INFLUENCE OF AVAILABILITY AND UTILIZATION OF INSTRUCTIONAL MATERIALS ON ACADEMIC PERFORMANCE OF AGRICULTURAL EDUCATION STUDENTS IN FEDERAL COLLEGES OF EDUCATION, NORTH-CENTRAL ZONE, NIGERIA

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DECEMBER, 2019

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A THESIS SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES AHMADU BELLO UNIVERSITY, ZARIA, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF SCIENCE DEGREE IN AGRICULTURAL EDUCATION

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DECEMBER, 2019

DECLARATION

I declare that the work in this dissertation titled “Influence of Availability and Utilization of Instructional Materials on Academic Performance of Agricultural Education Students in Federal Colleges of Education in the North-Central Zone, Nigeria” has been carried out by me in Agricultural Education Section, Department of Vocational and Technical Education, Ahmadu Bello University, Zaria. It is a record of my research work under the supervision of Dr. M. O. Ayorinde and Dr J.A. Abdullahi. It has not been presented in any form for the award of higher degree in any institution of higher learning. The source of information derived from the literature has been duly acknowledged in the text and list of references.

_____ _____

IFEAKOR, Mary-Rose Njideka Date.

CERTIFICATION

This research work titled "INFLUENCE OF AVAILABILITY AND UTILIZATION OF INSTRUCTIONAL MATERIALS ON ACADEMIC PERFORMANCE OF AGRICULTURAL EDUCATION STUDENTS IN FEDERAL COLLEGES OF EDUCATION IN THE NORTH-CENTRAL ZONE, NIGERIA" by Mary-Rose Njideka IFEAKOR has been read and meets the requirements and regulations governing the award of the degree of Master of Science of Ahmadu Bello University, Zaria and approved for its contribution to knowledge and literary presentation.

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DEDICATION

This work is dedicated to my beloved husband, Mr. Chika Ifeakor, my lovely daughter, Onyinyechi Mary-Judith Ifeakor and my parent, Mr. Paul Ezenkwu and Mrs Theresa Ezenkwu.

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LIST OF ABBREVIATION

C.A	Continuous Assessment
C.G.P.A	Cumulative Grade Point Average
IMUM	Instructional Materials UtilizationMean
FCEO	Federal College of Education Okene
FCEK	Federal College of Education Kontagora
FCEP	Federal College of Education Pankshin
G.P.A	Grade Point Average
I.E	That is
ICT	Information and Communication Technology
NASE	Nigerian Army School of Education
NASEI	Nigerian Army School of Education,Ilorin
NCCE	National Commission for Colleges of Education
NCE	Nigeria Certificate in Education
NTI	National Teachers Institute
SATPA	Students' Achievement Test in Practical Agriculture

Operational Definition of Terms

Academic Performance – is the final results of NCE III students of 2016/2017 academic session of agricultural science education of the four Federal Colleges of Education in North-central zone, Nigeria which was used as an index of academic performance.

Agricultural science education courses- All the agricultural science education courses done at NCE level (courses in NCE1, NCE 11 and NCE 111) the result of which was used to compute the CGPA that determine the final grades of NCE III result used in this study.

Agricultural science education lecturers- Lecturers that used instructional materials (the visual, Audio and Audio- Visual) in teaching agricultural science education courses in Federal Colleges of Education, North-Central Zone, Nigeria.

Agricultural science education students- are the 2016/2017 set of NCE 111 agricultural science education students of FCE Okene, FCE Pankshin, FCE Kontagora, and Nigerian Army School of Education Ilorin.

Availability- the level at which instructional materials (visual, audio, and audio-visual) are provided for use in teaching and learning of agricultural science education courses in the four Federal Colleges of Education, North-Central Zone, Nigeria.

Credit Unit- duration of contact hour of lecture per week.

Federal colleges of education- are FCE Okene, FCE Pankshin, FCE Kontagora, and Nigerian Army School of Education (NASE), Ilorin.

Instructional Materials- Are the visual aids (real objects or specimen, charts, pictures, map), audio (Public Address System and Radio), and audio-visual such as (Television, films, electronic boards and computers)needed for teaching and learning of agricultural science education courses, in the four Federal Colleges of Education, North-Central Zone, Nigeria.

North-Central Zone- Niger, Plateau, Kwara. Kogi, Benue and Nasarawa State.

Utilization- how often instructional materials (visual, audio and audio-visual) are used in teaching and learning of agricultural science education courses in Federal Colleges of Education in the North-Central Zone, Nigeria.

ABSTRACT

The researchwork investigated the influence of availability and utilization of instructional materials on academic performance of agricultural science education students in Federal Colleges of Education in North-central zone, Nigeria. The study was guided by three specific objectives, three research questions, and two null hypotheses. Descriptive survey research design was used for the study. The population of the study was 610 people comprising of 557 students and 53 lecturers of agricultural science education. Theproportion of 83 students and 27 lecturers were randomly sampled from the population and used for the study. Structured questionnaire and questionnaire checklistwere used as instrument for data collection. Four trained research assistants were used to distribute the questionnaireand collect data from the respondents, a questionnaire checklist was used to cross-check the available instructional materials indicated by the lecturers in the colleges.The data collected were analyzed using frequency, percentage, mean and standard deviation, t-test and regression statistics were used to test null hypotheses 1 and 2 respectively at 0.05 level of significance (p=0.05). The result of the study revealed thatvisual instructional materials such as real objects/specimen, models, posters, charts, maps, pictures/photograph, chalkboard and chalks, marker-board and marker, handouts, journals, magazines, textbooks and e-books as well as audio-visual instructional materials such as slides, projectors and computers were available in Federal Colleges of Education in North-central, Nigeria. The audio instructional materials such as radio/sound system, public address system and audio-tape/recorder as well some audio-visuals like television set, video tape/recorder/player, DVD/player/recorder were not available in any of the colleges. Students and lecturers often use visual and audio-visual instructional materials for teaching and learning of agricultural education courses. The null hypothesis one affirmed that students and lecturers did not vary in their opinions regarding the extent to whichvisual and audio-visual instructional materials are used in teaching and learning of agricultural education courses (t-cal.=3.66, p=.17). The null hypothesis two affirmed that theutilization of visual and audio-visual instructional materials in teaching and learning of agricultural education courses has significantinfluence on students' academic performance (r-cal.=.25, p=.020). The researcher therefore recommended that the college management boards should provide the instructional materials that are lacking in the department and the lecturers should further use instructional materials in teaching to improve students' academic performance.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

Teaching is an interactive activity of both the teacher and the students in the classroom through which the stated objectives of the lesson are achieved. Comb (2009) stated that for effective teaching to take place in schools, certain aspects of education components must be provided. He further grouped those components of education into input components and the output components. The input component of education refers to the resources used to teach the students which include the teacher, content, instructional materials and facilities while the outputcomponents are the goals and outcome of the educational process which reflect directly on the students' academic performance.

Instructional materials also referred to as instructional or teaching aids according to Jubay (2014) are the channels between the teacher and students through which skills, knowledge and attitudes are imparted to the students during instruction. They are what can be seen, touched, felt, manipulated(visual instructional materials) and listen to (Audio Instructional materials) in the classroom during instruction and have the potential of enhancing teaching, learning as well as students academic achievement (Bolarinwa, and Aramide, 2010). They also serve as the motivation on the teaching-learning process. These instructional materials can be obtained from within the learner's environment, commercially acquired or improvised by the teacher and used to make conceptual abstraction more concrete and practical to the learner (Iwu, Ijeoma,Onoja and Nzewuihe, 2011). Among the instructional materials recommended for effective teaching and learning of agricultural science education courses in colleges of education include chalk, chalk board, white board, charts, graphs, diagrams, exhibits, pictures, photographs, maps,

models, real objects, textbooks, reference books, computers, videorecorder, slide projector, public address system and film projector (NCCE, 2012).

Availability of instructional material in the opinion of Asogwa,Onu and Egbo (2013) refers to how an instructional material can easily be gotten for use for a particular purpose and time. It involves how operable or usable resources are upon demand to perform its designated or required functions. It refers to how much instructional materials are on hand to which teachers and learners have access to. It also refers to the quality, quantity, functionality, and disposability of such instructional materials to teachers at every point in time for effective utilization.

The utilization of instructional material according to Uzuegbu, MbadiweandAnunobi, (2013) is the degree of usage of a given instructional material in the execution of a given task. It involves the creation of value in things (Asogwa, Onu and Egbo, 2013). Utilization to a large extent judges the value of instructional materials by the degree in which it singly or collectively satisfies the derived needs. Teachers are considered as the major implementing factors of effective resource utilization in the teaching–learning process. Idris (2015) stated that the utilization of instructional materials in teaching depends on their availability in the school. Ifeakor (2016) added that the effective utilization of instructional materials in teaching agricultural science education courses stimulates students' interest in agriculture, makes them learn better, retain more and positively influence their academic performance.

Academic performance is defined as what the student has learnt or what skills the student has learnt after a given instruction and is usually measured by examinations and continuous assessment (CA)although there is no general agreement on how it is best tested or which aspect are most important. The described assessment information will be translated through grading system such as Grade point Average (G.P.A) and subject grade which later translate to

Cumulative Grade Point Average (C.G.P.A) on graduation and used for issuing of certificate. The quality of students'academic performance in any subject including agricultural science is greatly depended on how effective the learning experience is presented to them by the teacher using appropriate teaching method and instructional materials in a classroom environment (Cambridge University Reporter, 2003). Tukur (2012) stated that a number of factors have influence on academic performance of students during learning process which includes individual differences, learning environment, learners' background, instructional materials utilization among others but instructional material utilization has greater influence on academic performance as learners retain 90% of what they see, feel, and manipulate which instructional materials are capable of providing for the learners (Glasier in Aneke, 2012 and Cuban, 2001).

Agricultural science education according to Osinem (2008) is a process of imparting knowledge, skills and attitudes in agriculture to the learners at any educational level including colleges of education. Agricultural education students in colleges of education in the view of Ugwoke and Ifeanyi (2012) are those learners who engage in three years education programme that was designed to equip students with the skills, values, attitudes and related knowledge in production, processing and marketing of agricultural products. However the main aim of designing Nigeria Certificate in Education (NCE) agricultural science education programme is to produce competent agricultural science education teacherswith the right attitude to knowledge and professional competency in vocational agriculture; such teacher will be able to motivate students to acquire interest in and aptitude for agriculture; transmit agricultural knowledge and skills to the students in the content of their environment; establish and manage a model school farm, and to have sound background to enhance academic and professional progression of the student-teachers (National Commission for Colleges of Education (NCCE, 2012).

Yusuf (2015) stated that the objectives of agricultural education programme in colleges of education can only be successfully achieved when adequate opportunities are available to both learners and teachers to have suitable instructional materials to interact with during instructional process. Furthermore, if the teacher's selecting of instructional materials will take cognizance of the diverse backgrounds and interests of the learners, it will go a long way in enhancing and promoting teaching and learning as well as academic performance of the learners.

Colleges of education are among the tertiary institutions that contribute in manpower development in Nigeria. They are saddled with the responsibility of training teachers for nursery, primary and junior secondary schools (FRN, 2004, Gabriel, 2013 and Oritsebemigho, 2014). The colleges are to award NCE to those who successfully completed the prescribed courses. There are 152 colleges of education in Nigeria consisting of 21 federal, 82 private and 49 states (https://www.myschoolgist.com).

Agricultural science education is among the courses studied in colleges of education in Nigeria, leading to the award of the NCE. The place of instructional materials in instructional process as a device for imparting knowledge, skills, values and attitudes to the learner has made it necessary to investigate the influence of their availability and utilization in teaching agricultural education courses on academic performance of agricultural science education students which is the main focus of this study.

This study was carried out in Federal Colleges of Education, North-Central zone, Nigeria which has similar characteristic with the institution where the problem that led to this study was initially identified. It was revealed through literature that similar study has been carried out in South-South Zone and North-West Zone. In north-central zone, similar study has also been carried out in lower basic education level, upper basic education level, and none has been done

incolleges of education. Following the pattern similar researchhas been carried out in the North-Central Zone. This study therefore focused on Federal Colleges of Education in North-Central Zone, Nigeria.

1.2 Statement of the problem

The researcher through personal experience and visit to some colleges of education in Nigeria discovered that students'academic performance in agricultural education in colleges of education in Nigeria is poor. This finding was supported by the findings of Agwam (2017) who reporteda poor academic performance of agricultural education students in colleges of education (over 50% had GPA below 2.4), Yohanna (2017) discovered a poor academic performance of agricultural science education students in colleges of education (where 40% had passes and 60% failure), Akanmu, Adejare and Johnson (2016) also revealed a poor academic performance of students in agricultural education in colleges of education.Ibrahim (2000) observed that most lecturers in tertiary institutions teach in abstract without using the required instructional materials meant for teaching certain group of students and different aspect of courses which may contribute to poor academic performance of students. The issue of poor academic performance of students in Nigeria has been of much concern to the stakeholders and students themselves. Many researchers have sought to find out the reasons for the downward trend in the academic performance of students including agriculture in schools and colleges. Okpanachi and Ene (2008), and Fakomogbon (2010) identified inadequate provision and non-utilization of required instructional materials in teaching as one of the major causes of poor academic performance of students.

Achieng (2013) posited that students factor, family factor,society, schools, and government may be composite causative effect for these downtrend; he however concluded that there is need for each of these variables to be considered extensively to determine their influence on students'

academic performance,hence this study focused on the influence of availability and utilization of instructional materials on academic performance of agricultural education students in Federal Colleges of Education North- Central Zone, Nigeria.

1.3 Objectives of the study

The main objective of this study is to determine the influence of availability and utilization of instructional materials on academic performance of agricultural science education students in Federal Colleges of Education in North-Central Zone, Nigeria. The specific objectives of this study include: to

I. identify the available instructional materials(visual, audio, and audio-visual)for teaching agricultural education course in Federal Colleges of Education in North-Central Zone, Nigeria;
II. determinehow often theavailable instructional materials (visual, audio and audio-visual)are used in teaching and learning of agricultural education courses in Federal Colleges of Education in North-Central Zone, Nigeria;
III. ascertain the influence of extent of utilization of available instructional materials on academic performance of agricultural education students in Federal Colleges of Education in North-Central Zone, Nigeria;

1.4 Research Questions

The study provided answers to the following research questions:

1. What are the available instructional materials (visual, audio and audio-visual)for teaching agricultural education courses in Federal Colleges of Education in North-Central Zone, Nigeria?

2. How often do lecturers use available instructional materials(visual, audio and audio-visual) in teaching agricultural education courses in Federal Colleges of Education, North-Central Zone, Nigeria?
3. What is the influence of utilization of available instructional materials (visual, audio and audio-visual) on academic performance of agricultural science education students in Federal Colleges of Education, North-Central Zone, Nigeria?

1.5 Research Hypotheses

Thefollowing research hypotheses were formulated for the study andtested at 0.05% level of significance (p=0.05) which enabled the researcher arrived at meaningful conclusionfor the study include;

$HO_{1:}$ There is no significant difference in the mean responsesof the students and lecturers on how often instructional materialsare usedin teaching agricultural science education courses in Federal Colleges of Education, North-Central Zone, Nigeria.

$HO_{2:}$ There is no significant influence ofextent of utilization of available andinstructional materialson the academic performance of agricultural education students in Federal Colleges of Education, North-Central Zone, Nigeria.

1.6 Significance of the Study

The findings of this study when published will benefit Federal ministry of education, college management board, lecturers, designers of instructional materials and Scholars;

Federal ministry of education: will have information on the quality of agricultural science teachers produced in agricultural science education department in the four FCEin the North-central, Nigeria.

The study will help the college management boards to identifythe instructional materials that are available and those that are not available for teaching agricultural education courses and how often the available ones are used by the lecturers in teaching. This will enable them take a wise decision during resource allocation to departments in the colleges to ensure that the needed instructional materials for training quality teachers in the departments are adequately provided for use by the lecturers in teaching students.

The findings of this study will help the lecturers to see the need to improve themselves on the utilization of the instructional materials revealed unused in their teaching in order to improve on their teaching and enhance students' academic performance in the study area.

The designers of various instructional materials: When the various factors that enhance and promote the use of various instructional materials are taken into consideration, the various centers of educational technology both at institutional needs and at resources developing centers will benefit. They will be encouraged to produce more materials that are recent in the teaching of agriculture at college of education level.

The students of agricultural science education: will have better understanding and retention of agricultural science education courses as well as improving on their academic performance when different types of instructional materials are rightly used for them during instruction.

The Scholars: will benefit from this study which will be published in journals and add to the wealth of literature on the subject.

Other researchers: will be encouraged to carry out more research in the field of instructional materials, as recommendations were made for further studies.

1.7 Assumptions of the Study

The following assumptions were made for this study:

1. The visual, audio, and audio-visual instructional materialsfor teaching agricultural science education courses in FCE, North-Central Zone, Nigeria are available for use by the lecturers in teaching agricultural education courses.
2. The available visual, audio, and audio-visual instructional materials are often used in teaching agricultural education courses in the study area by the lecturers.
3. The utilization of available instructional materials (visual, audio and audio-visual) in teaching agricultural education courses will have significant influence on the academic performance of agricultural education students in FCE, north-central zone, Nigeria.

1.8 Delimitation of the Study

The study was delimited to the influence of availability and utilization ofinstructional materialson academic performance of agricultural education students in FCE, North-central zone, Nigeria.

It was delimited to agricultural education lecturers,NCE III of 2016/2017 academic session ofagricultural education students, and agricultural education courses offered in the department of agricultural education in FCE, North-Central Zone of Nigeria.

It was also delimited to the final results of NCE111 studentsof 2016/17 academic session in the department of agricultural education, FCE, North-central zone, Nigeria whichwere approved by the academic boards of the four Federal Colleges of Education in the study area and used as the indices to determine the influence of availability and utilization of instructional materials on academic performance of agricultural education students in the study area.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.0 Introduction

This chapter presents the relevant literature for this study as follows.

