ANALYSIS OF TEACHERS' PERCEPTION OF STRATEGIES FOR IMPROVING THE USE OF INSTRUCTIONAL MATERIALS IN AGRICULTURAL SCIENCE IN SENIOR SECONDARY SCHOOLS IN KANO STATE, NIGERIA

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

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SEPTEMBER, 2018

DECLARATION

I Aliyu GAMBO declare that this dissertation titled "Analysis of Teachers' Perception of Strategies for Improving the Use of Instructional Materials in Agricultural Science in Senior Secondary Schools in Kano State, Nigeria", has been carried out by me in the Department of Vocational and Technical Education, Ahmadu Bello University, Zaria. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this dissertation was previously presented for higher degree at any other institution.

_____ _____

Aliyu GAMBO Date

CERTIFICATION

This dissertation titled ANALYSIS OF TEACHERS' PERCEPTION OF STRATEGIES FOR IMPROVING THE USE OF INSTRUCTIONAL MATERIALS IN AGRICULTURAL SCIENCE IN SENIOR SECONDARY SCHOOLS IN KANO STATE, NIGERIA by Aliyu GAMBO meets the regulations governing the award of Master of Science in Agricultural Education of Ahmadu Bello University, Zaria and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

This dissertation is dedicated to my late parents Alhaji Aliyu Idris and Hajiya Fatima Adamu, as well as my late brothers Ahmad Aliyu, Abdullahi Aliyu and my late sister Sa'adatu Aliyu.

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LIST OF ABBREVIATIONS

ANOVA:	Analysis of Variance
CAI:	Computer Assisted Instructions
ETF:	Educational Trust Fund
ICT:	Information and Communication Technology
IMAA:	Instructional Materials Accessibility Act
NCE:	Nigeria Certificate in Education
NECO:	National Examinations Council
NGOs:	Non-Governmental Organizations
NPE:	National Policy on Education
PTA:	Parents Teachers Association
SD:	Standard Deviation
SME:	State Ministry of Education
SSS:	Senior Secondary School
WAEC:	West African Examination council
WWW:	World Wide Web
χ^2:	Chi-square

OPERATIONAL DEFINITION OF TERMS

Audio-Visual Materials: Is the combination of devices which appeal to the senses of both hearing and seeing such as; television, motion picture and the computer.

Conventional Method: are the traditional methods used for teaching that do not vary any strategy while imparting knowledge to the students at any level, e.g. lecture, discussion and others.

Equipment: This refers to those instructional media which are used in presenting the materials**.** These include bulletin boards, chalkboards, tape recorders, slides, filmstrips, motion pictures, projectors, and other forms of projectors.

Information and Communication Technology (ICT): It is technology used for assessing, gathering, manipulating, processing, storing, presenting and communicating information.

Instructional Materials: are the materials which help teachers to make a lesson explicit enough to the learners.

Instructional Media: This refers to all the various media that are employed in teaching, these include; television**,** radio, textbooks, computer, models, graphs, charts, asters, flannel boards, magnetic boards, maps, globes, slides, filmstrips.

Locally Made Materials: These are all instructional materials which are made by the teacher or students or jointly by both teachers and students, using resources from the school environment or raw materials which are imported from outside the school environment, examples maps, pictures and slides.

Materials: It refers to a concentration system or body of content of potential value when put to work. It includes maps, overhead transparencies, computers, posters.

Students' Academic Performance: this refers to the numerical scores of a student's knowledge which measure the degree of a student's adaptation to school work and to the educational system.

Vocational Schools: These are institutions where students are given vocational training in certain skills as stipulated in the school curriculum.

Qualified Teacher: Teachers of agriculture science that possess educational qualification in agriculture.

Unqualified Teacher: Teachers of agricultural science who do not possess educational qualification in agriculture.

ABSTRACT

The study analysed teachers' perception of strategies for improving the use of instructional materials in agricultural science in senior secondary schools in Kano State, Nigeria. Five specific Objectives were stated, five research questions and five null hypotheses were stated and tested at 0.05 level of significance. The study used descriptive survey design. The population of the study was 424 agricultural science teachers from 413 senior secondary schools in Kano State. The entire population was studied as a sample using purposive sampling techniques. A structured questionnaire was used for data collection. The instrument was designed by the researcher with a reliability co-efficient of 0.71 obtained by test-re-test methods. The researcher personally distributed the 424 copies of the questionnaire to the respondents. All the questionnaire were properly filled and returned. Data collected were coded and analysed using Statistical Package of Social Sciences (SPSS) version 16. Table of frequencies and percentages was used to summarise and present the bio-data of respondents. Mean score and standard deviation were used to answer the research questions, while t-test was employed to test the five null hypotheses at significance level of 0.05. The study revealed among others that training mode such as organizing conferences, workshops, symposiums, excursion, in-house discussion, enlightenment campaign, long vacation programmes and seminars had significantly improved the use of instructional materials for the teaching of agricultural science in senior secondary schools in Kano, State, Nigeria. In line with the findings, it was concluded that training modes, adequate motivation, good administrative approaches, access, and maintenance practices greatly improved the use of instructional materials for the teaching of agricultural science in senior secondary schools in Kano State, Nigeria. Recommendations were made by the researcher among which included that Kano state Ministry of Education should organize training modes such as workshops, seminars, conferences, excursions, in house discussions and long vocation training programs for agricultural science teachers on the use of instructional materials to update their professional excellence.

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

Secondary education is a fundamental stage in the life of students because it gives them a firm foundation with which they can opt for job, self-employment or proceed to higher institutions of learning for further studies. This is buttressed by the objectives of secondary education as stated in the National Policy on Education (NPE) (FRN, 2013) which included among others; the preparation for useful living within the society and preparation for higher education. The teaching of agricultural science in senior secondary schools is designed to educate individuals with the hope that agricultural science will be useful to individuals and the entire society.

Learning by-doing is emphasized in the curriculum so that students would be equipped with skills to engage in the production of food and other agricultural products after graduation to earn a living (Egbute, 2002). A series of activities are specified in the curriculum to ensure the development of practical skills in agriculture by students.

