

**AVAILABILITY, FUNCTIONALITY, AND UTILIZATION OF INSTRUCTIONAL  
MATERIALS IN THE TEACHING AND LEARNING OF BASIC SCIENCE IN  
JUNIOR SECONDARY SCHOOLS IN EGOR LOCAL GOVERNMENT AREA OF  
EDO STATE**

**BY**

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BENIN CITY.**

**JANUARY, 2026.**

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**A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF  
CURRICULUM AND INSTRUCTIONAL TECHNOLOGY, FACULTY OF  
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IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF  
BACHELOR OF SCIENCE (B.Sc/Ed) IN INTEGRATED SCIENCE.**

**JANUARY, 2026.**

## **CERTIFICATION**

We the undersigned, certify that this study was carried out by **Favour Otibhor ISESELE**, in the department of Curriculum and Instructional Technology, Faculty of Education, University of Benin, Benin City.

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## **DEDICATION**

This project work is dedicated to God Almighty, my helper, redeemer and strength.

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## **ABSTRACT**

This study investigated the availability, functionality and utilization of instructional materials in the teaching and learning of basic science in junior secondary schools in Egor local Government area of Edo state. Four research questions were raised to guide the study. Descriptive survey research design was adopted for the study. The sample for the study consists of 40 basic science teachers from 20 junior secondary schools in Egor local Government area of Edo state. A questionnaire titled “Availability, Functionality, and Utilization of Instructional materials in the Teaching and Learning of Basic Science in Junior Secondary Schools in Egor Local Government Area of Edo State” and a checklist were the instrument used for data collection. Data collected from the respondents were analyzed using percentage, mean and standard deviation. Findings from the study revealed that majority of the required and essential instructional materials for effective basic science teaching were not available in schools. Basic science teachers fairly utilize instructional materials during classroom instruction. Teachers’ lack of motivation, short periods allocated to basic science classes on the school time-table, large class size, lack of supervision of teachers by school administrators and lack of in-service training for teachers were identified as challenges faced by basic science teachers in the utilization of instruction for basic science teaching. Lastly, inadequate funding to acquire instructional materials, high cost of instructional materials, poor implementation of educational policies, mismanagement of funds meant to purchase instructional materials and insufficient improvisation of instructional materials are factors affecting the availability of instructional materials in schools. Based on these findings, the study recommended that Government should ensure adequate provision of funds for the procurement of instructional materials that are not available in secondary schools. Government should provide incentives to motivate and enable teachers purchase instructional materials. Teachers should improvise instructional materials for basic science teaching where the standard ones are not available. Principals and school administrators should ensure strict supervision of basic science teachers to ensure the utilization of instructional materials. Government should provide in-service training for teachers on the utilization of instructional materials.

# CHAPTER ONE

## INTRODUCTION

### **Background to the Study**

Basic science has been interpreted in various ways as a subject taught in schools. The definition of basic science varies among theorists, experimentalists, and prototype developers. The term "basic" usually denotes something that is required. This view has led to the idea that basic science is a "fundamental science." It is a science that provides the basic knowledge required for the study of other subjects. For this reason, in many countries, "basic science" may refer to the scientific disciplines of physics, chemistry, and biology. Basic science refers to the fundamental scientific knowledge and abilities needed for human life, sustainable growth, and social change. Basic science is designed to expose students to developing science skills that will assist them in making informed decisions, developing survival strategies, and learning to contribute and live qualitatively and quantitatively in the global community.

Basic science provides the foundation upon which students build knowledge and interest in core science subjects such as biology, chemistry, and physics in their senior secondary education. Teaching and learning basic science at the junior secondary school level lays the foundation for science education in Nigeria. Effective teaching and learning of basic science at this stage requires more than just theoretical instruction; it requires the use of instructional materials that can concretize abstract concepts, help learners stimulate interest, and promote active participation in the learning process. Ajemba et al. (2021) claimed that the level of education a student receives greatly depends on the quality of teaching/learning resources offered; hence, students learn rapidly when instructional materials are employed in the implementation of the teaching. Thus, it is required that "teachers, who are to implement the curriculum, use a wide range and quality instructional materials for effective and efficient teaching and learning in the classroom activities" (Matazu, 2022, p. 196).

According to Matazu (2021) in Matazu (2022), effective teaching and learning can only be achieved when people and material resources are available and used appropriately and efficiently. In order to help students develop innovative skills, critical thinking, and knowledge construction, teaching and learning activities in schools should be made participatory, interactive, constructive, practical-based, and experiential (instead of putting a lot of emphasis on theory) through the appropriate use of instructional materials.

Instructional materials are tools "designed to enrich the teaching and learning processes and hence contribute to better learning" (Akanbi, 2018, p. 15). According to (Chukwunazo et al., 2022), instructional materials serve as a practical and skill-development resource, facilitating the process of teaching, learning, and skill evaluation. These resources can be printed or non-printed and include textbooks, journals, computers, chalkboards, and more. In the view of Isma'il and Lukman (2022), instructional materials are all the things or materials that a teacher can utilize as part of the instructional process to produce effective and successful teaching that can help students achieve positive learning outcomes.

According to (Achimugu, 2017), instructional materials are physical objects that provide auditory, visual, or both sensory inputs during teaching. Both visual and audio-visual devices are used as instructional materials. Materials that are visible are referred to as visual equipment. Flashcards, posters, charts, textbooks, real objects, models, chalkboards, and so forth are examples of visual materials. Materials that appeal to both the visual (seeing) and auditory (hearing) senses are referred to as audio-visual materials. Computers, tape recorders, radios, and televisions are a few examples.

Mustapha et al. (2022) stated that instructional materials are teaching and learning resources utilized by a teacher to help students achieve the needed learning experience. Additionally, instructional materials reduce teacher-centeredness in the classroom by saving

teachers' energy and promoting active engagement in the learning process. In order to increase teacher effectiveness and raise student performance, instructional materials are crucial and important instruments for teaching and studying school topics. They add interest, usefulness, realism, and attractiveness to learning. Additionally, they facilitate active and productive participation in the classroom by both teachers and students (Olayinka, 2016).

