

**PERCEPTION OF PHYSICS TEACHERS ON THE AVAILABILITY AND
UTILIZATION OF IMPROVISED INSTRUCTIONAL MATERIALS IN SECONDARY
SCHOOLS IN BOSSO, MINNA NIGER STATE**

BY

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2018/3/74378BT

**DEPARTMENT OF EDUCATION TECHNOLOGY,
SCHOOL OF SCIENCE AND TECHNOLOGICAL EDUCATION
FEDERAL UNIVERSITY OF TECHNOLOGY
MINNA, NIGER STATE**

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**A PROJECT SUBMITTED TO EDUCATIONAL TECHNOLOGY DEPARTMENT
FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA, NIGERIA, IN PARTIAL
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ABSTRACT

this study investigated perception of physics teachers on the availability and utilization of improvised instructional materials in secondary schools in Bosso, Minna Niger state. Descriptive survey research design was employed for this study and teacher in secondary schools in Bosso, Minna, Niger state were used as research respondents. three research question guided the study and 15 items questionnaire was used as instrument for data collection. The questionnaire was validated by experts in educational technology. Pilot test was carried out and reliability coefficient of 0.97 and 0.87 were obtained. Data collected from the administration of the research instrument were analyzed using descriptive statistic of mean and standard deviation for research questions. A decision rule was set, in which percentage score of 50% and above was considered available, while a mean score below 50% was considered not available. Similarly, a mean score of 2.50 and above was considered agreed, while a mean score below 2.50 was considered disagreed. Findings from this study revealed that improvised instructional material in physics are not available in secondary school in Bosso, Minna, Niger state with the grand mean of 51.3%, the finding also revealed further improvised instructional material in secondary schools in Bosso, Minna, Niger State were adequately provided for the teachers to utilize in the element of teaching physics in secondary schools with a grand mean score of 2.70. Based on this finding it was recommended among others that physics teachers in secondary schools in Bosso, Minna, Niger State should be encouraged to utilize improvised instructional materials to teach physics since it helps in teaching and learning physics concepts and processes.

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CHAPTER ONE

1.0

INTRODUCTION

1.1 Background to the study

Physics can be conceptualized as the science that deals with the structure of matter and the interactions between the fundamental constituents of the observable universe (Dębowska & Greczyło 2017). In the broadest sense, physics (from the Greek word, *physikos*) is concerned with all aspects of nature on both the macroscopic and submicroscopic levels. Its scope of study encompasses not only the behavior of objects under the action of given forces but also the nature and origin of gravitational, electromagnetic, and nuclear force fields. Its ultimate objective is the formulation of a few comprehensive principles that bring together and explain all such disparate phenomena.

Physics is the basic of physical science. Until this recent times, physics and natural philosophy were used interchangeably for the science whose aim is the discovery and formulation of the fundamental laws of nature (Hongjun, 2018). Physics plays an important role in all the natural sciences, however, and all such fields have branches in which physical laws and measurements receive special emphasis, bearing such names as astrophysics, geophysics, biophysics, and even psychophysics. Physics can, at base, be defined as the science of matter, motion, and energy.

Physics like other sciences investigates and develop procedures in understanding natural environments, its interrelationship with other sciences in studying the nature contributes to social and technology development through practical activity. Studies have shown the aftermath of science leaning and more importantly the relevance of physics knowledge to technology development as a result of practical activity. With no doubt, modern technology leans heavily on

physics. On this ground, great emphasis should be tailored to set pace for technological invention which enables students to manipulate the environment for critical thinking. Integration of diverse media remain a pivot to other courses in the field of education, and in order to integrate emerging technologies into teaching and learning, educational technology is being offered as a body of knowledge to students in institutions of higher learning. The program is aimed at developing competencies and skills needed to systematically apply scientific process and products in educational tasks (Falode *et.al.*, 2022).

Education is culturally responsive, employs problem-solving and inquiry-based approaches and engages students in hand-on activities that offer opportunities to interact with science professionals (Tera, 2018). However, Samuel and Obikezie (2020) define science as the rational and systematic study of the environment through observation and experimentation with a view to understanding the environment and manipulating the resources of nature for human development. This implies that teaching must be proactive, creative and student centered to achieve a particular objective.

Secondary education is the education children receive after primary education and before the tertiary stage. The broad goal for secondary education in Nigeria is to prepare the individual for useful living within the society and higher education. Two major specific objectives of secondary education as stipulated in the National Policy on Education are: to provide trained manpower in the applied science, technology and commerce at sub-professional grades and to raise a generation of people who can think for themselves, respect the views and feelings of others, respect the dignity of labor, appreciate those values specified under our broad national goals (Adegbenro, 2016).

Undoubtedly, only functional secondary education can achieve these laudable goals and objectives. One cannot talk of functional education without the deployment of media technology

which by extension, if it is relatively unavailable, improvised instructional materials became the next move in teaching and learning of secondary school students. Furthermore, one cannot speak realistically of a sound science curriculum without considering the important role of physics just as science itself would not have developed to its present stage without physics. Therefore, it is unrealistic to think that true character of science can be portrayed without physics.

Considering the importance role physics play in Nigeria's educational systems and the worrisome deteriorating state of students' poor performance, retention and their consequent poor achievement in secondary school Physics, something serious need to be done at no other better time than now. Obviously, students do not achieve good grade in Physics because they do not understand concepts in physics as they ought to.

According to National Teachers Institute (2010) report, resources in the classroom can be classified into two broad categories, which include those that appeal to the sense of sight, are classified as visual resources and those which appeal to the sense of hearing, are classified as audio materials. Other resources also combine both features these are classified as audio-visual (AV) materials. Isola (2010) referred to instructional resources as objects or devices, which help the teacher to make a lesson much clearer to the learner. Instructional resources are also described as concrete or physical objects, which provide sound, visual, or both to the sense organs during teaching (Agina-Obu, 2011). These materials are both tools for teaching and avenues for learning. They include textbooks, chalkboards, model or mock-ups, television, radio and other projected as well as non-projected devices.

Consequently, improvisation is an act of using alternative materials locally made by the teacher, students or educational agency in a state of emergency as a substitute and supplement to standard

equipment (Ogeh, 2017). Improvisation has also been defined according to Akusoba (2013) as the “choice of the best instructional materials which enables the teacher. This study therefore seeks to investigate the perception of Physics teachers on the availability and utilization of improvised instructional material in secondary schools in Bosso, Minna, Niger State.

1.2 Statement of Problem

Despite substantive yearly allocations by the government, both at the federal and state level to the education sector in order to provide electronic resources in schools, statistically, the students’ understanding of Physics has witnessed a downward trend over the years (Adomi & Kpangban, 2015) and their performances in the subject in various examinations fronts are worrisome. Characteristically, statistics reeled out by the two major examination bodies in the country viz, the West African Examination Council (WAEC) and the National Examination Council (NECO) (WAEC Chief Examiners’ Report 2008 – 2018 and NECO Chief Examiners’ Report, 2016 - 2018) each time students’ results are released, points to the fact the students have not been meeting up to expectations.

This disturbing trend has had a far-reaching end in various states of the federation, and in particular Niger State. The big question now is could it be as a result of the inadequacies of improvised instructional materials in schools or that Physics teachers are not updated with respect to the use of technological instruments in teaching and learning Physics? It is on this note that the researcher explored the perception of Physics Teachers on the availability and utilization of improvised instructional material in secondary schools in Bosso, Minna, Niger State.

1.3 Aim and Objectives of Study

The aim of this study is to assess the perception of Physics teachers on the availability and utilization of improvised instructional materials in secondary schools in Bosso, Minna, Niger State.

