INFLUENCE OF TEACHING-LEARNING MEDIA ON TEACHING BIOLOGY IN NIGERIA SECONDARY SCHOOLS IN OREDO LOCAL GOVERNMENT AREA OF EDO STATE.

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BENIN CITY

JULY, 2021

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A PROJECT SUBMITTED TO THE DEPARTMENT OF CURRICULUM AND INSTRUCTIONAL TECHNOLOGY, FACULTY OF EDUCATION, UNIVERSITY OF BENIN, BENIN CITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE BACHELOR OF SCIENCE (Ed) DEGREE IN BIOLOGY

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CERTIFICATION

We, the undersigned, certify that this research work was carried out by Harrison Ogedegbe in the Department of Curriculum and Instructional Technology, Faculty of Education, University of Benin, Benin City in partial fulfillment of the requirements for the award of the Bachelor of Science (Ed) degree in Biology.

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DEDICATION

This research work is dedicated to God Almighty, for his love and wisdom towards me all through my stay in the University.

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TABLE OF CONTENT

CHAPTER FOUR: DATA PRESENTATION AND DISCUSSION OF FINDINGS

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

LIST OF TABLES

ABSTRACT

The purpose of the study is to acknowledge the problems hindering the effective teaching and learning of biology in Oredo Local Government Area of Edo State. The study is to determine how well teachers in Oredo Local Government use teaching-learning media in teaching of biology in secondary schools, the extent to which the lack of educational and instructional materials affect the teaching and learning of biology, the extent of the abilities of teachers and how well they cope with new technology and media used for proper learning of biology which is a core science subject, the extent to which the educational qualifications cover for the teachers in the use of computerized media for teaching and learning, and how well they are tested for effective teaching programs in the scope of biology.

The researcher employed a survey research method to gather information on the topic. The population of the study consists of 2 biology teachers selected from 10 public senior secondary schools in Oredo Local Government Area. A total population of 20 teachers was sampled from the 10 senior secondary schools. The instrument used in this study for the collection of data was a structured questionnaire. The instrument was designed by the researcher and validated by two experts in the department of curriculum and instructional technology. It was subjected to face content validity of the instrument. 20 copies of the questionnaire were distributed by the researcher to the 20 respondents (biology teachers) and were collected by the researcher on the spot. The methods of data collected were analyzed using mean score.

The result from the analysis showed that, the use of teaching-learning media in secondary schools is not much. teachers still use chalkboards and textbooks for teaching biology, the use of live biota and computers is almost non-existent in these schools, most schools do not have new technology for teaching available for use to teachers and students, many teachers were inexperienced to use computers, the non availability and lack of teaching-learning media in these schools makes learning biology difficult, incomprehensible and impossible to learn which leaves the students decades behind their counterparts in western and foreign schools. It also revealed that teachers will embrace old means of teaching biology unless they are taught how to use and navigate around these new teaching-learning media.

Some solutions include: the Ministry of Education providing adequate programs for coaching teachers on how to use teaching-learning media, qualified biology teachers should be provided with these resources and materials to ease the teaching of biology.

Also, the ministry of education should regularly supervise schools to make sure that they always meet up with the appropriate standard. Hence, there is much need for sufficient qualified and competent biology teachers with teaching-learning media skills in secondary schools in Oredo Local Government Area.

CHAPTER ONE

INTRODUCTION

Background to the study

Biology as a branch of the general body of knowledge (science), has been defined by different scholars according to their perception and understanding of the subject. Okwo & Tawtiyas (2017) defined Biology as a science which involves the systematic study of living things and interaction with each other and their environment. Kalu (2017) simply defined Biology as the science of life. Biology as a science of life is concerned with the characteristics of living things, their forms, functions and relationship with one another and with their environment among others.

Biology is a natural science that deals with the living world, how the world is structured, how it functions and what these functions are, how it develops, how living-things came into existence, and how they react to one another and with their environment (Umar, 2011). This includes medicines, pharmacy, nursing, agriculture, forestry, biotechnology, nanotechnology, and many other areas (Ahmed & Abimbola, 2011).

Biology is seen as one of the core subjects in secondary school curriculum. Because of its importance, more students enrolled for biology in the senior secondary school certificate examination (SSCE) than for physics and chemistry

(West African Examination Council, 2011). Biology is introduced to students at senior secondary school level as a preparatory ground for human development, where career abilities are groomed, and potentials and talents discovered and energized (Federal Republic of Nigeria, 2009). The quality and quantity of science education received by secondary school students are geared toward developing future scientists, technologist, engineers, and related professionals (Kareem, 2016).

Despite the importance and popularity of biology among Nigerian students, performance at senior secondary school level has been poor (Ahmed, 2018). The implication of this failure in education is that Nigeria may have shortages of manpower in science and technology-related disciplines. This may affect Nigeria's vision to become one of the 20 industrialized nations in the world by year 2026

Poor teaching methods adopted by teachers at senior secondary school level in Nigeria have been identified as one of the major factors contributing to poor performance of students in biology (Ahmed & Abimbola, 2017; Kareem, 2016; Umar, 2017). The convectional teaching method is classroom-based and consists of lectures and direct instructions conducted by the teacher. This teacher-centered method emphasizes learning through the teacher's guidance at all times. Students are expected to listen to lectures and learn from them. The teacher often talks at the students instead of encouraging them to interact, ask questions, or make them understand the lesson thoroughly. Most classes involve rote learning, where

students depend on memorization without having a complete understanding of the subject. Just passing the tests, consisting of descriptions, matching, and other forms of indicators, is all that matters to complete the curriculum (Adegoke, 2016; Umar, 2016). The persistence use of this method makes students passive rather than active learners. It does not promote insightful learning and long-term retention of some abstract concepts in biology (Ahmed, 2018; Ahmed & Abimbola, 2016; Kareem, 2016; Umar, 2015). From research evidence, educators see the pressing need to reconsider the techniques and methods of instruction at senior secondary school level. To address these challenges, there is need for an instructional system that is supported by technology for meaningful learning. In the 21st century, a motivating and captivating approach should be encouraged to help students better learn, understand, and retain biology concepts and promote their future involvement. One of the promising approaches, according to Adegoke (2015); Kuti (2016); Mayer, Dow, and Mayer (2015); and Moreno and Mayer (2016), involves media presentations supported in visual and verbal formats supplemented with pictures, animations, texts, and narration.