2.1 Theoretical Framework

2.2 Concept of instructional materials

2.3 Types of instructional materials

2.4 Instructional Materials Recommended for Teaching Agricultural Science

2.5 Availability of instructional materials in schools and colleges

2.6 Utilization ofinstructional materials for teaching in schools and colleges

2.7 Academic Performance

2.8 Influence of availability and utilization of instructional materials on students' academic Performance.

2.1 Theoretical Framework

The research was based on theCognitive Theory of Multimedia Learning (CTML) and Context Input Process and Product Evaluation Model.

2.1.1 Cognitive Theory of Multimedia Learning

The researcher adopted the Cognitive Theory of Multimedia Learning (CTML). The Cognitive Theory of Multimedia Learning was popularized by the work of Richard E. Mayer and Roxana Moreno alongside other cognitive researchers such as Baddeley, Paovio and Sweller who argue that multimedia supports the way that the human brain learns. They assert that people learn more deeply from words and other media or materials than from words alone, which is referred to as the multimedia principle (Mayer 2005a). The Cognitive Theory of Multimedia Learning model

depicts all that dual-channel processing going in the learner's mind when using multimedia instruction.

Multimedia researchers generally define multimedia as the combination of text and pictures; and suggest that multimedia learning occurs when we build mental representations from these words and pictures (Mayer, 2005b). The words can be spoken or written, and the material/media can be any form of graphical imagery including audios, illustrations, photos, animation, or video. Multimedia instructional design attempts to use cognitive research to combine words and pictures in ways that maximize learning effectiveness. The theoretical foundation for the CTML draws from several cognitive theories including Baddeley's Model of Working Memory, Paivio's Dual Coding Theory, and Sweller's Theory of Cognitive Load. As a cognitive theory of learning, CTML falls under the larger framework of cognitive science and the information-processing model of cognition. The information processing model suggests several information stores (memory) that are governed by processes that convert stimuli to information (Moore, Burton and Myers, 2004).

The Cognitive Theory of Multimedia Learning centers on the idea that learners attempt to build meaningful connections between words and other media/materials and that they learn more deeply than they could have with words alone (Mayer, 2009). According to CTML, one of the principal aims of multimedia instruction is to encourage the learner to build a coherent mental representation from the presented material. The learner's job is to make sense of the presented material as an active participant, ultimately constructing new knowledge. According to Mayer and Moreno (1998), and Mayer (2003), CTML is based on three assumptions:

i. The dual-channel assumption which states that working memory has auditory and visual channels based on Baddeley's (1986), theory of working memory and Clark and Paivio, (1991), dual coding theory.

ii. The limited capacity assumption which is based on cognitive load theory (Sweller, 1988,1994), and states that each subsystem of working memory has a limited capacity.

iii. The third assumption is the active processing assumption which suggests that people construct knowledge in meaningful ways when they pay attention to the relevant material, organize it into a coherent mental structure, and integrate it with their prior knowledge (Mayer, 1996, 1999).

CTML accepts a model that includes three memory stores known as sensory memory, working memory, and long-term memory. Sweller (1994), defines sensory memory as the cognitive structure that permits individuals to perceive new information; working memory as the cognitive structure in which we consciously process information, and long-term memory as the cognitive structure that stores individuals' knowledge base. Humans are only conscious of information in long-term memory when it has been transferred to working memory. Mayer (2005a) states that sensory memory has a visual sensory memory that briefly holds pictures and printed text as visual images; and auditory memory that briefly holds spoken words and sounds as auditory images. Schnotz (2005), refers to sensory memory as sensory registers or sensory channels and points out that though people tend to view the dual channel sensors as eye-to-visual working memory and ear-to-auditory working memory, that it is possible for other sensory channels to introduce information to working memory such as "reading" with the fingers through Braille or a deaf person being able to "hear" by reading lips. Working memory attends to, or selects information from sensory memory for processing and integration. Sensory memory holds an

exact sensory copy of what was presented for less than .25 of a second, while working memory holds a processed version of what was presented for generally less than thirty seconds and can process only a few pieces of material at any one time (Mayer 2010). Long-term memory holds the entire store of a person's knowledge for an indefinite amount of time.

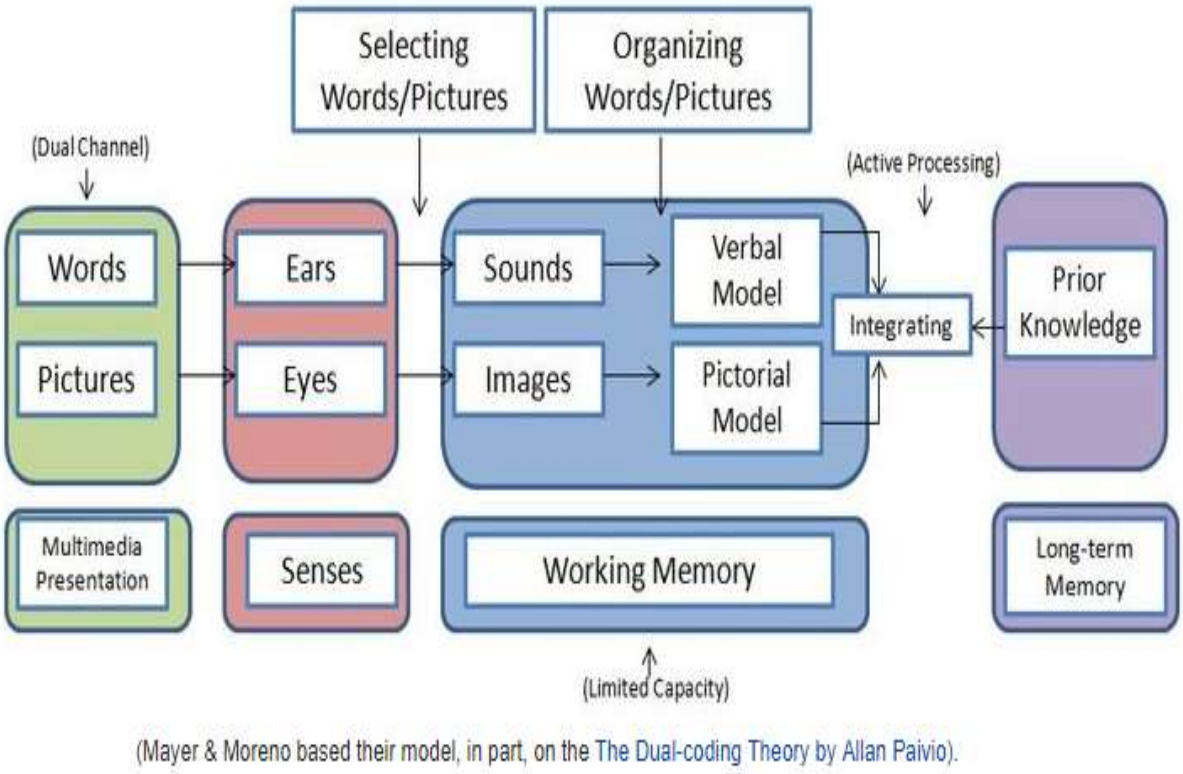


Figure 1 is a representation of how memory works according to Mayer's

Source: https://en.wikiversity.org/wiki/File:CognativeTheoryMML.jpg

Mayer (2005a), states that there are also five forms of representation of words and pictures that occur as information is processed by memory. Each form represents a particular stage of processing in the three memory stores model of multimedia learning.

a. The first form of representation is the words and pictures in the multimedia presentation itself.

b. The second form is the acoustic representation (sounds) and iconic representation (images) in sensory memory.

c. The third form is the sounds and images in working memory.

d. The fourth form of representation is the verbal and pictorial models which are also found in working memory.

e. The fifth form is prior knowledge, or schemas, which are stored in long-term memory.

According to CTML, content knowledge is contained in schemas which are cognitive constructs that organize information for storage in long term memory. Schemas organize simpler elements that can then act as elements in higher order schemas. As learning occurs, increasingly sophisticated schemas are developed and learned procedures are transferred from controlled to automatic processing. Automation frees capacity in working memory for other functions. This process of developing increasingly complicated schemas that build on each other is also similar to the explanation given by Chi, Glaser, and Rees (1982), for the transition from novice to expert in a domain.

The researcher deliberately chose CTML for its being consistent with the research topic and objectives, which seeks to find out the availability and effective utilization of electronic media in the process of teaching. As it implies, the theory gave credence to importance of hearing, seeing and reading which when combined can create better learning ability.

The Cognitive Theory of Multimedia Learning is relevant to the study as it identifies and explains how learning takes place. Specifically, it explains how instructional materials (multimedia)are able to influence the academic performance. The CTML shows that instructional materials can influence retention and positively affect the performance of

Agricultural Education students. The instructional materials identified in this study appeal to either of the ears, eyes and other senses. Therefore, the CTML is relevant to this study.

2.1.2 Context, Input, Process and Product (CIPP) Evaluation Model

This study also adopted the CIPP model to explain the influence of availability and utilization of instructional materials on the academic performance of students. The CIPP model is a model of curriculum evaluation and it was propounded by Daniel Stufflebeam in (1971) but popularized in 1975 and 1980 by Egan and Tim respectively. The CIPP model is an evaluation model that identify what should be evaluated in an academic set-up or training programme. Evaluation can be seen as the process of alienating, obtaining and providing useful information for judging decision alternatives. Thus, there are different evaluation models in educational endowment; as such educational evaluators choose the one that is suitable for conducting their studies. CIPP model among others agreed with the present study hence is used as a theoretical framework of the study.

In the CIPP model four elements are regarded as parameter thus: Context evaluation, Input evaluation, Process evaluation and Product evaluation.

Context Evaluation: this is applicable when a programme or course is newly planned. It is concerned with the determination and validation of goals and objectives of a programme. Context evaluation is conducted to define the prevailing environment in which a programme will take place, to discover the environments unmet needs (students? needs, community needs and state needs), to identify some of the constraints and problems underlying those needs and to discover the opportunities for meeting those needs which already exist in the community. Context evaluation answers the question: where are you and what are your needs?

Input Evaluation: This evaluation parameter provides information on the resources available and how these resources may be used to achieve the desired goals and objectives of a Programme. Input evaluation entails the assessment of resources, staff, students, physical facilities, equipment, library and resources that are involved in the educational programme (Akpan, 2006). It provides information on the quality and quantity of existing resources of a programme. According to Tim (1980) the end product of input evaluation is an analysis of alternative procedural designs in terms of potential cost and benefits in attaining the desired goals. Input evaluation attempts to answer the question: how will you get there? However, this study hinges typically on the input evaluation parameter.

Process Evaluation: This type of evaluation is undertaken during the period of programme implementation and it provides periodic feedback on the quality of implementation. The primary purpose of process evaluation is to detect or predict defects during the programme or course implementation or operational stages. Process evaluation determines if the programme is being implemented as originally planned. The overall process evaluation strategy identifies and monitors on a continuous basis the potential sources of failure. These include the course offerings, teaching methods, teachers, performance, interpersonal relationships among others (Tim, 1980). The real question to be answered by process evaluation is: how are you doing to get there?

Product Evaluation: This form of evaluation is undertaken at the end or conclusion of a programme or course. The primary purpose of product evaluation is to determine the degree to which intended objectives and goals of a programme have been met and to relate same to context, input, and process evaluation in the measurement and interpretation of the outcome.

Product evaluation is used to determine the effectiveness of a programme or course after it has been completed. It answers the question: have youmade it?

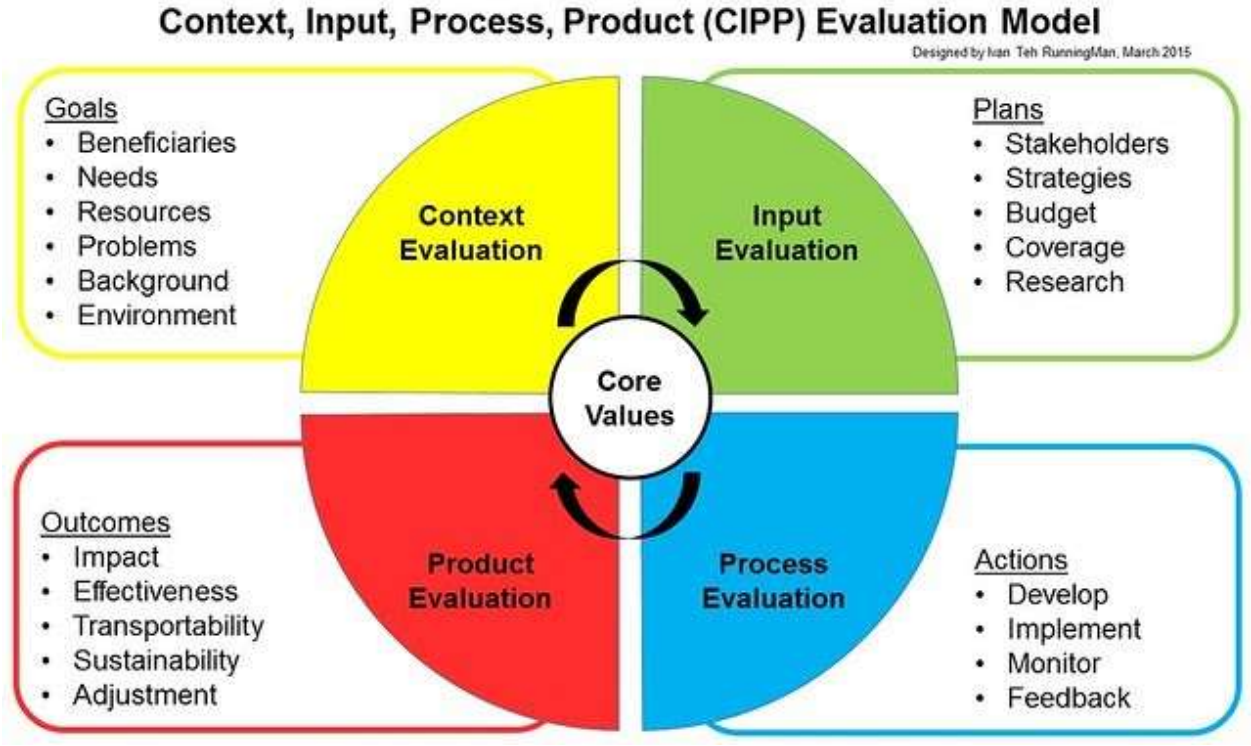


Fig 2: Context, Input, Process and Product (CIPP) Evaluation Model

Source: https://cphillips916.wordpress.com/2017/11/21/program-evaluation-cipp/

The CIPP evaluation model is relevant to the study as it identifies and describes such evaluation parameters as context which is Federal Colleges of Education in the North-central zone of Nigeria, input evaluation which assesses the educational resources (input resources) available for Agricultural education programme, process evaluation which evaluates the extent to which the instructional materials and the product evaluation which is reflected in the performance of the students.

Therefore, the entirety of this study is centered on the CIPP model because it seeks to assess the influence of the availability and utilization of instructional materials on the performance of

agricultural education students in Federal Colleges of Education, North-central zone, Nigeria. This has made the CIPP evaluation model very relevant in guiding this study.

2.2 Concept of Instructional Materials

Instructional Materials has born several nomenclatures from the colonial concept of apparatus to teaching aids, teaching aids to educational media, educational media to instructional technology, instructional technology to curriculum materials, and curriculum materials to its modern nomenclature – instructional materials. Each of these conception stages depicts the scope of its usage and application in the classroom.

Ibeneme (2000) stated that the general acceptable nomenclature by professionals of education is instructional materials. He sees instructional materials as those materials that appeals to the sense organs such as the eyes, nose, tongue, ear and hand. These senses are sight, smell, taste, touch and hearing. During instructional process, students employ one or more of these senses to learn. Some students learn better by seeing, touching, tasting and others by hearing and smelling when visual aids, audio aids, or audio-visual aid is employed by the teacher during instruction. Instructional materials can be obtained within the learner's environment, developed by the teacher or purchased to assist the teacher in transmitting organized knowledge, skills and attitudes to the learner within an instructional situation (Ikerionwu, 2000, and Nwachukwu, 2006).They are the devices that can be manipulated by both the teacher and the learner to achieve the stated objectives of the lesson.

Isola (2010) viewed instructional materials as things or objects, which make teaching and learning meaningful. He went further to refer to them as objects or devices, which help the teacher to make a lesson much clearer to the learner. According to Agina-Obu (2005),

instructional materials are concrete or physical objects which provide sound, visual or both to the sense organs during teaching and learning in the classroom.

According to Eya (2006) instructional materials are all forms of information carriers which can be used to record, store, preserve, transmit, concretize or retrieve information for the purpose of teaching and learning. Abdullahi (2009) viewed instructional materials as those things which a teacher uses or manipulates in the process of his teaching in order to enhance learning process. According to Zakari (2015), instructional material comprises theoretical, practical, and skills oriented resources which facilitate teaching and learning, skills acquisition, and evaluation of vocational courses. According to Olawale (2013), instructional materials include materials used to facilitate learning for better results. In the same vein, Uzuegbu, Mbadiwe and Anunobi (2013) defined instructional material as any device used to assist the instructor in the preparation of a lesson, teaching of lesson and facilitate students' learning of the subject matter. They include those objects that are commercially acquired or improvised by the teacher to make conceptual abstraction more concrete and practical to the learner (Iwu, Ijeoma, Onoja and Nzewuihe, 2011).They are relevant materials utilized by the teacher during instructional process for the purpose of making the contents of the instructions more practical and less vague. Thus, instructional materials could be regarded as the information dissemination devices used in the classroom for easy transfer of learning. Fakomogbon (2010) stated that instructional materials may be available in bound, unbound, kit or package form and may consist of hard backed or soft backed textbooks, consumable learning laboratories, slide, films and filmstrips, recording, manipulative electronic media (instructional computer programmes, online services, laser disc, CD-ROM etc). Ogwa (2002) stated that instructional materials can be in form of specimen (real object), tools, equipment, machines, educational materials such as chats and ICT instructional

resources. He added that instructional materials could mean all the materials or teaching aids or material resources which the teacher utilizes for the purpose of making teaching and learning more effective and meaningful to students.