Specifically, the study sought to:

1. Identify improvised instructional materials available for teaching physics in secondary schools in Bosso, Minna, Niger State.
2. Determine the extent to which physics teachers utilize improvised instructional materials for teaching in secondary schools in Bosso, Minna, Niger State.
3. Examine physics teacher's perception towards the utilization of improvised instructional material for teaching.

1.4 Research Questions

The following research questions were raised and answered in this study:

1. To what extent are improvised instructional materials are available for teaching Physics in secondary schools in Bosso, Minna, Niger State?
2. To what extent does Physics teachers utilize improvised instructional materials for teaching and learning Physics in secondary schools in Bosso, Minna, Niger State?
3. What are the perceptions of Physics teachers towards the utilization of improvised instructional materials?

1.6 Significance of Study

Practically, the findings of this study would be beneficial to following persons: Physics teachers, Physics students, education administrators, policy makers, researchers, curriculum planners and textbook writers.

The result of the study could enable the Physics teachers to see the need for effective and efficient utilization of available improvised instructional material to schools. In the same way, students will appreciate the need to manage and improvise improvised instructional material in secondary schools.

Physics students would realize the importance of group and individual laboratory work situations in the effort of learning Physics concepts. It could also help the students to become knowledgeable in the following areas: communication, problem-solving, improvisation, self-confidence and critical thinking. These are knowledge they are expected to acquire from practical activities which could lead to students' improvement on their academic achievement.

To education administrators as the recommendations will enhance educational growth. It will also furnish them with the quantity and quality of improvised instructional material that are available in secondary schools, the extent to which they are utilized for effective and efficient dispensation of lessons. They will also appreciate the need to plan, direct, control, and co-ordinate and supervise institutions of higher learning to actualize national educational objectives.

To the curriculum experts the findings of the study could form a basis for introducing laboratory innovations in teaching at all levels to promote practical based learning in schools.

The textbook writers on assessing the findings of this study would upgrade the content of the textbooks on all science and its related subjects.

1.7 Scope of Study

This study will be carried out in secondary schools in Bosso, in Niger State, Nigeria. Niger state is located in North Central zone in Nigeria. The scope of this study is to investigate the perception

of Physics teachers on the availability and utilization of improvised instructional materials in secondary schools in Bosso, Minna, Niger State. The time scope for this study is four weeks and the respondents sampled for this study is limited to teachers in secondary schools in Bosso. The researcher will be testing the instrument for the data collection and will be subjected to validation by the expert in the field of physics, physics education, and ICT.

1.8 Operational Definitional Definition of Terms

Availability: sufficient quantity of instructional materials for teaching Physics in secondary school.

Improvised: to make something up or invent it as one goes on; to proceed guided only by imagination, instinct and guesswork rather than a careful plan.

Instructional Materials: teaching materials intended for purposes of instruction.

Perception: conscious understanding of something. Organization, identification and interpretation of sensory information. It is that which is detected within consciousness as a thought, intuition, deduction.

Physics: branch of science concerned with the study of properties and interactions of space, time and energy.

Utilization: using instructional materials in teaching physics such as smartphone, TV Set, Projector, Graphics.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Conceptual Framework

2.1.1 The Concept of Science

By many measures, science and physics has grown exponentially, technology and science are having countless impact on a much broader section of the student. Accordingly, it should be mentioned that science strongly impact education, where both teachers and students have been immersed in practical experiences, thereby leading to a new stage in the education system, where teaching and learning take place (María *et al.*, 2022). Similarly, physics is the best place to start learning what science is all about. As science does not exist outside the context of society, the foundations that underpin this movement emphasizes personal relationships to science within wider contexts and histories, and promotes active and transformative learning. Specifically, it provides a magical power of sustaining teaching and learning beyond unexpected interruptions (Ayubu *et al.*, 2022).

Physics is a science subject which aim at equipping students with appropriate scientific attitude, competences and ability to apply scientific knowledge to every challenges of life. The importance of science and technology plays an important role to the society as it makes life easier and help students to better understand what happens in life through the concept of science (Ersay, 2015). There are still students who only understand the concept of science on the surface and have a limited understanding to make connections between the use of science and technology and its application to the community (Fakhriyah *et al.*, 2017).

2.1.2 The Concept of Information and Communication Technology (ICT)

Information and communications technology (ICT) is an extended term for information technology (IT) which stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals), computers as well as necessary software, its storage and the audio-visual systems, which enable all users to access, store, transmit, and manipulate information (Aduwa & Ogiegbaen, 2013). The term ICT is also used to refer to the combining of audio-visual and telephone networks with computer networks through a single cabling or link system. There are large economic incentives (huge cost savings due to elimination of the telephone network) to merge the telephone network with the computer network system using a single unified system of cabling, signal distribution and management. However, ICT has no universal definition, as "the concepts, methods and applications involved in ICT are constantly evolving on an almost daily basis. The broadness of ICT covers any product that will store, retrieve, manipulate, transmit or receive information electronically in a digital form e.g. personal computers, digital television, email and even the modern-day robots (Chandler, Daniel, Munday, Rod, I. 2016) ICT is the digital processing and utilization of information by the use of electronic computers. It comprises the storage, retrieval, conversion and transmission of information (Ifueko & Okauru, 2011).

2.1.3 The Concept of Improvisation

Improvisation is an act of using alternative materials locally made by the teacher, students or Educational agency in a state of emergency as a substitute and supplement to standard equipment (Omiko, 2015). According to Enaiyaiyeyu (2016), Improvisation in science teaching refers to the act of using alterative materials and resources to facilitate instruction whenever there is lack or

shortage of some specific first-hand teaching aids. Education is a very important instrument for harnessing the socio-economic and political resources of any Nation.

No matter how generous and rich an education authority might be, they are generally not always in a position to provide their schools with all the needs (Mbam, 2016) in a depressed economy, every individual is expected to be creative and resourceful in order to survive. It is therefore the duty and responsibility of teachers to find a means or appropriate method of communicating and sharing knowledge with the students to foster understanding of concepts being taught. Sometimes, learning becomes compounded and somehow mysterious. In most cases, learners from low socio-economic background, who are not exposed to the intrigues, cannot cope. When this happens, little or no learning atmosphere is recommended and an interactive learning aid should be paramount. Consequently, it is believed that abstract ideas could be made easy through improvisation of educational materials. Oladele and Lasisi (2016) assert that students comprehend and remember better when teaching materials are improvised.

Improvisation is the act of providing relevant local materials for instruction by the teacher or the students, when standard instructional materials are not readily available. Improvised instructional materials have been defined by various authors. Obanya (2019) viewed them as didactic materials which are supposed to make learning and teaching possible. Ehikioya (2019) defines improvised teaching aid as the production of local instructional materials within the environment that are useful in the teaching and learning process. Ikerionwu and Ishola (2015) define improvised instructional materials as objects or devices, which help the teacher to make a lesson much clearer to the learner. Instructional materials are also described as concrete or physical objects which provide sound, visual or both to the sense organs during teaching (Agina-Obu, 2015).

According to Onasana (2008); Adebimpe (2017) and Agusiobo (2018) improvisation demands adventure, creativity, curiosity and perseverance on the part of the teacher. It adds to students' skills and knowledge acquisition. To Anakoha (2018), the involvement of teachers and learners in improvising materials give students and teachers the opportunity to concretize their creativity, resourcefulness and imaginative skills. Everybody can be involved in the production of these alternatives - the teachers, learners, parents and all stakeholders in education. The locally made are usually tailored to meet the local challenges at very cheap or no cost at all.