The curriculum further recommends that each:

1. student be guaranteed adequate equipment, farm space (plot), farm structures and regular supply of fertilizers and animal feed;
2. students' achievement should be continuously assessed through various forms of tests and during field and laboratory practical, field trips and excursions;
3. individual assessment should be carried out for activities in crop production while group assessment be restricted to performance in animal production activities (NECO, 2012).

In spite of the emphasis placed on agricultural science as one of the vocational subjects in the secondary schools curriculum, it is usually taught theoretically without practical work and the use of relevant instructional materials (Egun, 2007). In line with this, Dooley, Suessy and Vasudevan (2004) stated that conventional teaching methods of explaining complex processes in agricultural science is inadequate because students seem unable to grasp a full understanding of the details of instruction. Furthermore, Dooley *et al,* (2004) re-affirm that the conventional chalk and talk method of teaching agricultural science in Nigerian secondary schools is no longer fully adequate unless correctly improved with appropriate instructional strategies. An untrained agricultural science teacher may not see reason for preparing and utilizing instructional materials in the classroom based on the assumption that the students are familiar with them.

Teaching and learning of agricultural science at secondary schools can better be reinforced with instructional materials of different varieties which can stimulate, motivate as well as arrest the learner's attention. Dalhatu (2009) states that instructional materials are those equipment a teacher uses or manipulates in the process of teaching in order to enhance learning. Instructional materials play an important role in the teaching and learning process because they help to enhance the memory levels of the students. Therefore, teachers need to use instructional materials to make the teaching and learning process interesting. The use of instructional materials is indispensable for effective classroom teaching (Hussain, 2010). Jacob (2000) stated that instructional materials are anything

used by teachers and learners before, during and after the lesson to facilitate the achievement of the objectives. With the use of instructional materials in secondary schools, there is no doubt they would help in improving the teaching and learning process and also enhance the academic performance of students in agricultural science.

Strategies are plans for achieving the goal of improving the use of instructional materials. It is a planned series of actions for achieving certain desired goal. The backbone of such strategies includes encouragement, ready access to instructional materials, training and support from school authorities which strengthens the teacher in taking steps towards enhancing how and what to teach with the use of instructional materials. According to Brace and Robert (1996), strategies for improving usage of instructional-materials among senior secondary schools include:

(i) Training: Training installs new skills and abilities to perform tasks, which were not possible previously;

(ii) Availability: For instructional materials to be exploited in an environment, it must first exist, from the class point of view;

(iii) Administrative Support: Leadership must foster an environment where teachers are encouraged to be creative and innovative;

(iv) Accessibility: Teachers need access to instructional materials of all types;

(v) Incentives: Recognizing and giving proper reward to teachers enhances instructional materials integration in the teaching and learning process;

(vi) Infrastructure: Adequate facilities that accommodate the available instructional materials, like buildings, stores, cold rooms/refrigerators, farm workshops should be put in place; and

(vii) Maintenance: Keeping the instructional materials is very important because it ensures continuity in their usage.

(viii) Motivation is the word derived from the word 'motive' which means needs, desires, wants, or drives within the individuals. It is a process of stimulating people to actions to accomplish the goals.

Usage of instructional materials is a firmly established and generally accepted practice, or procedures for the teaching and learning of agriculture. The usage of instructional materials for effective teaching and learning of agricultural science requires technical knowledge and vocational skills necessary for agricultural development. Dalhatu (2009) implores educators to constantly seek new ways to improve the usage of instructional materials in the teaching and learning of agricultural science in senior secondary schools so as to facilitate learning and to hold the attention of their students. In determining the usage of instructional materials for the conveyance of information in agricultural science, Fakomogbon (2000) came up with the following prepositions:

a. Nature of the subject matter and the objectives to be attained: If the subject matter is diversified, it may involve the use of more than one type of instructional materials to achieve its objective.

b. Number of learners/students involved: If the number of learners to be taught is large, e.g 200 students, it would be more logical and efficient to use public address system for the presentation of information.

c. The time available: Time is always limited and has its effect upon the kind of instructional materials used. If there is ample time, the agricultural science teacher is more likely to use the chalkboard and other techniques that encourage maximum participation. But when time becomes a limiting factor, the chalk and talk would be preferred.

d. Facilities and materials available: The kind and extent of physical facilities and the instructional material available, including community resources, affect the choice of instructional materials that can be used.

e. Interests and ability of agricultural science teacher: Most teachers have personal preferences and more security conscious in using selected instructional materials. Other things being equal, the teacher should use the methods that he/she likes or knows best. This does not mean that he/she should not be exposed to other developments that supplement or improve upon the instructional materials he/she frequently uses.

f. Effectiveness of instructional materials: All agricultural science teachers should evaluate instructional materials used in terms of objectives to be accomplished, and the situation at hand, and choose the one that will best meet the objectives of the lesson.

g. However, qualified teacher of agriculture science are teachers that possess educational qualification in agriculture while, unqualified teachers are

teachers of agricultural science who do not possess educational qualification in agriculture. An in-depth look at the secondary school agricultural science programmes reveals that, there is the need for improving the use of instructional materials and equipment in both the classrooms and schools farms. It is on the foregone above therefore, this study becomes pertinent.

1.2 Statement of the Problems

Commonly used chalk and talk method of teaching agricultural science in Senior Secondary Schools (SSS) has not been effective in developing the needed vocational skills necessary for agricultural development. To achieve this development, agricultural science teachers need to use instructional materials always. The usage offers teachers and learners a good opportunity to relate the theoretical knowledge to practical experiences and also save teachers energy of talking too much.

However, poor utilization of instructional materials and equipment in the teaching and learning of agricultural science affects the successful teaching and learning of agricultural science, which results to poor understanding of the subject and discourages students from choosing to offer agricultural science subject, leading to poor performance of students in external examinations like SSCE in both West Africa Examination Council (WAEC) and National Examination Council (NECO) over the years in Kano state.

The performance of students in agricultural science in external examination organized by West African Examination Council (WAEC) and National Examination Council (NECO) in Kano State has been generally poor.

In 2009, 2010 and 2011 the percentage failure recorded in WAEC was 78, 79 and 73, respectively, while the percentage for NECO in 2008 was 76% failure and 70% in 2012 (Department of Statistics Planning and Research, Ministry of Education, Kano State, 2013). This failure might partly be attributed to inappropriate use of agricultural science strategies, for improving the use of instructional materials.