Arop et al. (2015) conducted a study on the impact of instructional aids on teaching and learning among junior secondary school students in order to ascertain whether the use of instructional materials in teaching basic science would impact students' learning of the subject. The study found that respondents who received basic science instruction with instructional aids outperformed those who received instruction without instructional materials, and it was suggested that basic science teachers should make use of teaching aids to improve student learning. Kigwilu and Akala (2017) corroborated these findings by looking into how resource deployment affected curriculum implementation. According to their study's findings, the respondents gave the use of instructional resources a high rating for influence on curriculum implementation. The importance of quality, adequate and functional instructional materials in teaching and learning can be observed through their effective utilization during classroom teaching. It is against this premise that this study stands, which is to determine the availability, functionality, and utilization of instructional materials in the teaching and learning of basic science in junior secondary schools in Egor Local Government Area of Edo State.

### **Statement of the Problem**

Instructional materials such as charts, models, specimens, and laboratory apparatus facilitates effective teaching and learning, especially in science subjects where they provide practical demonstrations and hands-on experiences for students. However, the teaching and

learning of basic science have been greatly challenged by lack of instructional materials or poor utilization of the available ones. In schools, instructional materials are either not available, not functional or poorly utilized. Science laboratories, where they exist, are inadequately equipped with the necessary apparatus and equipment for effective teaching. Even when these materials are provided in schools, teachers often teach without them due to inadequate training, overcrowded classrooms, time constraints, poor supervision or lack of administrative support. As a result, science concepts are taught theoretically using the teacher-centred method of teaching which limit students' participation and poses a threat to students' academic performance in the subject. This research therefore seeks to investigate the availability, functionality and utilization of instructional materials in the teaching and learning of basic science in junior secondary schools in Egor Local Government Area of Edo State.

### **Research Questions**

The following research questions were raised to direct the study:

1. Are there instructional materials available for teaching basic science in junior secondary schools in Egor Local Government Area of Edo State?
2. Are these instructional materials utilized in the teaching and learning of basic science?
3. What are the challenges faced by basic science teachers in the utilization of instructional materials?
4. What are the factors affecting the availability of instructional materials in junior secondary schools in Egor Local Government Area of Edo State?

### **Purpose of the Study**

The study seeks to investigate the availability, functionality, and utilization of instructional materials in the teaching and learning of basic science junior secondary schools in Egor Local Government Area of Edo State. The purpose of the study is to:

1. Assess the instructional materials that are available for teaching basic science in junior secondary schools in Egor Local Government Area of Edo State.
2. Examine the extent to which these instructional materials are effectively utilized in the teaching and learning of basic science.
3. Examine the challenges faced by basic science teachers in the utilization of instructional materials.
4. Examine the factors affecting the availability of instructional materials in junior secondary schools in Egor Local Government Area of Edo State.

### **Significance of the Study**

The findings from this study will be beneficial to students, teachers, curriculum planners, the Ministry of Education, and society at large.

For students, the effective use of instructional materials will enable them to learn effectively with greater retention, thus improving their overall performance in basic science.

The findings from this study will expose teachers to the effective use of instructional materials, informing teaching strategies that will help them effectively engage students in basic science lessons.

The findings from this study will help curriculum planners to adequately plan for the place of instructional materials in teaching while planning the science curriculum.

For school administrators, the findings will help them understand the importance of supporting teachers with the required resources needed for effective teaching.

For policymakers, this study will provide valuable data regarding the current state of instructional materials in schools, hence guiding decision-making on funding, educational reforms, and policy adjustments that aim to improve the quality of science education.

To the Ministry of Education, the findings from this study will help make more informed decisions regarding the availability and distribution of instructional materials in schools.

This study provides foundational knowledge for future studies.

### **Scope and Delimitations of the Study**

The scope of the study covers the availability, functionality, and utilization of instructional materials in the teaching and learning of basic science in public junior secondary schools in Egor Local Government Area of Edo State.

The study will be limited to junior secondary schools in Egor Local Government Area of Edo State.

### **Definition of Terms**

**Availability:** The extent to which instructional materials are provided, and accessible in schools.

**Basic Science:** Basic science refers to the fundamental scientific knowledge and abilities needed for human life, sustainable growth, and social change.

**Instructional materials:** Instructional materials are all the tools a teacher uses in teaching a lesson to organize and support instruction and facilitate comprehension of ideas in the learners.

**Learning:** Learning is the process of gaining new information, insights, behaviors, abilities, attitudes, beliefs, and preferences.

**Public Junior Secondary Schools:** These are government-owned schools that provide education to junior secondary school students.

**Teaching:** Teaching is the practice implemented by a teacher aimed at transmitting skills (knowledge, know-how, and interpersonal skills) to a learner.

**Utilization:** Utilization refers to the degree to which teachers actively and effectively make use of instructional materials during classroom teaching.

## **CHAPTER TWO**

### **REVIEW OF RELATED LITERATURE**

This chapter critically analyzes existing works related to the research topic and establishes a foundation for the study. It provides a comprehensive review and organization of the relevant literature for this study, which is divided into the following subheadings:

Theoretical Framework

Concept of Instructional Materials

Improvisation of Instructional Materials

Types of Instructional Materials

Importance of Instructional Materials

Effects of Instructional Materials

Availability and Utilization of Instructional Materials

Factors Influencing Utilization of Instructional Materials

Summary of Reviewed Literature

#### **Theoretical Framework**

This study was based on the following learning theories; Piaget theory of cognitive development and Bruner's constructivist learning theory.

#### **Piaget's theory of cognitive development**

Jean Piaget views development to a large extent on the child's manipulation and active interaction with the environment. To him, knowledge comes from action. According to Piaget's theory of cognitive development, a child's intelligence or cognitive capacity develops over the course of four discrete stages. Each stage is characterized by the emergence of new abilities and information processing methods. According to him, cognitive development begins at birth and continues until adolescence. According to Piaget, cognition develops stage by stage through the construction of schemes and the processes of assimilation and accommodation. For people to learn, they must assimilate and accommodate. Schemes represent modes or concepts, assimilation refers to a process of interpreting actions or events in relation to the schemes, while accommodation refers to the modification of existing schemes to fit reality. As the individual continues to accommodate, he continues to learn.

### **Piaget's stages of development**

#### **Sensorimotor stage (birth to 2 years)**

During this stage, babies and young children explore their world using their senses and motor skills. At this stage, young infants are restricted by their actions and sensations and can exhibit little or no reasoning beyond what they can directly observe or engage in physically. Learning at this stage is not based on mental exploration or reasoning. Children learn by doing or interacting with their environment. Children at this stage are egocentric.