Media refers to the system used to present instruction. Students' interest and retention could be aroused and retained through the use of multimedia instructional approach (Adegoke, 2016). Starbek, Eriavec, and Peklai (2016) reported that students acquired better knowledge retention and improved comprehension skills more than the other groups when taught genetics with multimedia. Similarly,

Achebe (2015) and Gambari and Zubairu (2015) found that students who were taught food and nutrition at senior secondary school level, and pupils taught primary science at nursery and primary school levels performed better and had better retention than those taught with traditional methods respectively. According to Kim and Gilman (2015), it is necessary to apply learning theories in designing effective media instruction. For instance, Mayer and his colleagues propounded six principles of media learning: (a) the media principle – students learn better from words and pictures than from words alone; (b) the spatial contiguity principle - students learn better when corresponding words and pictures are presented close or next to each other rather than far apart on the page or screen; (c) the temporal contiguity principle – students learn better when corresponding words and pictures are presented simultaneously rather than successively; (d) the coherence principle – students learn better when extraneous words, pictures, and sounds are excluded rather than included; (e) the modality principle – students learn better when words in a media are presented as spoken rather than printed text; (f) the redundancy principle – students learn better from animation and narration than from animation, narration, and on-screen text (Mayer, 2017). According to Adegoke (2015), all six principles have been proven repeatedly in empirical research e.g., Mayer, Bove, Bryman, Mars, and Tapangco (2015) for media principle; Mousavi, Low and Sweller (2014) for modality principle; Mayer, Heiser, and Lonns (2018); Moreno & Mayer (2016); Tabbers, Martens, and Van-

Merrieboer (2016) for redundancy principle. However, Thalheimer (2016) has reported findings that were not in consonance with Mayer's (2014) media learning principle. For instance, Muller, Lee, and Sharma (2018) found that the redundancy principle did not transfer to normal classroom situations. In his study, Muller (2018) suggested that addition of interesting information may help maintain the learners' interest in a normal classroom environment. The effective use of animation and its positive results on instructional message design is made evident by other research. For instance, Nusir, Alsmadi, Al-Kabi, and Shardqah (2015) found that the computer animation learning courseware had positive effects on students' academic performance and achievement level (high and low).

Moreno and Mayer (2018) and Tabbers (2016) found that learning outcomes of students who learnt biology with courseware version of animation + narration were better than their colleagues who learnt biology either with animation + on-screen text or animation + narration + on-screen text. Mayer and Anderson (2014) reported that simultaneous presentation of animation and narration improved learning. However, Grobe and Struges cited in Saibu (2007) found that those taught through the conventional teaching methods achieved a mean posttest score slightly higher than those taught by the audio-tutorial (narration) method. Studies on animation + narration + on-screen text were made evident by Mubaraq's (2009) results that a still picture is better than (sound) words, animation better than a still picture, and sound better than silence. This was supported by Adegoke (2010),

Adegoke (2011), and Chuang (2009) in their studies which examined the effect of animation, narration, and on screen text-based materials when combined simultaneously; the result showed that students in the animation + narration + onscreen text group scored significantly higher on the post-biology achievement test than their colleagues who were in the animation + narration only group, as well as those who were in the animation + on-screen text group. These studies were also not in agreement with the redundancy principle. However, Okwo and Asadu (2012) reported that three media (video, audio + picture, and audio) were found to be equally effective with no significant difference effect among the means when used for teaching Biology.

Statement of the Problem

The picture today is that biology education is failing. The results of the Senior Secondary School Certificate Examination (SSSCE) of biology students in Nigeria are highly disturbing, considering the fact that the students would become future scientists. According to West African Examination Council 2009-2014 Annual Report, the number of students that passed biology at credit level (A1-C6) was consistently less than 50% for the past five years (2009-2014) in Nigeria. From research evidence, educators see the pressing need to reconsider the techniques and methods of instruction at senior secondary school level. To address these challenges, there is need for an instructional system that is supported by technology

for meaningful learning. In the 21st century, a motivating and captivating approach should be encouraged to help students better learn, understand, and retain biology concepts and promote their future involvement. One of the promising approaches, according to Adegoke (2017); Kuti (2015); Mayer, Dow, and Mayer (2016); and Moreno and Mayer (2017), involves multimedia presentations supported in visual and verbal formats supplemented with pictures, animations, texts, and narration.

It is well recognized that multimedia remains the key towards improving learning outcomes. However, the extent to which this has been achieved has not yet been addressed in biology education. Therefore, this study investigates the effect of teaching and learning media on the Teaching Biology in Nigeria secondary schools.

Purpose of the study

The main purpose of the study is to determine the effect of teaching and learning media on the teaching of Biology in Nigeria schools. Specifically, the study is aimed to determine:

1. Which of the following teaching-learning media would you say is user-friendly (easy for the teacher to use)

2. how does teaching and learning media improve student performance in Biology;

3. Which of the following teaching-learning media do you have available at your school ?

Research questions

The following questions were answered in the study

1. What teaching-learning media would you say is user-friendly (easy for the teacher to use)

2. How does teaching and learning media improve student performance in Biology?

3. Which teaching-learning media is available at your school?

Significance of the Study

The essence of this study is to conduct an inquiry into the effect of teaching and learning media on the performance of secondary school students in Biology, Nigeria. This research will be of great importance to the students, teachers, parents, government, curriculum planner and the nation at large. This project will equally help to correct misconception of any student or teacher on media. This research also will enable the educators to see the need to integrate media into education, it encourage the curriculum planner to design curriculum with the use of media, which involves the infusion of media as a tool to enhance learning and understanding in a content area or in a multidisciplinary setting.

Benefit to Students: Media environment enables students to learn in ways not previously possible. Effective integration is achieved when students are able to select media to obtain information in a timely manner, analyze and synthesize the

information and present it effectively. Student are more engaged in the lesson and they take ownership of their learning.