The problem that this study addresses is that available instructional materials for teaching of agricultural science subject are not fully utilized by agricultural science teachers in Kano state Senior Secondary School. In line with this, the study by Egun (2007) reveals that many agricultural science teachers in SSS have lukewarm attitude towards utilization of instructional materials and equipment required for effective teaching and learning of the subject. This finding agrees with that of Apantaku (2004) who observes that non usage and poor utilization of instructional materials and equipment in the teaching and learning of agricultural science encourage lack of seriousness on the part of the students which results to poor understanding of the subject and leading to poor performance of students in external examinations. It is thus, in an attempt to break the impasse that this study analysed teachers' perception of strategies for improving the use of instructional materials in agricultural science in SSS in Kano state.

1.3 Objectives of the Study

The general objective of the study was to analyse teachers' perception of strategies for improving the use of instructional materials for teaching agricultural science in SSS in Kano State. The specific objectives were to:

1. determine the teachers' perception of training modes for improving the use of instructional materials for teaching agricultural science in SSS in Kano state;
2. ascertain the teachers' perception of motivators for improving the usage of instructional materials for teaching agricultural science in SSS in Kano state;
3. examine the teachers' perception of administrative approaches for improving the usage of instructional materials for teaching agricultural science in SSS in Kano state;
4. determine the teachers' perception of ways of increasing access to improving the usage of instructional materials for teaching agricultural science in SSS in Kano state; and
5. determine teachers' perception of maintenance practices for improving the usage of instructional materials for teaching agricultural science in SSS in Kano state.

1.4 Research Questions

The following research questions were answered in this study:

1. What are the teachers' perception of training modes for improving the use of instructional materials for teaching agricultural science in SSS in Kano State?

2. What are the teachers' perception of motivators for teachers to improve the usage of instructional materials for teaching agricultural science in SSS in Kano state?
3. What are teachers' perception of administrative approaches for improving the usage of instructional materials for teaching agricultural science in SSS in Kano state?
4. What are the teachers' perception of ways of increasing access to improving the usage of instructional materials for teaching agricultural science in SSS in Kano state?
5. What are the teachers' perception of maintenance practices employed to improve the usage of instructional materials for teaching agricultural science in SSS in Kano state?

1.5 Research Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance:

1. There is no significant difference between the mean responses of qualified and unqualified agricultural science on teachers' perception of training modes for improving the usage of instructional materials for the teaching of agricultural science in SSS in Kano state.
2. There is no significant difference between the mean responses of qualified and unqualified agricultural science on teachers' perception of motivators for improving the usage of instructional materials for the teaching of Agricultural Science in Senior Secondary Schools in Kano state.

3. There is no significant difference between the means responses of qualified and unqualified agricultural science of teachers' perception of administrative approaches for improving the usage of instructional materials for the teaching of agricultural science in SSS in Kano state.
4. There is no significant difference between the mean responses of qualified and unqualified agricultural science of teachers' perception of ways of increasing access and improving the usage of instructional materials for the teaching of agricultural science in SSS in Kano state.
5. There is no significant difference between the means responses of qualified and unqualified agricultural science of teachers' perception of maintenance practices for improving the usage of instructional materials for the teaching of agricultural science in SSS in Kano state.

1.6 Significance of the Study

This study would be of significance to Kano State Government (KSG), agricultural science teachers, agricultural science inspectors and researchers in the field of agricultural science.

The study would be of help to KSG to understand the advantages of using instructional materials. Findings from this study also would help the KSG to effectively provide the required instructional materials to all the SSS for the successful teaching of agricultural science.

Similarly, the study would be of help to both agricultural science teachers and agricultural science inspectors to develop interest in utilizing instructional materials in the teaching and learning of agricultural science in Kano State. The research will also help trained and untrained teachers in the Ministry of Education

Kano State to understand the need for continuous and regular improvisation of instructional materials for teaching and learning of agricultural science.

The study would be of great significance to agricultural science teachers in choosing appropriate instructional materials capable of reducing student's tension towards the subject thus improving student's academic performance in agricultural science. This study would also be of importance to researchers in the field of agricultural science to form a basis for further studies on the strategies for improving the usage of instructional materials in other learning aspects of agricultural science as a subject.

1.7 Basic Assumptions of the Study

The study was based on the following assumptions that:

1. The teachers make effective usage of instructional materials in teaching of Agricultural Science.
2. The agricultural science teachers have the required knowledge on how to use instructional materials for the teaching of agricultural science.
3. The SSS in Kano state have relevant instructional materials needed for teaching agricultural science

1.8 Delimitation of the Study

The study was delimited to SSS offering agricultural science subject in Kano state, Nigeria. The study was further delimited to only teachers teaching agricultural science in SSS in the State. The study was further delimited to 14 Zonal Education Offices (ZED) in Kano State Ministry of Education Namely; Bichi, Dala, Dambatta, Dawakin Kudu, Gaya, Gwarzo, Karaye, Kura, Minjibir, Municipal, Nasarawa, Rano, Tudun-Wada and Wudil to ensure wider coverage.

CHAPTER TWO
REVIEW OF RELATED LITERATURE

In this chapter, the researcher reviewed the related literature under the following sub-headings:

2.1 Theoretical Framework

2.1.1 Cognitive Load Theory

2.1.2 Diffusion of Innovation Theory

2.2 Concept of Instructional Materials

2.2.1 Criteria for Selecting Instructional Materials

2.3 Approaches for Effective Utilization of Instructional Materials

2.3.1 Non Projected Display Instructional Materials

2.3.2 Projected Display Instructional Materials

2.3.3 Printed and Duplicated Instructional Materials

2.4 Secondary School Agricultural Science Materials

2.5 Rationale for using Instructional Materials

2.6 The use of Computer Information and Communication Technology as Agricultural Science Teaching Tools.

2.7 Agricultural Education in Secondary School.

2.8 Strategies for Improving the Usage of Instructional Materials

2.9 Empirical Studies

2.10 Summary of Literature Reviewed.

2.1 Theoretical Framework

This research was premised on the theories, namely; cognitive load theory and diffusion of innovation theory.