This means that vocational education programmes including agriculture require materials, tool and equipment that will help in facilitation of the acquisition of occupational skills in the diverse areas of agricultural technology. This implies that the success in the skills and knowledge acquisition in an instructional situation depends on the suitability of the instructional material, adequacy and effective utilization of the available materials.

2.3 Types of Instructional Material

Abdullahi (2009); Clark (2009), Prem, Tushar, Prithwiraj, Shankar, Sanjay, and Sanjit (2015),Zakari (2015), Okwelle (2014) Oladejo, Olosunde, Ojebisi and Isola, (2011) and Blankenship (1989) outlined different types of instructional materials needed for effective and learning in schools and colleges as follows:

Visual instructional Material: is anything which either helps the students to see better, using diagrams or pictures to explain betterwhich appeal to the sense of sight only. Examples include chalkboard or whiteboard, graphs, models, map, diagrams, pictures, charts, models, and specimen or real objects.The research of Cuban (2001) indicated the psychology of visual aids as under 1% of what is learned is from the sense of taste, 1.5% of what is learned is from the sense of touch, 3.5% of what is learned is from the logic of smell, 11% of what is learned is from the sense of hearing and 83% of what is learned is from the sense of sight. This statement supported the view of Abolade (2004) that what students can see only, can take up to 80% in the learning process, what they can hear takes 11% and olfactory, tactile and tasting takes 9% therefore visual instructional materials has a great impact on students' academic achievement.

Audio instructional materials: are materials on which sounds are stored or recorded and can be reproduced or played back mechanically, electronically or both. They include radio, tape, Public Address System (PAS). These devices make use of the sense of hearing only.

Audio-visual instructional materials: appeal to the sense of both hearing and seeing. They include television set, motion pictures, films, computers and DVD players.Prem, *et al* (2015) stated that audio-visual has the ability to draw student's attention, secure their interest in the subject matter, transmit information quickly and efficiently to large number of students, explain facts ideas and processes more clearly, illustratively and elaborately during instruction.

Anzaku (2011) opined that audio- visual instructional materials may be used to convey meaning of concept without complete dependence upon verbal symbols or language during instruction. Ezeh (2013) stated that students learn more and faster by audio-visual process than by verbal explanation alone. Oketunji (2000) stressed that audio-visual materials when effectively used lessen verbalism, vitalize subject matter, provide interesting approach to new topics and give initial correct impressions economize time in learning, supply concrete materials needed, and stimulate the initiative of the students. They also help the teacher to overcome physical difficulties of presenting subject matter (Gopal, 2010). This is to say that with audio – visual materials, the barrier of communication and distance is broken and the culture and climatic condition of other countries can be brought into the classroom with the aid of slides, films, filmstrips and projectors. This is important because according to Dike (1993) "once the phenomenon is visualized, the picture and knowledge becomes very clear and permanent". Agreeing to this assertion, a 20th century Chinese philosopher stated that "one picture is worth a thousand words".

Natoli (2011) added that audio – visual materials are rich opportunities for students to develop communication skill while actively engaged in solving meaningful problems'. This is true because students like it more and learn better if they are engaged in important and appealing activities during instruction.Swank (2011) on the effectiveness of audio-visual instructional materials in learning, estimated that about 40% of the concepts are based upon visual experience, 25% upon auditory, 17% on tactile, 15% upon miscellaneous organic sensation and 3% upon taste and smell. With the above assertion, it becomes clearer why audio – visual materials are important in the teaching and learning process. This is because they combined different senses contributions together to get 100% clarity.

Textual (printed) instructional materials: they are publications, documents or records used for effective instruction (SlideShare, 2014). Iwu, Ijeoma, Onoja and Nzewuihe, (2011) and Nwoji (2002) agreed that printed materials are the fourth major type of instructional materials which include magazines, newspapers, journals, textbooks, e-books and handouts. They contain bits of information which teachers use to prepare and teach the lesson and students read and memorize for understanding of concepts and principles of the subjects. According to Ogwu and Oranu (2008) the use of textbook aids the learners to get primary source of information and detail explanations covering the fundamental operations as well as other relevant information that have bearing on the subject under discussion.

Projected instructional materials: Ogbondah (2008) described them as the instructional materials thatmakeuse of electricity to produce clear images on screen and give illusion to reality in teaching- learningprocess. Such materials include films,slides, projectors, overhead projectors, tape recorder/recording, episcope video cassette/ video disc machine and computer instructional system. They express the channel through which the learning takes place in the classroom. They

have the ability to reproduce real objects and events with high fidelity and enable larger number of people to see an illustration (Encyclopedia vol. 4). Hence, for a teacher with large number of students, there is no alternative to the use of projected materials if the teaching must be effective. Dubey and Barth (1977) asserted that films can be a substituted for travel as they give impressions and expressions that are not possible to get in other way.

According to John (1970), whatever the subject is, an important dimension can be added by the film in instruction. He added that film shows actuality as it happened to provide history in images of the actual events in form 16 millimeter films.John (1970) also stated thatprojected is very relevant in instructional process but is expensive, require skills and power supply to be used when available to enhance learning and performance of students in agriculture. This is worsened by erratic power supply in the country. This means that the enabling environment to fully use of the projected materials in schools is not there.Abdullahi (2009) described these as problems which force teachers to concentrate on lecture method which alienate other human resources, like the students who are very relevant to the teaching and learning activities.

2.4 Instructional Materials Recommended for Effective Teaching and Learningof Agriculture in schools/Colleges.

Soetan (2010) in Adalikwu, and Iorkpilgh (2013), NCCE (2012) Ateke (2008), Farauta (2007) and Mundi and Alfred (2006) recommended chalk, chalk board, marker and marker board, , exhibits, flat pictures, photographs, maps, models, real objects, motion pictures, textbooks, reference books, radio, audio tape, computers,video recorder, video player, slide projector, overhead projector, film projector, magnetic board, public address system, color television set, cameras, voltage stabilizer, handbooks, human voice, journals, minimum standard syllabus, public address system, magazines, newspapers, printing machines, farm tools and

equipmenthandouts, videotape or film, DVDs, CD-ROMs, e-mail, internet, and interactive video conferencing, graphics including charts, posters, sketches, cartoons, graphs and drawings as the essential materials required for communicating facts and ideas clearly during instructional process. They added that the use of graphics in teaching creates definitiveness to the materials being studied, help to visualize the whole concepts learned and their relationships with one another.. Teaching with these instructional materials, especially newer technologies that suit today's information technological society is the trend in the contemporary society. They provide first-hand experience where possible or vicarious one where only that is feasible.

2.5 Availability of Instructional Materials in Schools/Colleges

The findings of the researchers on the availability of instructional materialsfor teaching agricultural science education and other subjects in schools and colleges were reviewed as follows: Abubakar (2010) in his study observed that chalk and chalk board, marker and marker boards, computers, CD-ROMS, Internet, e-mail, microfilm, microfiche, video tape, audio tape and slide projectors as available instructional materials for teaching library studies in the six library schools in Nigeria(Abia State University, Bayero University, Kano, University of Ibadan, University of Maiduguri and University of Nigeria, Nsukka). This finding agrees with Uzuegbu, Mbadiwe and Anunobi (2013) observation that human voice, textbooks, chalkboards, handbooks, syllabus, marker boards, public address system and magazines are the available instructional materials for teaching library education in Abia state tertiary institutions. This also in line with the finding of Ojo (2013) in his study that chalkboard, charts, pictures, real objects, books, overhead projectors, tape recorders and video tape recorders are available for teaching Yoruba in Senior Secondary Schools in Ogbomoso North Local Government Area of Oyo State.Okeke (2000) revealed that the needed instructional materials (audio materials) for teaching Igbo

language are not available in secondary schools in Nsukka Local Government Area. Njoku (2013) in his studyobserved the availability of instructional materials for teaching Yoruba language in the 17 Senior Secondary Schools in Ogbomosho North Local Government Area of Oyo State as follows; 17 schools had chalkboard, 15 schools had textbooks, 13 had chart and real objects, 10 schools had posters, 9 schools had radio and portable boards, 7 had strip chart, flip chart, culture roots, tape recorders and records, 6 schools had model and artifacts, 5 schools had wall maps andatlas, 4 schools had television, 3 schools had flannel board, 1 school had transparencies, overhead projector, slides, tape recorders, films, and computers. This implies that chalkboard was available in all theschools. Most schools had chart, pictures, real objects and books. The instructional materials that were least available in the schools were transparencies, overhead projectors, films, slides, and computer. Asogwa, Onu and Egbo (2013) found out that among the twenty-two instructional materials recommended by theNigerian Educational Research and Development Council (NERDC) NERDC (2009), for teaching fish production to students, only eight of them were available. This is evidence that the instructional materials for fish production in those schools are inadequate. Uzuegbu, Mbadiwe and Anunobi (2013) observed that human voice, chalkboard, marker board, journals, minimum standard, textbooks, handouts and newspapers are the common available instructional materials that are used by the lecturers in teaching agricultural science education courses in tertiary institutions in Nigeria.This is in line with Idris (2015) and Eze (2004) reportthatthe teaching of agricultural science education courses by the teachers is devoid of modern technological devices and the available visual instructional materials in schools out-numbered the combination of the audio and audio-visuals.

2.6 How often Instructional Materialsare Utilized in Teaching Schools/Colleges

The findings of the researchers on the utilization of instructional materials are were reviewed as follows

Abubakar (2010) observed that all the available instructional materials for teaching library studies (chalk and marker boards, computers, CD-ROMS, Internet, e-mail, microfilm, microfiche, video tape, audio tape and slide projectors) are often used by the lecturers in teaching library courses in six library schools in Nigeria (Abia State University, Bayero University, Kano, University of Ibadan, University of Maiduguri and University of Nigeria, Nsukka). This finding contradicts Uzuegbu, Mbadiwe and Anunobi (2013) observation in one of the tertiary institutions covered by Abubakar (2010) in his study. According to Uzuegbu *et al* (2013), only human voice, textbooks and reference materials are often used in teaching library education in Abia state. Ojo (2013) observed that teachersoften use chalkboard and chalk in teaching Yoruba language in Senior Secondary Schools in Ogbomoso North Local Government Area of Oyo State at the expense of other instructional materials like the overhead projectors, tape recorders and video tape recorders which can give better illustrations and results. This could be among the observations of Ishaku (2014) that instructional materials that were simple and familiar to the teachers are what they mostly use to teach in schools compared to unfamiliar ones which they do not understand their functions and how to use them. Idris (2015) noticed that among the instructional materials recommended for effective teaching, the classroom teacher use of visual instructional materials out-numbered the combination of the audio and audio-visual. The reason could be that they are the materials that are available for them and the ones they know how to use best.

Okeke (2000) observed that the few available instructional materials for teaching Igbo language in secondary schools in Nsukka Local government Area were not adequately utilized by the teachers. Ishaku (2014) revealed that 27.27% of identified instructional materials for teaching crop production in senior secondary schools in Taraba state were highly utilized, 68.18% of them were moderately utilized and 4.55%of them were slightly utilized in teaching and learning at different degrees. This implies that the percentage of instructional material utilization in teaching crop production in senior secondary schools, Taraba state is high. The study of Njoku (2013) revealed that chalkboards and books were very often used, pictures and real objects were often used and posters, models, charts, strip charts, artifacts, wall maps, atlas, flannel boards, portable boards, culture roots, tape recorders, radios, records, television, computers and video tape were not often used, in teaching Yoruba language in the 17 Senior Secondary Schools in Ogbomosho North Local Government Area of Oyo State was chalkboard.

Asogwa, Onu and Egbo (2013) found out that out of the twenty-two instructional materials recommended by the Nigerian Educational Research and Development Council (NERDC) NERDC (2009), for teaching fish production to students, only five of them were accessible and often utilized by teachers in teaching fish production in senior secondary schools in Benue state. This is evidence that the instructional materials for fish production in those schools are inadequate and skills for fish production are not properly taught at that level.

Uzuegbu, Mbadiwe and Anunobi (2013) observed that human voice, chalkboard, marker board, journals, minimum standard, textbooks, handouts and newspapers are the common instructional materials that are used by the lecturers in teaching agricultural science education courses in tertiary institutions in Nigeria. This is in line with Idris (2015) and Eze (2004) report that the teaching of agricultural science education courses by the teachers is devoid of modern

technological devices and the available visual instructional materials in schools out-numbered the combination of the audio and audio-visuals. This could be the reason why they are mostly used in teaching. Ogbonda (2008) lamented that the area of utilization of instructional materials in teaching and learning situations in our schools is extremely discouraging. This is because a situation in which agricultural science education teachers use few or no instructional materials in the classroom or laboratories does not portray any seriousness on their part towards harnessing the available resources for meaningful teaching.

2.7 Concept of Academic Performance

Epunam (1999) defined academic performance as the learning outcome of the learners which includes the knowledge, skills and ideas acquired and retained through their course of study within and outside the classroom situation. This also shows the outcome of instruction and the extent to which a student has achieved his/her educational goals.According to Idris (2015) academic performance is the grade given to students either falling below the grade or expected standard after a test or examination is conducted. Cambridge University Reporter (2003) added that students learning outcome is measured through assessment like standardized test, performance assessment and portfolio assessment. This assessment information is usually translated through grading system such as Grade Point Average (G.P.A) and subject grade.The examination scores of agricultural science students as contained in the NCE minimum standard for vocational and technical education (4^{th} edition) are classified in grades for easy calculation of CGPA. This leads to the classification of final results into grades as follows;

Scores	Grades	Points
70 – 100	A	5
60 – 69	B	4
50 – 59	C	3
45 – 49	D	2
40 – 44	E	1
01 – 39	F	0

And the final grade classification is also as follows:

CGPA	Grades	Remarks
4.50 – 5.00	A	Distinction
3.50 - 4.49	B	Credit
2.40 – 3.49	C	Merit
1.50 – 2.39	D	Pass
1.00 – 1.49	E	Pass
0.00 – 0.09	F	Fail

The subject grade of 50% and above is considered to be good performance and grade below 50% is considered as poor grade. The CGPA from 2.4 and above is considered to be good grade and that below 2.4 is considered to be poor grade (NCCE, 2008)

Adeyemi (1997) stated that the quality of students' academic performance depends on the human and material resources available and implementation strategies employed. He described human resource as the teachers and students and instructional resources as machineries, equipment's and tools among others. Thelma (2014) argued that retention and academic performance are dependent on a combination of variables such as personal, institutional and demographic

variables. “He went further to say that academic performance can be successful when personal variable, institutional variable and demographic variables are positive.”According to Ikot (2008) the academic performance of students in agricultural science education in high schools is usually poor. This observation supported Akanmu, Adejare, and Johnson (2016) observation that students performance in agricultural was poor and 51% had credit pass and 49% failed. They also observed that instructional material is deficient, process (implementation) highly deficient and the product (students’ performance) in agriculture poor. Poor academic performance in view of Adewole (2004) is adjudged by the examinee/test and some other significant variables as falling below an expected standard. The quality of students’ learning outcome is a product of many factors and how they intertwine with each other. Highlife Foundation (2016) opined that students’ academic performance is affected by his or her study skills, study habit, self-concept, level of preparedness, self perception, and individual differences. Reading is one of the most important means for acquisition of knowledge. A student who does not give enough time to read may find it difficult to do well in examination when the course coverage is wide and there is limited time to prepare for examination and produce poor result at the end.Study skills are fundamental to academic success. Tschumper (2006) reported that the study skills of the higher school students are very poor. Poor performance in school have been traced to poor study habit (Abdurrazaq, 2013). Bradon (1996) noted students with poor study skills will continue to perform poorly in tests and examinations, and may not be able to realize their full potential. Students should therefore develop good study habit skills like note-taking, time management, prepare for test, regular recording of assignments in a notebook, having regular time to study while removing distractions that come from television or phone call at home. Zarei (2008) suggested that frequent exposure of students to quizzes will help to modify their studying

pattern, and better their academic performance. A self-concept theory suggests that self-perception of relative ability is influential in academic performance and achievement (Anderman, Anderman and Griesinger,1999; Harackiewiez, Baron, Tauer, Carter and Elliot, 2000). Poor perception of ability (low self-concept) may lead to disengagement in achievement-related tasks, and high self-concept may lead to enhanced engagement in tasks (Zucho and Pintrich, 2001). Self-concept does not only directly influence achievement but can also interact with other variables in determining whether a student will engage or not engage in achievement-related behavior (Barker, Dowson and Mclnerney, 2006). Kolo (2011) observed that students' academic achievement can be influenced by their level of preparation. Students have the tendency of performing well when they are adequately prepared and poorly performed when they are poorly prepared. He discovered that students are not properly prepared for examinations. He also noticed that both our private and public schools these days are teaching and students are learning only for examination purpose, Course contents of subjects are no longer taught for the basic aim of wide knowledge and understanding. Vonstumni, Sophie, Hell, Benedic, Chamoro, and Thomas (2011) opined that individual differences (intelligence and personality) can as well influence student's academic performance. They further stressed that students with higher mental ability grab knowledge and acquire skills faster than those with low mental ability in the classroom which is evidence when academic performance is measured. Highlife also discovered that lacks experience, class management skills, not well grounded on the subject matter or is dispassionate about teaching, and authoritative on the part of the teacher willcause poor students learning outcome. Bangbade (2004) supported Highlife view that teacher's attitude have significant relationship with students' academic performance. Such attitudes according to Bangbade include teacher's knowledge of the subject matter, communication ability, emotional

stability, good human relationship and interest in the job.This is in support of Sunshine, Lawrence, Juan, and David (2015) findings that teacher-related factors were deemed to be the most impactful category of factors that pose an impact on students' academic performance. They also added that for students to perform well in an examination, the knowledge of teacher concerning their state of physical, intellectual, and psychological readiness is paramount.