Eshiet (2016) defined improvisation as the sourcing, selection, deployment of relevant instructional elements of teaching and learning process in the absence of shortage of the accredited teaching and learning element for a meaningful realization. Anyakaorah (2017) asserts that inquiry, curiosity, creativity and productive application of students' intellect could be widened through improvisation. According to Abdullahi (2019), instructional materials are materials or tools locally made or imported that could make tremendous enhancement of lesson impact if intelligently used.

Improvised materials come in different forms. Soetan (2016) opines that improvised materials include graphics, charts, posters, sketches, cartoons and drawing to aid teaching and the combination of these aids creates definitiveness to the material being studied. They help students visualize the whole concepts learned and their relationships with one another. Also, Okpala (2018) says the inculcation of graphic in improvised teaching encourages efficiency in learning process. To Berk and Trieber (2019), when improvisation is reformatted as small-group collaborative learning exercise, it can be a powerful teaching tool to promote deep learning. Ibeneme (2020) sees it as using alternative materials and resources to facilitate learning whenever there is lack or shortage of some first-hand teaching aids. Eze (2019) refers to it as a substitute for the readymade

or imported material. Okeke (2019) urged teachers to produce their own aids in order to teach effectively.

According to Henry (2018), improvisation is task-driven opportunities designed to stimulate spontaneous peer interaction. Ozigi (2017) defined improvisation as the art of providing inexpensive materials to aid the teaching methods and asserted that utilization of equipment, facilities and other teaching aids are essential to effect teaching and learning experiences and constitute the teacher's trade tools and institutions which lack these essential tools cannot expect to achieve its aims and objectives from a teaching learning process. Gur-Zevce (2015) says improvisation, when true to itself, transcends any limited context, border, dogma, regulations, drives, habits and fear dwelling in the moment of ecstasies of the here and now. He further stressed that improvisation is not rhetorical.

Over the years, teachers have been depending on excessive use of words to convey ideas or facts in the teaching-learning process. The "chalk-talk" method is increasingly being wiped out with advances in technology which have made it possible to produce teaching aids in order to make teaching clearer, more interesting and easier for the learners to assimilate (Onasanyya *et al.*, 2018).

Standardized instructional materials have the same importance and effect in teaching and learning. Considering the fact that government does not provide standard instructional materials needed to enhance teaching, teachers can teach with improvised materials. If this is done, the deteriorating performance of students could be reduced. Students taught with standardized method of learning do not show difference with those taught using improvised instructional materials. Improvised instructional materials allow students to use their intellectual ability during learning and teaching

process. In other words, students acquire more information through many instructional materials so as to bring deeper understanding of the topics under consideration.

The National Policy on Education (FME, 2004) emphasized actively based child-centered learning approach. instructional materials standardized lecture method, an improvised material is innovative based. Affirmation has been extracted from various researches on improvised learning methods and is seen as enhancement kit to learning. Gatzke (2012); Burch (2017) employed the use of learning kits to enhance teaching and learning in Mathematics. This is a modern expository method that encourages some level of interaction between the teacher and the learners.

Also, Achimugu (2015); Folorunso and Nwosu (2016); Etukudo (2017) and Williams (2017) have found the use of low-cost materials very effective in teaching and learning. According to Akusola and Okeke (2016) low cost learning kits are used as an innovative way of facilitating students' performance. Bastruk (2015) combined lecture plus Computer Assisted Instruction (CAT) and obtained good outcome of results in statistics than those taught using lecture method only. Efforts to change the instructional strategy will go a long way in improving and facilitating teaching and learning in the Nigerian school system.

Improvisation, though increasingly important in learning process, is not usually employed by teachers due to time of gathering relevant ideas, facts or materials and the cost of execution (Omoosewo, 2018; Akin, 2019). Improvisation in learning costs more when compared to standardized learning process. According to Akinyemi and Orukota (2016), improvisation, whether it costs less than standard manufactured ones or not, costs money and this is not readily available for the teacher. Though government is aware of the importance of instructional materials in teaching, they cannot do much due to unavailability of funds. According to Chute (2019), it is

hard to get teaching aids because the foreign exchange rates have made the cost of the materials unaffordable. It is, however, imperative to look for other means of providing the needed teaching aids. Improvisation becomes the option of coping with the demands of teaching and learning.

2.1.4 Role of Improvisation of Instructional Materials in Instruction

Though improvisation of teaching materials by teacher has been a long-standing problem, yet works done in this area has been fragmentary (Njoku, 2012). The proper use of instructional materials in the classroom requires more than a simple knowledge of general teaching methods and skills. It rather calls for teachers' proper orientation into the production of instructional materials. Furthermore, adequate educational curriculum as the current society trends now demands, cannot be effective if the implementers (the teachers) are lacking skills and methodology with which to teach the students. For instance, Abba (2013) revealed that there is a strong positive relationship between the use of improvised instructional materials and achievement in education. He further stressed that schools where more teachers employ instructional materials or aids in teaching get better result than schools that do not do so. He recommended that teachers should make extensive use of teaching aids and where these aids are not available; the teacher should try to improvise, with the use of local raw materials, which provides stimulation or motivation to the students.

Anochie (2016), stated that science subjects are better learnt by doing and not by talking. Effective teaching and learning can only be possible through the use of adequate equipment or instructional materials. Unachukwu (2015), in his study into the extent to which teachers improvise teaching aids in colleges of education found out that, generally apart from the chalkboard, most of the teachers in the schools do not make adequate improvisation of instructional materials for teaching

subjects in their various schools. Also, Onyejemezi (2013), quoting a Chinese saying said. “A look is worth a thousand words”. This statement illustrates the value of teaching and learning materials enhances effective learning, she also said that; these materials do not achieve any of the attitude values on their own. Rather, that their usefulness depends on what the teachers make out of them. Intelligent handling of the improvised instructional materials in the classroom is necessary (Igwe, 2011).

2.1.5 Need for Improvisation

The need to improvise some materials or substitute for other is as old, as experimental science itself. According to Ogeh (2017); rationales for improvisation include the following:

It contributes to the achievement of our education objectives by providing opportunity to develop necessary science skills, attitudinal and practical skills needed to function effectively in the society as professional scientists, technologists or generalists.

Improvisation undertaken by the teacher enables him to rethink and research for cheaper, better and fosters methods of making the teaching or learning process easier for the students. This implies that it promotes creativity and self-reliance.

To some extent, improvisation fills the vacuum created by lack of shortage of science equipment by providing a frame of reference in which students can key their attention during classroom activities.

Improvisation provides a cognitive bridge to lead students from abstraction and its attendant “mental indigestion” to a nodding acquaintance with reality, other writers refers to this as giving students the “bread of living” experience rather than the stone of abstract theory.

Situations where equipment are available but not affordable and/or where technical expertise for saving or repairing equipment is lacking, or spare parts and replacement items are not based on the above rationale, the educational benefits of improvisation of instructional materials for computer education cannot be farfetched. Ideally, no effective science education program can exist without instructional materials. Improvisation provides a framework of references on which pupils key their attention during classroom activities.

2.1.6 Types of Improvisation

Basically, two forms of improvisation can be identified. According to Igwe (2011); the first is described as “Role substitution”. Role substitution is when the original item generally requires little or no modification before it can be used to fulfill the new functions in an experimental setting, examples are; kerosene stove as a burner, a glass tumbler as a beaker, and such will reduce the cost for production. Computer monitor and central processing unit of a computer can be substituted using carton and polythene sheets. The second type of improvisation is described as “Role stimulation”. In this case, actual construction of the apparatus or equipment is undertaken as an emergency measure either because the needed equipment is too expensive or not really available. An example is the use of local carpenter to construct computer keyboard. Other instructional materials that can be improvised include; imported charts, it can be substituted using cardboard sheet to draw the diagrams of the equipment not available with the aid of pencil or markers (colored). With specific reference to Nigeria, science curriculum emphasizes activity-based learning and student-centered learning.