2.1.1 Cognitive Load Theory

The cognitive load theory was proposed by Chandler and Sweller in 1988. This theory suggests that effective usage of instructional materials facilitates learning by directing cognitive resources towards activities that are relevant to learning rather than to processes that are adjunct to learning. Cognitive load theory may be viewed as the level of "mental energy" required to process a given amount of information. Psychologists posited that in an attempt to learn anything a learner must pay attention to it. It also involves exploration of the visual field, fixing the eyes successively on different parts, rating these parts and anticipating phenomenon that are not yet clearly perceived (Ree and Glerger, 1982). The cognitive load theory prescribed the need to ensure that the eradication of non-essential information from usage of instructional materials. The theory provides clear information, thoughtful practice, informative feedback, and strong motivators. This research falls in line with the cognitive load theory due to the fact that the theory offers guidance and insight on instructional materials utilization.

2.1.2 Diffusion of Innovation Theory

The diffusion of innovation theory was proposed by Lazarsfeld, Barelson and Graudet in 1944. This traces the process by which innovation is communicated through certain channels, over time among members of a social

system. The model describes the factors that influence people's thoughts and actions and the process of adopting a new technology or idea.

Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system. Diffusion is a special type of communication concerned with the spread of messages that are perceived as new ideas. An innovation is an idea, practice or object that is perceived as new by an individual. The characteristics of innovation as perceived by the members of social system determine its rate of adoption (Lazarsfeld *et al.*, 1944).

Innovation can be a new product or output of a new process or a way of doing something or a new idea or concept. The 'newness' of an innovation is subjective, determined by the potential adopter. Diffusion of innovation theory attempts to explain how an innovation is spread and why it is adopted at both the micro and macro levels of analysis, the four main elements in the diffusion of innovation theory or process are: innovation, communication channels, time and social system. Individuals' innovativeness or psychological factors such as communication needs are analyzed as micro-independent variables. At the macro-social level, this theory assumes that a social system, by utilizing mass and interpersonal communication channels, people can get information about an innovation and perceive its usefulness (Lazarsfeld et al., 1944). This principle linked the concept of usage of instructional materials at school level and teacher preparation.

2.2 Concept of Instructional Materials

Instructional materials are the tools by which a teacher tries to improve the teaching and learning process. These tools are invaluable and must be provided by the schools in sufficient quantity and good quality at the right time and place so that the teacher can teach efficiently and effectively (Umar, 2004). It is in realization of this that the NPE provided for the establishment of teacher resources centres from federal to local government levels and given the responsibility among others of developing and promoting effective use of innovative materials in schools (FRN, 2013).

Ikerionwu (2000) refers to instructional materials as objects or devices, which help the teachers to make a lesson clearer to the learner. Oloruntobi (2004) reaffirms that instructional materials are the materials a teacher could use during a lesson to aid learning. Instructional materials are concrete or physical objects which provide sound, visual or both to the sense organs during teaching (Agina-Obu, 2005). Ajibade (2002) reports that instructional materials are those devices which facilitate learning. It is a generic term referring to communication, experience, equipment and materials used for communication of instructions in which more than one sense is used in learning.

Ema and Ajayi (2004) states that instructional materials are all the tools which can be used by the teacher to provide help and encouragement to learners. In learning activities, such materials bring together man and materials in a systematic co-operation to effectively solve educational problems. Instructional materials are those things which when added in instructional process facilitate

learning (Abdullahi, 2007). Dalhatu (2009) observes that instructional materials are often referred to as instructional resources, instructional technology or educational technology. Instructional materials are the equipment the teacher use or manipulate in the process of teaching in order to enhance the learning process.

Umar (2004) reports that instructional materials are the written and published textbooks and related core materials including those specific materials which shall be used by the teacher for classroom instruction. According to Egun (2007) these are text books, supplementary books, work books, reference books, charts, magazines, maps, journals, pamphlets. newspapers, posters, programmed texts and non print materials like films, film strips, models, mock ups studies, pictures, audio and video tapes, recorders, transparencies, globes, chalkboard. Ofoefana (2006) asserts that teachers, medical doctors and skilled professional workers need essential tools and equipment to do their best work. In line with this, Esu, Enukoha and Umorem (2004) add that instructional materials are the pivot and the wheel that encourage effective teaching and learning activities.

According to Mary (2004), instructional materials are characterized based on their ability to appeal to the senses, attract and hold attention, simplicity, availability, flexibility, colourful, visible, timelines, acceptability and relevancy Esu, Enukoha and Umorem (2004) further stated that instructional materials are in various classes and are classified based on their sensory modes, thus;

1. Audio or aural: Audio or aural instructional materials refer to those devices that make use of the sense of hearing only like radio and audio tape recording.

2. Visual instructional materials: are those devices that appeal to the sense of sight only such as chalkboards, charts, slides, and film strips.
3. Audio-visual instructional materials is the combination of devices which appeal to the senses of both hearing and seeing such as television, motion picture and the computer (Esu *et al.*, 2004). Among the instructional materials that the classroom teacher uses are a combination of the audio and the audio-visual.

Category 1: Sensory mode

Audio	**Visual**		**Audio-visual**
	Projected	Non-projected	
Radio, record, disc, audio tape, recordings reel to reel, cassette	Projectors Slides Transparencies	Book Journal Magazine Maps graphs, Newspaper Charts Diagrams, Photographs Posters, Drawing Painting Chalk board	Television Computer Motion picture Video language Laboratory

Source: Esu *et al.* (2004)

Apart from classifying instructional materials based on sensory modes, there are four (4) other ways of classification according to Enukoha (2004) as stated thus;

1. Printed and non-printed
2. Hardware/equipment and software/materials
3. First, second and third generation
4. High technology/high cost and low technology/low cost instructional materials.