Crosnoe, Monica, and Glen (2004) and Magnuson and Katherine (2007) opined that the ownership, class size and the type of school in which students study has great influence on their academic performance. They discovered that independent private schools due to better funding, small class size, good infrastructure, qualified teachers and conducive learning environment, motivated faculty, access to relevant instructional materials provides better learning experience which produces better learning outcome of the students than the public schools.

Considine and Zappola (2002) quoted Sparkles (1999) that school environment and teacher's expectations from their students have strong influence of students' academic performance. Teachers working in poor schools run short of basic teaching materials and facilities (such as library, laboratories and other practical teaching facilities) and when they are not able to improvise or make alternative arrangement for their use, they continue teaching without them thus ignoring aspects that require their usage which contribute to low performance expectations from their students and poor academic performance of students.

Kwenga (2002) has the same view that the number of material and facilities a school provides usually determines the quality of the school, which in turn affects the performance and accomplishment of its students. Highlife Foundation (2016) stated that students' academic performance can be influenced by the teacher-student ratio per class. They pointed out that when the school enrolls the number of student they are not able to accommodate, could not provide

the necessary materials to cater for the population, nor provide the number of qualified teachers to match with the student population nor building expansions, the classes sometimes become over crowded to the point that students could not hear the teacher learn and teacher has to spend more time on classroom management than on teaching which can result in low students' academic performance.

Quebec (2017) identified the practices pertaining students admission requirement as one of the major factors that influence students' academic performance in the school. Some educational institutions admit students indiscriminately whereas others select students on the basis of previous achievement or their results on aptitude tests. Those who admit indiscriminately have high tendency of producing students with poor results while those who admit on the basis previous academic achievement or their results on aptitude tests have the tendency of producing students with good results. This is in line with Staffolani and Bratti (2002) observation that student previous educational outcomes are the most important indicators of students' future achievement. This implies that the higher their previous achievement, the better their future academic performance and vise visa.

Shodimu (1999) in his study on the relationship between resources (teacher quality, availability of classrooms, well equipped laboratories, libraries, workshops and academic learning time) and students' academic performance in the secondary school examination in both private and public schools found out that there was a significant relationship between student/teacher ratio and students' academic performance. He also found a statistically significant relationship between the qualities of teachers, laboratories, workshops, academic learning time provided in the schools and students' academic performance.

Sentanum (2003) agreed that schools influence educational process in content organization, teacher and teaching-learning and in the end, evaluation of all. All these educationists and researchers agreed with the principle that schools have strong influence on academic performance and educational attainment of students.

Obeka (2009) observed that educational background of parents can influence the academic performance of students. This is to say that students whose parents have good educational background do perform better because they do create time to check their books, provide additional help to make up their deficiencies, than those whose parents have no or poor educational background. It is also possible that parents who misused their educational opportunities during their time might encourage their children with all their available resources to ensure that they don't make the same mistake thus influencing their educational attainment and performance. Jeynes and William (2002) confirmed that academic achievement of students is contingent upon parent's socio-economic background. He said that students from high socio-economic background perform better than those from low socio-economic background. This so because parents with high socio-economic background can easily provide all that their wards needs to excel academically such as fees, learning materials as well as good feeding unlike the low socio-economic background parents who hardly pay fees on time, provide the necessary learning materials for their wards which affect their learning and academic performances. The influence of this is evidence in the students test/examination scores (Considine and Zappala, (2002). Highlife Foundation (2016) observed that the nature of parents' occupation has influence on the academic performance of their children. Most working class parents are too busy with their job or business that they do not have time to attend to their children issues including education because of priority pressed on survival need of the family thus causing children to lose

their academic focus which reflect in their examination scores. On the other hand parents whose job or business allow them time to care for their children do care for their children's academic activities, supervise, correct, monitor and encourage and ensure that their attentions are directed towards achieving excellent academic performance.

Adamu (2015) opined that peer group influence plays a vital role in determining students' educational achievement. This is true because students desire to conform to behaviors that are defined by a particular group within or outside the classroom. The desire often takes the form of wishing to take part in class activities so that they can win the approval of their teachers and parents or wishing not to take part to win the approval of their friends. They may do these to win approval of their behavior within and outside the classroom which may influence their academic performance either positively or negatively.

Among the above discussed factor, Glasiecited in Aneke (2012) observed that the availability and the utilization of instructional materials in teaching have greater influence on students' academic performance. His statistical evidence had it that learners retain 90% of what they learn see, feel and manipulate which instructional materials are capable of providing for the learners. This is in line with Cuban (2001) assertion that students learn 1% from what they taste, 1.5% from what they touch, 3.5% from what they smell, 11% from what they hear and 83% from what they see. This statement supported the view of Abolade (2004) that what students can see only, can take up to 80% in the learning process, what they can hear takes 11% and olfactory, tactile and tasting takes 9% therefore instructional materials has significant influence on the quality of students' result. It is therefore not out of place to accept the assertion of Ogunranti (1981) that, no matter how professional a teacher is, his/her interaction with students in the classroom might not yield a good result as compared to a teacher that make use of such versatile instructional

materials in his/her teaching. This is true because the use of instructional materials in teaching provide the student with the learning experience which the conventional (lecture method) or print materials only will not afford him.

2.8 Influence of Availability and Utilization of Instructional Materials on Student's Academic Performance

School facilities and instructional materials have been observed by Odeh, Oguche and Ivagher (2015) as potent factors to qualitative education. The influence of availability and utilization of instructional materials on teaching and learning and academic performance of students cannot be over-emphasized. The dictum that 'teaching is inseparable from learning but learning is not separable from teaching" is that teacher do the teaching to make the students learn, but students can learn without the teachers. This is to say that learning can occur through one's interaction with one's environment which refers to the instructional materials within his classroom including the books, audio-visual, software and hardware of educational technology and chalkboard (Akande, 1995). Adeogun (2001) in his study revealed a strong positive link between instructional materials and academic performance. According to Adeogun, schools that possess more instructional materials perform better than schools that have less instructional materials. He further commented that effective teaching and learning cannot occur in the classroom environment if essential instructional materials are not available. Mwiria (1995) also supports that students performance is affected by the quality and quantity of teaching and learning materials. This implies that the schools possess adequate teaching and learning materials such as textbooks, charts, pictures, real objects for students to use, hear and experiment with, stand a better chance of performing well in examination than poorly equipped ones. The study done by Maundu (1987) agrees with the idea that in order for a school to have a good performance, it

must be well equipped with relevant and adequate textbooks and other teaching and learning materials. Olagunju (2000) found out that there was a remarkable difference in the achievement scores of students taught with various instructional materials and those not exposed to use of instructional materials. This finding is in line with the finding of Nwike and Onyejegbu (2013) and Okechukwu (1997) that those students taught with instructional materials performed better than those taught without instructional materials. This finding is in support of Osokoya (2007), which shows that students taught history using video-taped materials and students taught practical agriculture using animated instructional materials performed better than their counterparts taught using only lecture method. This implies that instructional materials may have provided enthusiasm, excitement, as well as total involvement of the learners.

Ikot (2008) in his study to determine the effects of instructional materials utilization on performance of junior secondary students in practical agriculture found out that there was significant different between the performance of students taught with filmstrip and those taught without filmstrip. Abass, Bimbo and Ojo (2012) in their study to determine the effects of animated agricultural science instructional packages on the attitude and performance of junior secondary schools students in the South West area, Nigeria discovered that the animated agricultural packages significantly influenced the academic performance of the selected students. Adalikwu and Iorkpilgh (2013) study revealed that there is a statistical relationship between the academic performance of chemistry students and use of instructional materials in teaching-learning. This result agrees with the findings of Inyang (1997) that teaching is effective when the teacher make use of instructional materials. (Lance *et al*1999; Todd and Kuklhau, 2004) confirmed a significant correlation between the availability and use of instructional materials by the students and teachers with better performance. Ishola (2010) in his study discovered that

instructional materials utilization in teaching and learning process has a significant effect on students' academic achievement. In the same vein, Adalikwu *et al* (2013) found out that there is a statistical relationship between the academic performance of students and the use of instructional materials in teaching and learning. Similarly, Todd and Kuklthau (2005) found a simple correlation between the student's inputs and better academic achievement. The analysis shows that the availability and use of chalkboard, math kit, teaching guide, science guide, audio-visual aids and the use of science kit have positive impact on the academic performance for science students. Instructional material as a concept does not only stimulate the interest of students, but enhances learning outcome, increases relationship and recall by involving the relevant senses and make instruction clear, meaningful and in most cases real. Ajayi (2004) also asserted that teaching equipment and materials have change over the years, not only facilitate teaching-learning situation but also address the instructional needs of individual and groups. Okendu (2012) affirmed that adequate supply of instructional resources have significant effect on students' academic performance. Onasanya and Omosewo (2011) confirmed that both standard and improvised instructional materials have the same positive effects on students' academic performance. Buba (2009) stated that instructional material can only have positive influence on students' academic performance when the teacher uses it in teaching and allow it to take over its values.

2.9 Empirical Studies

Ogbu (2015) investigated the influence of inadequate instructional materials and facilities in teaching and learning of electrical/ electronic technology education courses in Ebonyi State University, Abakaliki. The study was guided by two objectives, two research questions and two null hypotheses which were tested at 0.05 level of significance. The researcher employed

descriptive survey design with a population of 56 electrical/electronic teachers and students. Due to small population size no sampling was carried out. Validated questionnaire with 0.89 reliability coefficient was used for data collection.

The data collected were analyzed using mean and standard deviation to answer the research questions while t-test statistic was used to test the null hypotheses. Findings made were that inadequate instructional materials and facilities often influence the teaching and learning of electrical/electronic technology courses in 32 negative ways. It was recommended that all the stake holders should provide instructional materials and facilities adequately to prevent all the negative influences of inadequate instructional materials and facilities to effective teaching of electrical/electronic courses.

Ogbu's work and this work focusedon instructional materials Both study useddescriptive survey research design, useddescriptive statistical tools for data analysis and t-test to test the null hypothesis but differ in the following ways; while Ogbu investigated the influence of inadequate instructional materials and facilities in teaching and learning of electrical/ electronic technology education courses in Ebonyi stateUniversity,this study investigatedinfluence of availability and utilization of instructional materials on academic performance of agricultural education students in FCE, North-Central Zone Nigeria. Ogbu's work was guided by two specific objectives, two research questions and two null hypotheses whilethis study was guided by three specific objectives, three research questions, and two null hypotheses. Ogbu used only t-test statistical tool while this study used both t-test and regression analyses.

Iji, Ogbole and Uka (2014) carried out a research on the effect of improvised instructional materials on students' achievement in geometry at the upper basic education level in Makurdi metropolis, Benue state, Nigeria. Two objectives were stated, two research questions were asked

with two hypotheses tested at 0.05level of significance. It adopted a quasi-experimental design of non-randomized pre-test post-test control group type. The research was carried out with a population of 1,680 Universal Basic Education (UBE) students. From this, 139 students were sampled from four schools out of 22 UBE Schools. Instrument for data collection was Geometry Achievement Test (GAT). Research questions asked were answered using descriptive statistic of mean and standard deviation while the hypotheses formulated were tested at 0.05level of significance using Analysis of covariance. The study found out that students were taught with improvised instructional materials. Also that both male and female in the experimental group equally improved upon their geometry achievement over those of the control group. Encouraging mathematics teachers to use improvised instructional materials in their mathematics classroom was among the three recommendations given. Iji, Ogbole and Uka's study and this study were related in the following ways;

Iji, Ogbole and Ukas' study and this study were centered on instructional materials and students academic achievement in the same geo-political zone but differed in the following ways; whileIji, Ogbole and Ukas' study was carried out in mathematics this study was in agriculture, Iji, Ogbole and Uka'sresearch was guided by two objectives, two research questions and two null hypotheses while this study was guide by three specific objectives, three research questions and two null hypotheses, Iji, Ogbole and Uka's study was carried out in secondary schools while this study was carried out in colleges of education. Iji, Ogbole and Uka used quasi-experimental design while this study used descriptive survey research design. Iji, Ogbole and Uka's used only primary source of data (Geometry Achievement Test) while this study used both primary and secondary data for the study.

Asogwa, Onu and Egbo (2013) assessed the availability and utilization of instructional materials for effective teaching of fish production to students in senior secondary schools in Benue state, Nigeria. Four specific objectives and four research questions were developed to guide the study. Descriptive survey research design was adopted for the study. The population of the study was 284 teachers of Agricultural Science. The sample for the study was 142 teachers of Agricultural Science obtained through stratified random sampling technique. A fish production instructional material questionnaire was used for data collection. Six field work assistants helped in administering and retrieving the questionnaire. Data collected were analyzed using descriptive statistical tools as frequency table, percentage, mean scores. The results of the study revealed that out of all the instructional materials recommended for teaching fish production to students, 8 of them were available, 5 were accessible, and 8 were often utilized by teachers in Senior Secondary Schools. The study also revealed that 12 challenges were encountered by teachers in accessing and utilizing available instructional materials in fish production in senior secondary schools in Benue state. It was therefore recommended that teachers of agricultural science should improvise some of the instructional materials lacking in the school locally, among others.

Asogwa, Onu and Egbo's work and this study were similar because they measured the same variables, employed the same research design in the study, and were conducted in the same geo-political zone. Descriptive statistical tools were used in both studies for data analyses. Asogwa, Onu and Egbos' study was only on instructional materials for teaching fish production in secondary schools in Benue State while this study investigated the instructional materials for teaching all aspect of agricultural science education in the colleges of education in North-Central zone. Asogwa, Onu and Egbos' study was guided by two specific objectives and two research

questions while this study wasguided by three specific objectives, threeresearch questions and two null hypotheses.

Nsa and Udo (2013) conducted a research work on the effects of instructional materials utilization on student's academic performance in practical agriculture in secondary schools in Ikot Abasi Local Government Area, Uyo. The study used a quasi-experimental design with a pre/post-test non-randomized control group arrangement. A sample of 200 students was used for the study. Four specific objectives and four null hypotheses were formulated and tested at 0.05level of significance. Students' Achievement Test in Practical Agriculture (SATPA) was developed to gather data for the study. The instrument was validated by research experts and the reliability coefficient of 0.8 was obtained using K-R. Data were analyzed and hypotheses were tested using t-test and Analysis of covariance (ANCOVA). The findings of the research indicated that there was a significant difference between the performance of students taught with instructional materials and those taught without it among other findings. Based on the findings, it was recommended that teachers should use instructional materials in teaching practical agriculture where practical demonstration is not visible in order to enhance effective teaching and learning among other recommendations. Nsa and Udo's work and this study investigated the effect ofutilization of instructional materials on student's academic performance in agriculture. Thetwostudies differ in topic coverage, while Nsa and Udo's study concentratedon practical agriculture and instructional materials needed for it only,this study present considered both practical and theoretical aspects of agriculture as well as the instructional materials needed for both. Nsa and Udo'sused only agricultural practical result of students while this study considered both practical and theory result. Nsa and Udo used a quasi-experimental design with a pre/post-test non-randomized control group arrangement while thisused descriptive survey research

design. Nsa and Udo generated result used in their study while this study made use of result produced by the lecturers in the FCE under study.

Nwike and Onyejegbu (2013) conducted a research on effects of use of instructional materials on student's cognitive achievement in agricultural science in secondary schools in Orumba South local Government Area, Anambra state. Quasi experimental design was used. The sample comprised of 256 JSS students randomly sampled from 5 schools drawn from 5 towns in the local government area. Students were divided into two groups (experimental and control, group). An Agricultural Achievement Test (AAT) of reliability 0.82 was used for the study. The experimental group was taught using instructional materials while the control group was taught without instructional materials. Data collected were analyzed using mean, standard deviation and z-test statistics. The findings revealed that students taught with instructional materials performed better than those taught without instructional materials. Also there is no significance difference in the mean achievement scores of male and female students. The null hypothesis tested at 0.05 level of significance indicated that there is significant difference between the achievement scores of those taught with instructional materials and those taught without instructional materials. It was therefore recommended that instructional materials be used in teaching in secondary schools because it has positive impact on student's performance.

The two studies were focused on instructional materials and students' academic achievement in agriculture. Nwike and Onyejegbu's work was done in secondary school in one state while this study was carried out in FCE in four states. Nwike and Onyejegbu employed Quasi-experimental design while this study used descriptive survey research design. Nwike and Onyejegbu used Agricultural Achievement test (AAT) to obtain performance result while this study used the final

result of NCE III students in the colleges under studyto obtain performance result and questionnaire to obtain answers for research questions which Nwike and Onyejegbu did not use. Nwike and Onyejegbu used z-test for testing null hypotheses while this study used t-test and regression statistics to test the null hypotheses.

Ojo (2013) carried out a research work on the availability and use of instructional materials for teaching Yoruba in senior secondary schools in Ogbomosho North Local Government Area of Oyo State. The researcher used two objectives, and two research questions for the study. Seventeen senior secondary schools were sampled. The researcher used questionnaire as instrument for data collection. Frequency count, percentage and t-test statistic were used for data analysis. The result showed that transparency, overhead projector, slides were not available and used in most schools, that chalkboard and textbooks were often used. It was recommended that more emphasis should be placed on Educational Technology in the training of pre-service teachers, that some part of the school re-current budget should be earmark for the provision of instructional materials. Ojos' study and this study investigated the availability and use of instructional material in teaching, employed descriptive survey research design andused questionnaire to collect data for the study.Ojo's study did not measure the influence of the variables on students' academic performance in Yoruba which this study measured in agriculture. Ojo used t-test statistic only for testing null hypotheses while this study used both t-test and regression statistics to test the null hypotheses.