Benefit to Teachers: Teachers have a more positive attitude towards their work and are able to provide more personalized learning. The teacher also finds a convenient way of gathering and keeping students record through the use of media.

Benefit to Parents: The Parents will benefit from this research by seeing their children excelling in Biology class and being able to grasp and comprehend information and instruction they give to their children.

Benefit to Nation: The country also benefits from this in terms of Economic progress which can result from direct job creation in the technology industry as well as from developing a better educated workforce.

Scope and Delimitation of the Study

The scope of the study is on the influence of teaching-learning media on teaching biology in Secondary school in Oredo Local government area of Edo state.

This study is delimited to all Biology Senior secondary school teachers in Oredo local government area of Edo state.

Definition of Terms

Media: Collective communication outlets or tools that are used to store and deliver information or data.

Visual media: This is a colloquial expression used to designate things such as television, film, photography and painting, etc.

Audio media: It's a communication outlets through audio devices like analog tape cassettes, radio, etc.

Audio-visual media: This is a communication outlets through both video and audio outlet such as a computer set with speaker, etc

Multimedia: Using more than one medium of expression such as combining video with audio in teaching could be meaningful.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter deals with the review of related literature, and will be organized under the following sub headings:

- Learning and Teaching media theories
- Definition of Media
- Concept of Teaching-Learning media.
- The Extent to which Teaching learning media affect Student Performance
- Challenges Teachers face in accessing Teaching learning media
- Strategies to Minimize the Challenges of Attaining and using Quality Teaching learning media.
- Factors to be considered before choosing teaching- learning media.
- Audio and visual media
- Computer-based media
- Computer-assisted education (virtual classroom)
- Limitation of the study
- Summary of Literature reviewed.

Theoretical Frame work

Learning and Teaching Media Theories

Learning and Teaching Media theories assume that there is a direct link between the media that the teachers use, and the students' learning outcomes. These outcomes include higher abilities to learn, quality strategies to learn and perform classroom activities and positive attitude towards learning. Further, these theories assume that learning and Teaching Media have the capacity to develop into students the highest order of intellectual skills as they illustrate clearly, step by step how to follow the rules/principles and elaborate on the concepts, all of which have positive impact on solving new problems by analyzing the situation and formulating a plan (Gagné et al. 2015). According to Gagne et al, learning and Teaching Media can be used to develop higher learning abilities to the learners through self-teaching or guided learning. This implies that the learning and Teaching Media mainly comprise "eliciting performance" and "providing feedback on performance correctness," in addition to "providing learning guidance" for guided discovery learning. Many of Gagné's 9 ideas have broad implications for secondary teachers in rural secondary schools in Benin district. Many of these ideas have capacity building undertones with themes of students' acquisition of critical thinking and problem-solving skills. However, the theory does not relate to whether or not students can think critically in what aspects or how they can solve a particular problem by themselves. However, I have the opinion that the purpose of

learning and Teaching media or technology in education is to stretch students' imagination and to encourage them to solve problems in their lives.

Similar ideas are held by Lev Vygotsky, a Russian psychologist who held a view that tools and signs, which are in a form of learning and Teaching media, have the capacity to develop in students higher level of thinking, which is important in problem-solving activities. However, since they are considered to be domain-specific, the ways learning and Teaching media can start cognitive development is yet to be studied with respect to classroom teaching. Thus, this study stretches these views.

Definition of Media

Media can be seen as a medium, broadly conceived, any person, material, or event that establishes conditions which enable the learner to acquire knowledge, skills and attitudes (Jacobs *et al 2016*). Reiser & Gagne (2017) define education media as: " .the physical means by which an instructional message is communicated."

Generally, media are selected on their ability to present the events of instruction (Reiser & Gagne, 2016) and to facilitate the achievement of stated objectives (Gerlach 2017).

According to Mayer (2015) media refers to the presentation of material using both words and pictures. He further states that learners can better understand an explanation when it is presented in words and pictures than when presented in words alone.

According to several researchers media can be defined as all the methods and material that can be used to support the learning process (Dugger *et al.*, 2015:32, Perraton, 2015:31, Cheek & Walsh, 2014:46).

Atherson (2013) quotes Marshall McLuhan's famous words that "the medium is the message". In teaching the medium is certainly a message. The use of any adjunct to the voice sends a message to the learners, which will be received and understood at least out of consciousness and perhaps explicitly. Media can be seen as any medium or method that are used to present a message.

Concept of teaching-learning media.

The terms 'teaching' and 'learning' are associated with the introduction (explaining, elucidating, etc.) and learning of knowledge. This transfer of information is accomplished by using certain symbols. When we speak, read or observe things we use symbols, which represent specific information to give meaning to those things we are observing. For example a red ladybird is a definite symbol of danger (Jacobs *et al.*, 2016)Teaching-learning media can be seen as many different kinds of media used to introduce (explain, elucidate, etc.) the learning content to the learners, so that the learning that takes place by the learners can be effective.

A teaching-learning medium can be defined as an object the teacher uses, or which is given to the learners to use, to achieve specific teaching and learning outcomes. It is not only apparatus or pictures, but include many other types of learning experience (Jacobs *et al.*, 2015).

Teaching-learning media can therefore be defined as any medium a teacher uses to present a lesson effectively.

The Extent to which Teaching learning media Affect Student Performance

In his study Adeogun (2015) revealed a strong positive link between teaching learning media and academic performance. According to Adeogun, schools that possess more teaching learning media, performed better than schools that have less teaching learning media. This finding supported the study by Babayomi (2014) that private schools performed better than public schools because of the availability and adequacy of teaching and learning resources. Adeogun (2015)noted that there was a low level of teaching learning media available in public schools and hence commented that public schools had acute shortages of both teaching and learning resources. He further commented that effective teaching and learning cannot occur in the classroom environment if essential teaching and learning media are not available.