Category 2: Printed and Non-printed Instructional Materials

Printed Materials	Non Printed Materials
Books, journals magazines: charts, newspapers, droving, photography, graphs. Cartoons	Television, chalkboard, **models,** specimen, motion picture**.**

Sources: Esu *et al* (2004)

Category 3: Hard ware/ Equipment and Soft Ware/Materials

Hardware/ Equipment	Soft ware/material
Computer, television record players, slides projectors, over head projectors, video players, and machine boards.	Slides, filmstrips, posters, cassette audio and video

Sources: Esu *et al* (2004)

Category 4: First, Second and Third Generation of Instructional Materials

First	**Second**	**Third**
Chalkboard, books, journals, magazines, charts, maps, drawings, painting, posters, photography.	Television, filmstrips, video, radio, projector	Computers, Satellite

Sources: Esu *et al* (2004)

Category 5: High technology/high cost and low cost instructional material

The high cost combines both the second and third generation instructional materials found in the fourth category above while the low cost involves items in the first generations.

2.3 Approaches for Effective Utilization of Instructional Materials

The teachers should exhibit skills and understanding in the use of some instructional materials for maximum results (Mary, 2004). Abdullahi, (2007) re-affirms that there are many ways by which teachers could use instructional materials in teaching depending on their objectives for the lesson to be taught.

Their sources could be mainly for introducing lesson, supporting lesson, demonstration and summarizing lesson.

Dike (1988) emphasize that, effective utilization of instructional materials requires that teachers should put certain factors into consideration which include:

1. The lesson objectives,
2. The suitability of the media,
3. The teacher ability to put media to effective use,
4. The technical quality of media,
5. The availability of the media,
6. The cost of the media.

Barde, Ezugwu, Mohammad and Mustapha (2003) express that some of the important stages at which instructional materials may be introduced include: the introduction, in the body of the lesson (middle) and also at concluding part (towards the end) of the lesson.

2.3.1 Non-Projected Display Instructional Material

Realia and chalk board: are common examples of non-projected display instructional materials mostly used by agricultural science teachers; they are visual aids.

Chalkboard: is the commonly use instructional materials in teaching and learning. It eases teaching and it facilitates learning in almost every lesson. Oloruntobi (2004) pointed out that the flexibility, availability, and versatility of black and white boards are a definite boom to the classroom teacher. Wankat and Oreovicz (2001) also added that chalk boards are excellent for recording

permanent information such as assignments. Oloruntobi (2004) further elaborated the advantages of using the chalk board.

1. They are freely available in classrooms
2. They need no power (except in case of electronic board)
3. They can display a large number of colours.
4. They can be used with a variety of other materials for a broad range of teaching strategies.

In order to effectively use the chalkboard, the agricultural science teacher should abide by the following standards:

(1) Ensure that the chalk board is clear before using it

(2) Bring your chalk with you to the class

(3) If you have problems with your writing draw horizontal lines.

(4) Do not write title of what you intend to teach until it has been introduced.

(5) Stand aside while writing on the chalkboard. Eye contact with students is important. Face the class when you talk. Do not turn your back to the class any more than necessary,

(6) Write the title of your work in capital letters,

(7) Let your words be legible and neat,

(8) Use the chalk that the learners can see clearly on the chalk board e.g. white, yellow and green.

(9) Prepare your teaching aids ahead of your class (Nnaji and Okorie, 2002).

Realia: These are real objects which are brought to the class for illustration. Objects such as coins, tools, plants, animals etc. are everywhere in our

environment. Real things become sources of contents and serves as stimulators for learning when they are studied, handled tested and manipulated. The field trip is a practical way of arranging for an entire class to observe real objects (Quadri et al, 2000).

2.3.2 Projected Display Instructional Materials

Films and slides are motion pictures of people, places and events. They are used to present information in sequence and to create lasting impressions and experiences in the agricultural science class. They are modern materials that give learners the opportunity to learn through more than one of their sense organs, and are very useful substitutes for travelling.

To ensure that slides and films are used to achieve maximum results in terms of stated objectives, the teachers of Agricultural Science must ensure that they:

Focus on an aspect or subject matter which the class is interested in studying.

(1) Familiarize them with the content and identify the specific features to be observed by the learners. In other words, the teacher should preview the film or slide to be shown, to ensure that the audio and visual qualities are okay,

(2) Prepare the learners by telling them the purpose of the lesson.

(3) check to make sure that all the electrical gadgets to be used are in good functioning condition,

(4) Ensure non- interruption of electricity supply.

(5) Organize follow-up activities through questioning to promote critical and reflective thinking.

Teachers should note that, the use of these materials requires skills in terms of operation and maintenance of the equipment. Mass training of Agricultural Science teachers in this area would be quite beneficial.

2.3.3 Printed and Duplicated Instructional Materials

These are also referred to as reading materials. Individuals go through them to gather information about people, places, processes and events. In the class, they can be used to provoke general class discussion/raise issues for in-depth class analysis. The class textbook is a basic material for the agricultural science class However, the nature of agricultural science requires broad and current knowledge. Therefore, the teacher needs to expose learners to other print materials such as encyclopaedia, news magazines, pamphlets and poems. In using them, teachers should not turn the class into a reading session even though developing reading skills is important. These materials should be used to:

1. provide organized object matter for learners to study
2. Envelop the skills of identifying needed information on a variety of issues, persons and processes.
3. solve identified group problems to suggest rational solutions,
4. stimulate thinking and interest,
5. Create awareness of current matters of national and international importance.

However, for these purposes to be achieved the teachers must ensure that the content of such materials are authentic and accurate, to the learners and environment, free from distortions and bias. Also, materials should be checked for good illustrations, clear prints and durability. Furthermore, the teachers should

combine the use of reading materials with other categories of materials to practically illustrate and demonstrate processes.

2.4 Secondary School Agricultural Science Materials

Any practical subject like agricultural science requires materials and tools. In recognizing this, school authorities are to make some provision for these necessities. It is common to find most secondary schools well equipped for teaching wood work, but without any equipment for practical agricultural science - teaching. The equipment needed for work suggested in this research work is very simple much of it can either be collected at home or made by agricultural science teachers and students as well. There are, however a few items which must be bought, and there ought to be a small grant or allowance for this.

According to Imogie (1989) let no agricultural science teacher think that it is impossible to teach agricultural science without most of the apparatus and equipment (instructional materials). Stringent economies may have to be made, the delivery of apparatus and chemicals may be long delayed, or apparatus may be temporarily unobtainable. The poor agricultural science teacher complains, blames lack of equipment for the dullness of his/her lessons, and allows his/her students to revert to the dull monotony of note-taking and passive learning of the textbook.