2.10 Summary of the Reviewed Literature

This chapter reviewed literature on instructional materials and academic performance, beginning with the theoretical framework. The chapter also reviewed various works of some authors who have worked on the same or similar topics the researcher worked on.The researcher reviewed

the opinion of different researchers on theconcept and types of instructional material,instructional materials recommended for effective teaching of agricultural science in schools and colleges, availability of instructional materials in schools and colleges, how often instructional materials are used by the teachers in teaching courses in schools/colleges, concept of academic performance, influence of availability and utilization of instructional materials on academic performance of students.

Finally, six empirical studies relevant to this study were reviewed and from these reviewed works, the researcher observed that of all the studies reviewed, none of them was carried out on influence of availability and utilization of instructional materials on academic performance of students in the field of agricultural science in tertiary institution in North-Central Zone, Nigeria. The gap identified from the reviewed literature showed that in north-central, similar study has been carried out in lower basic education level, upper basic education level,and none has been done incolleges of education which this study filled.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter presents the research methodology used in this study under the following sub-headings:

3.1 Research Design

3.2 Population for the study

3.3 Sample Size and Sampling Procedure

3.4 Instrument for Data Collection

3.4.1 Validation of the Instrument

3.4.2 Pilot Study

3.4.3 Reliability of the Instrument

3.5 Procedure for Data Collection

3.6 Procedure for Data Analysis

3.1 Research Design

The Descriptive Survey Design was adopted in this study which enabled the researcher work with large population and collected data from the target population who were located at various points in the study area using questionnaire.Descriptive Survey Design gives accurate assessment of the characteristics of the whole populations of people and more realistic than the experiment as it investigates phenomena in their natural setting (Osuala, 2005).

Sambo (2008) added that descriptive survey design is appropriate for identifying facts, attitude and behavioral self-report from large sample size.

3.2 Population for the study

The population for the study comprised of the four Federal Colleges of Education in the North-Central Zone of Nigeria,53 agricultural education lecturers and 557 agricultural education students in the four FCE, North-Central Zone of Nigeria.

Table 1: Population distribution of agricultural education lecturers and students in Federal Colleges of Education, North-Central Zone, Nigeria.

S/No	Colleges of education	Total lecturers	Total students
1	NASE, Kwara	7	9
2	FCE,Pankshin	16	298
3	FCE, Okene	14	151
4	FCE, Kontagora	16	99
Total	**4**	**53**	**557**

Source: Field Survey, 2017

3.3 Sample Size and Sampling Procedure

The four Federal Colleges of Education in North-central zone were used for the study. The researcher purposefully sampled NCE III agricultural science education students for the study. This is because they were in their final year and must have been taught by all the lecturers in their departments. Final year students also have better knowledge of the instructional materials used in their department and can respond better to items in the instrument for the study. According to Razaq, and Ajayi (2000), purposive sampling technique is the best sampling technique to use when a researcher needs certain group from the target population that are relevant to the investigation under consideration. The researcher randomly drew 50%proportion from the population of agricultural education lecturers and NCE III studentsineach of the four

colleges corresponding to27 lecturers and 83 students (Table 2 below). According to Creative Research System (1982), 50 % sample size is accurate for determining good result.

Table 2: Sample distribution of agricultural science lecturers and NCE111 students of 2016/2017 academic session in Federal Colleges of Education, North-Central Zone, Nigeria.

S/No	Colleges	Lecturers population	Sampled Lecturers	NCE III Students	Sampled NCE III Students	Total Sample
1	NASE, Ilorin	7	4	9	5	9
2	FCE Pankshin	16	8	48	24	32
3	FCE, Okene	14	7	61	31	38
4	FCE, Kontagora	16	8	46	23	31
Total	**4**	53	**27**	**164**	**83**	110

The researcher wrote “Yes” and “No” in equal proportion so that half of the sampled respondents will pick “Yes” while the other half will pick “No”. This was done to give each of the respondent equal chance of being selected for the study. Those that picked “Yes” were used as respondents to the questionnaire. Best and Khan (2006) statedthat the more restricted part of that group and individuals the better one will have one or more common characteristics that are of interest to the researcher to generalize the result appropriately to entire population.

3.4 Instrument for Data Collection

Primary and secondary sources of data were used in the study. The questionnaire was designed for both the lecturers and students of agricultural science education. The questionnairehad twosections. Section ‘A’ (bio-data)and section ‘B’ which contained questions on available instructional materials and how often instructional materials are used by the lecturers and students in teaching and learning agricultural education. The questions were structured in four points scale and values of 1, 2, 3, and 4 were attached where 1 represented highly not available

and not used, 2 = not available and rarely used, 3 = available and often used and 4 = highly available and very often used.Each research question contained 27 research items.

A questionnaire checklist was also designed and used by the researcher to cross-check the available instructional materials indicated by the lecturers in their colleges.

The final result of NCE III studentsof 2016/2017 academic session of agricultural science education of the four FCE in the study area were collectedafter approval by the college academic boards from the examination officers of agricultural education department of the colleges.The mean was calculated from the frequency of respondents to the items.

The mean value of 1.00-1.49 was considered as Highly Not Available and Not Used

1.50-2.49was considered as Not Available and Rarely Used

2.50-3.49 was considered as Available and Often Used

3.50-4.00 was considered as Highly Available and Very Often Used

The Highly Available and Available were considered as Available, Not Available, and Highly not available were considered as Not Available, Very Often Used and Often Used were considered as Used and Rarely Used and Not Used were considered as Not Used.

The CGPA of 2.4 and above was considered as good academic performance and below or less than 2.4 was considered as poor academic performance (NCCE, 2008).

3.4.1 Validation of the Instrument

The instrument used in this study was vetted by three expertsfrom the department of Education Foundation and Curriculum and department of vocational and technical education in the Faculty of Education, Ahmadu Bello University, Zaria. This was done to determine the validity of the instrument.The researcher effected all the necessary corrections and modifications made by the experts.

3.4.2 Pilot Study

A pilot study was carried out in F.C.E Zaria in Kaduna State, which is not part of the study area. The college was used because it uses the same minimum standard with the target population.The N.C.E students and lecturers were used because they are similar with the students and lecturers that were used for the study. The researcher used 30 questionnaires which 20 copies were administered to 20 NCE III students and 10 to lecturers for data collection.

3.4.3 Reliability of the Instrument

The data obtained from pilot study wereused to determine the internal consistency and reliability of the instrument. Split-half techniques was adopted which Asaka (2004) preferred to be ideal technique for determining the reliability of an instrument. The data obtained were subjected to reliability test which gave a reliability coefficient value of 0.87. Osuala (2005) stated that a reliability coefficient at or above 0.80 are often considered sufficiently reliable to make decisions about an instrument.

3.5 Procedure for Data Collection

The researcher collected letter of introduction from the Head of Department of Vocational and Technical Education, Ahmadu Bello University, Zaria to the Department of Agricultural Education of each of the Federal College of Education, North-Central Zone, Nigeria. The researcher with the aid of four trained research assistants administered the requisite copies of questionnaires to the respondents and collected data from the study areas.

A total of 110 questionnaires were randomly distributed to 27 lecturers and 83 students in the study area. Such number of questionnaires represented 50 % of the sample of the population in the study area.

Table 3: Copies of Questionnaire distributed to the respondents in each of the Federal College of Education in North-central zone, Nigeria.

S/No	Colleges	Lecturers	Students	Total
1	NASE, Ilorin	4	5	9
2	FCE Pankshin	8	24	32
3	FCE, Okene	7	31	38
4	FCE, Kontagora	8	23	31
Total	**4**	**27**	**83**	110

Data on students' academic performance was obtained from the final results of NCE III of 2016/2017 academic session after approval by the academic board of the colleges and used to determine the influence of extent of utilization of instructional materials on academic performance of students in the study area.

3.6 Procedure for Data Analysis

The data on availability of instructional materials, how often instructional materials are used and students academic performance were analyzed using simple descriptive statistics (frequency and percentage, mean and standard deviation).

The null hypotheses 1 and 2 were tested using t-test and regression statistical tools respectively at 0.05 level of significance (p=0.05)using Statistical Package for Social Science (SPSS) version 10.Ebuh(2013) stated that t-test and regression statistical tools are most suitable statistical tool to determine whether significant difference and influence exist between two variables or not. The null hypotheses of no significant difference or influence was retained when the alpha significance value of 0.05 <p value and null hypotheses of no significant difference or influence was rejected when the alpha value was> P value.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.0 Introduction

Thischapter presents the analysis of data collected on the influence of availability and utilization of instructional materials on academic performance of agricultural education students in Federal Colleges of Education in the North-central Geo- political zone of Nigeria. The chapter is presented under the following sub headings

4.1 Answers toResearch Questions

4.2 Test of Null Hypotheses

4.3 Summary of the Major Findings

4.4 Discussion of Major Findings

4.1 Answers to Research Questions

Research Question One: What are the available instructional materials (visual, audio and audio-visual) for teaching agricultural education courses in Federal Colleges of Education, North-Central Zone, Nigeria?

Table 4. Lecturers' Responses on Availability of Instructional Materials in FCE North-Central, Nigeria.

	ITEMS	FCEP					FCEO					FCEK					NASEI						
		4	3	2	1	$\bar{x}$	4	3	2	1	$\bar{x}$	4	3	2	1		4	3	2	1	$\bar{x}$	$G\bar{x}$	DEC
	Visual																						
1	Real obj.	7	-	-	1	3.6	6	-	-	1	3.5	7	-	1	-	3.6	3	1	-	-	3.2	3.4	AV
2	Models	6	2	-	-	3.7	4	3	-	-	3.5	5	-	-	2	3.1	2	1	-	1	3.0	3.3	AV
3	Posters	8	-	-	-	4.0	5	2	-	-	3.7	6	2	-	-	3.7	4	-	-	-	4.0	3.8	HA
4	Charts	7	-	-	1	3.6	7	-	-	-	4	8	-	-	-	4	4	-	-	-	4.0	3.9	HA
5	Maps	5	-	2	1	3.1	6	1	-	-	3.8	6	-	2	-	3.5	3	-	-	1	3.7	3.5	HA
6	Pictures	7	-	-	1	3.6	6	-	-	1	3.5	7	-	1	-	3.6	3	1	-	-	3.2	3.4	AV
7	Chalkboard	6	2	-	-	3.7	4	3	-	-	3.5	5	-	-	2	3.1	2	1	-	1	3.2	3.3	AV
8	Marker board	8	-	-	-	4.0	5	2	-	-	3.7	7	1	-	-	3.6	4	-	-	-	3.1	3.7	HA
9	Handout	6	-	-	2	3.2	7	-	-	-	4	8	-	-	-	4	4	-	-	-	4.0	3.8	HA
10	Journals	5	-	2	1	3.1	5	1	-	-	3.7	6	-	2	-	3.5	3	-	-	1	3.7	3.5	HA
11	Magazines	6	-	-	2	3.2	6	-	-	1	3.5	7	-	1	-	3.6	3	1	-	-	3.2	3.4	AV
12	Textbooks	6	2	-	-	3.7	4	3	-	-	3.5	5	-	-	2	3.1	2	1	-	1	3.2	3.3	AV
13	e-books	7	-	-	1	3.6	5	2	-	-	3.7	6	2	-	-	3.7	4	-	-	-	4.0	3.8	HA
14	Newspapers	-	-	-	7	1.0	-	-	-	7	1.0	5	-	2	1	3.1	-	-	-	4	1.0	1.7	RA
	Audio																						
15	Radio	-	-	-	8	1.0	-	-	3	4	1.4	-	1	4	3	1.3	-	-	-	4	1.0	1.2	HNA
16	Public A.S	-	-	-	8	1.0	-	-	4	3	1.6	-	1	3	4	1.6	-	-	-	4	1.0	1.3	HNA
17	Audio-tape		-	-	8	1.0	-	-	2	5	1.3	-	-	3	5	1.4	-	-	-	4	1.0	1.2	HNA
	Audiovisual																						
18	Television	-	-	-	8	1.0	-	1	2	4	1.6	-	1	3	4	1.4	-	-	-	4	1.0	1.6	NA
19	Video-tape	-	-	-	8	1.0	-	1	2	3	1.4	-	-	2	6	1.3	-	-	-	4	1.0	1.2	HNA
20	DVD/Player	-	-	-	8	1.0	-	-	3	4	1.4	-	-	3	5	1.4	-	-	-	4	1.0	1.2	HNA
21	Elec. Board	-	-	-	8	1.0	-	1	3	2	1.6	-	1	4	3	1.8	-	-	-	4	1.0	1.4	HNA
22	Slides	8	-	-	-	4.0	7	-	-	-	4.0	8	-	-	-	4.0	4	-	-	-	4.0	4.0	HA
23	Films	-	-	-	8	1.0	-	1	3	3	1.6	-	-	4	4	1.5	-	-	-	4	1.0	1.3	HNA
24	Projectors	8	-	-	-	4.0	7	-	-	-	4.0	8	-	-	-	4.0	4	-	-	-	4.0	4.0	HA
25	Computer	8	-	-	-	4.0	7	-	-	-	4.0	8	-	-	-	4.0	4	-	-	-	4.0	4.0	HA
26	Videotape	-	-	2	6	1.3	-	-	3	4	1.4	-	-	3	5	1.4	-	-	-	4	1.0	1.3	HNA
27	Internet	6	2	-	-	3.7	5	-	2	-	3.4	-	-	-	8	1.0	-	-	-	4	1.0	2.2	NA

Key: FCEP =Pankshin, FCEO= Okene, FCEK=Kontogora, NASEI=Ilorin. 4=Highly Available, 3=Available, 2= Highly Not Available 1= Not Available, AV= Available, NA= Not Available, $G\bar{x}$ = Grand Mean, Dec = Decision

The results in table 4 above revealed that all the visual instructional materials in the table were available in FCE Pankshin, FCE Okene, FCE Kontogora and NASE Ilorin except newspapers which was rarely available for teaching Agricultural Education courses in the colleges. The audio instructional materials such as radio/sound system, public address system and audio-tape/recorder werehighly not available in any of the colleges.The table also revealed that Audio-Visual instructional materials that were highly available in the four Colleges of Education were slides, projectors and computers. This implies that some of the instructional materials for teaching Agricultural education courses in Federal Colleges of Education in North-Central Zone, were lacking.

Research Question Two: How often do lecturers use instructional materials (visual, audio and audio-visual) in teaching agricultural education courses in federal colleges of education, North-central Zone, Nigeria?

Table 5: Students and Lecturers Responses ontheUtilization of Instructional materialsin the Colleges

COLLEGES	STUDENTS					LECTURERS						
	VOU	OU	RU	NU	$\bar{x}$	VOU	OU	RU	NU	$\bar{x}$	G$\bar{x}$	DEC
FCE Pankshin												
Visual	96	-	-	-	4.0	32	-	-	-	4.0	4.0	VOU
Audio	20	6	8	13	1.9	-	-	6	5	1.3	1.6	RU
Audio-Visual	96	-	-	-	4.0	32	-	-	-	4.0	4.0	VOU
FCE Okene,												
Visual	112		-	3	3.7	28	-	1	-	3.6	3.7	VOU
Audio	24	15	4	18	2.0	-	-	8	3	1.5	1.7	RU
Audio-Visual	116	-	-	2	3.8	28		1	-	3.6	3.7	VOU
FCE Kontogora												
Visual	64	-	8	5	3.3	24	-	4	-	2.6	2.9	OU
Audio	20	-	10	13	1.8	-	-	6	5	1.0	1.4	NU
Audio-Visual	64	-	8	5	3.3	22	-	6	-	3.1	3.2	VOU
NASE Ilorin												
Visual	8	-	4	1	2.6	8	-	-	2	2.5	2.6	OU
Audio	-	-	2	4	1.2	-	-	-	4	1.0	1.1	NU
Audio-Visual	8	-	4	1	2.6	8	-	-	2	2.5	2.6	OU
Cumulative Mean					**2.9**					**3.0**		

Source: Field work, 2018

Kēy: VOU=Very Often Used, OU=Often Used, RU= Rarely Used, NU=Not Used, G$\bar{x}$ = Grand Mean, Dec = Decision, $\bar{x}$= mean

The results in table 5revealed that students and lecturers in colleges did not vary inopinions regarding the use of instructional materials in teaching and learning of agricultural education courses in FCE, North-Central Zone, Nigeria. The results showed that visual and audio-visual instructional materials were often used for teaching and learning because their grand mean scores were equal to 2.5 and above. Analysis of research question twodid not will reveal whether or not the utilization influences students' performance.

Research Question 3: What is the influence of utilization of instructional materials (visual, audio and audio-visual) on academic performance of agricultural education students in Federal Colleges of Education, North-Central Zone, Nigeria?

Table 6:College Instructional MaterialsUtilization Mean and Students' Academic Performance in agriculture for 2016/2017 Academic Session in FCE North-Central, Nigeria.

S/N	Colleges	IMUM	Subject Grade/ Cumulative Grade Point Average												No of Students	C%GR	C%PR
			4.50-5.00 (A)		3.50-4.49 (B)		2.40-3.49 (C)		1.50-2.39 (D)		1.00-1.49 (E)		0.00-0.09 (F)				
			F	%	F	%	F	%	F	%	F	%	F	%			
1	FCE.P	3.2	-	-	12	25	19	40	13	27	4	8	-	0	48	65	35
2	FCEO	3.0	-	-	5	8	16	26	17	28	8	13	15	25	61	34	66
3	FCEK	2.2	-	-	3	7	12	26	10	22	13	28	8	17	46	33	67
4	NASEI	2.1	-	-	-		9	100	-	-	-	-	-	-	9	100	0
CUMULATIVES		2.620	57		40		25		23		164						

Source: Field Survey, 2018.