Raw materials that are available in the locality are explored and modified to produce instructional materials, by so doing we make science teaching more meaningful to both teachers and students (Omiko, 2012).

2.1.7. Benefits of Improvised Instructional Materials

The influence of improvised instructional materials in promoting students' academic performance and teaching and learning in educational development is indisputable. Improvised teaching aid is essential. They are needed by teachers to demonstrate and undertake co-operative studies. Hence, instructional materials can be improvised from inexpensive materials from the locality in the absence of the original materials. The use of locally produced instructional materials in the teaching learning situation has many advantages. Stated by Archin and Asimah (2016), the advantages of improvised teaching aids include:

Learners are motivated through participator activities. It allows a collective participation of students in sourcing learning materials.

Improvisation builds a good teacher-student relationship and such relationship depicts teachers as role models.

Materials can be used to teach a populated class and fosters better understanding amongst students.

It arouses the interest of learners because lessons are drawn from what is seen in their daily environment.

Objects and models are presented in different dimensions to enhance learning process.

Importantly, students are allowed to participate fully in the actual construction of the kits that gives them idea and better exposure on how the materials work. By using improvised materials in

teaching, there is clarity in unfamiliar concepts to students. Also, the acquisition of appropriate manipulative skills is made possible, familiarizing students with improvised materials in teaching and learning. Convincingly, both students and teachers positively improve their skills and potential using improvised teaching aids.

2.1.8 Availability of Improvised Instructional Materials

Accordingly, the success of the teaching-learning process depends to a large extent on the availability and utilization of relevant instructional materials to facilitate instruction. Learning is facilitated when the learners make use of at least three of the sense organs namely; seeing, hearing and touching. This agrees with the popular Chinese proverbs that states: I hear- I forgot, I see- I remember, I do- I understand (Ogwuazor, 2008). The need for improvisation in the absence of standard instructional materials cannot be over-emphasized. Improvisation occurs when the teacher on the ground of inadequacy or lack of standard instructional materials, makes a step or move to develop, construct, design and utilize alternative instructional materials to aid instructional delivery and facilitate students' understanding of concept taught. It is an essential innovation in educational technology.

2.1.9 Utilization of Improvised Instructional Materials

The use of instructional materials in science instructions has been widely researched but many questions still remain unanswered. The need for exploring locally available materials in our schools and resourcefulness of the teacher must be in line with the learners' curriculum and environment, so that classroom teaching does not have to be retarded by lack of funds. The educational technology field emphasizes communication skills and approaches to teaching and learning through the judicious use and integration of diverse media (Chukwuemeka & Iscioglu, 2016; Dey, 2020)

Hence, government must strike to develop her local technology in all its ramifications since physics is interested in providing solution to man's problems holistically. Many writers in education have printed out the grossly unavailability of instructional materials during classroom teaching and learning situation. The problems are that instructional materials are not available in our schools, teachers are not improvising and reluctant in using them.

2.2 Theoretical Framework

The theory that backs this study is the Technology Acceptance Model and globalization theory. User acceptance of technology has been an important field of study for over two decades now. Although many models have been proposed to explain and predict the use of a system, the Technology Acceptance Model has been the only one which has captured the most attention of the Information Systems community. Thus, it is essential for anyone willing to study user acceptance of technology to have understanding on Technology Acceptance Model. Technology Acceptance Model (TAM), which was developed by Fred Davis in 1985, is one of the highly cited models. Chuttur 2013 argues that the wide acceptance of TAM is based on the fact that the model has a

sound theoretical assumption and practical effectiveness. From the time it was proposed in 1985, the model has been refined so as to incorporate variables and relationships obtained from the Fishbein and Ajzen Theory of Reasoned Action (TRA) of 1975. The output from the adjustments was a more refined model essential for anyone willing to interrogate the theory around technology acceptance and its utilization in learning. The model has been designed to show how users come to accept and use a technology. The theoretical basis is built on the premise that when users are presented with a new technology, three major factors influence their decision on how and when they will use it. The first determinant is its perceived usefulness (PU), the second is the perceived ease of use (PEOU), while the third determinant is user attitude towards usage (ATU). According to Davis 1989 perceived usefulness (PU) is the degree to which a user believes that using a particular system would enhance their job performance. On the other hand, perceived ease-of-use (PEOU) is the degree to which a user believes that using a particular technology would be free from effort. In other words, it is the degree to which consumers perceive a technology as better than its substitutes.

The relationship between these determinants can be illustrated by the model in Fig. 1 as suggested by Davis.

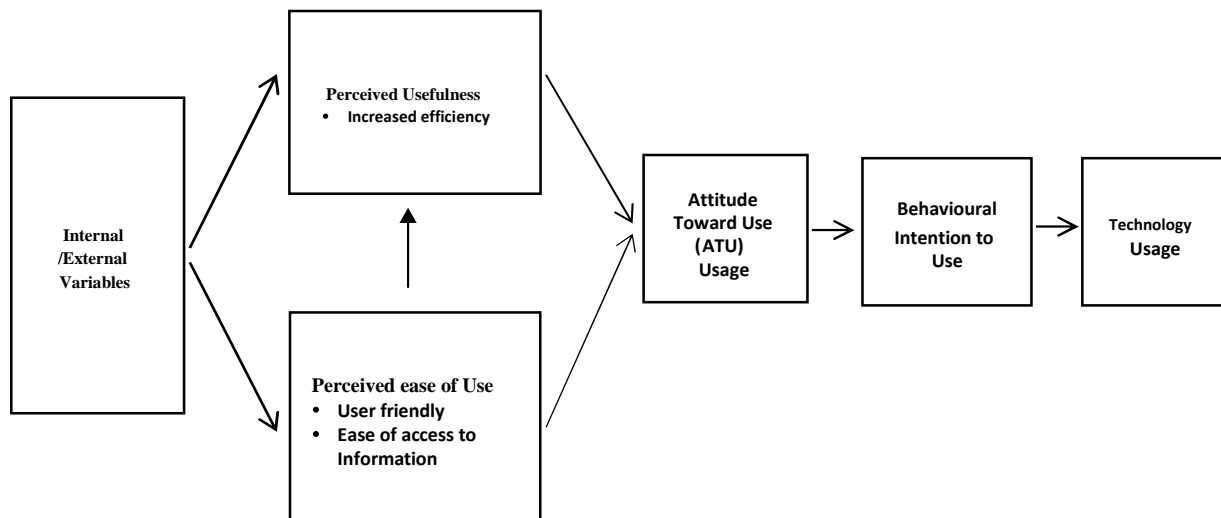


Fig. 2.1 The technology acceptance model (Fred Davis 2010)

In addition, both perceived ease of use and perceived usefulness are influenced by some critical variables. Different scholars have given their suggestions on the variables that determine the usefulness and ease of use of a technology.

Perceived Usefulness

Perceived usefulness of information and communication technology tools is associated with its ability to provide teachers with ease of assessing and evaluating students through learning management system. The platform is an avenue that provides opportunity for assessing evaluating students any time anywhere, often times providing chances for individualized assessment.