The good agricultural science teacher, however, finds in the same circumstances a challenge to his ingenuity. With an alert mind he/she adapts his/her lessons to the materials available. With patience, simplified versions of more complicated apparatus can be made. In fact, “the simpler the apparatus, the

better is the student's ability to appreciate the method used and the facts to be illustrated" (Balogun, 1988).

The author stress that, some possible improvisations in agricultural science laboratories include:

Beakers: Canned fruit tins can be used for heating liquid contents.

Botanical Specimens: Flowers, whole plants, leaves, **t**hese can be pressed and dried between sheets of newspaper. Those collections of dried specimens are called a herbarium. Its main purpose is to provide a supply of identified plants for general reference and to facilitate the naming of freshly collected specimens

Bottles: Narrow neck, for liquids - various kinds and sizes which when ordinarily purchased as drug, bottles that contained medicines, etc., may be used.

Those with plastic screw-tops are to be preferred. The paper, or rubber, washer inside the screw-top must be removed and washed or replaced.

Cages: The cages for small domestic animals like chicken, rabbit etc., can be made from wooden boxes, and can be of various types and sizes - simple box type, improved type. A cage which has no glass side is not much used for observation; every school ought to have one at least. An improved cage type is easy to clean the shallow drawer at the bottom can be removed for cleaning without opening the cage. If possible, line the drawer with metal.

Feeding Trough: A small tin can be used as a feeding trough, if the cut sides are rolled inwards to avoid sharp edges. If this hangs by wire hooks, it can be removed without reaching right down into the cage. Some domestic animals like rabbit for example, will drink water from a drinking tube (Odukwe, 1983).

2.5 Rationale for Using Instructional Materials

The conventional chalk and talk method of teaching Agricultural Science in Nigerian secondary schools has not been effective in developing the needed technical knowledge and organization of vocational skill necessary for agricultural development as stated, in the NPE (FRN, 2013). Nnaji and Okorie, (2002) stated that instructional materials offered the teachers and the learners good opportunity to relate the theoretical knowledge to practical experiences.

The usefulness of instructional materials in teaching and learning process includes:

i. Facilitating the learning of abstract concepts and ideas,
ii. Keeping the learner busy and active thus increasing their participation in the lesson,
iii. Saving teacher energy of talking too much,
iv. Illustrating the concept clearer and better than the teacher's words only.
v. Helping to overcome the limitation of the classroom by making the inaccessible accessible.
vi. Helping to broaden students knowledge by increasing their level of understanding as well as discouraging rote-learning (if used judiciously)
vii. Helping to stimulate and motivate learners (Esu *et al.*, 2004).

Ekpo (2004) aptly declared that instructional materials are often used to compensate for the inadequacies of the dominant organs. In line with this Ofoefuna, (2006) asserted that when instructional materials are properly used for teaching and learning the following are attained:

i. Shared expertise,

ii. Knowledge reaching a lot of people simultaneously,

iii. Preservation of records and documents,

iv. Bringing before learners what otherwise appeared imaginary or farfetched,

v. Enriching learning,

vi. Allowing students to learn at their own pace,

vii. Integrating brain with hand in a well rounded education,

viii. Challenging sense of creativity,

ix. Making teaching and learning pleasurable and more effective,

x. Promoting better planning and scheduling on the part of the teacher and

xi. Allowing the teacher more time for supervisory role and individual attention.

2.6 The Use of Computers Information and Communication Technology as Agricultural Science Teaching Tools

A Computer is an electronic device for storing data processing data and performing calculations. It has no intelligences and cannot think, but will do what it is told to do (Patrick, 2002). The world today is in the computer era, computer has become a household word to a vast majority of people. Globally, the immense contribution of computer and internet technologies to the development of agricultural science is quite remarkable. In support of this Mbakwem (2001) points out that, computer and other technological devices are used to deliver data in texts or picture forms with sound, and at the same time provide interactive capability.

Hubard and O'Connell (2007) assert that computer in science teaching has a lot of advantages and amongst these are provision of individual learning options and advanced opinion for stimulation and graphics. Computer when used with groups of students it encourages interaction among students about what they are learning and it leads to understanding and growth of conceptualization of the content of the world and its processes. Reeves (2002) states that computer is used in instruction, satellite broadcasting, words processing and other information network.

The interactive, stimulation provided by computer in science classes are particularly important because they help users to explore and visualize the consequences of their reasoning (Magill, Stuvessy, Vasudaren and Dooley, 2004). Computer Assisted Instruction (CAI) can be of benefit to you and your students in an agricultural science class. If you can procure the basic Information and Communication Technology (ICT) materials, they will be very useful in the class, the learning centres and larger setting. In case one is new to the computer, he may follow the suggestions given below in order to succeed:- Ask for help whenever/wherever necessary;

(i) Go for either in-service/informal training;

(ii) Do not be shy to learn from even your children at home and school (they must have learnt it faster);

(iii) Allow the gifted children to be of aid to their peers in the classroom;

(iv) Consider joining a computer-user group for your own brand of machine (their software and applications vary) and

(v) Do not forget to include a generating set in your list of requirements from donor agencies, (Ajala, 1988);

The world is increasingly becoming a global village through the internet and other information networks. Majority of the teachers at all levels of the educational system at present lack knowledge on computers and its application (Mbakwem, 2001). Therefore, there is need for training and re-training of more Nigerian citizens on computer education. In line with this it has been stated that recent happening in the knowledge and skills application of technology in agriculture has affected the teaching and other basic sciences (Akanbi, 1984). Thus, the need arises to acquire such practical abilities and skills on the use of ICT in teaching of agricultural science in schools and colleges, this involves being able to seek out and use information stored in the computer and other electronics based materials for teaching in order to be up to date. Examples of such materials include: audio and video tape, CD Rom (compact disc) and reader memory. Computer has proved to be a very useful support material in the teaching of agricultural science (Ajala, 1988).