#### **Pre-operational stage (2-7 years)**

The ability to display symbolic thought is what defines this stage. Children can use symbols to represent ideas, events, and objects. The rate at which children's language and concepts grow at this age is astounding. However, much of their thinking remains

surprisingly primitive. Pre-operational children are egocentric in their thinking; they believe that everyone sees the world exactly from their own perspective.

### **Concrete operational stage (7-11 years)**

Concrete operational children usually exhibit mastery of various logical operations, which include measurement, arithmetic, and conceptions of hierarchical structures. However, they cannot think or reason abstractly; they reason along the way they perceive things. The older, concrete operational child reacts to inferred reality, or the perception of things in relation to other meanings. They can also arrange things in a logical progression, for example, lining up objects from the smallest to the largest.

### **Formal operational stage (11 years and above)**

At this stage, the child is able to think abstractly and logically and to see possibilities beyond the here and now. These skills continue until maturity, including the capacity to handle hypothetical or potential circumstances. At this stage, individuals can conduct practical experiments and demonstrations. This stage offers individuals the ability to use abstract symbols for representational purposes.

### **Implication of cognitive learning to education**

- To encourage the development of insightful qualities, teachers should constantly assign tasks to students.
- Teaching should be conducted in a manner that ensures effective information processing.
- Learning activities should be designed in such a way that day-to-day life experiences are incorporated into learning.

- Learning by discovery and showing interest in children are two primary teaching techniques that should be encouraged.
- Teachers and parents should stimulate the child's abilities by using a variety of concrete experiences to enable the child to learn effectively.

### **Bruner's Constructivist Learning Theory**

The key tenet of Bruner's theoretical framework is that learning is an active process in which students build new concepts or ideas from preexisting information. The process's components include choosing and transforming information, making decisions, formulating hypotheses, and drawing conclusions from data and experiences. Schemas and mental models, or cognitive structures, provide experiences structure and significance and enable the individual to go beyond the information provided. According to Bruner, learning is a continuous process in which people build on their prior knowledge as they engage with new ideas and gradually deepen and broaden their comprehension (Bruner, 1974).

Additionally, Bruner presented three modes of representation that explain how students absorb and retain information.

1. Enactive Representation: Learning by hands-on activities and direct experience.
2. Iconic Representation: Acquiring knowledge through mental models and visual imagery.
3. Symbolic Representation: Learning through abstract thoughts, symbols and language.

His theories have had a significant and lasting impact on educational practices, especially in the aspect of curriculum design, scaffolding and discovery learning.

The foundation of Bruner's constructivist learning theory is the notion that students actively create their own knowledge. According to him, the main goal of education should be discovery learning, which encourages students to investigate and find solutions to problems. He also highlighted scaffolding, in which teachers provide structured support to help students build their own problem-solving abilities, and the spiral curriculum, in which ideas are reviewed with increasing depth over time (Bruner, 1978).

### **Implications for Education**

Instructional Design: Over the past few decades, Bruner's theory have influenced the development of lesson plans, curriculum development, and differentiated instruction. Teachers have benefited from his spiral curriculum, which explains the need to introduce fundamental ideas early and then revisit them at progressively higher levels of complexity. This enables students to comprehend concepts more deeply. Bruner placed a strong emphasis on discovery learning, which has aided teachers in adopting an inquiry-based, more student-centered teaching approach. Instead of memorization of facts and details, these methods combine problem-based learning and hands-on activities to help students explore as they learn. Lastly, his work with scaffolding has inspired educators to give students organized support, which they can then progressively withdraw as students gain proficiency. Bruner's ideas are incorporated into contemporary teaching methods, particularly in differentiated instruction, collaborative group projects, and project-based learning. This facilitates students' engagement with the material and enables teachers to modify their lessons to accommodate a range of student demands.

## **Concept of Instructional materials**

The term instructional material is used in a variety of contexts, including teaching tools, teaching aids, instructional tools, learning materials, and instructional resources (Chacha, 2018). These resources are a collection of instructional tactics and practices that instructors apply in their classrooms (Salayo et al., 2021). Instructional materials are physical objects that provide auditory, visual, or both sensory inputs during teaching (Achimugu, 2017). Instructional materials, whether guided or selfteaching, can assist students in developing greater learning abilities. Thus, instructional materials serve as a practical and skill-development resource, facilitating the process of teaching, learning, and skill evaluation (Chukwunazo et al., 2022).

According to Isma'il and Lukman (2022), instructional materials are all the things or materials that a teacher can utilize as part of the instructional process to produce effective and successful teaching that can help students achieve positive learning outcomes. Instructional materials help students concretize their learning experiences, making teaching more intriguing, dynamic, and interactive. The term refers to all the materials and physical means that a teacher uses to implement lessons and help students reach their learning objectives. Instructional materials facilitate the teaching and learning process, making it more relevant and understandable. Instructional materials have the capacity to help learners achieve adequate levels of literacy (manipulative, communicative, and lifelong skills). As a result, instructional materials such as textbooks, computers, laboratories, and workshops should be readily available and adequate. The science teacher should effectively use instructional resources to illustrate, emphasize, and clarify his lesson for ease of learning and potential applicability to real-world circumstances.

The availability, adequacy, and usage of instructional materials promote active learning among students by allowing students and teachers to participate in concrete learning

activities that foster the concept of self-evaluation. Instructional materials can be in the form of print materials (textbooks, handouts, charts, posters, workbooks, practical books, magazines, newspapers, self-learning modules), audio materials (audio recordings, CDs, ROMs, podcasts, audio-visual presentations), visual materials (simulations, diagrams, videos), digital materials (multimedia applications, interactive software, educational websites), and hands-on materials.

Mustapha et al. (2022) defined instructional materials as teaching and learning resources utilized by a teacher to help students achieve the needed learning experience. Similarly, Adesola et al. (2022) defined instructional materials as any living or inanimate objects, as well as human and nonhuman resources, that a teacher can employ in teaching and learning scenarios to achieve desired learning outcomes. As a result, instructional materials include all the resources or equipment that a teacher may employ as part of the instructional process in order to give effective and efficient teaching that promotes positive student learning outcomes.