IMUM$(\bar{x})$ = Instructional Materials Utilization Mean,C%GR=cumulative percentage of good result, C%PR= cumulative percentage of poor result, F=frequency, %=percentage.

Table 6 above presents colleges instructional materials utilization meansand Academic Performance of Agricultural Education final year Students of 2016/2017 Academic Session in FCE North-Central, Nigeria.

The results revealed 65% and 35% of C%GR and C%PR in FCE Pankshin with IMUM of 3.2, 34% and 66% of C%GR and C%PR in FCE Okene with IMUM of 3.0, 33% and 67% of C%GR and C%PR in FCE Kontogora with IMUM of 2.2 and 100% of C%GR in NASEI with IMUM of 2.1. This implied that utilization of visual and audio-visual instructional materials influences academic performances of agricultural education students in Federal Colleges of Education in North-central Nigeria.The ranking order revealed that FCE Pankshin was leading in the use of visual and audio-visual in teaching with C%GR 65%, followed by FCE Okene with C%GR 34%%, FCE Kontagora 33% and the least was NASE Ilorin 100%.The fact that NASE Ilorin

with the least mean had the highest percentage of good resultcan mean that it is not only instructional materials that can influence students' academic performance.

4.3 Test of Null Hypotheses

Results of test of null hypotheses were as presented in Table 7 and 8.

HO_1: There is no significant difference in the mean score of the responses of the students and lecturers on how often instructional materials (visualand audio-visual) are used in teaching agricultural education courses in Federal Colleges of Education, North-Central Zone, Nigeria.

Table 7: Mean Responses of students and lecturers on how often instructional materials (visual, and audio-visual) are used in teaching agricultural education courses in the colleges.

Variables	N	Mean	Std. Dev.	t-cal.	Sig.
Students	83	2.9	.42		
				3.66	.17
Lecturers	27	3.0	.32		

Source: Field work, 2018

Table 7 above shows difference in the mean score of the responses of the students and lecturers on how often instructional materials (visual, and audio-visual) were used in teaching agricultural education courses in Federal Colleges of Education, North-Central Zone, Nigeria. The results revealed 2.9 meanresponses for students and 3.0 meansresponses for lecturers. The t-value of 3.66 and sig. value of 0.17 were obtained. Since the alpha value of 0.05 is less than sig. value of .17 the null hypothesis was retained and the alternate was rejected. This means that there is no significant difference in the mean score of the responses of the students and lecturers on how often instructional materials (visual, and audio-visual) are used in teaching agricultural education courses in the study area.

HO_2: There is no significant influence of the extent to which instructional materials are utilized on the academic performance of agricultural education students in Federal Colleges of Education, North-Central Zone, Nigeria

Table 8: Influence of utilization of instructional materials on academic performance of agricultural education students in FCE, North – Central Zone, Nigeria.

Variable	Mean	Std. Dev.	N	r^2	r-adj.	Coefficient	Sig.
Constant	3.33	.65					
Utilization	2.95	10.09	110	.07	.05	.25	.02

Source: Field Survey, 2018

The result in Table 8 shows influence of utilization of instructional materials (visual, and audio-visual) on the academic performance of agricultural education students in FCE, North-Central Zone, Nigeria. The results revealed r-adj. of .05 with coefficient value of .25 at sig. value of .02. Since the alpha value of 0.05 is more than sig. value of .02the null hypothesis was rejected and the alternate was retained.The coefficient value of .25 indicated that a unit increase in utilization of instructional materials (visual and audio-visual) will influence students' academic performance by 25%. This means that there is significant influence of utilization of instructional materials (visual, audio, and audio-visual) on the academic performance of agricultural education students in FCE, North-Central Zone, Nigeria.

4.4 Summary of the Major Findings

The major findings of this research are summarized as follows:

1. Visual and audio-visual instructional materials were available for teaching agricultural education in Federal Colleges of Education in North-central Nigeria.
2. Visual and Audio-Visual instructional materials were used in teaching and learning Agricultural Education courses in Federal Colleges of Education in North-Central Zone, Nigeria.
3. Visual and Audio-visual instructional materials influence Agricultural Education Students' academic performance in Federal Colleges of Education in North-central zone, Nigeria.

4. There is no significant difference in the mean responses of lecturers and students on how often visual and audio-visual instructional materials were utilized in teaching Agricultural Education courses in Federal Colleges of Education in North-Central zone, Nigeria.
5. Utilization of Visual and Audio-visual instructional materialshassignificant influence on the academic performance of Agricultural Education students in the Federal Colleges of Education in North-central Zone Nigeria.

4.5 Discussion of Major Findings

Thefinding of the study revealed that visual instructional materials such as real objects/specimen, models, posters, charts, maps, pictures/photograph, chalkboard and chalks, marker-board and marker, handouts, journals, magazines, textbooks and e-books as well as audio instructional materials such as slides, projectors and computers were available in Federal Colleges of Education in North-Central Nigeria. But audio instructional materials such as radio/sound system, public address system and audio-tape/recorder as well audio visual like television set, video tape/recorder/player, DVD/player/recorder were not available in any of the colleges.The findings showed that there are more visual instructional materials than audio visual instructional materials in the study area. This observation agrees with Eze (2004) and Idris (2015) who reported that the available visual instructional materials for teaching and learning of agricultural education courses in schools out-numbered the combination of the audio and audio-visuals.The findings also revealed that the available visuals and audio visuals in the study area is in accordance with the recommended instructional materials for effective teaching and learning of agriculture in schools and colleges by Soetan (2010) in Adalikwu, and Iorkpilgh (2013), NCCE (2012) Ateke (2008), Farauta (2007) and Mundi and Alfred (2006) . The finding also implies that

the visual and audio-visual instructional materials for teaching agricultural education courses are highly available in FCE North-Central zone, Nigeria.

The results revealed that students and lecturers often use visual and audio-visual instructional materials for teaching and learning of agricultural education courses.

The result of null hypothesis one in Table 7 affirmed that students and lecturers did not vary in their opinions regarding utilization of visual and audio-visual instructional materials which are the only available instructional materials in the study area for teaching and learning of agricultural education courses. This finding concurs with the report of Ojo (2013), and Uzuegbu, Mbadiwe and Anunobi (2013) who observed that the instructional materials available for teaching and learningin tertiary institutions in Nigeriasuch as human voice, textbooks, chalkboards, handbooks, minimum standard, handout, marker boards, textbooks and reference materials in teaching are what the lecturers use in teaching.

This finding contradicts the report of Okeke (2000) who observed that the available instructional materials for teaching and learning Igbo language in secondary schools were not utilized.

Ogbonda (2008) lamented that a situation in which agricultural science education teachers use few or no instructional materials in the classroom or laboratories does not portray any seriousness on their part towards harnessing the available resources for meaningful teaching.

The finding also revealed that utilization of visual and audio-visual instructional materials for teaching and learning of agricultural education courses influences students' academic performance.

This finding agrees with the report of Adalikwu and Iorkpilgh (2013), Nwike and Onyejegbu (2013), Ishola (2010), Adeogun (2001) and Olagunju (2000) that there is a strong positive link between instructional materials utilization and good academic performance. Adeogun (2001)

also reported that schools that possess and utilize more instructional materials perform better than schools that have and utilize less instructional materials. This implies that for a school to have a good academic performance, relevant instructional materials must be available and utilized in teaching and learning process. This is in line with Buba (2009) observation that instructional materials can only have positive influence on students' academic performance when the teacher uses it in teaching and allow it to take over its values. This finding did not agree with the finding of this study where the college with least mean of instructional material utilization had the highest percentage of cumulative percentage of good result which implied that students' academic performance can also be influenced by other factors. This is supported by Crosnoe, Monica, and Glen (2004) and Magnuson and Katherine (2007) finding that class size has great influence on students' academic performance. They stressed that when the class size is small, class management becomes easy, teaching and learning becomes more effective, which produces good academic performance.

The finding in null hypotheses revealed that the influence of utilization of visual and audio-visual instructional materials for teaching and learning of agricultural education courses has on students' academic performance is statistically significant. This agrees with Iji, Ogbole and Ukas (2014) that students taught with instructional materials improved upon their mean achievement scores. This is also in support of Etim, (2006), Nsa, Ikot and Udo (2013) that instructional materials utilization in teaching influences students academic performance positively. In comparisons, their findings identified a significant different between the academic performance of students taught practical agriculture using filmstrips and those taught without filmstrips. The finding is in support of Osokoya (2007) and Abass *et al*(2012) that students taught history using video-taped materials and students taught practical agriculture using animated instructional

materials performed better than their counterparts taught using only lecture method.The good results produced by students taught with instructional materials can be link to its role of close representations of ideas and concepts unlike teaching without those presentations but as abstract concepts can contribute to poor students' academic performance.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the summary, conclusion, contribution to knowledge, recommendations and suggestions for further studies.

5.1 Summary

The study was carried out to determine the influence of availability and utilization of instructional materials on academic performance of agricultural education students in Federal Colleges of Education in North-Central Zone, Nigeria. The study was guided by three specific objectives, three research questions and two null hypotheses. Descriptive survey research design was used for the study. The population of the study was 610 people comprising of 557 students and 53 lecturers of agricultural education. The proportion of 83 students and 27 lecturers were randomly sampled from the population of NCEIII student's of 2016/2017 academic session and lecturers of agricultural education respectively and usedfor the study. Structured questionnaire and questionnaire checklistwere used as instruments for data collection. The instruments used were validated by the experts from the departments of Vocational and Technical Education and Education Foundation and Curriculum in the faculty of Education, Ahmadu Bello University, Zaria and the reliability coefficient value of 0.87 was obtained.

Face to face method of delivery was used to distribute the questionnaire to the respondents for data collection by the research assistants who were trained and used by the researcher. Frequency, percentages, Mean and standard deviation were used to analyze data collected for the study,t-test and regression statistical tools were used to test null hypotheses 1 and 2 respectively at 5% level of significance.The findings revealed thatVisual instructional materials such as real

objects or specimen, models, posters, charts, maps, pictures/photograph, chalkboard and chalks, marker-board and marker, handouts, journals, magazines, textbooks and e-books as well as audio-visual instructional materials such as slides, projectors and computers were available for teaching and learning agricultural education courses in the Colleges.However audio instructional materials such as radio/sound system, public address system and audio-tape/recorder as well some audio- visuals like television set, video tape/recorder/player, DVD/player/recorder were not available in any of the colleges. Students and lecturers often use visual and audio-visual instructional materials in teaching and learning of agricultural education courses. The result of null hypothesis one affirmed that students and lecturers did not vary in their opinions regarding the utilization of visual and audio-visual instructional materials in teaching and learning of agricultural education courses (t-cal.=3.66, p=.17).

Utilization of visual and audio-visual instructional materials for teaching and learning of agricultural education courses influences students' academic performance. The result of null hypothesis two affirmed that the influence of utilization of visual and audio-visual instructional materials for teaching and learning of agricultural education courses has on students' academic performance is statistically significant (r-cal.=.25, p=.02).

5.2 Conclusion

It was concluded based on the findings that instructional materials are not fully provided and utilized for agricultural education instruction in Federal Colleges of Education in North-Central zone, Nigeria. The extent to which the available visual and audio-visual instructional materialsare used willimprove the teaching and learning of agricultural education courses and influence the general academic performance of agricultural education students. This also implied

that non-availability of instructional material and lack of utilization by students and lecturers will negatively affect the academic performance of students.

5.3 Contributions to Knowledge

Based on the findings of this study, the following contributions to knowledge were established:

1. Visual and audio- visual instructional materials are available in Federal Colleges of Education in North-central Nigeria.
2. Students and lecturers often use visual and audio-visual instructional materials for teaching and learning of agricultural education courses.
3. Utilization of visual and audio-visual instructional materials for teaching and learning of agricultural education courses influences students' academic performance positively.

5.4 Recommendations

Based on the findings of the study, the following recommendations were made

1. The college management boardsshould provide the instructional materials that are lacking in the colleges.
2. Lecturers should develop themselves on the utilization of instructional materials revealed unused in their teaching in other to improve on teaching and students' academic performance.
3. Lecturers should further utilize the available instructional materials to improve students' academic performance.

5.5 Suggestions for Further Studies

The researcher suggested that further studies should be conducted on:-

1. The study should be extended to state Colleges of Education and Universities in North-Central Zone Nigeria.

2. Research on effect of audio instructional materials on students' academic performance in FCE Colleges of Education in North-central zone should be carried out by other researchers.

REFERENCES

Abass, B.T., Bimbo, A. &Ojo, A.O. (2012). Effects of animated agricultural science instructional package on attitude and performance of junior secondary school students in South-West Nigeria. *Journal of Social Science*. 3(1): 425-435.

Achieng, B.O. (2012). Influence of institutional capacity on academic performance of students in public secondary schools in Usigu Division – Bondo District Kenya. A Masters Thesis, University of Nairobi.

Adesehinwa, O.A. (2013). Effect of family type (monogamy and polygamy) on students' academic achievement in Nigeria. *Int. J. of psychology and counseling* 5(7): 153 – 156.

Adesehinwa, O.A. &Aremu, A.O. (2010). The relationship among predators of child, family, school, society, and the government and academic achievement of senior secondary school students in Ibadan, Nigeria. *Procedia Soc. Behav. Sci*.2(5): 842 -849.

Abdulkareen, L.(2006). Problems of teaching and learning of agriculture in Nigerian schools. Lagos: Macmillan.

Abdullahi, D. (2009). Relevance of instructional materials to teaching of Islamic studies. *Journal of Educational Research and Development*, 4(3):108-11.

Abdurrazaq, S.(2013). Secondary education entrepreneurship: Quality learning outcomes strategies for low and middle levels manpower processing. *Journal of Vocational Education*. 6(1):177-197.

Abolade, A.O. (2004). *An Introduction to Research Method in Education and Social Sciences*. Lagos. Johns-lad publishing limited.

Achieng, B.O. (2013). Influence of Institutional Capacity on academic performance of students in public secondary schools in Usigu Division-Bondo District Kenya. A Masters Thesis, University of Nirobi.

Adalikwu, S.A, &Iorkpilgh, I.T. (2013). The influence of instructional materials on academic performance of senior secondary schools in chemistry in Cross River State. *Global Journal of Educational Research:* 12(6):39-45. www.globaljournalseries.com.

Adamu, M.D. (2015). Effects of expository and discovery methods of teaching on academic performance of senior secondary school agricultural science students in Kaduna State. An Unpublished Msc (Ed) Thesis of Department of Vocational and Technical Education, Faculty of Education Ahmadu Bello University, Zaria.

Adedijo, E.M. (2000). Availability and utilization of instructional materials in teaching business education subjects in Osun and Ogun Colleges of Education. Unpublished M.sc Ed. Thesis. Faculty of Education ABU. Zaria.

Adeogum, A.A. (2001). The principles and financial management of public secondary schools in Osun State. *Journal of Educational System and Development.* 5(1): 1-10.

Adewole, A.T. & Ognubemi, E. (2004). Social Studies in Nigeria, Kaduna Refaith Publishing Company.

Adeyemi, B.A. (1997). Evaluation of the implementation of vocational and Technical Education programme in the Colleges of Education. Unpublished Ph.D Thesis, Dept. of VTE; University of Nigeria, Nsukka.

Agina-Obu, T.N. (2005). The relevance of instructional materials in teaching and learning in Robert-Okah. I &Uzoeshi, K.C (Ed). Theories and Practice of Teaching, Port-Harcourt: Harey Publication.

Agwam, Y. (2017). Effect of computer assisted instruction on academic performance of agricultural science education students in College of Education Gidan- Waya, Kaduna. M.Sc Thesis, department of Vocational and Technical Education, Faculty of Education, Ahmadu Bello University, Zaria.

Ajayi, T.D. (2004). Improving teaching aids in primary and secondary schools. *Nigeria Journal of Education Studies*10(1): 54 – 56.

Akanmu, S.A, Adejare, S.O, & Johnson, U. (2016). How effective is the Nigerian Senior School agricultural science curriculum?. A survey of evidence from content development to product. URL: http://dx.doi.org/10.19044/esj:2016. 12(4):395- 399.

Akpan, V. C. J. (2006). *Vocational Education Evaluation*: Theories and Applications, Uyo: Dorand publishers.

Anderman, E.M, Anderman, L.H, &Griesinger, T. (1999). The relation of present and possible academic selves during early adolescence to grade point average and achievement goals. *The Elementary School Journal*, 100(1):3-17.

Aneke, C.U. (2012). Skills Required by secondary school agricultural science students for success in groundnut production and marketing enterprises, *International Research Journal department of technology and vocational education*. 2(1) 59-68.

Anzaku, F. (2010). Library Experts Speak on Audio-Visual Materials. A paper presented at the United Nations Educational, Scientific and Cultured Organization (UNESCO) World Day for Audio-Visual Heritage. Lafia.

Asaka, N. (2004). Research methodology in behavioral sciences. Ikeja, Lagos. Longman Nigeria Plc.

Asogwa, V.C., Onu, D.O. &Egbo, B.N. (2013). Availability and utilization of instructional materials for effective teaching of fish production to students in Secondary Schools in Benue state, Nigeria. *Academic Journals*. 8(49): 6601-6607.

Ateke, H. (2008). Teaching the teacher. Ibadan: Macmillan publishers.

Baddeley, A. (1986). Oxford psychology series, No. 11. Working memory. New York, NY, US.

Bangbade, J.O. (2004). Effects of knowledge of subject matter on the teaching and learning of Biology and Physics. *Teaching and Teacher Education*: 10(9):102 -105.

Barker, K.L., Dowson, M. &Mclnerney, D.M. (2006). The first step towards examining the question. What do student motivation goals and self-concept have to do with academic achievement? A Research Report. Published by Self Research Centre University of Western Sydney, Australia.