2.7 Agricultural Education in Secondary Schools

Advanced technology is making agriculture more mechanized and more efficient just as instruction in agriculture calls for a pragmatic approach. Johnson (2000) noted that several attempts by past government to introduce agriculture as a vocational subject failed, until in 1977 when the NPE was implemented by the FGN, Olotu (1982) reported that the policy listed agriculture as a course in secondary schools. This indeed revolutionized it to be taught as a science or a vocational course in the secondary schools. He further observed that the policy

would mark radical transformation of the agricultural sector. The 2013 NPE listed practical agricultural as a pre-vocational source at the Junior Secondary School (JSS) and agricultural science as a vocational subject at the senior secondary school levels. Accordingly, graduates of SSS were expected to posses at least some basic skills in agricultural science. Also, any student taking agriculture as a course at the senior levels of secondary schools should have pre-vocational ability to be self-employed.

The teaching of agriculture at the secondary level in Nigeria today is done at two levels: at the JSS and at the SSS. At the JSS, spanning through the first three years of secondary education, "practical agriculture" is recommended as one of the core subjects.

It is therefore, acknowledged that the agricultural science teacher can only teach if he/she is convinced that the subject has some importance for the students. Some agricultural science teachers look on the practical side of agricultural science as an extra, and rather a tiresome extra, because it usually requires more preparation than the purely oral lesson. The value of practical work in such subject (agricultural science) is obvious and is at once recognized. In agricultural science, it is not necessary to spend so large a proportion of time on practical work, but once the agricultural science teacher understands its value, he/she will not be tempted to omit it.

2.8 Strategies for Improving the Usage of Instructional Materials

Strategies are plans for achieving the goal of improving the usage of instructional materials, the usage of instructional materials should be backed up

with encouragement, ready access to instructional materials, training and support before the teacher takes steps toward enhancing how and what they teach with the use of instructional materials (Brace and Robert, 1996). There are several strategies that contribute to the improved usage of instructional materials as summarized by Spodark (2003) thus:

1. **Training**: Training provides new skills and abilities to perform tasks which were not possible previously. It provides confidence in the teachers in undertaking their duties. Ochs, (1993) observes, training is an investment in the skill and productivity of programs, good training course drill concepts in to a format that is easy to master. Training on the usage of instructional materials can be done in either pre-services or initial training and in service programs. Training is the instructing of others in information new to them and its application. Training involves the teaching of new skills, methods and procedures in the use of instructional materials (Glazer, Hannafin and Song, 2005). The most important element in a training situation on the use of instructional materials is the teacher. The teacher who is enthusiastic, energetic and genuinely interested in the training will evoke the greatest response from the trainees. The teacher who lacks interest in the training, who has no enthusiasm for the training goes through the motions of training is a failure (Jacob, 2010). Successful training is the training which provides the desired result, the measure of the success of the training on the use of instructional materials is the relationship that develops between trainer and trainees. In sound, productive training situation there is mutual respect and

trust between them. Training improves the teachers' knowledge and skills on the use of instructional materials (John, 2010). To facilitate teaching and learning of the students using instructional materials, the teacher proceeds from:

a. Knows to unknown
b. Simple to complex
c. Whole to part and back to whole
d. Concrete to abstract
e. Particular to general
f. Observations to reasoning
g. Point to point in logical order (Royer, 2002).

2. **Motivational Strategy**

Motivation has been defined in various ways based on someone's perception of the term. For instance Nyarko, Wiafe and Abdul (2013) define motivation as some kind of internal drive which pursues someone to do things in order to achieve something. Perry and Wise (1990) maintain that motivation is a term that is used to define the success or failure of any complex task. Mackey (2004) in their own views they deal with three matters while discussing motivation. There are what energize human behaviour, what direct or channels such behaviour and how this behaviour is maintained or sustained. Motivation is thought to be responsible for why people decide to do something, how long they are willing to sustain the activity, and how hard they are going to pursue it (Lam and Punch, 2001). Motivation is the word derived from the word 'motive' which

means needs, desires, wants, or drives within the individuals. It is a process of stimulating people to actions to accomplish the goals. In the work goal context the psychological factors stimulating the people's behaviour can be: desire for money, success, recognition, job satisfaction, team work (Imo, 2013). Teachers can be motivated in various ways such as furnishing his or her office and giving him or her car loan by the management he or she is working for. It is in this regards that Green and Awoyua (2001) state that teachers that can be motivated through such methods as pay, promotion praise etc, which are term extrinsic motivation and stems from the work environment external to the task and is usually applied by others or someone other than the person being motivated.

The strength of educational system largely depends upon the quality of its teachers. It is a teacher who helps to change an individual into a person of imagination, wisdom, and discipline, as well as the country into a learning society. Handling the challenging situation in the class as well as outside the class makes teachers exhausted, which hinders their success. Being intrinsically and extrinsically motivated increases job satisfaction (Mackay, 2004); this shows that motivation is of paramount importance and plays a greater role in upgrading and strengthening the quality of job efficiency of teachers.

Teachers may be motivated in two ways, thus; intrinsic or extrinsic. Nyarko *et al.* (2013) point out that intrinsic motivation stems from a direct relationship between the doer and the task and is usually self-applied. These are the self generated factors which influence people to behave in a particular way or to move in a particular direction. These include, responsibility, freedom to act,

scope to use and develop skills and abilities, interesting and challenging work and opportunities for advancement. Extrinsic motivators can have an immediate and powerful effect on individuals, but this will not necessarily have a long lasting effect. Extrinsic motivation is related to tangible rewards (such as furnishing an academic staff office and giving a car loan) and is often determined at the organizational level and is usually outside the control of the individual involved. On the other hand, intrinsic motivators which are concerned with the quality of working life are likely to have a deeper and long-term effect on individuals. It is on this regards that Imo (2013) also maintained that the lack of effective motivation of teachers on use of instructional materials in manifested in an individual indifferences to learning, that is lack of interest in learning, weak drive towards goal attainment and little identification with school subjects, this is manifested in the students by being absent frequently from school due to lack of interest in the teaching learning process. A child who is not under the care of a well-motivated teacher does not take school work serious irrespective of gender.