Perceived Ease of Use

The second aspect is perceived ease of use (PEOU). The argument is that, mobile devices have an easy to use operating system which manages its hardware and software. Examples of popular operating systems on mobile devices are Android, Symbian iOS and Windows phone. The operating systems are designed as user friendly systems whose operation is experiential. The user

does not require formal training for them to operate the interface. Within thirty (30) or so minutes of operation, a user can navigate through the graphical user interface with ease. On the same vein, mobile devices are designed to have at least one home screen. The home screen displays the main menu, apps and widgets. The user can customize the home screen, or add an extra home screen, providing them with freedom of arranging the apps on an appropriate page. Besides the user can select and download apps that are unique to their needs, tastes and preferences. Thirdly today's mobile devices have a large internal memory (up to 64GB) and slots for a large capacity micro SD card. This makes it convenient and easy for users to save and retrieve files downloaded from the net or obtained from any other computing devices. Lastly many mobile devices are portable, have inbuilt net interface that allow Internet connectivity, either through Wi-Fi, blue tooth, hotspot, GPRS/EDGE/3G or 4G facilities. This gives the user support, ease and freedom to carry and connect to the net as well as share or receive academic data and files without the need of plugging extra hardware.

Attitude Towards Usage

The third aspect is related to attitude towards use (ATU). As earlier indicated, the attitude of a user towards usage of a technology is an important element in determining the acceptance of the technology. A mistake made by donor agencies is to take a technology to schools then expect teachers and learners to utilize. Such users get excessive exposure and are subjected to anxiety towards it especially when the technology is not easy to use.

2.2.4 Empirical Studies

Anyakaorah *et al.*, (2021) in a review on improvisation of instructional materials for effective teaching and learning of computer in junior secondary Schools in Ebonyi State. Survey research

design was adopted. 18 computer science teachers only in Junior Secondary Schools in Enugu North constituted the population of the study and were used as the sample. The questionnaire contained 7 items for teachers only which was designed for the purpose of the study. The research questions were answered using Mean. The major findings show that software components of the computer are being improvised at a low extent. Also, the hardware components of the computer are being improvised partially at a great extent and at a low extent. More so, the basic computer accessories are being improvised partially at a great extent and at a low extent. When there is no instructional material, there will be lack of interest of students towards computer Education, retention and transfer of learning in computer Education will no longer take place in the Junior Secondary school. The basic components can be improvised by the teacher, students or Local carpenters with the resources within the learners' environment. The improvised material provides opportunity for development of science attitudinal skills and practical skills needed to function effectively in the society. The study therefore, recommends among others, that Government should organize seminars, workshops, and conferences on improvisation to make the teachers resourceful enough to improvise the instructional materials needed for Computer Education when the standard equipment is not readily available for effective teaching.

A survey research conducted by Thankgod and Gorge (2021), on the availability, utilization and improvisation of instructional materials for effective mathematics teaching and learning in junior secondary schools in Rivers State, Nigeria. The researchers investigated availability, utilization and improvisation of instructional materials for effective mathematics teaching and learning in junior secondary schools in Rivers State Nigeria. Two objectives guided this study. The research design was analytical survey design. The sample for the study was 12 junior secondary school mathematics teachers in Akuku Toru Local Government Area of Rivers state. Census sampling

technique was used. The two instruments used to collect data were titled “Mathematics Instructional Material Availability Inventory” and “Mathematics Instructional Material Utilization and Improvisation Questionnaire”. Cronbach alpha was employed to establish a reliability coefficient of 0.82 and 0.76 for the instruments respectively. Mean, standard deviation and independent sample t-test were used for statistical analysis at 0.05 significant level. The finding showed that the extent of available instructional materials in schools was low. The result revealed that the experienced and less experienced teachers’ extent of utilization of instructional materials for mathematics teaching and learning in junior secondary schools was also low though with no significant difference. The study also showed that the experienced and less experienced teachers do not improvise instructional materials for the effective teaching of mathematics with a statistical significant difference. It was recommended amongst others that all the stakeholders of mathematics education should avail themselves to support the move of equipping schools with instructional materials and also the mathematics teacher should endeavor to utilize and improvise instructional materials for mathematics teaching and learning.

Ogbe (2017) in the study, “improvisation and utilization of resources in the teaching and learning of science and mathematics in secondary schools in Cross River State”, examined the importance of improvisation in the teaching and learning of science and mathematics in the senior secondary schools in Cross River State of N Nigeria. Human and material resources are inevitable in enhancing the teaching and learning of science and mathematics generally and practically at this level of Education. The instructional materials lend credence and reality to abstract concepts taught at this level. Such instructional materials include charts, computers, and television, audio and visual materials. When these materials are not available or inadequate, the teacher is expected to improvise. Adequate and relevant materials give room for effective and efficient teaching and

learning of science and mathematics. It is the lack of such a situation that has resulted into poor performance and low achievement in science and mathematics. Therefore, these papers recommend that the way forward in this issue is for all hand to be on deck. The teachers, government and all stakeholders in Education should provide and supply to all secondary schools in the state adequate and relevant resource materials for the teaching and learning of science and mathematics. Functional centers for the provision of locally made teaching aids and instructional materials. Teachers should be sponsored by the government to attend workshops and seminars, vocational course and conferences to be enlightened on the latest development in their subject areas.

A survey research on the equality in the distribution of educational resources in Enugu state secondary schools conducted by Chikani (2010), he argued that since resources are inadequately distributed in schools, there is every tendency that poor performance recorded in results is its output. His findings further revealed that the methods adopted by the state and federal ministry of education in the provision, distribution and management of human and material resources affected not only the teachers' teaching methods but also the performance of the students whom they teach.

He recommended that the government should distribute financial, human and material resources equally to all schools irrespective of location or level. He also recommended monitoring of the distributed resources for effective utilization of such resources.

2.5 Summary of Review

Among the recommendations given in the thesis of (Odo, 2015) in "Effect of students' improvised instructional materials and students' achievement in Physics" is for Teachers to improvise instructional materials in the proper dissemination of the basic principles of Physics and encourage

their upcoming scholars (students) to do same in order to drive knowledge home and improve their achievement scores in Physics. Moreover, the author stressed that the involvement of stakeholders such as policy makers and local education authority in organizing workshops for teachers on improvisation and use of instructional materials in the teaching and learning of Physics we are well on track to achieving one of the Millennium development goals (MDGs) which is to re-train science teachers.

Improvised instructional material enable educational institutions to utilize a set of features such as flexibility, simplicity, and portability in learning that will be of great benefit to teachers and students in the new digital era (Briz-Ponce *et al.*, 2017; Chukwuemeka *et al.*, 2021). Studies carried out by Amasha *et al.*, (2021), Gezgin (2019), Ketyi (2015), and Oyelere *et al.*,. (2018) all revealed that instructional contents embedded in improvised instructional material improved students' academic achievements in education.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Research Design

The research design adopted for this study was a descriptive research design. In a research where a group of people or items are examined by collecting and analyzing data from their representatives through questionnaires, it is suitable to use survey type of research design. The descriptive survey design is used to describe the distinctiveness of individual or group, the relationship that exist between variables and describing them.

3.2 Population of the Study

The totality of under considerable elements are called population therefore, 15 physics teachers teaching in secondary school in Bosso Minna, Niger State constituted the population of this study. The target population for this study is secondary school in Bosso Minna, Niger State.

3.3 Sample and Sampling Techniques

A multi-stage sampling technique was employed in selecting respondents for this study. In the first stage, the purposive sampling procedure was used to select 10 physics teachers in secondary school in Bosso, Thereafter, the researcher used convenience sampling to sampled 5 other physics teachers in Tudun Fulani, and Maikunkele based on their availability. The researcher was unable to draw samples from all the respondents because some lecturers were not available at the time of visit.

3.4 Research Instrument

The research instrument that was used in this study to collect the data was observation checklist and questionnaire which was designed by the researcher. The questionnaire was titled "perception of physics teachers on the availability and utilization of improvised instructional material in secondary schools in Bosso, Minna, Niger State (PPTAUIIM)". In constructing the questionnaire, effort was made to see that the instructions were precise and clear to the respondents. The questionnaire was divided into four sections; section A, consists of demographic information about the respondents. Section B, consists of statements on availability of improvised instructional material in physics. Section C, consists of statements on utilization of improvised instructional material in physics. Section D, consists of statements to physics teachers' perception of instructional material.