Fuller and Clark (2014) suggested that the quality of learning and teaching processes experienced by a learner determines quality of education. In their view they suggest that quality teaching learning media, create into the learners quality learning experience. Mwiria (2015) also supports that students performance is affected by the quality and quantity of teaching and learning media. This implies that the schools that possess adequate teaching and learning media such as computer, phones, projector, Television, cassettes, real objects for students to see, hear and experiment with, stand a better chance of performing well in examination than poorly equipped ones.

A study by Chonjo (2014) on the physical facilities and teaching learning media in Primary schools in Tanzania supports the above views. Chonjo interviewed teachers and students on the role of teaching learning media on effective learning. From is his study he learned that performance could be attributed to adequate teaching and learning materials and equipments that are in a school. He

recommended that in order to provide quality education the availability of sufficient quality facilities is very important. Chonjo's study was one of its kinds in Tanzania which directly linked the role of physical facilities with students' academic performance in primary schools.

However, Chonjo focused only on physical facilities, leaving out Media for instruction. To me, physical facilities such as buildings including classrooms, chairs and desks are not enough to provide quality teaching and learning. Teaching learning media are also necessary. The study done by Maundu (2015) agrees with my ideas that, in order for a school to have a good performance it must be well equipped with relevant and adequate instructional medium and other teaching and learning resources.

Challenges Teachers Face in Accessing Teaching learning media

Teachers in community secondary schools most especially in rural schools face some challenges in accessing Teaching learning media. One of the big challenges that teachers in rural secondary schools face in accessing Teaching learning media is meagre funds provided by the government to rural secondary schools for purchasing Teaching learning medium.

Most rural secondary schools depend to the large extent on the government for funding. Very little support is received from local government and communities around the schools most especially in rural areas due to poverty. The funds are provided in form of capitation grants. The capitation grant is aimed at improving the quality of education by making sure that sufficient leaching and learning material are found at school level. In particular, the capitation grant is meant to finance the purchase of textbooks and other teaching and learning medium as

well as to fund repairs, administration materials, and examination expenses (Uwazi, 2015).

However, while the number of students who are enrolled in schools has been increasing each year, education capitation grant has been dropping. Even without adjusting for inflation, the actual amount of money reaching schools for capitation grants is clearly much less today compared to what it was between 2015 and 2016. According to the Education Public Expenditure Tracking Survey of 2014, in the period 2010-2013 schools received an average of 5,400 shillings per pupil. In 2015/16 however, the money actually reaching the schools had declined to 4,189 shillings per pupil (URT, 2010). This amount of money is grossly insufficient to purchase a minimum set of textbooks apart from other Teaching learning medium which are highly needed by the teachers. According to Onche (2014), government's Policy towards efficient provision of these aspects of educational resources has not been encouraging and has always not been well planned, monitored, supervised and evaluated with rural schools as the back bench of implication of these policies.

Another challenge that teachers face is the lack of exposure and limited accessibility to modern Teaching medium. Most secondary schools especially in rural areas do not have access to information communication technology (ICT) which could alleviate shortage of Teaching media. As we are in a new millennium, there is an increased awareness of the need to use modern scientific approach in teaching and learning processes in our schools.

At present, there is a universal recognition of information and communication technology as a major force in the dissemination of knowledge (Aina, 2017). Majority of teachers who were trained early 1990's and backward do not have skills in the field of Information and Communication Technology. Where there

are skilled teachers, other problems naturally include problem of installation, maintenance, operation, network administration and local technicians to service or repair these equipment's and the other facilities. In most of the rural secondary schools, most of the facilities are non-existent, hence the traditional chalk and duster approach still dominates in secondary school pedagogy (Obasi, 2018). Poor salary is also another challenge that teachers face. Teachers like most civil servants in Tanzania are poorly paid. This becomes a hindrance for them to purchase their own teaching medium or acquisition of new ideas, skills and knowledge by failure in enrolling for further educational programmes including Information and Communication Technology (ICT). With this, the academic and intellectual capacities of teachers and learners are bound to be affected substantially during classroom interaction (Onche, **2017).**

Lack of sufficient skills and creativity may hinder teachers to improvise their own Teaching learning media.

Local governments and communities around community secondary schools are supposed to provide resources most especially funds to these schools so that teachers can use them to access Teaching media. But very often this is not the case due to number of reasons. Some local communities have very narrow tax base. Also the performance of local councils in the collection of their own revenue have been recorded very poor.

According to Galabawa (1993), there are few types of councils in Tanzania, which can manage to collect government grants. Many local authorities however have found themselves unable to deal with such a rapid increase in expenditure and their budget deficit increase. Education is one of the sectors, which are mostly affected by this situation. Poverty is another reason, which may hinder members of the community in supporting teachers and schools financially so that

they can access Teaching media According to Kimego (2011), Parents and communities participation differ from rural to urban communities and from one mode of economy to another. Parents who are involved in cash crops economy have economic ability to finance education compared to parents who are not involved in cash crop economy. Another challenge that teachers face in accessing Teaching learning media is lack of clear policy and monitoring mechanisms to ensure that enough funds are provided to community secondary schools for purchasing Teaching learning media and also these funds are used for the intended purpose. As Onche (2014) comments, government's Policy towards efficient provision of these aspects of educational media has not been encouraging and has always not been well planned, monitored, supervised and evaluated with rural schools as the back bench of implication of these policies.

Strategies to Minimize the Challenges of Attaining and using Quality Teaching-learning media.

There are a number of strategies, which can be used in order to minimize the challenges of attaining and using quality Teaching learning media According to studies done in different parts of the world including Africa, one of the strategies is improvisation of some of the Eshiet (2016) states that improvisation involves sourcing, selection and deployment of relevant mei into the teaching-learning focus in the absence or shortage of standard materials for a meaningful realization of specified educational goals and objectives. According to studies done by Abodelraheem & Al-Rabane (2015), Udosen (2013) and Ibe-Bassey (2012) some creation of improvised media of low technological materials and resource-centred learning can enlarge the limited knowledge base of any course of study and enrich instruction to a guaranteed quality. It can also promote strategies that ensure the integration of technology in the teaching and learning process of basic science education. their findings are in agreement with the findings of Dodge

(2017) who observed that using technologies like simulation devices open new horizons for individual learning tools, the environment resources and services.