Instructional materials are the resources utilized by teachers during the teaching and learning process. (Ogoche and Usman, 2019). These materials include books, documents, archives, artifacts, sheets, flashcards, radios, computers, videos, televisions, and magazines. Olatunde-Aiyedun (2021) in Ajemba et al., (2021) gave some examples of instructional materials. They include modern textbooks, equipment, consumables such as chemicals and reagents, models, charts, and physical learning environments such as science classrooms and laboratories. Matazu (2022) included prints, textbooks, periodicals, newspapers, slides, pictures, workbooks, and electronic media as examples of instructional materials. Similarly, Adesola et al. (2022) listed cardboard paper, real objects, CD-ROMs, charts, radios, DVDs, test tube holders, clinostats, reptile hooks, models, diagrams, and photographs as examples of instructional materials.

## **Improvisation of Instructional materials**

Improvisation is the process of using substitute materials to improve instruction when there aren't enough of the original ones. The teacher starts the process of creating the alternative resources, and it is completed by him or local craftsmen (such as carpenters, blacksmiths, and welders). In order to support the teaching and learning process, improvisation entails the selection and creation of inexpensive, simple, and widely accessible materials. Improvisation is the concept of using accessible local resources to fill the gap created by the original ones to ensure that teaching and learning go concurrently without interruption (Eze, 2017).

Improvisation is the process of creating teaching and learning materials that can help teachers and students transfer knowledge more easily by using local resources found in the immediate environment (Ajayi, 2018; Onwuamanam, 2017). Researchers and educators have discovered the value of improvised instructional materials in a number of science subjects taught in secondary schools. A committed and goal-oriented instructor cannot wait to use improvisation as a way to teach basic science concepts when there are no instructional materials accessible. Therefore, the teacher must be creative, innovative, and resourceful in order to improvise instructional materials for basic science teaching (Oyetunde, 2018).

The utilization of locally available resources to facilitate the seamless transfer of knowledge from educators to students is known as improvisation. In order to improve effective instruction, improvisation involves the use of tools and materials that are available in the local environment, created by the instructor, or created with assistance from local resource workers (specialists in local art and crafts). The cognitive, affective, and psychomotor domains of learning are all impacted by improvisation. To ease instruction, improvisation can be defined as the use of substitute materials or equipment that are available

from the local environment or that are made by the instructor or with assistance from local personnel (Shodeind, 2015).

In addition to encouraging active engagement and skill acquisition, improvisation of instructional materials gives students a direct experience with reality, particularly when they are permitted to manipulate the materials. Observation, measurement, and manipulation are some of the skills required for improvisation. According to Abdu-Raheem and Oluwagbohunmi (2015), talented and resourceful teachers should improvise essential instructional materials to raise academic standards in Nigerian schools.

### **Types of Instructional materials**

Ong'amo et al. (2017) define instructional materials as items that streamline teaching and learning activities to accomplish lesson objectives and are classified into three types:

- **Visual aids for instruction**

These are teaching instruments that focus primarily on the visual sense. Simple visual aids include images, film strips, photos, charts, maps, and objects. These resources are simple to use, impressive in their presentation, and uncomplicated.

- **Audio teaching resources**

These are instructional devices geared primarily toward the auditory sense. Audio aids rely on the auditory sense, so children with hearing difficulties cannot benefit from them. Audio equipment that assists the transmission of content through hearing includes compact discs (CDs), radios, gramophones, record players, and cassettes (Sarwinda et al., 2020).

- **Audiovisual teaching resources**

These are educational resources that can display both visual and audio aspects at the same time. Examples include television, videotape shows and records, sound films, filmstrips, and synchronized sound-enhanced slides.

Chukwunazo et al. (2022) divided instructional materials into two broad

groups:

- **Standard Instructional materials**

These are the typical laboratory supplies and tools used to teach science that are either created in factories or imported from outside (Ezeliora et al., 2021). They are standardized because they perform in the same manner in all settings and applications. Examples include scientific kits, thermometers, test tubes, Bunsen burners, evaporating dishes, flasks, funnels, measuring cylinders, chemistry models, pipettes, and spatulas.

- **Locally produced or improvised instructional materials**

Locally generated or improvised educational resources are easily accessible and correspond with the curriculum. There are readily available and fairly priced improvised resources in the classroom (Mushimiyimana et al., 2022). Educators and students build and employ substitute material resources to enhance efficient teaching and learning. Students' motivation, creativity, and critical thinking can be increased through the use of improvised instructional materials in the classroom.

Instructional materials are educational media that enable teachers to confidently transfer knowledge and help pupils comprehend concepts, ideas, and theories. (Haas et al., 2021; Kamji and Agu, 2022). These researchers divided instructional materials into four categories.

- **Print media and reading materials**

These are instructional materials that offer brief information for use in the classroom. This form of content includes photographs, pictures, pamphlets, journals, figures, generalizations, maps, and charts, as well as textbooks.

- **Non-printed media**

These include posters, models, wall charts, and diagrams.

- **Electronic Media**

Electronic media include audio recordings, video films, computers, projectors, television sets, radio recorders, manipulated objects, and computer-based machines.

- **The communal source**

The general public has access to these resources. They include schools, colleges, libraries, government offices, parks, airports, banks, and hospitals.

### **Importance of Instructional materials**

The importance of instructional materials in teaching and learning cannot be overemphasized. A lot has been published to demonstrate the importance of instructional materials in curriculum implementation. Instructional materials allow teachers and students to participate actively and effectively in lesson sessions. They make learning more engaging, enticing, realistic, and useful.

Instructional materials are highly important in the teaching and learning process. It helps students remember things better. Instructional materials promote active learning and save teachers' energy, reducing teacher-centeredness in teaching. Akanbi (2018) defined instructional materials as aids aimed to improve teaching and learning processes, hence contributing to better learning.

According to Onga'mo et al. (2017), instructional materials provide students with access to a wide range of learning skills and assist them in consolidating their knowledge in order to develop distinctive teaching and learning capabilities. This encourages teachers to employ instructional resources when teaching sciences so that students can become engaged in the teaching-learning process and become active participants.

According to Matazu (2022), instructional materials played an important role in the teaching-learning processes, which includes the following:

- i. Improving students' memory capabilities.
- ii. Make the teaching and learning process easier.
- iii. Increase student assimilation rates.
- iv. Serve as tools for teachers to use in correcting false impressions and illustrating concepts that students will not readily forget.
- v. Help to give the body of knowledge under debate a sense of reality.
- vi. Personalizes instruction and encourages teachers' creativity.
- vii. Allow teachers and students to engage in concrete learning activities that foster the concept of self-evaluation.