3.5 Validity of the Instrument

The instrument was validated by two lecturers, all from the Department of Educational Technology, Federal University of Technology Minna, for face and content validity in terms of clarity, suitability, use of language, logical arrangement of the items among others. Based on their suggestions and recommendation, some items were modified while some items were also added and some were removed completely.

3.6 Reliability of the Instrument

A Pilot test was conducted to test the reliability of the instrument. A total number of 5 lecturers from Federal university of Technology Minna and a total number of 5 questionnaires were administered to teachers from Mariam Babangida Girls secondary school and Government day secondary school, which are not part of the sample but are part of the population. The administration was done once and a reliability coefficient of 0.75 from the variable was obtained using Cronbach Alpha formula to measure the internal consistency and how closely related a set of items are as a group. Based on the coefficient obtained, the instrument was considered reliable.

3.1.7 Method of Data Collection

An introductory letter was collected by the researcher from the Department of Educational Technology, Federal University of Technology, Minna. The researcher presented the letter to the appropriate authorities of each sampled schools in order to seek permission to have access to the teachers of the schools for the research. Once the permission was granted, the researcher, using observation checklist, measures the availability and adequacy use of improvised instructional material in the secondary schools selected. And the researcher then selects the required numbers of teachers needed for the study. All the respondents were briefed on the objectives of the study

and how to fill the questionnaires to ensure that valid data were collected. The instrument was collected from the respondents personally by the researcher. The researcher administered the questionnaire personally to the respondents and waited behind on the same day and ensures retrieval of the completed questionnaires. This method enabled the researcher to obtain at least 90% return of the filled questionnaires, it also helped the researcher to aid the respondents when needed. The filled and completed copies of the questionnaires were then collected by the researcher for further analysis.

3.8 Method of Data Analysis

Research questions one (B) was answered using frequency percentages. this was appropriate because it had only two response options (available/ not available) Responses that have a percentage score of 50% and above were rated positive(available)while percentage score below 50% were rated negative (not available).

Research questions C and D were answered using mean and standard deviation. for four (4) points scale responses, values of 4, 3, 2 and 1 for Strongly Agree/Very Great Extent (SA/VGE), Agree/Great Extent (A/GE), Disagree/Moderate Extent (D/ME) and Strongly Disagree/Low Extent (SD/LE) respectively were assigned to responses from which a mid-point mean value was calculated.

Formula

Σ = Sum of

X = Nominal Value

N= Total Number of Respondents

F = frequency

The numeric values assigned to a different scaling items used as follows:

SA/Very Great Extent = 4

A/Great Extent = 3

D/Medium Extent = 2

SD/Low Extent = 1

$$\begin{aligned}\bar{X} &= \frac{4 + 3 + 2 + 1}{4} \\ &= 2.5\end{aligned}$$

Decision Rule

The decision rule was based on the values of the calculated mean of the response options numerical values.

Therefore, any item of mean score which is 2.5 and above were agreed by the researcher as positive influencing the questionnaire items, while any point that is below 2.5 were disagreed by the researcher as negative

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Data obtained from research question

Research Question 1: To what extent are improvised instructional materials are available for teaching Physics in secondary schools in Bosso, Minna, Niger State?

Table 4.1: Observation Checklist on Availability of improvised instructional material in physics in secondary schools in Bosso, Minna, Niger state.

S/N	ITEM	Available frequency	Percentage (%)	Not available frequency	Percentage (%)	Decision
1	Color brochure.	10	66.7	5	33.3	Available
2	Disposed dry cell battery.	6	40.0	9	60.0	Not Available
3	Magnifying or reading glass.	11	73.3	4	26.7	Available
4	Stripped cardboard	6	40.0	9	60.0	Not Available
5	Graduated feeding bottle	5	33.3	10	66.7	Not Available
6	Flexible iron rod and thread reel	7	46.7	8	53.3	Not Available
7	Simulation videos	8	53.3	7	46.7	Available
8	flip chart and realia	10	66.7	5	33.3	Available

9	Photograph	5	33.3	10	66.7	Not Available
10	lids of jam jars	5	33.3	10	66.7	Not Available
						Not Available
	Total	75	48.7	77	51.3	Available

Table 4.1 shows the availability of improvised instructional material in physics in secondary schools in Bosso, Minna, Niger state. The data in table 1 shows that 4 items had a high frequency percentage out of the 10 listed items on the availability of improvised instructional material in physics in secondary schools in Bosso, Minna, Niger state. Specifically, items 1,3,7,8 had frequency percentage range of, 53.3 and 76.3. The values were up to the average and above, which were interpreted as available, and therefore indicated that, Color brochure, Magnifying or reading glass, Simulation videos, flip chart and realia are the available digital resources, on the other hand, low frequency percentage of 60.0, 60.0, 66.7, 53.3, 66.7 and 66.7 were obtained for items 2,4,5,6,9 and 10 respectively. The values indicate that, disposed dry cell battery, Stripped cardboard, graduated feeding bottle, flexible iron rod and thread reel, Photograph, lids of jam jars are not available. The result shows the grand mean of 51.3% which is greater than the decision mean of 50% which implies that improvised instructional material in physics are not available in secondary school in Bosso, Minna, Niger state.

Research Question 2: To what extent does Physics teachers utilize improvised instructional materials for teaching and learning Physics in secondary schools in Bosso, Minna, Niger State?

Table 4.2: Mean scores on the extent to which physics teachers utilize improvised instructional material in secondary schools in Bosso, Minna, Niger State.

SN	ITEM	N	Mean	Std. Deviation	Decision
1	I have the knowledge of using Color brochure material.	15	3.67	0.62	Great extent
2	I can actively implement disposed dry cell battery in the classroom.	15	2.93	0.70	Great extent
3	I can improvise and install magnifying or reading glass to conduct experiment in the classroom.	15	2.33	1.05	Low extent
4	I have the ability to carry out a simple presentation using stripped cardboard materials.	15	2.93	1.22	Great extent
5	I use graduated feeding bottle to teach liquid measurement in physics.	15	2.53	1.00	Great extent
6	I am capable of using flexible iron rod and thread reel to facilitate specific teaching concept in physics.	15	2.80	1.08	Great extent
7	I can use simulation videos material to support various students learning styles (e.g use of simulation videos for illustration in teaching projectile).	15	2.40	1.12	Low extent
8	I know how to effectively use flip chart and realia to communicate with my students.	15	2.40	1.18	Low extent
9	I can share lesson note and teaching materials through photograph approach.	15	2.33	1.18	Low extent

10	I am competent in the use of lids of jam jars in teaching and learning.	15	2.67	1.18	Great extent
Grand Mean			2.70		Great extent

Decision mean = 2.50

Table 4.2 shows the mean and standard deviation of Physics teachers' responses on the extent to which physics teachers utilize improvised instructional material in secondary schools in Bosso, Minna, Niger State.

Four out of eleven items stated in the research instrument on the extent to which physics teachers utilize improvised instructional material are not adequately use. Also, the grand mean to all the ten items is 2.70 which is greater than the decision mean of 2.50. The implication is that, the extent to which physics teachers utilize improvised instructional material in secondary schools in Bosso, Minna, Niger State is very high. Hence, this implies that improvised instructional material in secondary schools in Bosso, Minna, Niger State were adequately provided for the teachers to utilize in the element of teaching physics in secondary schools.

Research Question 3: What are the perceptions of Physics teachers towards the utilization of improvised instructional materials?

Table 4.3: Mean and standard deviation for physics teacher's perception toward the utilization of instructional material in secondary schools in Bosso, Minna, Niger State.

