.	0.	Accepted

helps students perform better in	48.	52.	0.	0
----------------------------------	-----	-----	----	---

Examination

22. Students enjoys Biology more	21.	18.	1.	0.	Accepted
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when Instructional materials	53.	45.	2.	0
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Are used in teaching

23. Students learn faster when	25.	14.	1.	0.	Accepted
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instructional materials are used.	63.	35.	2.	0
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24. Non availability of Instructional	15.	21.	4.	0.	Accepted
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materials affects students interest	37.	53.	10.	0
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In Biology

Benchmark: 50.0

Table 5 with a benchmark of 50.0 shows that all the respondent agreed that instructional materials affect students academic performance in Biology. These findings confirm that

instructional materials play a crucial role in enhancing student's comprehension, interest and overall achievement in Biology.

Discussion of Findings

This findings of this study provide important insights into the availability and the use of instructional materials in the teaching of Biology in public secondary schools in Oredo Local Government Area.

The findings of research question one show that instructional materials are moderately used by Biology teachers in public secondary schools. This implies that while teachers recognize the importance of instructional materials, their use remains inconsistent due to dependence on verbal methods. This finding aligns with Abidoye, Adekunle, and Olaide (2023), who reported that although Biology teachers utilize charts, models, and specimens, their application is not regular because of insufficient supply and inadequate training. Similarly, Adetunji, Owoyomi, and Irinoye (2024) found that most Biology teachers seldom use instructional materials effectively during lessons, especially for practical activities. These similarities suggest that moderate use of instructional materials in Biology teaching remains a nationwide challenge across Nigerian public schools.

The findings of research question two revealed that traditional instructional materials such as charts, models, and diagrams are fairly available, while modern instructional tools such as

audiovisual devices and projectors are lacking. This result agrees with Osakwe (2021), who found that although most secondary schools had basic teaching materials like charts and laboratory specimens, they lacked modern digital tools needed for effective teaching. Likewise, Umeohana (2024) reported that while Biology teachers had access to printed materials, they faced shortages in modern instructional technologies, which limited interactive learning. This supports the present study's conclusion that Biology teaching in Nigerian public schools still depends largely on traditional materials rather than technology-based resources.

The findings of research question three indicate that Biology teachers face significant challenges in accessing and using instructional materials. These challenges include overcrowded classrooms, inadequate laboratory assistants, and limited government support. This corresponds with the findings of Buba, Gana, and Bularafa (2019), who identified insufficient funding, poor maintenance, and lack of technical support as major barriers to the effective use of instructional materials in schools. Similarly, Osakwe (2021) observed that the absence of laboratory technicians and overpopulation in classes hindered the use of teaching aids during Biology practicals.

The findings of research question four revealed that the availability and effective use of instructional materials positively influence students' academic performance in Biology. This finding aligns with Abidoeye, O. Adekunle, K. and Olaide, T. (2023), who concluded that the

use of instructional materials significantly enhances students' comprehension and performance in Biology. Likewise, Buba, M., Gana, J. and Bularafa, M. (2019) found that students taught with sufficient instructional materials performed better than those taught with verbal explanations alone. These findings affirm that instructional materials not only make Biology lessons more engaging but also promote better understanding, retention, and academic success among students.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter presents the summary of the study, conclusion drawn from the findings, recommendations, and suggestions for further research. The study investigated the availability and use of instructional materials in teaching biology in public secondary schools in Oredo Local Government Area.

Summary

This study examined the availability and use of instructional materials in teaching Biology in public secondary schools in Oredo Local Government Area. The main purpose of the study was to determine the extent to which instructional materials are available for Biology teaching and to assess how frequently teachers make use of these materials during classroom instruction. The study also sought to identify the challenges teachers encounter in using instructional materials and to suggest possible solutions to improve their effective utilization.

A descriptive survey research design was adopted for the study. The target population consisted of Biology teachers in public secondary schools within the area. A total of 40 respondents participated in the study. Data were collected using a structured questionnaire, and the results were analyzed using frequency counts and percentage methods.

The findings revealed that although some instructional materials such as charts, textbooks, and models were available in schools, essential materials like microscopes, preserved specimens, and laboratory equipment were inadequate. It was also discovered that most Biology teachers relied more on verbal explanations and textbooks than on practical instructional materials. Factors such as inadequate funding, poor maintenance, and lack of training in the improvisation and effective use of materials were identified as major challenges. The findings of this study highlight the critical role that instructional materials play in promoting effective Biology teaching and fostering student learning. While some materials such as charts, textbooks, and models are available, their use remains limited, and more specialized tools such as Audio-visual materials and preserved specimens are not consistently provided. The insufficient availability of these essential materials has made it difficult for teachers to implement practical, hands-on learning experiences that are crucial for understanding complex biological concepts. This situation has resulted in a reliance on theoretical teaching methods, which, though useful, do not fully engage students in the learning process.