### **Effects of Instructional Materials**

The use of instructional materials improves teaching effectiveness because it allows students to actively participate in classroom instruction, which leads to higher accomplishment. According to Arop et al. (2015), students who were taught with instructional materials outperformed those who were taught without them. Based on this conclusion, it was advised that instructional materials be employed in teaching because they improve student performance.

According to Ojelade et al. (2020), audio-visual instructional materials have a significant impact on students' science achievement; they asserted that the use of audio-visual instructional materials increased the effectiveness of male and female students learning science without gender disparity. Teachers should therefore incorporate the use of appropriate audiovisual instructional resources when delivering instruction to their students, and they

should be encouraged to employ audiovisual aids in order to increase the interest of male and female students and keep them attentive in class.

Using instructional materials to teach and learn can improve students' performance (Chikendu et al., 2021). As a result, learners who do not use instructional resources may do badly because there will be less interaction and comprehension during the learning process (Ndiokubwayo et al., 2018). According to a study conducted in Sudan by Arbab (2020), students were more interested in the teaching and learning process and performed better when teachers employed instructional materials, particularly audiovisuals and improvised ones.

Olayinka (2016) carried out a study to highlight the contribution of instructional materials to the academic achievement of secondary school student. The study revealed that students who received instruction using instructional materials performed better than those who received instruction without instructional materials. The study therefore recommended that teachers utilize the necessary instructional materials during classroom instruction and also improvise in situations where the original materials are not available

### **Availability and Utilization of Instructional Materials**

Instructional materials act as a bridge between the teacher and the students during the knowledge transfer process. The usage of available instructional materials can help to improve teaching and learning outcomes. Teachers use instructional materials in all aspects of their teaching. Instructional materials are required to provide background knowledge on the subject being taught (Chikendu et al., 2021). Teachers also utilize these resources to evaluate their students. These materials enable students to expand their knowledge by providing a variety of relevant and firsthand experiences (Gustiani et al., 2017).

The utilization of instructional materials is vital for teaching and learning basic science. It encourages both teachers and students to share resources. It also minimizes the extent to which students misinterpret certain scientific concepts. Instructional materials improve educational efficiency by enhancing the quality of teaching and learning (Bukoye, 2019). It promotes cooperative learning both among students and between students and teachers. Audio-visual teaching devices, such as smart boards, can assist teachers in effectively teaching a subject in a crowded classroom. Similarly, Dhakal (2017) observed that teachers' use of instructional resources brings about engaging and effective science instruction. As a result, it is essential to stress the importance of instructional materials in teaching and learning. Using instructional materials can help teachers transfer knowledge that will assist students in developing and strengthening their learning skills.

The utilization of instructional materials help students retain the subject and them to produce high-quality work (Manjale and Abel, 2017). The use of several instructional materials can help with efficient communication and concept transfer (Idris et al., 2018). Using these resources makes instruction more engaging and promotes closer interactions between teachers and students in the classroom (Abubakar et al., 2021). Using real and actual items as teaching aids is an effective technique to supplement the teaching of basic sciences. These resources conceptualize the subject matter being taught, making learning more engaging, efficient, and meaningful (Ibe et al., 2021). Instructional materials assist both teachers and students in understanding broad rules and concepts. Thus, instructional materials should always be used when teaching basic science in secondary schools.

Teachers can improve significantly in both their performance and comprehension of the subject matter by attempting to acquire, learn, and comprehend modern tools or by

improvising teaching aids locally as needed. When teaching basic science in secondary schools, instructional materials are used to develop lesson plans, measure students' knowledge, advise teachers on how to deliver tests, and devise unique and creative ways to evaluate students' performance. This shows that effective usage of instructional materials is essential for both students and teachers while teaching and studying basic science in secondary schools (Mbaegbu et al., 2021).

The availability and utilization of instructional materials for teaching chemistry in senior secondary schools in Ankpa Local Government Area of Kogi state was investigated by Achimugu (2017). The study was guided by four research questions. Descriptive survey design was used. Out of the 75 secondary schools in Ankpa Local Government Area, 36 chemistry teachers from 30 schools were chosen at random to make up the sample size. Data was gathered using two tools: a checklist of instructional material availability and a questionnaire for instructors called Utilization and Inhibiting Factors. Simple percentage, mean, and standard deviation were used to analyze the collected data. The findings showed that while a sizable amount of lab equipment and audio-visual teaching resources were available, they were not being utilized to their full potential, and neither were they being utilized to teach chemistry. It was also discovered that the factors preventing the efficient supply and use of teaching resources for chemistry education were, lack of funding, bad implementation policy, and lack of motivation. It was suggested that the government provide sufficient funding for the purchase of instructional materials and that chemistry teachers should make an effort to use the resources that are currently available.

Similarly, Dhakal (2017) studied the availability and utilization of instructional materials in teaching geography in secondary schools in the Kathmandu district. Eight secondary schools were chosen for the study using random sampling out of the sixteen schools that offer geography. A total of 174 pupils made up the study's sample. Data was

gathered through surveys and observations. Percentage was used to analyze the data. The findings showed that printed and graphic instructional materials for teaching geography were widely available and utilized, however audio, visual, and audio-visual instructional materials for teaching geography were in short supply and rarely utilized in classrooms.

Onajite et al. (2019) researched on teachers' utilization of instructional materials for effective business studies instruction in Delta State junior secondary schools. Three research questions guided the study. The research design used in the study was a descriptive survey. The sample of the study were chosen using the proportionate stratified random sampling technique. The study was conducted using a 38-item questionnaire. Standard deviation and a mean score of 2.50 were used to examine the data. The study's conclusions showed that business studies teachers in junior secondary schools utilized instructional materials, both printed and nonprinted, to a very low extent.

In the same vein, Isma'il and Lukman (2022) carried out a study on the availability and utilization of instructional materials in teaching and learning biology in senior secondary schools in Talata Mafara Town, Zamfara State. The study used quantitative data and a descriptive survey research design. Data was gathered using a validated questionnaire. Frequency counts and percentages were used to analyze the collected data. The findings showed that although some of the necessary teaching resources were reasonably accessible, biology instructors do not frequently utilize them. Large class sizes, lack of funding for purchases, and lack of in-service training for biology teachers were found to be the main obstacles to the efficient supply and use of educational resources.