S/N	Items	N	Mean	Std. Deviation	Decision
1	I perceived that improvised instructional material will be useful in teaching and learning activities	15	3.07	1.03	Agree
2	I perceived that improvised instructional material will provide supplementary teaching material	15	2.47	0.83	Disagree
3	I perceived that improvised instructional material can be of great advantages to teaching pedagogy	15	2.13	1.19	Disagree
4	I perceived that improvised instructional material will reduce the cost of learning materials	15	2.47	1.25	Disagree
5	I perceived that improvised instructional material can increase better learning opportunities for students	15	2.40	1.30	Disagree
6	I perceived that improvised instructional material can foster collaborative learning among the student.	15	2.13	1.06	Disagree
7	I perceived that improvised instructional material support discovery learning.	15	2.33	0.98	Disagree
Grand Mean			1.70		Disagree

Decision mean = 2.50

Table 4.3 shows the mean and standard deviation for physics teacher's perception toward the utilization of instructional material in secondary schools in Bosso, Minna, Niger State. The respondents are in disagreement with six items out of seven stated in the research instrument on the perceptions of Physics teachers towards the utilization of improvised instructional materials. Also, the grand mean to all the seven items is 1.70 which is less than the decision mean of 2.50. The implication is that, the perceptions of Physics teachers towards the utilization of improvised instructional materials is not adequate. Hence, this implies that teachers in secondary school in Bosso, Minna, Niger State have negative perception toward the utilization of improvised instructional materials.

4.3 Summary of the Findings

1. The availability of improvised instructional material for physics in secondary school in Bosso, Minna, Niger state. is very low.
2. improvised instructional material for physics in secondary school in Bosso, Minna, Niger state were adequately provided for the teachers to utilize in teaching and learning physics in secondary schools.
3. Physics teachers do not make use of improvised instructional material for physics in secondary school in Bosso, Minna, Niger state.
4. Teachers in secondary school in Bosso, Minna, Niger State have negative perception toward the utilization of improvised instructional materials.
5. Inadequate availability of improvised instructional material, lack of adequate fund in schools, lack of regular power supply, excessive teachers' workload, inability of teachers to create instructional tools from local materials, high cost network connections and high cost of

electronic resources are all factors affecting the utilization of improvised instructional material for physics in secondary school in Bosso, Minna, Niger state.

4.4 Discussion of the Findings

The result of the study as shown in table 4.1 revealed that most of improvised instructional material for physics in secondary school in Bosso, Minna, Niger state are not available. The opinion of the respondents on availability of improvised instructional material assessment revealed that material resources such as Color brochure, Magnifying or reading glass, Simulation videos, flip chart and realia are the available improvised instructional material, at least one of the brands of the resources is present in all Physics laboratories of secondary schools in Bosso, Minna, Niger State. The findings of this study are in contrast with the findings of Okoli and Osuafor (2012) that almost all the required biology laboratory resources are not available in the schools. Among the resources they reported not being available are Digital photometer, interactive white board, overhead projector and video, which is in accordance with the earlier findings of Okoli and Osuafor (2012). This goes to affirm the fact that most improvised instructional material are not available in secondary schools in Bosso, Minna, Niger State.

Table 4.2 depicts Utilization of improvised instructional material by teachers in teaching and learning physics. The results obtained show that most laboratory resources are not adequately and effectively utilized by teachers due to inadequacy in the quantity and quality of such resources provided to secondary schools. In a situation whereby, the desired resources to use for teaching and learning are not available, teachers are left with no other option than to change the original method of teaching such topics which will not require resource utilization hence, adopt substitutional method which might not be in the best interest of the secondary school students.

This has hampered the actualization of physics educational objectives. This goes to affirm the findings of Imogie (2011) that resources are not effectively utilized in secondary schools. With reference to the above report, Okoli and Osuafor (2012) opined that resources which are effectively utilized in secondary schools are worthy to note that the extent of utility of improvised instructional material depends on their level of availability. The inadequacy in the quantity and quality of such resources has invariably affected their utilization.

From the findings of the result utilization of improvised instructional material in teaching and learning Physics in secondary schools by the students indicates that not all the listed items are being utilized by the teachers. All the above assertion point to one fact: only the perception of physics teachers on the available and utilization of improvised instructional material in secondary schools.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The purpose of the study was to investigate the perception of physics teachers on the availability and utilization of improvised instructional material in secondary school in Bosso, Minna, Niger State. Findings made from this study showed that: some of the improvised instructional material are not available. Based on the findings of the study, the following conclusions were made:

Most improvised instructional material are not available in secondary schools in Bosso, Minna, Niger state. Among the 10 resources considered in the study, six (6) among the resources were not available, such as disposed dry cell battery, Stripped cardboard, graduated feeding bottle, flexible iron rod and thread reel, Photograph, and lids of jam jars, which makes it almost impossible for only the teachers to supervise and control large classes thereby affecting the utilization and actualization of the teachers' objectives.

The extent to which the improvised instructional material for teaching and learning physics are available in secondary schools is not satisfactory. The present state of unavailability of improvised instructional material to secondary schools invariably affected its utilization. Hence, the extent of utilization of improvised instructional material in secondary schools is paralyzed while only resources that are commonly available are effectively utilized.

The result revealed further that, the extent to which teachers and students utilize improvised instructional material, which revealed that effective utilization was affected by teachers' perception without proportionate increase unavailability in the resources.

5.2 Recommendations

The following recommendations are made from the findings of the study.

- i. Teachers' should ensure regular attendance of conferences, workshops and exhibitions on improvisation, in order to promote a favorable attitude towards the use of improvised materials in schools and improve performance of students.
- ii. physics teachers should be encouraged to utilize improvised instructional materials to teach physics since it helps in teaching and learning physics concepts and processes
- iii. Efforts should be made by the governmental and non-governmental organizations together with the general public to provide adequate human and material resources to secondary schools.
- iv. Unavailable resources should be improvised to achieve the best in the teaching and learning of physics in secondary schools. This will boost students' active participation during and after teaching and learning.
- v. Text book authors and publishers should incorporate the use of improvised instructional material in their textbooks in order to offer students the opportunity to learn how to use physics resources even when they are not guided

5.3 Limitations of the Study

The following are the limitations of this study:

1. This study was limited to Bosso, Minna, Niger State.
2. Teachers in Bosso, Minna Niger State who are teaching other courses were not selected as part of the sample for this study. Selection of sample was limited to teachers teaching physics in Bosso, Minna Niger State.

3. Some teachers do not give correct opinion about the subject matter, rather some of them just ticked the questionnaire, even though the concept of this research sounds strange to them.

5.4 Suggestions for Further Research

Further studies in a number of areas related to the general use and the availability of improvised instructional material in various levels of education will provide a rewarding research experience.

For examples:

1. A research should be done to examine assessment of teachers' attitude and frequent use of improvised instructional materials on students' performance in physics
3. A research should be done to examining availability, utilization and improvisation of instructional materials for effective physics teaching and learning in secondary schools in Minna, State.
4. A study on the factors influencing the selection of improvised instructional material in secondary schools should be conducted.