To improve students' academic performance and comprehension in Biology, it is essential for schools and educational authorities to address the gap in the availability and use of instructional materials. This calls for a comprehensive and combined effort from the government, school management, and teachers. The government should increase funding for the provision and maintenance of necessary materials, while teachers should receive

professional training to enhance their ability to use available resources effectively and creatively. Furthermore, schools should establish regular monitoring and evaluation systems to ensure that instructional materials are properly utilized and maintained. Through these combined efforts, a more interactive and effective Biology learning environment can be achieved in public secondary schools.

Conclusion

Based on the findings of this study, it can be concluded that instructional materials are essential tools for effective Biology teaching in secondary schools. While teachers in Oredo Local Government Area appreciate and make use of these resources, their application remains inconsistent due to several challenges. Traditional instructional aids such as textbooks and charts are generally available, but the scarcity of modern multimedia resources, inadequate training, overcrowded classrooms, and lack of technical support staff hinder effective utilization.

The study affirms that instructional materials have a direct and positive impact on students' engagement and academic performance. Therefore, improving the provision, maintenance, and systematic use of instructional materials will enhance biology learning outcomes in public secondary schools.

Recommendation

Government and school authorities should ensure the adequate provision and regular updating of instructional materials in public secondary schools.

Biology teachers should be encouraged and trained to diversify their use of instructional resources, incorporating modern digital and multimedia tools into their lessons.

School administrators should allocate sufficient funds for the procurement and maintenance of instructional facilities, particularly laboratory equipment and ICT resources.

Government and education stakeholders should work toward reducing class sizes by employing more teachers and providing additional classrooms. This will make it easier to integrate instructional materials effectively into lessons.

Teachers should adopt a learner-centered approach by involving students in the use of instructional materials to promote active participation and better retention of knowledge.

Suggestions for further research

In light of the findings and limitations of this research, it is suggested that future studies should incorporate" **students assessment of teachers use of instructional materials**" in order to capture learners' perspectives, since they are the direct beneficiaries of instructional

practices. This will provide a more balanced and comprehensive view of the situation. Research can also be extended to cover a larger geographical scope beyond Oredo Local Government Area to allow for broader generalization of findings.

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APPENDIX 1

QUESTIONNAIRE ON AVAILABILITY AND THE USE OF INSTRUCTIONAL MATERIALS IN TEACHING BIOLOGY IN PUBLIC SECONDARY SCHOOLS IN OREDO LOCAL GOVERNMENT.

Dear respondee,

The researcher is an undergraduate student of the department of curriculum and Instructional Technology. Faculty of Education University of Benin. The information being asked for is to enable her to complete her research work. The research work is purely for Academic purposes, as such you are enjoyed to kindly and truthfully assist to provide answers to the questions below. Your responses will be treated in utmost confidentiality.

Thanks.

Miss. MOHAMMED JEMILATU

SECTION A: DEMOGRAPHIC DATA

1. Sex Male [] Female []

2. Teachers Qualification: NCE[] BSC(Ed)[.] M.sc(Ed) []

4. Teaching Experience:

- 1–5 years [] - 6–10 years [] - 11–15 years [] - Above 16 years []

Instructions: please indicate the level of agreement with the following statement by ticking the appropriate box using the following scale .

Strongly Agree(SA), Agree(A), Strongly Disagree(SD), Disagree(D)

S/N	ITEMS	SA	A	D	SD
	SECTION B: EXTENT TO USE OF INSTRUCTIONAL MATERIALS				
1.	Instructional materials are regularly used in Biology classes				
2.	I use instructional materials in every Biology lessons.				
3.	Instructional materials are well integrated into Biology lessons				
4.	Biology teachers depend more on verbal teaching than Instructional materials				
5.	Instructional materials are used during both theory and practical				

	sessions.				
6.	Teachers are consistent in using instructional materials for Biology lessons.				
7.	Instructional materials are used in line with scheme of work.				
	SECTION C: AVAILABILITY OF INSTRUCTIONAL MATERIALS				
8.	My school has models like humans skeleton and plant structure.				
9.	We have enough laboratory equipment for practical for Biology lessons				
10.	Multimedia tools like projectors are available for Biology teaching.				
11.	Charts, diagrams, and illustrations are available for Biology lessons				
12.	Textbooks and guides used are up-to-date and sufficient.				