### **Factors Influencing the Utilization of Instructional Materials**

One factor that hinders the utilization of instructional materials is the inaccessibility of educational resources in schools (Abubakar, 2020). Inadequate funding for schools also

hinders administrators' ability to purchase essential instructional materials, especially audio-visual materials, and prevents teachers from making good use of them in the classroom. Most importantly, a large number of secondary schools in developing countries lack the supplies of contemporary digital technologies. Computers, televisions, semiconductors, and other electrical and digital devices become difficult to use as a result.

According to Adade (2022), the continent is lagging behind in the use of ICT infrastructure because many African countries are still struggling to incorporate ICT into their educational systems. The delivery of high-quality education suffered as a result. Students can obtain a higher-quality education when teachers are equipped with all the resources they require and are proficient in their usage (Dhakal, 2017). Other factors that limit the utilization of instructional materials include the size of the classroom and the amount of time allocated to teaching each topic. It becomes discouraging to use the chosen instructional tools if class sizes are not kept to a minimum (Obiyo and Inyama, 2019).

The ability of teachers to create and improvise educational materials is another obstacle to their utilization. It was discovered that most teachers lacked proficiency in using and operating educational resources, especially the digital ones; this led to problems in selecting and implementing the appropriate resources (Manurung, 2017). Low technical proficiency, insufficient coverage of laboratory technicians, lack of inservice training programs, low teacher enthusiasm, and short class duration are other factors that hinder the use of instructional materials (Shukla, 2018).

### **Summary of Reviewed Literature**

The literature reviewed in this chapter emphasizes the significant role instructional materials play in enhancing teaching and learning. This research is based on two theories that support the idea that the availability and appropriate use of instructional materials are closely

related to effective teaching. The concept of instructional materials was widely explored, researchers agreed that they are essential resources that support comprehension, memory, and student engagement. According to literature on improvisation, when instructional materials are unavailable or inadequate, teachers usually improvise using local resources thereby enhancing teaching. The types of instructional materials were highlighted, which includes; audio aids, visual aids, and audiovisual resources. The effects of instructional resources were also examined, studies reveal how these resources enhance comprehension, raise students' motivation, interest, and academic performance. Additionally, a number of factors that impact utilization were discussed which includes; uneven supply, restricted access and teachers' lack of motivation or training. This chapter concludes by presenting data from related research revealing instructional materials availability and utilization.

## **CHAPTER THREE**

### **METHODOLOGY**

This chapter presents the research methodology adopted for the study. It is presented under the following sub-headings:

- Research Design
- Population of the Study
- Sample and Sampling Technique
- Research Instrument
- Validity of the Instrument
- Reliability of the Instrument
- Method of Data Collection
- Method of Data Analysis

#### **Research Design**

This study was designed to investigate the availability, functionality, and utilization of instructional materials in the teaching and learning of basic science in junior secondary schools in Egor Local Government Area of Edo State. The descriptive survey research design was employed. The design is appropriate because it enables the researcher to collect quantitative data.

### **Population of the Study**

The population of the study comprises all basic science teachers in junior secondary schools in both public and private secondary schools in Egor Local Government Area of Edo State.

### **Sample and Sampling Technique**

The sample for the study consist of forty (40) basic science teachers from some selected junior secondary schools in Egor Local Government Area of Edo state using simple random sampling technique.

**Table 1: Sample Distribution of Basic science teachers selected from Junior secondary schools in Egor local Government Area.**

<b>S/N</b>	<b>Name of School</b>	<b>Type</b>	<b>Sample Selected</b>
1.	Asoro Grammar School	Public	2
2.	Jossy Wisdom Secondary School	Private	2
3.	Iyoba Girls Secondary School	Public	2
4.	John Kelly Group of Schools	Private	2
5.	Egor Secondary School	Public	2
6.	St. Mercy Group of Schools	Private	2
7.	Evbuetubu Secondary School	Public	2

8. Vacglon Secondary Schools	Private	2
9. Evbereke Secondary School	Public	2
10. Precious Secondary Schools	Private	2
11. Federal Government Girls College	Public	2
12. Jacksonville Academy	Private	2
13. Government Science Technical College	Public	2
14. Kings and Queens Secondary Schools	Private	2
15. Boys College Brano High School	Public	2
16. Sunny Comprehensive College	Private	2
17. Jubilee Group of School	Public	2
18. Ransford Education Centre	Private	2
19. Aideyan Memorial Academy	Public	2
20. Auntie Maria School	Private	2
<b>Total</b>		<b>40</b>

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### **Research Instrument**

The Instruments for data collection was a checklist and a structured questionnaire. The questionnaire titled “Availability, Functionality, and Utilization of Instructional materials in the Teaching and Learning of Basic Science in Junior Secondary Schools in Egor Local Government Area of Edo State” (AFUITLBSJSS) was designed by the researcher and consists of questions that seek to answer the research questions raised for the study.

### **Validity of the Instrument**

The Instrument was validated by the project supervisor and two other lecturers from the faculty of Education. Their suggestions and corrections were added to produce the final draft of the Instrument.

### **Reliability of the Instrument**

The reliability of the Instrument was achieved by first administering the Instrument to 15 respondents who were part of the Population but were not included in the Sample. The data collected was analyzed using Cronbach's alpha and a reliability coefficient of 0.89 was obtained.

### **Method of Data Collection**

The administration of the questionnaire was carried out by the researcher, copies of the questionnaire were administered to the respondents and retrieved on the spot.

### **Method of Data Analysis**

The data collected from the respondents by the researcher using the questionnaire was analyzed using descriptive statistics which include simple percentage, mean and standard deviation.

Nominal values were assigned to the four point Likert scale: Strongly agree=4, Agree=3, Disagree=2, Strongly disagree=1. The mean value was obtained using:

$$X = \frac{\sum fx}{N}$$

N

$$X = \frac{4+3+2+1}{4} = \frac{10}{4}$$

4      4

$$X = 2.50.$$

The mean value of 2.50 was the criterion. This implies that 2.50 and above was regarded as agree while below 2.50 was regarded as disagree for each questionnaire item.