Best, R & Khan, J.V. (2006). Research in education, (9th edition), Indian: Darling Kinderstey PVT Ltd.

Blankenship, D.M. (1989). Utilization and instructional materials in the teaching of agricultural science. Hebrew University of Jerusalem. *Journal, faculty of Agricultural Science Education*, 58(4):179-198.

Bolarinwa, O.M.Aramide, & K.A. (2010). Availability and use of audio visual and electronic resources by distance learning students in Nigerian Universities: A case study of National Open University of Nigeria (NOUN), Ibadan Study Center. Library Philosophy and Practice. Retrieved from: http://Unlib.Unl.edu/ lpp.

Buba, I. (2009). Educational Technology for Schools and Colleges. Lagos: Longman Group.

Cambridge University Reporter. (2003). *Indicators of academic performance.* Retrieved on June 13, 2016 from http:www.admin.cam.ac.uk/reporter/2002-3/weekly/5913/Chi, M.T., Glaser, R., and Rees, E. (1982). *Expertise in Problem Solving*. Hillsdale: NJ, Erlbaun.

Clark, J. M., &Paivio, A. (1991). Dual coding theory and education. *Educational psychology*

review, *3*(3):139-210.

Clark, L. M. (2009). Teaching tools for teaching in the secondary school New York: Macmillan Publishing Co. Inc

Comb, T.(2009). Teacher's perception of effects and use of learning aids in teaching. A case study of Winneba Basic and Secondary Schools in Ghana. Retrieved on 10th July, 2008 from www.google.com.

Considine, G. &Zappola, G. (2002). Influence of social and economic disadvantage on the academic performance of school students in Australia. *Journal of Sociology*, 3(8)129-148.

Creative Research System (1982). https://www.survey system.cor. Retrieved 6th Dec. 2017.

Crosnoe, R, Monica, K.J & Glen, H.E.Jr.(2004). School size and the interpersonal side of education: an example of Race/Ethnicity and organizational context. *Social Science Quarterly*, 85(5): 110- 115.

Cuban, L. (2001). Computers in the classroom, Cambridge, M.A. Harvard University Press. Retrieved from http://www.webpages. uidaho.edu/mbolin/akerele-afolable.htm

Dale, E. (1969). Audio-visual method in teaching, (third Edition0. Dryden press.

Dike, V.W.(1993). Library Resources in Education, Enugu: ABIC Publisher.

Dubey, D.L. & Barth, J.L. (1977). Inquiry methods for Nigerian social studies. Ahmadu Bello University, Zaria.

Ebuh, G.U. (2013). Use of ICT packages in research works. Ibrahim RechardIshaku Computer Center Workshop Training Mannual on use of ICT Packages in Research Works. Organized by Federal College of Education Zaria, Kaduna State on 6th-10th May, 2013.

Egunsola, A.O.E. (2014). Influence of home environment on academic performance of secondary school students in agricultural science in Adamawa state, Nigeria. *Journal of Research and Method in Education* 4(4); 46 – 53. www.josrjournals.org.

Encyclopedia of Education, Vol. 2, 4. 7 and 9. Macmillan and Free Press.

Epunam, C. (1999). Influence of school environmental variables on academic performance as perceived by students. Unpublished Msc..Ed.Thesis, Ahmadu Bello University, Zaria.

Etim, P.J. (2006). Issues in educational technology, Uyo. Abaam publishing Company.

Eya, P. (2006). Role of instructional materials in improving qualitative education in Nigeria. *Ebony State University Journal Educ*. 4(1): 77-92.

Eze, A.N. (2004). Effects of overlay on secondary schools' achievement in a complex topic in agricultural science. *Journal of Vocational and Adult Education*, 3(1): 107 – 117.

Fakomogbon, M.A.(2010). Monograph on vocational methods 11 for Degree students. Unpublished Msc Thesis University of Ado Ekiti (UNAD).

Fakomogbon, R.(2010). Science in Nigeria. Lagos: Macmillan.

Farauta, C.K. (2007). Effect of instructional materials on the performance of Senior Agricultural Science students in public Secondary Schools in Adamawa state. *Unpublished Ph.D*. Thesis. Yola: Federal University of Technology.

Federal Republic of Nigeria, FRN. (2004). National Policy on Education, 4th Edition Lagos:

Gabriel, Q.I.A. (2013). A Historical Perspective of teacher education in River State of Nigeria: 1967-1998. *African Research Review*. 7(3); 206-226.

Gopal, V.P.(2010). Importance of Audio – Visual in teaching methodology. India, Mahourastra.

Gouvernement du Quebec (2017). www.education: gouv.qc. ca/en/teacher.

Harackieweiz, J.M., Baron, K.E., Tauer, J.M., Carter, S.M. & Elliot, A.J. (2000). Revision of achievement goal theory; necessary and illuminating. *Journal of Educational Psychology*, 9(2); 316-330.

Highlife Foundation (2016). https://www.highlifefoundation.com/factor.retrieved: February 17th, 2016.

https://www.myschoolgist.com
https://www.slideshare.net.nemalynyap
Ibeneme, O.T. (2000). Provision and utilization of instructional equipment for teaching and learning science and technology. *Issues in Educational Journal*. 1(1): 139-144.

Ibrahim, S.A. (2000). Instructional materials. *Journal-Teachers Periscope of NUT*, 8(7): 54-59.

Idris, A.O. (2015). Effect of availability and utilization of instructional materials on academic performance of secondary school students in Geography in Kaduna State. Unpublished M.ED Thesis Department of Curriculum and Instruction, Faculty of Education, Ahmadu Bello University, Zaria.

Ifeakor, M.N. (2016). Strategies for effective teaching and learning of vocational agriculture in Nigerian secondary schools for skills acquisition. *Kubanni Journal of Art and Social science.* 1(1): 1088-1095.

Iji, C.O., Ogbole P.O. &Uka, N.K. (2014). Effect of improvised instructional materials on students' achievement in Geometry at the upper Basic Education Level in Makurdi Metropolis, Benue State, Nigeria. *Journal of Educational Research and Reviews*. 9(15): 504-509. http://www.academicjournal.org/ERR.

Ikerionwu, J.C. (2000). Importance of aids and resources in classroom teaching. In A.M. Oyeneyin (Ed), Perspective of classroom teaching, Abuja: Martmonic Investment Ltd.

Ikot, G.S. (2008). Effects of Instructional Materials Utilization on performance of Junior Secondary Students in Practical Agriculture in Ikot-Abasi Local Government Area. Unpublished M.Sc. (Ed) Thesis. University of Uyo, Uyo State.

Inyang, N.E.U. (1997). Local materials in science technology and methods of teaching, identification and utilization. Proceedings of the 38th Annual Conference of STAN: 4(6): 64-67.

Ishaku, D.I. (2014). Utilization of identified instructional materials in teaching of agricultural science in senior secondary schools in Taraba State. *Journal of Education and Policy Review,* 6(2):75-92.

Isola, O.M. (2010). Effects of standardized and improvised instructional materials on student's academic achievements in secondary school physics. M.sc(Ed)Thesis, University of Ibadan.

Iwu, R.U., IjeomaB.C.Onoja, A. I. &Nzewuihe, G.U. (2011). Teaching Aids. A panacea for effective instructional delivery in Biology. Research, 3(2), 62-65. Retrieved on June 24, 2014 from http://www.Sciencepub.net/research/research030/084388research0302-62-65-teachpdf.

Jeyne, J &William, H. (2002). Examining the effects of parental assess on the academic achievement of adolescents: the challenge of controlling family income. *Journal of family and economic issues*.2(3):2-7.

John, D.A. (1970). "Films within the curriculum" Sehillaci A. and Chulkin Edited, Film Deliver: Teaching Creativity with Film.

Jubay, A. (2014). What are the importance of instructional materials? Retrieved from http://www.answers.com/Q/What-are-the-importance-of-instructional-materials

Kolo, U.I.(2011). Influence of instructional materials on the Academic performance of students in agricultural science in secondary schools in Kwara State, Nigeria. Unpublished Msc (Ed) Department of Vocational and Technical Education, Faculty of Education, Ahmadu Bello University, Zaria.

Kwenga, C.J.(2005). Women's access to higher education in Africa: Uganda's experience, Kampala. Fountain publishers Ltd.

Lance, K.C, Hamilton-Pennel, C, & Rodney, M.J. (1999). Information Empowered: The school Librarian as an agent of academic achievement in Alsaka Schools, Alsaka State Library, and Junea, AK.

Magnuson, G.B, &Katherine, P. (2007). "Materials education and children's academic achievement and performance during middle childhood" Developmental Psychology 4(3) 1497-1512.

Maundu, J. (1987). Family background and student achievement in kenya national Examinations. Unpublished M.Ed. Thesis, Kenyatta University, Nairobi,

Mayer, R. E. (1996). Learning strategies for making sense out of expository text: The SOI model for guiding three cognitive processes in knowledge construction. *Educational Psychology Review,* 8(4): 357-371.

Mayer, R. E. (1999). Research-based principles for the design of instructional messages: The case of multimedia explanations. *Document Design, 1,* (1): 7-20.

Mayer, R. E. (2003). Elements of a science of e-learning. *Journal of Educational Computing Research, 29*(3): 297-313.

Mayer, R. E. (2005a). Cognitive theory of multimedia learning. In R.E. Mayer (Ed.), *The Cambridge handbook of multimedia learning.* New York: Cambridge University Press.

Mayer, R. E. (2005b). Introduction to multimedia learning. In R.E. Mayer (Ed.), *The Cambridge Handbook of Multimedia Learning.* New York: Cambridge University Press.

Mayer, R. E. (2009). *Multimedia learning* (2nd ed). New York: Cambridge University Press.

Mayer, R. E. (2010). Applying the science of learning to medical education. *Medical Education*, 44(9): 543–549.

Mayer, R. E., & Moreno, R. (1998). A cognitive theory of multimedia learning: Implications for design principles. *Journal of Educational Psychology, 91*(2): 358-368.

Mboto, F.A., Ndem, N.U. & Stephen, U. (2011). Effect of improvised materials on students achievement and Retention of the concept of Radio activity. l5 (1): 342-353.

Medugu, J.D. (2011). Effectiveness of a digital Oscilloscope for the teaching of some radio, television and electronic work concept at technical colleges level. Unpublished PhD Thesis. Abubakar Tafawa Balewa University, Bauchi, Nigeria.

Moore, D. M, Burton, J. K. & Myers, R. J. (2004). Multiple-channel Communication: The theoretical and research foundations of multimedia. In Jonassen, D. H. (Ed.), *Handbook of research on educational communications and technology* (2nd ed.). Mahwah, NJ: Lawrence Erlbaum Associates.

Mundi, N.E. & Alfred, S.D. (2006). General teaching methods: Agricultural Science Methods. Lagos, Nigeria: National Open University of Nigeria.

National Commission for Colleges of Education. NCCE. (2012). Minimum Standard for NCE Teachers Minimum Standard for NCE Teachers

National Commission for Colleges of Education. NCCE. (2013). Minimum Standard for NCE Teachers Retrieved on 31/01/2015 from www.ncceonline-org.

National Teachers Institute, (2002). Course book on educational, general methodology of teaching 11 and evaluation. Kaduna: NTI Press.

Natoli, C.(2011). The importance of Audio-Visual materials in teaching and learning. Wwwhelium. .com/channels/224-early-childhood-ed.

Newby, T.J., Stepich, D.A., Lehman, J.D, & Russell, J.D.(2009). Instructional technology for teaching and learning. Designing instruction, integrating computers, and using teaching aids: (2nd ed.) Upper Saddle River, N.J, Merrill.

Nigerian Educational Research and Development Council (NERDC) (2009). Senior Secondary School Curriculum: Fishery for SSS1-3. Sheda, Abuja: University Press Plc.

Nsa, S.O, Udo, M.F, &Iko, A.S. (2013). Instructional Materials Utilization and Students performance in practical agriculture. *Journal of Education Research and Reviews*, 1(4), 49-54.

Nwachukwu C.E. (2006). Designing appropriate methodology in vocational and technical Education for Nigeria, Nsukka, University Trust Publishers.

Nwike, M.C. &Onyejegbu, C. (2013). Effects of use of instructional materials on students' cognitive achievement in agriculture. *Journal of Education and Social Research* 3(5): 54 – 62.

Nwoji, O.J.(2002). Production and utilization of teaching materials. Enugu. Fulladu publishing company.

Obeka, S.S. (2009). Epodawalad and power stimulation games of geographical and environmental education. Zaria A.B.U, Press Limited.

Odeh, R.C, Oguche, O.A, &Ivagher, E.D. (2015). Influence of school environment on academic achievement of students' in secondary schools in Zone "A" senatorial district of Benue state, Nigeria. *International Journal of Recent Scientific Research* 6(7): 4914-4922.

Ogbanda, L. (2008). An appraisal of instructional materials used to educate migrant fishermen's children in River state, Nigeria. *International journal of Scientific Research in Education*. 1(1), 13 – 25. Retrieved on December 4, 2014 from http:// www ijsre.com.

Ogbu J.E. (2015). Influence of inadequate instructional materials and facilities in teaching and learning of electrical / electronic technology education courses. *International Journal of Vocational and Technical Education* 7(3):20-27.

Ogunranti, S.A. (1981). Biophysics investigation. *Journal of Science Teachers Association of Nigeria,* 2(1): 19-22.

Ogwa C.E. (2002). Effective teaching methods. Enugu: Cheston Ltd.

Ojo, G.T. (2013). Availability and use of instructional materials for teaching Yoruba in senior secondary schools in Ogbomosho North Local Government Area, Oyo State. Journal of Educational Research and Development 8(1): 121-131.

Okeke, L.S. (2000). Utilization of instructional materials in secondary school Igbo language teaching, in Ali, A and Okeke, E. (ed) Information technology and education. Enugu: City Press Ltd.

Okendu, J.N.(2012). The influence of instructional process and supervision on academic performance of secondary school students of River State, Nigeria. *Journal of Academic Research International*,2(3): 32 – 39.

Oketunji, I. (2000). Application for information Technologies in Nigeria libraries: problems and prospects in I.K: Nwalo (ed); Information Technology in library and information technology education in Nigeria. National association of Library and Information Science Education NALISE.

Okpanachi, S.S &Ene, I.O. (2008). Tips on Teaching practice. Living spring Sango, Ibadan; Safmos Publishers.

Okwelle, P.C,&Allagoa, F.O.N. (2014). Enhancing Teachers' Competence in the use of Instructional Materials in Electronic education in Senior Secondary Schools in Nigeria. *Research on Humanities and Social sciences* 4(28): 20-25.

Oladejo, M.A, Olosunde, G.R, Ojebisi, A.O, & Isola, O.M. (2011). Instructional Materials and Student Academic Achievement in Physics: Some Policy Implications. *Journal of Humanities and Social Sciences*, 2(1): 116 - 210.

Olagunju, I. (2000) Strategies and Utilization of improvised Biology Instructional Materials and students Achievement and attitudes in Ekiti Secondary Schools. Nigeria. *International Journal of Research in Education* 3(2): 45 – 52.

Olawale, S.K. (2013). The use of Instructional Materials for effective learningof Islamic studies. *Jihat-al-Islam,* 6(20) 29-40. Retrieved on December 7, 2014, from http: // pu.pk / images / journal/ jihat-ul-Islam/PDF.

Onasanya, S.A &Omosewo, E.O.(2011). Effect of improvised and standard Instructional Materials on Secondary Student's Academic performance in Physics in Ilorin, Nigeria. *Singapore journal of Scientific Research*.1 (2):68-76.

Oritsebemigho, T.O. (2014). An appraisal of the revised Nigeria certificate in education minimum standard (English Language curriculum). *European Scientific Journal Special Edition,* 2(4): 165-171.

Osinem, E.C (2008). Managing Agricultural Education and Training: Research Principles and Methods. Enugu: Belony International Publishers.

Osokoya I.O. (2007). Effects of Video-taped Instructional Materials on Secondary School Students' Achievement in History, *Int. J. Afr. Am Stud.* 6(1);22-34.

Osuala, E.O. (2005). Introduction to Research Methodology (3rd edition) pp.218-235). African. Fep publishers Limited.

Prem, K. Y, Tushar, K.B, Prithwiraj, M, Shankar, Y, Sanjay, K.S &Sanjit, K.K. (2015). Audio-visual aids in teaching-learning process of health science students and professionals. *Journal of Universal college of medical science*. 3(4):50-53

Quadri, K. &Olowo, G.M. (2013). Academic performance of direct and Pre-NCE students in Federal College of Education (special) Oyo: implications for education administrators. *Research Journal in Organizational Psychology and Education Studies.* 2(4): 218-223.

Razaq, B. & Ajayi, O. O.S. (2000). Research methodology and statistical analyses. Ilorin: Haytee press and publishing company limited.

Salisu, S.O. (2002). Use of Instructional Materials for Effective Teaching Training Manual on Workshop on the production and Utilization of Instructional Materials. Lagos. Megodo publishers Ltd.

Sambo, S. (2008). Research methods in Education. Nigerian.Ibadan.Stirling- Horder Publishers

Schnotz, W., (2005). An integrated model of text and picture comprehension. In R.E. Mayer (Ed.), *The Cambridge handbook of multimedia learning*. New York: Cambridge University Press.

Sentanum, N.P. (2003). Schools' influence on learning. A case study of upper primary schools in Kampala &Wukiso District. *American journal of Education Research.* 1(8):283-289.

Shodimu, G.O. (1999). Resources availability, utilization and productivity in public and private secondary schools in Lagos State. Unpublished Ph.D thesis, Department of Educational Administration, University of Lagos.