13.	Audio-visual materials for teaching Biology are provided.				
SECTION D: CHALLENGES IN ACCESSING AND USING INSTRUCTIONAL MATERIALS					
14.	Most Biology instructional materials are outdated or damaged.				
15.	Teachers are not trained to how to use Instructional materials				
16.	Some Instructional materials are too complex to use effectively.				
17.	Overcrowded classrooms make using some Instructional materials difficult				
18.	Shortage of laboratory technicians affect the use of practical materials				
SECTION E: EFFECT OF INSTRUCTIONAL MATERIALS ON STUDENT PERFORMANCE					
19.	Practical activities help students relate Biology to real-life issues				

20.	Instructional materials increases classroom participation				
21.	The use of instructional materials helps students perform better in examination.				
22.	Students enjoys Biology more when instructional materials are used in teaching.				
23.	Students learn faster when instructional materials are used.				
24.	Non availability of instructional materials affect student's interest in Biology.				


APPENDIX 2

UNIVERSITY OF BENIN
 BENIN CITY, NIGERIA
 DEPARTMENT OF CURRICULUM AND INSTRUCTIONAL TECHNOLOGY
 FACULTY OF EDUCATION

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Office of the Head of Department
 CIT/45

Our Ref: _____
 Your Ref: _____



The Executive Chairman
 State Secondary Education Board,
 Sapele Road,
 Benin City.

Date: _____

RECEIVED
 STATE SECONDARY EDUCATION BOARD
 9/9/2025
 BENIN CITY

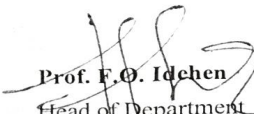
LETTER OF INTRODUCTION

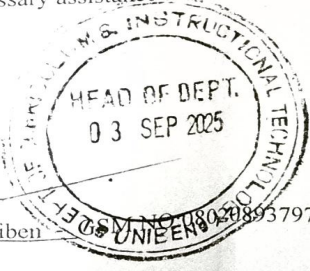
The bearer, **MOHAMMED JEMILATU** is 400 level student with Matriculation No. LDU2102025 in the above named Department. As part of her field work, she is required to collect data from some Senior Secondary Schools in Oredo Local Government Area of Edo State. It is for this reason that I write to solicit your kind assistance to enable her with the number and comprehensive list of all Public Senior Secondary Schools in Oredo Local Government Area.

The researcher is carrying out a study on "Availability and Use of Instructional Materials in Teaching Biology in Public Secondary Schools in Oredo Local Government Area."

Kindly give her the necessary assistance to actualize her purpose.

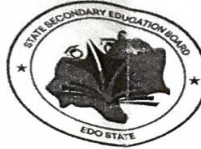
Thank you.


Prof. F.O. Idehen
 Head of Department
 email - festus.idehen@uniben



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APPENDIX 3



EDO STATE SECONDARY EDUCATION BOARD

Address: Ground Floor, Palm House Edo State Secretariat,
Benin City, Edo State.
Email: stateeducationboard@edostate.gov.ng

LIST OF SENIOR SECONDARY SCHOOLS IN OREDO LGA

S/N	School Name	Address	School LGA
1	ANGLICAN GIRLS G/S, B/C	Off Upper Adesuwa Road	Oredo
2	EDO COLLEGE, B/C	M.M Way	Oredo
3	EDOKPOLOR GRAMMER SCH.	1, First Federal Road Benin city	Oredo
4	EMOTAN COLLEGE, B/C	Wire Road Benin City	Oredo
5	IDIA COLLEGE, B/C	15 Urubi Street, Iyaro Benin City	Oredo
6	IHOGBE COLLEGE, B/C	ICE Road Benin city	Oredo
7	IMAGUERO COLLEGE, B/C	53 sapele Road Opposite Shoprite Benin City	Oredo
8	NEW ERA GIRLS, B/C	Mission Road Benin City	Oredo
9	IYEKOGBA G/S, IYEKOGBA	Estate Gate, Ebo Community	Oredo
10	OBA AKENZUA SEC. SCH., B/C	ICE Road Benin City	Oredo
11	OBA EWUARE S/S, B/C	Gapiona Road Off Oko Central Road Benin City	Oredo
12	OGBE SEC. SCH	By st.Paul Airport Road Benin	Oredo
13	OREDO GIRLS, B/C	1 Awo Street Off First East Circular Road Benin City	Oredo

I. O.
(Signature)

IDUMWONYI O.
Director, PRS Dept.,
SSEB.