The use of ICT can also minimize some of the challenges. According to UNESCO (2014), the use and rapid spread of electronic communications has the capacity to affect the quality and efficiency of basic education throughout the world. The ease with which teachers and students can gather information over the Internet on virtually any topic has the potential to transform instructional content and pedagogical practice. Moreover, courses developed by the best teachers in one country can be made available to students across many countries. Newer technology-based media strategies, incorporating the Internet and the World Wide Web (WWW), can therefore be used more to expand communication and increase access to resources. Tinio (2012), points out that ICT has potentials in increasing access and improving relevance and quality of education in developing countries. Tinio further states the potentials of ICT as follows: ICTs greatly facilitate the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance educational systems.

Factors to be considered before choosing Teaching-learning Media.

Before choosing a teaching-learning medium, the teacher should firstly consider a number of factors that can influence his or her choice.

1. Developmental Levels

The developmental levels, the capabilities, cognitive development and previous experiences of learners should be considered (Avenant, 2016). The individual characteristics of learners may influence the choice of teaching-learning media. Teachers should take cognisance of the reading abilities, socio-economic backgrounds, learning styles and motivation of the learners. Teachers

must realize that learners do not always comprehend certain concepts until they have been shown concrete or pictorial examples illustrating these concepts (Briel,2016). Murray (2019) points out that certain learners need certain treatment under certain conditions.

2. The Nature and Complexity Of the subject

The nature and complexity of the subject matter and the type of learning task facing the learners will influence the selection of both the media and the medium of instruction (Marais, 2019). The teacher should know his/her subject content, to determine what type of media will be the most sufficient (Steyn, 2018) If the teacher is going to teach about the morphology of a flower, it would be advisable to collect a few examples of flowers rather than to draw examples on a transparency.

3. The Instructional Method

The instructional method being used will determine or limit the choice of teaching-learning media to be used during the presentation of a lesson. To determine the appropriateness of the medium to accomplish a defined task is important, as well as the physical attributes and capabilities of the teaching-learning media are necessary (Reiser & Gagne, 2015).

4. Communicative Properties of the Media

Teachers should consider which medium would communicate a message more effectively, that is, auditory, visual or tactile media. Teachers need to identify the most appropriate teaching- learning media for presenting these stimuli. According to Guild (2015) some learners learn equally well from various media, yet the degree of visual, auditory and kinesthetic perception required for information processing depend to a large extent on the learning style of the individual learner. In certain instances a combination of these multi-media would be more appropriate or successful.

5. Availability

The availability, reliability and condition of the equipment should be considered. The physical facilities available must also be borne in mind, such as lighting, the possibility of darkening the room and the availability of electricity. The size of a venue for practical lessons would determine the medium of instruction (Briel, 2013).

6. Cost

Gallup (2016) describes cost effectiveness as follows:

> Within an instructional technology context, cost effectiveness means comparing cost and benefits encountered in utilizing two instructional alternatives to teach the same course content, and then using those comparisons to make decisions on which alternative is the most effective.

The cost of the teaching-learning media should be calculated and compared to the anticipated learning benefits. Teachers should consider whether it is economically viable and time or cost effective to purchase, hire or produce teaching-learning media. Financial constraints may impede conducting identification tests and experiments (Marais, 2017).

In case of money restrictedness teachers can produce their own programmes, transparencies, etc. Self-prepared teaching-learning media often suits the teachers more than expensive ones.

Audio and Visual Media

According to Ittelson (2014) studies in the psychology of learning suggest that the use of audiovisuals in education has several advantages. All learning is based on perception, the process by which the senses gain information from the environment. The higher processes of memory and concept formation cannot occur without prior perception. Persons can attend to only a limited amount of information at a time; their selection and perception of information is influenced by past experiences. Researchers have found that, other conditions being equal, more learning occurs when information is received simultaneously in two modalities (vision and hearing, for example) rather than in a single modality. Furthermore, learning is enhanced when material is organized and that organization is evident to the student.

1. The Chalkboard

The chalkboard is one of the oldest media, but is still in use in almost every classroom today. Chalkboards are such simple teaching-learning media that teachers consider it as one of the basic requirements to teach effectively (Davis, 2017).

2. The Transparency According to the OED (2016, 6:1233) the meaning of transparency is picture, inscription, etc., made visible by light behind it.

Using transparencies on the overhead projector are of the most versatile mediums. The teacher can still face the class and has eye contact with the learners (Petty, 2015:71-72). Transparencies can be used over and over again. It is time saving and learners can even help to make transparencies. Special effects can be

obtained like overlapping transparencies to illustrate certain internal organs in the human body. At the end all these overlapping transparencies make up a complete image.

3. Television, Videos and Slides : By using television, video or slides the learners can visualize the reality, hear the sounds, see how things (animals or plants) move and they can see the colour of the animals or plants (Jost, 2015: 19).

4. Radio, Cassette and Cd-Player

The hearing senses play an important role, especially when a cassette or cd-player is used to demonstrate different animal sounds. Sounds that the learners normally would not hear, e.g. call of a fish eagle, cry of a jackal, etc. can be recorded and played to the learners. Sounds and verbal words can be repeated so that the learners can make an association.

5. Charts, Diagrams, Pictures and Posters.

Charts, maps, pictures, posters, flash cards and diagrams can effectively be used to visualize an object and to interpret it. Posters can be used to catch and hold the attention of the beholder long enough to implant a significant idea the mind. Pictures speak a universal language "a picture paints a thousand words".

6. Models

Teachers often bring samples of objects into the classroom or take the class to view the real thing in its natural environment. Sometimes it is not that easy, for

the classes are too large or the real thing is too small to be seen with the naked eye. Then the teacher turns to an alternative display, a model of the real thing.

Computer-Based Media

Due to the immense benefits of Biology to both individual and societal development, the Federal Government of Nigeria, in the National Policy on Education, (FME, 2014), sees Biology as a subject that has high population of students who offer and register it for external examinations at the senior secondary school (SSS).