Sparkles, J. (1999). Schools, Education and Social Exclusion, CASE paper 29, centre for Analysis of Social Exclusion, London. School of Economics, London in (Shoutkat, J, Zubair, H, Fahad, M, Hamid, K, Awais, A. (2013). Factors contributing to the students' Academic Performance. A case study of Islamia University Sub-campus. *American journal of Educational Research,* 1(8):283-289.

Staffolani, S &Bratti, M. (2002). Student Time Allocation and Educational production function. Department of Economic Working paper,University of Ancona, pp. 120-170

Stufflebeam, D. L. (1971). The relevance of the CIPP evaluation model for educational accountability.

Sunshine, B.A, Lawrence, C, Juan, J, &David, T. (2015). Factors affecting the Academic Performance of student Nurses of BSU. *International journal of Nursing Science*: 5(2); 60-65. Article: sapub.org/10.5923.j.nursing.

Swank, R.C. (2011). The educational function of University Library. http://www.ideals.illinois.ed/bitestream/handle214/5455/librarytrend.

Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science,* 1(3):257-285.

Sweller, J. (1994). Cognitive load theory, learning difficulty, and instructional design. *Learning and Instruction*, *4*(2): 295-312.

Taale, K.D & Mustapha, B. (2014). Effect of teacher constructed electrical models on students' academic achievement in basic electricity in technical colleges inBorno state, Nigeria. *International journal of innovative social and science Education Research,* 2(1): 16-25.

Thelma, Y.M. (2014). Variables associated with academic achievement with African males in four years undergraduate institution in Zhirin, S. (2015). Influence of academic performance in agriculture on choice of vocational agriculture as students' future career in colleges of education in North-central zone, Nigeria; Unpublished Msc Thesis, department of Vocational and Technical Education, Ahmadu Bello University, Zaria.

Tim, L. W. (1980). *Evaluating occupational education and training programme*: Boston: Allyn and Becon Inc.

Tood, R, &Kuklthau, C. (2004). Students learning through Ohio schools Libraries: Background, methodology and Report of findings, OELMA, Columbus: OH.

Tschumper, K.S.(2006). Study skills instruction in high school: where o' where the High school students' study skills Gone? Published by University of Wisconsin La Crosse Onalaska Learning Community.

Tukur, A.K. (2012). Teachers guide to improvisation and utilization of instructional materials: Zaria. A.B.U Press Ltd.

Ugwoke, C.U, & Ifeanyi, F.O.(2012). Pineapple processing Competencies Required by NCE Agricultural Education Graduates for Sustainable Economic Transformation. *Int J Edu Res*, 11(1):187-193.

Umunadi, K.E. (2009). Teacher utilization of instructional equipment and materials in teaching basic electricity in urban and rural technical colleges. *International journal of scientific Research in Education*; 2(2), 88-95. Retrieved December 24, 2010 from http: //www.ijsre.com.

Uzuegbu, C.P, Mbadiwe, H.C, &Anulobi, J.C. (2013). Availability and Utilization of Instructional Materials in teaching and learning Library education in tertiary Institutions in Abia State. Wudpecke.r*Journal of Educational Research*, 2(8), 111-120. Retrieved on December, 2014 from http: // wud pecker research journals .org/ WJER/pdf.

Vonstumni, L, Sophie, I, Hell, U, Benedic, J, Chamoro, P,& Thomas, K. (2011). "The Hungry Mind: Intellectual curiosity is the third pillar of Academic Performance" perspective on psychological science 6(6):574-588.

William, S.E.(2001). The relationship between Learning style, Academic major and Academic performance of College students. *Journal of Agricultural Education.*1(4): 30-37.

Yohanna, J. (2017). Causes of poor academic performance of agricultural science students in Colleges of Education, Kaduna state. A paper presented at Annual National Conference of Vocational and Technical Education, Federal College of Education, Zaria from 11th-14th July.

Yusuf, H.O. (2015). Fundamentals of curriculum and Instruction. Kaduna-Nigeria. Graphics Printer and Publishers.

Yusuf, K. (2010). Effect of Information and Communication Technology on Teaching and Learning of Business Education courses at NCE Level in Nigeria. Unpublished M.Ed. Business Education Thesis, Ahmadu Bello University, Zaria.

Zakari, G. (2015). Effects of Improvised Instructional Materials on performance of Senior Secondary School students in Islamic studies in Kaduna state, Nigeria. Unpublished M.Ed. Dept. of Curriculum and Instruction, ABU, Zaria.

Zarie, A.A. (2008). On the Learning ability of three categories of Idioms by Iranian EFL Learners. *Journal of Humanities of the University of Kerman*. 2(2): 82-100.

Zucho, A. &Pintrich, P. (2001). Motivation in the second decade of life. In T.C Urban and F. Pajares (Eds.) Adolescence and Education. USA: Information Age Publishing.

DEPARTMENT OF VOCATIONAL & TECHNICAL EDUCATION
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INTERIM HEAD OF DEPARTMENT: Dr. Sani Ibrahim, *B.B.Ed, M.Ed, Ph.D (ABU)*

28th March, 2018

Your Ref P12EDVE8041 Date

Our Ref

LETTER OF IDENTIFICATION
MARY ROSE NJIDEKA IFEAKOR – P13EDVE8041

This is to certify that the above mentioned person is a postgraduate student (M.Sc Agric Education) in the Department of Vocational and Technical Education, Faculty of Education, Ahmadu Bello University, Zaria. She is carrying out a research on Availability and Utilization of Instructional Materials on Academic Performance of Agricultural Education Students in Federal Colleges of Education, North-Central Zone, Nigeria.

kindly give her every assistance she may require .

Dr. Sani Ibrahim
Interim Head of Department

APPENDIX II: CALCULATION OF PROPORTION SAMPLE SIZE FOR COLLEGES

$$\text{FORMULAR} = S = \frac{N}{1} \times \frac{\text{percentage proportion}}{100}$$

Where N = Population size

S = Sample size.

$$\text{Sample size (s)} = \frac{\text{population of the group (N)}}{1} \times \frac{50}{100}$$

$$\text{Sample size of lecturers (50\%)} = \frac{53}{1} \times \frac{50}{100} = 27$$

$$\text{Sample size of students (50\%)} = \frac{164}{1} \times \frac{50}{100} = 83$$

Source: Creative Research Survey System (1982)

APPENDIX III: AGRICULTURAL EDUCATION NCE MINIMUM STANDARD

	YEAR ONE-FIRST SEMESTER		
COURSE CODE	**COURSE TITTLE**	**CONTACT HOURS L-T-P**	**CREDITS**
VTE 110	Introduction to Voc. And Tech. Education	1 -0 - 0	1C
AGE 111	Introduction to Agriculture	1 – 0 – 3	1C
AGE 112	Agricultural Biology	2 – 0 – 3	2C
AGE 113	Agricultural Mathematics	1 - 0 – 0	1C
AGE 114	Agricultural Physics	1 – 0 – 3	1C
AGE 115	Introduction to Agro-Climatology	1 – 0 – 3	1C
AGE 116	Agricultural Chemistry	2 – 0 – 3	2C
AGE 117	Practical Agriculture 1	1 – 0 – 4	2C
AGE 118	Introduction to Crop Production	1 – 0 – 3	1C
AGE 119	Introduction to Rural Sociology and Extension	1 - 0 – 3	1C
	Total		**13C**
	YEAR ONE –SECOND SEMESTER		
AGE 121	Arable Crop Production	1 – 0 – 3	2C
AGE 122	Introduction to Animal Science	1 – 0 – 3	1C
AGE 123	Youth Organization in Agriculture	2 – 0 – 3	2C
AGE 124	Principles of Agricultural Economics	2 – 0 – 0	2C
AGE 125	Agricultural Methodology	2 – 0 – 0	2C
AGE 126	Introductory Soil Science	2 – 0 – 3	2C
AGE 127	Agric Finance	1 – 0 – 0	1C
	Total		**12C**
	YEAR TWO – FIRST SEMESTER		
AGE 121	Tree Crop Production	1 - 0 – 3	2C
AGE 122	Poultry Production	1 – 0 – 3	2C
AGE 123	Introductory to Genetics	2 – 0 – 3	2C
AGE 124	Principles of Agricultural Economics	2 – 1 – 0	2C
AGE 125	Farm Power and Machinery	2 – 0 – 3	2C
AGE 126	Curriculum Development in Agriculture	1 – 0 – 3	1C
AGE 127	Fish Production	2 – 0 – 4	2C
AGE 128	Animal Nutrition	1 – 0 – 3	1C
AGE 129	Entrepreneurship in Agric Education	1 – 0 – 3	1C
	Total		**15C**
	YEAR TWO – SECOND SEMESTER		
VTE220	Entrepreneurship in Voc. and Tech. Education	2 – 0 – 0	1C
AGE 221	Research Method in Agricultural Education	2 – 0 – 0	1C
AGE 222	Soil Fertility	1 – 0 – 3	1C
AGE 223	Principles of Crop Protection	1 – 0 – 3	1C
AGE 224	Crop Improvement	1 – 0 – 3	1C
AGE 225	Livestock Production (Ruminant/ Non Ruminants)	2 – 0 – 3	2C

AGE 226	Principles of Farm Management	1 – 0 – 2	1C
AGE 227	Practical Agriculture IV/Field Trip	0 – 0 – 4	1C
AGE 228	Land Survey and Farm Stead Planning	1 – 0 – 2	1C
AGE 229	SIWES	2 – 0 – 4	2C
	Total		**12C**
	YEAR THREE-FIRST SEMESTER		
	Teaching Practice		6C
	YEAR THREE-SECOND SEMESTER		
AGE 320	Seminar in Agricultural Education	1 - 0 – 0	1C
AGE 321	Environmental Education in Agriculture	1 - 0 – 0	1C
AGE 322	Animal Health	1 - 0 – 3	1C
AGE 323	Food Products Technology	2 - 0 – 0	2C
AGE 324	Basic Agricultural Water Engineering	2 - 0 – 3	1C
AGE 325	Horticulture	1 - 0 – 2	1C
AGE 326	Agricultural Development and Policy	2 - 0 – 0	1C
AGE 327	Bee keeping/Snail/Cane Rat Farming	1 - 0 – 3	2C
AGE 328	Animal Breeding	1 - 0 – 3	1C
AGE 329	Agricultural Marketing and Cooperatives	2 - 0 – 0	1C
	Total		**12C**

APPENDIXI V: STUDENTS ACADEMIC PERFORMANCE GRADING SYSTEM

SUBJECT GRADE

Scores	Grades	Points
70 – 100	A	5
60 – 69	B	4
50 – 59	C	3
45 – 49	D	2
40 – 44	E	1
01 – 39	F	0

FINAL GRADE

CGPA	Grades	Remarks
4.50 – 5.00	A	Distinction
3.50 - 4.49	B	Credit
2.40 – 3.49	C	Merit
1.50 – 2.39	D	Pass
1.00 – 1.49	E	Pass
0.00 – 0.09	F	Fail

APPENDIXI V: SUMMARY OF 2016/2017 NCE III FINAL RESULT OF FCE AGRICULTURAL EDUCATION STUDENTS IN NORTH-CENTRAL ZONE, NIGERIA

S/N	College	CGPA						
		4.00-5.00-	**3.50-4.49-**	**2.40 3.49 –**	**1.50-2.39 -**	**1.00 1.49**	**0.00-0.09-**	**Total**
1	FCE Pankshin	-	12	19	13	4	-	48
2	FCE Okene	-	5	16	17	8	15	61
3	FCE Kontagora	-	3	12	10	13	8	46
4	NASE Kwara	-	-	9	-	-	-	9
	Total	**0**	**20**	**56**	**40**	**25**	**23**	**164**

APPENDIXI VI

A checklist of available instructional materials for teaching agricultural science education courses in FCE North Central Zone, Nigeria.

S/N	Instructional materials	Colleges		
	Visuals		Available	Not Available
1	Real objects/specimen			
2	Models			
3	Posters			
4	Charts			
5	Maps			
6	Pictures/Photographs			
7	Chalk board &chalks			
8	Marker board &markers			
9	Handouts			
10	Journals			
11	Magazines			
12	Textbooks			
13	e-books			
14	News papers			
	AUDIO			
15	Radio/sound system			
16	Public address system			
17	Audio-tape/recorder			
	Audio-visuals			
18	Television set			
19	Video tape/recorder/player			
20	DVD/player/recorder			
21	Electronic board			
22	Slides			
23	Films			
24	Projectors			
25	Computers			
26	Video-tape			
27	Internet facilities			

APPENDIX VII: QUESTIONNAIRE FOR THE RESEARCH

Agricultural Education Section,
Department of Vocational and Technical Education,
Faculty of Education,
Ahmadu Bello University, Zaria, Kaduna State,
4th August, 2017.

Dear Respondent,

REQUEST TO FILL QUESTIONNAIRE

I am a post graduate student of Agricultural Science Education in the Department of Vocational and Technical Education, Ahmadu Bello University, Zaria, carrying out a research on *''Influenceof Availability and Utilization of Instructional Materials on the Academic Performance of Agricultural Education students of Federal Colleges of Education, North-Central Zone, Nigeria*." This questionnaire is to solicit for your assistance and co-operation in providing the required information by ticking the items in the options provided. It is purely an academic exercise for the award of Master of Science degree in Agricultural Education. The information to be provided by you shall be used strictly for this research purpose and confidentially treated.

Thanks for your cooperation.

Yours Faithfully

Mary-Rose, Njideka Ifeakor.

P13EDVE8041

QUESTIONNAIRE FOR AGRICULTURAL EDUCATION STUDENTS

SECTION A: BIO-DATA

1. Gender: Male [ ] Female [ ]
2. Name of the College……
3. Class Size(Total Number of student in your class): less than50 [ ] 50 -100 [ ] Above 100 [ ]

SECTION B

INSTRUCTION: Read and Tick [√**]** appropriate in the column provided against the option of your choice

PART1: **Extent ofInstructional Materials (Visual, Audio, and Audio-Visual) Utilization in teaching agricultural science education courses by the lecturers in FCE North-Central Zone Nigeria.**

KEY FOR RATING (4 points Rating Scale)

Very often use (**4** points), Often used (**3** points), Rarely used (**2**points) and Not Used (**1**point).

S/N	Instructional materials	Very often used	Often used	Rarely used	Not used
	Visual				
1	Real objects/Specimens				
2	Model				
3	Posters				
4	Charts				
5	Maps				
6	Pictures/photographs				
7	Chalkboard &chalks				
8	Marker board & marker				
9	Handouts				
10	Journals				
11	Magazines				
12	Textbooks				
13	e-books				
14	Newspapers				
	Audio				
15	Radio /sound system				
16	Public address system				
17	Audio-tape/Recorder				
	Audio-visual				

18	Television/set				
29	Video-tape/Recorder/Player				
20	DVD/Player/Recorder				
21	Electronic boards				
22	Slides				
23	Films				
24	Projectors				
25	Computers (laptop/Desktop)				
26	Video-tape				
27	Internet				

Agricultural Education Section,
Department of Vocational and Technical Education,
Faculty of Education Ahmadu Bello University
Zaria, Kaduna State.
4th August, 2017.

Dear Respondent,

REQUEST TO FILL QUESTIONNAIRE

I am a post graduate student of Agricultural Science Education in the Department of Vocational and Technical Education, Ahmadu Bello University, Zaria, carrying out a research on ‘’Perception of Availability and Utilization of Instructional Materials on the Academic Performance of Agricultural Education students of Federal Colleges of Education, North-Central Zone, Nigeria.” This questionnaire is to solicit your assistance and co-operation in providing the required information by ticking the items in the options provided. It is purely an academic exercise for the award of Masters of Science degree in Agricultural Education. The information to be provided by you shall be used strictly for this research purpose and confidentially treated.

Thanks for your cooperation.

Yours Faithfully

Mary-Rose, Njideka Ifeakor.

QUESTIONNAIRE FOR AGRICULTURAL EDUCATION LECTURERS

Instruction: Please tick [√] as appropriate in the spaces provided:

SECTION A: **Bio-Data**

1. Name of the College:……
2. Gender: Male [ ] Female [ ]
3. Level of students you teach: (a) NCE 1 [ ] (b) NCE11 [ ] (c) NCE 111 [ ]
4. Class Size(Highest number of student per class): less than50 [ ] 50 -100 [ ]Above 100 [ ]

5. Highest Educational Qualification Obtained**:**

Ph.D [ ]

M Sc/M.Sc(Ed) [ ]

M.A./M.Ed [ ]

B.A/B.Sc . [ ]

B. Agric [ ]

B.Sc (Ed) [ ]

HND/PGDE [ ]

Any other please specify……..

6. Work Experience**:**

a. Less than 5years [ ]

b. 5-10years [ ]

c. 11 -15years [ ]

d. 16-20years [ ]

e. 21years and above[ ]

PART2:**Extent ofUtilizationof Instructional Materials (Visual, Audio, and Audio-Visual) in teaching agricultural science education courses by the lecturers in FCE North-Central Zone Nigeria.**

KEY FOR RATING (4 points Rating Scale) Very often use (**4** points), Often used (**3** points), Rarely used (**2** points), and Not Used (**1**point)

S/N	Instructional Materials	Very often used	Often used	Rarely used	Not used
	Visual				
1	Real objects/Specimens				
2	Model				
3	Posters				
4	Charts				
5	Maps				
6	Pictures/photographs				
7	Chalkboard &chalks				
8	Marker board & marker				
9	Handouts				
10	Journals				
11	Magazines				
12	Textbooks				
13	e-books				
14	Newspapers				
	Audio				
15	Radio /sound system				
16	Public address system				
17	Audio-tape/Recorder				
	Audio-Visual				
18	Television/set				
29	Video-tape/Recorder/Player				
20	DVD/Player/Recorder				
21	Electronic boards				
22	Slides				
23	Films				
24	Projectors				
25	Computers (laptop/Desktop)				
26	Video-tape				
27	Internet				

Thank you for responding to all the questions candidly