## **CHAPTER FOUR**

### **PRESENTATION OF RESULTS AND DISCUSSION OF FINDINGS**

This chapter presents the analysis and interpretation of the data collected from the respondents. The data collected were analyzed using frequency count, percentage, mean and standard deviation. The results are presented in tables

#### **Presentation of Results**

**RESEARCH QUESTION ONE:** Are there instructional materials available for teaching basic science in junior secondary schools in Egor Local Government Area of Edo State?

**Table 2: Checklist on the availability of instructional materials for basic science teaching in junior secondary schools in Egor Local Government Area of Edo State.**

<b>S/N</b>	<b>Instructional Materials</b>	<b>Available</b>	<b>Not available</b>	<b>Decision</b>
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1	Textbooks	15	5	Available
2	Charts	12	8	Available
3	Real objects/ Model	11	9	Available
4	Audio Tapes	6	14	Not available
5	Slides	5	15	Not available
6	Filmstrip	3	17	Not available
7	Overhead projector	3	17	Not available
8	Motion picture	4	16	Not available
9	Computer	12	8	Available
10	Television	3	17	Not available
11	Interactive White board	5	15	Not available
12	Graphs	6	14	Not available
13	Flipchart	2	18	Not available
14	Flashcard	2	18	Not available
15	Posters	15	5	Available
16	Specimen	9	11	Not available
17	Microscope	6	14	Not available
18	Thermometer	5	15	Not available
19	Printed materials	14	6	Available
20	Maps	9	11	Not available
21	Globes	6	14	Not available
22	Tablets	19	1	Available
23	Educational videos	6	14	Not available
24	Multimedia presentations	5	15	Not available

25	Photographs	11	9	Available
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Table 2 shows that out of the 25 listed instructional materials, only 8 were available in schools which are textbooks, charts, real objects, computers, posters, printed materials, tablets and photographs. Audio tapes, slides, filmstrip, Overhead projector, Motion picture, Television, Interactive whiteboard, graphs, flipchart, specimen, microscope, thermometer, maps, globes, educational videos and multimedia presentations were not available in schools.

**RESEARCH QUESTION TWO:** Are these instructional materials utilized in the teaching and learning of basic science?

**Table 3: Checklist on the utilization of instructional materials for basic science teaching in junior secondary schools in Egor Local Government Area of Edo State.**

S/N	Instructional Materials	Utilized	Not utilized	Decision
1	Textbooks	14	6	Utilized
2	Charts	11	9	Utilized
3	Real objects/ Model	11	9	Utilized
4	Audio Tapes	3	17	Not utilized
5	Slides	4	16	Not utilized
6	Filmstrip	2	18	Not utilized
7	Overhead projector	3	17	Not utilized
8	Motion picture	4	16	Not utilized
9	Computer	8	12	Not utilized
10	Television	1	19	Not utilized
11	Interactive White board	4	16	Not utilized
12	Graphs	5	15	Not utilized

13	Flipchart	2	18	Not utilized
14	Flashcard	2	18	Not utilized
15	Posters	14	6	Utilized
16	Specimen	7	13	Not utilized
17	Microscope	4	16	Not utilized
18	Thermometer	3	17	Not utilized
19	Printed materials	13	7	Utilized
20	Maps	8	12	Not utilized
21	Globes	5	15	Not utilized
22	Tablets	18	2	Utilized
23	Educational videos	5	15	Not utilized
24	Multimedia presentations	4	16	Not utilized
25	Photographs	11	9	Utilized

Table 3 shows that out of the 25 listed instructional materials, only 7 were utilized in the teaching of basic science in schools which are textbooks, charts, real objects, posters, printed materials, tablets and photographs. It shows that textbooks, charts, real objects, posters, printed materials, tablets and photographs were utilized in basic science teaching. However, audio tapes, slides, filmstrip, overhead projector, motion picture, computer, television, interactive whiteboard, graphs, flipchart, flashcard, specimen, microscope, thermometer, maps, globes, educational videos and multimedia presentations were not utilized. It also revealed that audio-visual materials were neither available nor utilized by the basic science teachers in the sampled schools.

**RESEARCH QUESTION THREE:** What are the challenges faced by basic science teachers in the utilization of instructional materials?

**Table 4: Frequency, Mean Rating and Standard Deviation of Teachers' Responses on the Challenges faced by basic science teachers in the utilization of instructional materials.**

S/N	Items	SA	A	D	SD	Mean	SD	Decision
1	Large class size.	14	20	4	2	3.15	0.79	Agree
2	Teacher's lack of motivation.	9	19	8	4	2.83	0.88	Agree
3	Lack of in-service training for teachers.	7	17	8	8	2.58	0.98	Agree
4	Lack of supervision of teachers by school administrators.	8	15	9	8	2.58	1.01	Agree
5	Short periods allocated to basic science classes on the school time-table.	14	20	5	1	3.18	0.72	Agree

Table 4 shows that items 1 to 5 scored above the criterion mean of 2.50. This implies that basic science teachers agreed that the above five items inhibit effective utilization of instructional materials in basic science teaching. It revealed that the challenges faced by basic science teachers in the utilization of instructional materials are: teachers' lack of motivation, short periods allocated to basic science classes on the school time-table, large class size, lack of supervision of teachers by school administrators and lack of in-service training for teachers.

**RESEARCH QUESTION FOUR:** What are the factors affecting the availability of instructional materials in junior secondary schools in Egor Local Government Area of Edo State?

**Table 5: Frequency, Mean Rating and Standard Deviation of Teachers' Responses on the Factors affecting the availability of instructional materials in junior secondary schools in Egor Local Government Area of Edo State.**

S/N	Items	SA	A	D	SD	Mean	SD	Decision
1	Inadequate funding to acquire instructional materials.	15	20	4	1	3.23	0.70	Agree
2	High cost of instructional materials.	9	19	8	4	2.83	0.88	Agree
3	Poor implementation of educational policies.	7	17	9	7	2.60	0.97	Agree
4	Mismanagement of fund meant to purchase instructional Materials	8	15	10	7	2.60	0.99	Agree
5	Insufficient improvisation of instructional materials.	10	12	9	9	2.58	1.08	Agree

The results in table 5 shows that the five factors scored above the criterion mean of 2.50. This implies that the five factors inhibit the provision and availability of instructional materials in teaching basic science. It revealed that the basic science teachers sampled for the study agreed that the factors affecting the availability of instructional materials for basic science teaching are: inadequate funding to acquire instructional materials, high cost of instructional

materials, poor implementation of educational policies, mismanagement of funds meant to purchase instructional materials and insufficient improvisation of instructional materials.