The last few decades have put tremendous pressure on the use and utilization of modem technology on the educational system (Bates, 2015). At present we are experiencing what is called the informational and technological revolution and it is absolutely vital that the educational system stays abreast with the latest technologies and informational systems.

In the early seventies it was already pointed out that the computer was the answer to many related educational problems such as a shortage of qualified teachers, overloaded syllabi, rapidly changing learning contents, overcrowded classrooms and essential adaptation to individual learning needs (Conradie & Du Plessis, 2016).

By using the computer the learners can get the latest information by using the Internet. The Internet is a worldwide connection of computer networks and more than 50 000 networks and billions of users are part of this (Charp, 2016, Pedroni, 2017).

The influence of the World Wide Web (www) as a new concept in technology, the library on your desktop and a dictionary at your fingertips and the sound at your ear (Kruse & Kel, 2015:11). By making use of search engines like Google, Yahoo, Lycos, Infoseek, Magellan, etc. learners can have an international library in front of them (Strydom, 2015; Branston & Stafford, 2017). Communication can be sent and received through the Internet. Through the IRC (Internet Relay Chat) learners can participate in any discussion and get useful information (Harris, 2016; Plotnick, 2017).

The computer can be used for collecting information, whether it is in the form of words, pictures, logical statements, music or events. Any kind of information can be fed into the computer as long as it is coded into digital form (Megarry *et al., 2016*).

Computer-Assisted Education (Virtual Classroom)

Computer-assisted learning entails the use of the Internet through the www (world wide web) and the use of a dedicated mail server_ The environment where each student sits at his computer at home and the teacher presents his class through the server is called a 'virtual class room' (VC).

The use of different Media as used in Teaching learning Biology

Some of the media that can be used to teach and learn Biology effectively will be looked into. Learners are often left perplexed, with a handful of disconnected concepts that they have to master in order to pass a grade, instead of making

the information more understandable. By making use of different media types, learners will be able to understand the information much better.

According to Allers (2016) and Cawood *et al.* (2015) media in Biology can be classified from live biota to visual media. They recommend that using the real object is the best way to teach biology, Some of the media that can be used will be discussed with the relevant advantages and disadvantages. Media such as live biota, preserved materials, excursions, computer based articles and reference works, as well as audio-visual media will be looked into. Teachers should make use of the best media for what must be achieved in a specific lesson. They should follow the golden rule of Gerlach *et al. (2016)* that states that a medium of instruction must be selected on the basis of its potential for implementing an objective. "A good aid is like a window, it should not call attention to itself, and it should just let the light in" (Reznich, 2016).

1. Live Biota

Live biota includes the real, living animal or plant material. Live biota can be kept in the classroom or in captivity. An aquarium with fish or a terrarium with termites can be kept in the classroom. Even mice or snakes can be kept in a cage in the classroom. Live biota also includes ecological visits to nature reserves, zoo's or botanical gardens and visits to pet shops.

2. Preserved Material

Preserved animals such as embryos of sheep, horses, etc. can be kept so that learners may observe it. The learner still has direct contact with the material, but it is not living material, but the non-living. This is not as effective as the live biota, because not all of the senses are used.

3. Models, Simulations and Play

Models are recognizable, three-dimensional objects that have been made to scale to represent actual or existing objects with the purpose to explain or demonstrate the shape, structure and or the functioning thereof. A model of the *eye* for example can be made with clay, and the different parts of the eye can be made in different colours (Conradie, 2016)

4. Photos, Transparencies, Pictures, Cassettes, CD- Players, TV and Video.

Learners make use of their auditory and visual senses. The learners can see how animals move and hear the sounds they make. According to Malan (2016) teaching-learning media such as the computer, radio, television and video can help to promote interest in the subject and motivate learners to develop some skills.

5. Graphs, Tables and Diagrams.

Writing is a method of human intercommunication by means of arbitrary visual marks forming a system (Whiting, 2017). As this is the most basic form of communication and also used the most, it is relevant to make some mention about

this method of conveying knowledge. So language, legibility and conciseness is of great importance if the learner is to grasp exactly what is meant.

Limitation of the study

Limitation is the problem encountered during the time research was carried out and when carrying out this type of research, it is believed that a lot has to be done, because no activity that is wholly free of limitation. Some of the problems are time factors, non-availability of current textbooks on the research topic, reluctance of respondents, finance, constrains etc.

Summary of Literature reviewed.

This chapter presented the relevant literature for this study. The literature review focused on the following,. The extent to which Teaching learning media affect student performance; the challenges that teachers in rural secondary schools face in accessing Teaching and learning media ; and the strategies that teachers use to minimize the challenges of attaining and using quality Teaching learning media, Classification of Media by various media specialists, Factors to be Considered before choosing Teaching learning media, Audio and visual media, The use of different media in Teaching learning Biology.

CHAPTER THREE

METHODOLOGY

In this chapter, the methodology of the study is presented under the following sub-headings:

• Design of the Study

• Population of the Study

• Sample and Sampling Technique

• Research Instrument

• Validation of the Instrument

• Reliability of the Instrument

• Method of Data Collection

• Method of Data Analysis.

Design of the Study

The research design adopted for this study is the survey research design. The character of this study underscores the need for adoption of descriptive survey design. The adoption of this research design allows for the use of questionnaire by the researcher as a data collection instrument and it is cost effective.

The adoption of this design was selected by its efficient way of collecting information about the population of interest, ease of administration of research instrument questionnaire, which can be tailored to the problem the researcher is studying.

Population of the Study

The population of this study consists of all Biology Teachers from the thirteen (14) public senior secondary schools one (SSS 1) in Oredo Local Government Area of Edo State.

Sample and Sampling Technique

Ten (10) schools were randomly selected from the fourteen (14) public senior secondary schools in Oredo Local Government Area of Edo State. Two (2) teachers each were randomly selected from the ten (10) sample schools selected for the study. A total of twenty (20) teachers were selected for the study.

Research Instrument

The research instrument adopted for this study was the questionnaire constructed by the researcher. The questionnaire is made up of two sections; Section A and B. Section A elicited the necessary demographic data of the respondents while Section B consists of items on The Influence of learning media on teaching Biology in Nigeria Secondary schools in Oredo local government area of Edo State.