REFERENCES

- Abdo, M. & Semela, T. (2021). Teachers of poor communities: The tale of instructional media in primary schools of Gedeo zone, Southern Ethiopia. *Australian Journal of Teacher Education*, 35 (7), 78-92.
- Adepoju. M. O & Popoola, S. O. (2020). Teaching effectiveness, availability, accessibility and use of library and information resources among teachers of Schools of Nursing in Osun and Oyo State, Nigeria. *Library Philosophy and Practices*. Retrieved on 15/08/14 from <http://www.webpages.uidaho.edu/~mbolin/adeoye-popoola.htm>
- Aduwa-Ogiegbaen S. O & Imogie, A. I. (2021). *Instructional communication and technology in higher education Ibadan: Stirling Hordon publishers (Nig) Ltd.*
- Akano, B. U. (2011). The Status for Human and Material Resources for Teaching the Basic Sciences in Colleges of Education in Niger State. *Proceedings of the 47th Annual Conference of STAN*. 27-32.
- Bakare, G.M. (2019). *Poor Academic Performance, Aetiology, Diagnosis and Remediation*. Ibadan: University Press.
- Beauchamp, G., & Kennewell, S. (2017). Transition in pedagogical orchestration using the interactive whiteboard. *Education and Information Technologies*, 18, 179-191. doi: 10.1007/s10639-012-9230-z
- Brophy, J., (ed) (2020), *Using video camera in teacher education*, *Advances in Research on Teaching*, Oxford: Elsevier Berck, K.; Graf, D., 2021. *Biologiedidaktik. Grundlagen und Methoden*, Quelle & Meyer, Wiebelsheim.

- Calandra, B. and Rich, P. (editors), (2015), *Digital Video for Teacher Education: Research and Practice*, New York: Routledge. Chaudary.R.& Sharma.D. (2021): M-learning and student engagement <http://research.repository.murdoch.edu.au/9347/1/01Whole.pdf>
- Chandler, Daniel, Munday, Rod, I. 2016. *Innovative Practice Using ICT in Schools: Findings from two Case Studies*. *Management in Education (MIE)*, 16 (1), pp. 31-34
- Chimezie, C. E. (2012). *Appraisal of Availability and Utilization of Instructional Materials for Teaching and Learning Mathematics in Secondary Schools in Udi Local Government Area of Anambra State. An Unpublished M. ED Thesis*. University of Nigeria, Nsukka.
- Chimezie, O. S, Ike, G. A. & Iwu, A. O. (2021). *New educational technology*. Nigeria: Onii Publishing House.
- Chukelu, U. O. (2020). *Effects of Biology Practical Activities on Students' Process Skill Acquisition in Abuja Municipal Area Council. An Unpublished M. ED Thesis*. University of Nigeria, Nsukka.
- Dangbin & Yala, H. (2021). *School Facilities and Academic Achievement of Secondary School Agricultural Science in Ekiti State Nigeria*. *Asian Siciak Sciences* 7(7), 23-30.
- Dangbin.O.E (2018). *Using new technologies in creating excitement in biology laboratory activities*. *Proceedings of the 47th Annual conference of STAN*. PP.134.
- Davis, F.D. (2021) "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology" *MIS Quarterly* 13(3), pp. 319-340. Federal ministry of information and communication (2012). *National ICT policy*: Retrieved on 6th July, 2019 from <http://www.information.go.ke/doc.ict20policy.pdf>
- Davis, F.D. (2019) "User Acceptance of Information Technology System Characteristics, User Perceptions and Behavioral Impacts" *International Journal of Man-Machine Studies* 38(3), pp. 475-487.
- Ferry, B. (2019). *Using of mobile phones to augment teacher learning in environmental education*. In hello! Where are you in land scape educational technology? *Proceedings ascilite*
- Gambari, A.I. (2021). *Instructional function of CAI; Computer assisted instructions*. Department of science Education, FUT, Minna,Niger state.
- Grabe, A & Grabe L.J: (2018). *Educational and National Developments*. New Delhi: Reed Educational and Professional Publishing ltd.
- Hornby O. (2017). *Differential Distribution and Utilization of Human andMaterial Resources on Students Academic Performance in Secondary Schools in Ogun State*. *African Journal for the Study of educational issues*, 3 (4), 23-27.
- Ifueke, S. F., Omoigu, O. O, & Okauru, (2019). *Application of ICTs in Nigerian secondary schools*. Retrieved on June17, 2019 from <http://www.webpages.Uidaho.edu/~mbolin/adomi-kpangban.Htm>.

- Ihieglulem, A. A., Oludare, A, & Emmanuel (2019). Relationship between educational resources and students' academic performance in Lagos State Nigeria. *International Journal of Educational Management*, 5-6, 144-153.
- Imogie, A. I. (2021). A New Paradigm for Teacher Preparation in the 21st Century Nigeria. *A Paper Presentation at the Annual National Conference Organized by the Institute of Education*, University of Nigeria, Nsukka.
- Kareem, A. (2018). A Survey of Resources and Instructional Methods for Intending Social Studies, Ogun State COED, Ijebu-Ode. Unpublished M.Ed Thesis, University of Ibadan, Nigeria.
- Karimi, M. (2019). Benefits of Instructional materials in teaching. Retrieved December 12th 2015, from: <http://www.uonbi.ac.ke>.
- Koufaris, M. (2022) "Applying the Technology Acceptance Model and Flow Theory to Online Customer Behavior" *Information Systems Research* 13(2), pp.205-223.
- Lee, Y., Lee, J., & Lee, Z. (2021) "The Effect of Self-identity and Social-identify on Technology Acceptance" *Proceedings of the International Conference on Information Systems (ICIS)*.
- Misoy, J. (2019). Teaching Style and Textbooks. *Teaching and Teacher education* 7, (2) 185-196.
- Nwosu, D. S. (2020). Attainment of Professionalism in Science Education: Competencies and Skills Needed by Biology Teachers. *Proceedings of 46th Annual STAN conference*. 118
- Nzewi, C. R. (2020). Effects of Two Teaching Methods on the Achievement in and Attitude to Biology of Students of Different Levels of Scientific Literacy. *International Journal of Education Research*, 45(2020)216-229.
- Oladipo, Y. (2012). The Issue of Poverty in the Provision of Quality Education in Nigeria Secondary Schools. *Educational Research and Review*. 2,(7),60-68.
- Imogie, O. (2009). Will N10.00 Do? An example of how lack of fund kill improvisation of educational materials in secondary schools in Nigeria. *Journal of Educational Media Technology* 2(2), 137-155.
- Queensland University, (2020). Pedagogical benefit of digital video. *Journal of institute for Teaching & Learning Innovation*.
- Saade, R. G., Nebede, F. & Mak, T. (2017). The Role of Intrinsic Motivation in System Adoption: A Cross-Cultural Perspective. *Journal of Information, Information Technology and Organizations* 4: 107-126.
- Tibenderana, P. K. & Ogao, P. J. (2019). Information Communication Technologies Acceptance and Use among University Communities in Uganda: A Model for Hybrid Library Services End-Users. *International Journal of Computing and ICT Research*, Special Issue, 1 (1): 60-75. Also Available at: www.ijcir.org/special-issue/volume_1-number_1/article8.pdf; (Accessed 8 November 2011).

- Türel.S. & Johnson, (2019). Student Engagement, Visual Learning, and Technology: Can Interactive Whiteboards Help. Action Research Exchange, 1(1).
- Uyoata J. C. (2022). Importance of aids and resources in classroom teaching. In Oyeneyin, A.M. (ed).Perspectives of Classroom Teaching. Abuja: Martmonic Investment Ltd.
- William, E. (2019). Fundamental Principles of Agricultural Education, (2nd. ed.) (16- 73).Nsukka: Dramond Publishers Limited
- Yekini, L. A. & Lawal, F. F. (2018). The use of digital information resources to enhance learning among university students. A case of Teofilo Kisanji University in Tanzania. Masters Dissertation, University of Dares Salaam.
- Yunus, M. M., Salehi, H. & John, S. A. (2018). Using visual aids as a motivational tool in enhancing students' interest in reading literary text. Recent Advances in Educational Technologies, 114-17.n <http://arxiv.org/ftp/arxiv/papers/1305/1305.6360.pdf>