### **Discussion of Findings**

The findings of this study revealed that print materials and real objects for teaching basic science were available in schools, while audio and audio-visual instructional materials were not available. The findings of this study collaborates with the findings of Achimugu (2017) who asserted that most schools do not have audio-visual instructional materials.

Table 3 shows that textbooks, charts, real objects, posters, printed materials, tablets and photographs were utilized in basic science teaching. However, audio tapes, slides, filmstrip, overhead projector, motion picture, computer, television, interactive whiteboard, graphs, flipchart, flashcard, specimen, microscope, thermometer, maps, globes, educational videos and multimedia presentations were not utilized. It also revealed that audio-visual materials were neither available nor utilized by the basic science teachers in the sampled schools. These findings also corroborate with the work of Achimugu (2017) who asserted that ICT resources are not available in most secondary schools and that the few ones available are not properly utilized by the teachers.

Table 4 revealed that the challenges faced by basic science teachers in the utilization of instructional materials are: teachers' lack of motivation, short periods allocated to basic science classes on the school time-table, large class size, lack of supervision of teachers by school administrators and lack of in-service training for teachers.

Finally, the findings from table 5 revealed that the basic science teachers sampled for the study agreed that the factors affecting the availability of instructional materials for basic science teaching are: inadequate funding to acquire instructional materials, high cost of instructional materials, poor implementation of educational policies, mismanagement of

funds meant to purchase instructional materials and insufficient improvisation of instructional materials.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

This chapter presents the summary of the study, conclusion, as well as recommendations based on the findings of the study.

#### **Summary**

The study was conducted to investigate the availability, functionality and utilization of instructional materials in the teaching and learning of basic science in junior secondary

schools in Egor local Government area of Edo state. Four research questions were raised to guide the study. Descriptive survey research design was adopted for the study. The sample for the study consists of 40 basic science teachers from 20 junior secondary schools in Egor local Government area of Edo state. A questionnaire titled “Availability, Functionality, and Utilization of Instructional materials in the Teaching and Learning of Basic Science in Junior Secondary Schools in Egor Local Government Area of Edo State” and a checklist were the instrument used for data collection. Data collected from the respondents were analyzed using percentage, mean and standard deviation.

Findings from the study revealed the following:

1. Majority of the required and essential instructional materials for effective basic science teaching were not available in schools.
2. Basic science teachers fairly utilize instructional materials during classroom instruction.
3. Teachers’ lack of motivation, short periods allocated to basic science classes on the school time-table, large class size, lack of supervision of teachers by school administrators and lack of in-service training for teachers were identified as challenges faced by basic science teachers in the utilization of instruction for basic science teaching.
4. Lastly, inadequate funding to acquire instructional materials, high cost of instructional materials, poor implementation of educational policies, mismanagement of funds meant to purchase instructional materials and insufficient improvisation of instructional materials are factors affecting the availability of instructional materials in schools.

## **Conclusion**

The findings of the study provide the basis for the researcher to conclude that adequate instructional materials are not available and utilized for basic science teaching in schools. Factors affecting the availability of instructional materials in schools include inadequate funding to acquire instructional materials, high cost of instructional materials, poor implementation of educational policies, mismanagement of funds meant to purchase instructional materials and insufficient improvisation of instructional materials. Challenges faced by basic science teachers in the utilization of instructional materials are teachers' lack of motivation, short periods allocated to basic science classes on the school time-table, large class size, lack of supervision of teachers by school administrators and lack of in-service training for teachers.

### **Recommendations**

Based on the findings from the study, the following recommendations were made:

1. Government should ensure adequate provision of funds for the procurement of instructional materials that are not available in secondary schools.
2. Government should provide incentives to motivate and enable teachers purchase instructional materials.
3. Teachers should improvise instructional materials for basic science teaching where the standard ones are not available.
4. Principals and school administrators should ensure strict supervision of basic science teachers to ensure the utilization of instructional materials.
5. Government should provide in-service training for teachers on the utilization of instructional materials.

### **Suggestion for Further study**

The study investigated the availability, functionality and utilization of instructional materials in the teaching and learning of basic science in junior secondary schools in Egor local Government area of Edo state using 40 respondents. Future studies can be carried out in other local government areas or with a larger population.

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## **APPENDICES**

### **QUESTIONNAIRE**

DEPARTMENT OF CURRICULUM AND INSTRUCTIONAL TECHNOLOGY

FACULTY OF EDUCATION

UNIVERSITY OF BENIN

BENIN CITY.

AVAILABILITY, FUNCTIONALITY AND UTILIZATION OF INSTRUCTIONAL MATERIALS IN THE TEACHING AND LEARNING OF BASIC SCIENCE IN JUNIOR SECONDARY SCHOOLS IN EGOR LOCAL GOVERNMENT AREA OF EDO STATE.

Dear Respondents,

This questionnaire is designed solely to investigate the availability, functionality and utilization of instructional materials in the teaching and learning of basic science in junior secondary schools in Egor Local Government Area of Edo State. Kindly provide appropriate answers to each of the questions. All information provided will be used strictly for research purpose and will be treated with utmost confidentiality. Please respond to each questions by providing a tick ( ✓ ) in the appropriate spaces.

Thank you for your cooperation.

**KEYS:** SA= Strongly agree, A=Agree, D=Disagree, SD=Disagree.

**RESEARCH QUESTION THREE:** What are the challenges faced by basic science teachers in the utilization of instructional materials?

S/N	Items	SA	A	D	SD
1	Large class size.				
2	Teacher's lack of motivation.				
3	Lack of in-service training for teachers.				
4	Lack of supervision of teachers by school administrators.				
5	Short periods allocated to basic science classes on the school time-table.				

**RESEARCH QUESTION FOUR:** What are the factors affecting the availability of instructional materials in junior secondary schools in Egor Local Government Area of Edo State?

<b>S/N</b>	<b>Items</b>	<b>SA</b>	<b>A</b>	<b>D</b>	<b>SD</b>
6	Inadequate funding to acquire instructional materials.				
7	High cost of instructional materials.				
8	Poor implementation of educational policies.				
9	Mismanagement of fund meant to purchase instructional materials.				
10	Insufficient improvisation of instructional materials.				