The instrument is scored on a 4-point Likert scale: strongly agree (SA), agree (A), disagree (D) and strongly disagree (SD). The points are weighted as 4,3,2 and 1 respectively.

Validity of the Instrument

To validate the research instrument, the researcher after constructing the questionnaire took it to his supervisor and two other lecturers in his department who scrutinized the instrument and made useful suggestions which were used in the final draft of the questionnaire.

Reliability of the Instrument

To ascertain the reliability of the instrument, pilot testing was carried out on six (6) SSS1 Biology teachers from three (4) mixed Nigerian senior secondary schools that were not part of the main study. The reliability of the instrument was obtained using Cronbach alpha formula and a reliability coefficient of 0.7 was established.

Method of Data Collection

To collect the data, the researcher visited the schools personally and with the cooperation and help of the school teachers, the questionnaire was administered to the respondents (SSS 1 teachers) to elicit the needed information. The questionnaires were collected immediately after completion.

Method of Data Analysis

Data will be analyzed using descriptive statistics namely frequency distribution and percentages mean value. The result was analyzed and presented in tables to explain the various response to each of the questions.

The cut-off point is 2.5 (for acceptance is $x \geq 2.5$) and 100% will be used to present the data on the basis of conclusions drawn and recommendations made.

CHAPTER FOUR

DATA PRESENTATION AND DISCUSSION OF FINDINGS

This chapter contains the presentation of collected data on the research work and subsequent analysis of the data using simple percentages. It is organized into two sections of data presentation and discussion of findings.

Data presentation

Research question 1: Which of the following teaching-learning media would you say is user-friendly (easy for the teacher to use) ?

Table 1: Responses on which teaching-learning media is user-friendly for teaching Biology

1.	Chalkboard	19	= 95 %
2.	Transparency	18	= 90 %
3.	Video/ slides/ TV	10	= 50 %
4.	Radio/ Cassette CD	8	= 40 %
5.	Computer/ Internet	10	= 50 %
6.	Textbooks	18	= 90 %
7.	Flashcards/ Posters	13	= 65 %
8.	Excursions	12	= 60 %
9.	Models	14	= 70 %
10.	Live Biota	16	= 80 %
11.	Plays/ simulations	18	= 90 %
12.	Experiments	15	= 75 %

Table.1 Data on what teaching-learning media teachers are using.

The teaching-learning media that is most often used are the chalkboard (95%), textbooks (90%), posters and flashcards (65%). Live biota (80%), the computer (50%), radio and cassettes (40%) are not likely to be used by teachers. Teachers feel more comfortable to use media such as the chalkboard and textbooks for there is no specific skill requirement necessary, as there is for using the computer for example.

Research Question 2: How does teaching-learning media improve student performance in Biology?

Table 2: Responses on how teaching-learning media improve student performance in biology

S/N	Teaching-learning media and the academic performance of Biology students	SA	A	D	SD	Mean
13	Teaching- learning media enables teachers to disseminate learning content effectively.	12	4	2	2	3.3
14	Teaching-learning media makes teaching better than just demonstration.	14	2	3	1	3.4
15	Teaching Biology teaching-learning media's ensures better understanding of the topics	10	5	3	2	3.1
16	Biology students who learn with teaching-learning media have higher chances of learning better, compared to students who do not.	15	3	2	1	3.7
17	Availability and the use of teaching-learning media make students perform excellently.	9	3	4	4	2.8
18	Availability and uses of teaching-learning media ensures retentive memory of the subject matter in students	12	4	2	2	3.5
19	Teaching-learning media are compulsory tools for teaching Biology students.	8	4	2	6	2.9

Total mean = 22.7

$\frac{22.7}{4} = 5.6$

Source: Field Survey

Table 2 shows if teaching-learning media improve student performance in Biology. The item; Biology students who learn with teaching-learning media have higher chances of learning better than students who do not had a mean of 3.7. The item; Availability and uses of teaching-learning media ensures retentive memory of the subject matter in students had a mean of 3.5. The item; Teaching-learning makes teaching better than just demonstration had a mean of 3.4. The item; Teaching-learning media enables teachers to disseminate learning content effectively had a mean of 3.3. The item; teaching biology with teaching-learning media ensures better understanding of the topics had a mean of 3.1. The item; Teaching-learning media are compulsory tools for teaching Biology students had a mean of 2.9. The item; Availability and uses of teaching-learning media are compulsory tools for teaching Biology students had 2.9

This signifies that teaching-learning media has effect on the academic performance of Biology students. This is justified by the table above with 3.3, 3.4, 3.1, 3.7, 2.8, 3.5, 2.9 , mean score.

Research question 3: Which of the following teaching-learning media do you have available at your school?

Table 3: Responses on what teaching-learning media teachers have available at their schools

1. Chalkboard	20	=	**100 %**
2. Transparency	11	=	**55 %**
3. Video	13	=	**65 %**
4. Radio	6	=	**30 %**
5. Computer/ Internet	8	=	**40 %**
6. Textbooks	14	=	**70 %**
7. Flashcards/ Posters	4	=	**20 %**
8. Models	2	=	**10 %**
9. Live biota	6	=	**27 %**
10. Slides	5	=	**25%**
11. TV	8	=	**40%**
12. Cassettes	2	=	**10 %**
13. CD's	4	=	**20%**

Table 3 : Data on which teaching-learning media is available in schools.

According to table 3 all schools have a chalkboard in the Biology class, and most schools (70 %) have textbooks. some schools have televisions (40 %) and video players (65 %). The teaching-learning media that is not available in many schools are live biota (27%) and cassettes (only 10 %).

Discussion of findings

This research aims at investigating the effect of instructional materials on teaching and learning of basic science in some selected secondary school in Oredo Local Government Area. The research is carried out under the following three research questions below.

In the first research question that states: Which of the following teaching-learning media would you say is user-friendly (easy for the teacher to use). It was stated that the teaching-learning media that is most often used in most secondary schools are the chalkboard, textbooks, posters and flashcards. Live biota, the computer, radio and cassettes are not likely to be used by teachers. Teachers feel more comfortable to use media such as the chalkboard and textbooks.

Furthermore, in the second research question that states: How does teaching and learning media improve student performance in Biology? The mean value was above 5.6, this implies that teaching-learning media have effect on the academic performance of Biology students.

Lastly, the third research question; which of the teaching-learning media is available in schools. According to research, all schools have chalkboards in the Biology class, and most schools (70%) have textbooks. some schools have

televisions (40%) and video players (65%). teaching-learning media which is not available in many schools are live biota and CD's (only 10 %).

CHAPTER 5

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary

The first chapter outlined the rationale of the study. The study focused on what type of teaching-learning media teachers are using and why they are using that specific teaching- learning media.

The purpose of the literature study, in chapter 2, was to introduce the different types of teaching-learning media, as well as the advantages and disadvantages of these media, that can be used in presenting a lesson, such as the chalkboard, transparencies, television, videos and slides, the radio, cassette and cd-player, charts, diagrams, pictures and posters, models, and the computer. The views of different media specialists were discussed, such as Ellington, Marais, Romiszowski, Gerlach, Schramm and Coger. According to them teaching-learning media is classified into visual, audio-visual, audio, computer-based, excursions and the real thing.

Also in this chapter, the factors that need to be considered before choosing a teaching-learning media were discussed. Factors such as the developing levels of the learners, the nature and complexity of the subject, the instructional method, the communicative properties of the media, the availability, and the costs of the media, should be taken into consideration before choosing any teaching-learning media.

The fourth chapter presented the data analysis and interpretation by means of tables representing the views of the respondents. A self-structured questionnaire was used as the research instrument and the advantages and disadvantages of such. A questionnaire was presented in this chapter. In Conclusion, The following findings with regard to the

empirical study were considered: Teachers still make use of the traditional teaching-learning media, such as the chalkboard (100%) and textbooks (70%) as indicated.

Conclusions

This study indicated that teachers are still making use of the traditional teaching-learning media like the chalkboard and textbooks. They are not making use of the more advanced media such as the computer or Power Point, either they do not know how to use it, or it is not available at their schools. There is a need for courses, where teachers can be trained in how to use the more advanced teaching-learning media.

Teaching-learning media play an important role in teaching Biology in Nigeria secondary Schools. Without such media, teaching still remains teacher-centered and not learner-centered. By making use of media such as experiments, plays/simulations and excursions, learners are actively involved and they learn to think critically.

It is hoped that the suggestions and recommendations made in this study will help to provide teachers with more information on how to use teaching-learning media more effectively so that the learners can benefit by understanding the information presented to them.

Recommendations

Based on the findings and conclusions of this study, it recommends as follows;

1. Secondary Schools should offer courses, included in the training of teachers, on how to create their own teaching-learning media and to use more advanced teaching- learning media like the computer and power point.

2. Schools should arrange for workshops at schools, where courses in the use of teaching-learning media can be presented.

3. Learners can assist in creating teaching-learning media, like building models and making posters, which at the same time develop their research and creativity skills.

4. In Secondary Schools, the teacher can make use of any teaching-learning media to communicate (for example information in magazines, internet or newspapers), and not only make use of the traditional teaching-learning media, such as the chalkboard and textbooks.

Suggestions for Further Study

For the purpose of further studies, the researcher suggest that since this study covers only Oredo Local Government Area of Edo State, other areas in the state and Country should be studied to find out similar results. Further research on the topic can be done by changing the design and analysis of the study.

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APPENDIX I

DEPARTMENT OF CURRICULUM AND INSTRUCTIONAL TECHNOLOGY,
UNIVERSITY OF BENIN, BENIN CITY.

TEACHERS' QUESTIONNAIRE

Dear Respondent,

I am a final year student of the above named institution carrying out a research work on "Influence of teaching-learning media on teaching Biology in Nigerian schools in Oredo local government area of Edo state".

I will be grateful if the questionnaire is responded to as sincerely as possible. You are assured that your views will be respected and treated with confidence.

Thank you immensely for taking time to complete this questionnaire.

Yours faithfully,

Ogedegbe Harrison Osakpolor

Instruction: Please read carefully and tick (√) against any option that best represents your opinion and fill in the spaces provided with the appropriate information.

SECTION A: BIO-DATA

Name of School: ……

Sex: Male ( ) Female ( )

Age: ( )

Class: _____

SECTION B: INFORMATION ON THE INFLUENCE OF TEACHING-LEARNING MEDIA ON TEACHING BIOLOGY.

INSTRUCTION: Please kindly respond to the questions as they best appeal to you and ticking (√) the appropriate box provided.

Research question one:

Which of the following teaching-learning media would you say is user-friendly (easy for the teacher to use)?

Chalkboard	
Transparency	
Video/ slides/ TV	
Radio/ Cassette/ CD	
Computer/ Internet	
Textbooks	
Flashcards/ Posters	
Excursions	
Models	
Live Biota	

Plays/ simulations	
Experiments	
Other (Specify please)	

Research question two:

How does teaching and learning media improve student performance in Biology?

S/N	**Teaching-learning media and the academic performance of Biology students**	**SA**	**A**	**D**	**SD**
13	Teaching-learning media enables teachers to disseminate learning content effectively.				
14	Teaching-learning media make teaching better than just demonstration.				
15	Teaching Biology with teaching-learning media ensures better understanding of the topics				
16	Biology students who learn with teaching-learning media have higher chances of learning better compared to students who do not.				
17	Availability and the use of teaching-learning media make students perform excellently.				
18	Availability and use of teaching-learning media ensures retentive memory of the subject matter in students				
19	Teaching-learning media are compulsory tools for teaching Biology students.				

Research question three:

Which of the following teaching-learning media do you have available at your school ?

Chalkboard	
Transparency	
Video	
Radio	
Computer/ Internet	
Textbooks	
Flashcards/ Posters	
Models	
Live biota	
Slides	
TV	
Cassettes	
CD's	
Others (Please specify)	