Current school environments are reward scarce setting for professional work and often seem to work against teachers' best effort to grow professionally and improve students' learning (Peterson, 1995). Recognizing and rewarding teachers enhance instructional materials integration in the teaching and learning process (Spodark, 2003). Several ways of how incentives can be given are as follows:

i. Pay stipends to teachers to explore educational computing and related instructional materials,
ii. Provide instructional materials role models for teachers.

iii. Lend various configurations of instructional materials to teachers for their use.

iv. Encourage and praise to teachers for using instructional materials.

v. Schedule convenient instructional staff development session.

vi. Set-aside time during the work day for teachers to explore computer and related instructional materials (Hope, 1997).

Motivated teacher is one who not only feels satisfied with his or her job, but also is empowered to strive for excellence and growth in instructional practice. . The pay raise across teacher board work environment premium for difficult assignment, grant for research will improve performance of agricultural science teachers (Spear and Pardee, 2000). According to Johnson (2000) measures developed to boost teacher motivation are based on three theories of motivation and productivity:

Expectancy theory: individual are more likely to strive in their work if there is an anticipated reward that they value, such as a bonus or a promotion than if there is none.

(1) Equity theory: individuals are dissatisfied if they are not justify compensated for their effort and accomplishment.

(2) Job enrichment theory: workers are more productive when their work is varied and challenging.

The first two theories are justification for merit pay and career ladder and the third suggests differentiated staffing, use of organizational incentives and reforms-oriented development.

Merit pay has a straight forward appeal. It provides financial rewards for meeting established goal and standards. It also encourages teachers to adjust their teaching down to program goals. Frase, Spear and Pardee (2000) state that teacher enter teaching to help young people learn, that there must be gratifying reward to accomplishing this goals. Daniel (2006) reveals that well implemented school improvement plans can increase collegiality and give teacher the satisfaction to committing themselves to school improvement goal. Johnson (2002) believes that rewards may be more effective in motivating teachers and improving their use of instructional materials. Recognition of teacher effort have been cited as important motivators in the use of instructional materials and also evaluation is an obvious vehicles for using these incentive to direct the teacher on the path towards professional growth and improvement of instructional materials usage (Frase, 1992).

3. **Administrative support**: Adequate implementation of the usage of instructional materials requires support from the administrations. Such as financial allocation, technical support and training as well as monitoring and encouraging the usage of instructional materials in the classes. It is important that administrators take the initiative to organize in house discussion and sharing of ideas on how some of the instructional materials can be incorporated in the classroom. Hope (1997) observed that, leadership must foster on environments where teachers are encouraged to be creative and innovative to explore instructional materials. Without leadership with a vision, instructional materials usage cannot reach its potential in schools. Another source of support comes from

members of staff as they support their peers in the usage of instructional materials. Administrative approach facilitates success, continuity and access to instructional material. It can also reduce the time waste and effort that goes toward the obstacles of instructional material usage (Hubbard, 2007). A sense for team spirit develops when the administrative approach and energy is directed toward the use of instructional materials. Benefits of administrative support are:

(i) Provide access to instructional material
(ii) Minimization of potential schedule conflict on the use of instructional material.
(iii) Sense of team spirit on the use of instructional material.
(iv) Continuity of the instructional materials used (Francis, 2003).

School administrators control what happens at the school level and without their support the continuity of instructional material usage is uncertain. The school principals control the school budget and they allocated the instructional material purchase fund to keep the usage going. Administrative supports on instructional materials usage boost students' performance.

Ways to maintain administrative support on instructional material usage:

(i) Create a rigorous school curriculum that meets standard of instructional material usage at state and zonal education level.
(ii) Integrate the instructional material usage to form part of agricultural science teacher promotion criteria.
(iii) Communicate every success of the instructional material usage in schools.
(iv) Spread the importance of instructional material usage in the school.

(v) Set priorities

(vi) Be flexible

(vii) Be persistent (CEO Forum, 2000)

In any school change effort, the role of the school administrator through every stage of implementation is critical. The attitudes and actions of school leaders surrounding new technologies will encourage and support teachers as they engage in learning opportunities and explore new tools. Through their role as school leaders, school administrators can help ensure that the use of instructional materials is prioritized, and that teachers feel comfortable trying new things (Seaver, 2002). Beggs (2000) affirms the need for such support "as teachers first use instructional materials, the friendly, helping hand of support can make the experience easier, peer support can be one of the easiest and most available ways that teachers can get help, but also calls for collaboration with colleagues, when those who know how to work with a particular instructional materials are willing to render the support needed. Such support is possible when all members of staff have a common goal and work as a team (Hope, 1997). This collegial bond allows for a free open exchange of experiences and knowledge among teachers (Weems and Onwuegbuzie, 2001). This support can be in the form of technical support. Runkel and Schmuck (1994) remarks that demonstrated commitment on the part of the principals facilitate and improve instructional materials usage in the classroom. Another support comes from members of staff as they support peers in the use of instructional materials.

4. Accessibility: Some instructional materials are designated in specialized rooms like computer labs and audio-visual rooms where over head projectors and video equipment are kept. These special rooms need to be easily accessible by members of staff when they need to use a particular instructional material. Brace and Robert, (1996) also emphasized that, secondary schools teachers need access to instructional materials of all types. Example like networked computer, audio visual equipment must be readily available. It should also be noted that equipment may be available but kept under strict rules.

Brace and Robert (1996) recommend check out system that makes instructional materials available and accessible any time and everywhere. Such accessibility enhances lesson preparation and delivery as well as eliminating the frustrations that teachers may have if they can access particular instructional materials that they have planned to use.

For teachers to have access to use instructional material in their teaching, the instructional materials should be made available, Hope (1997) reiterates that for instructional materials to be exploited in an environment, it must first exist, from the classroom point of view, the adequacy of classroom and electricity supply increase the usage of instructional materials (Majed, 1996).

For agricultural science teachers to have access to instructional materials the facilities that accommodate the available resources, in the classrooms for example, accessories like sockets should be available and functioning. The higher order instructional materials like over head projectors being delicate, expensive and sensitive to heat need to be placed in cool rooms. Air conditioners have to be

bought and fixed to help sustain the life span of the instructional materials (Seavers, 2002).

It is well known that when instructional materials are available and the administrators/management are committed to the implementation and when there is willingness of the subordinates (teachers) to participate, the change effect can be noticed (Runkel and Schmuck, 1994). Therefore, confidence and readiness of teachers to persist through frustrations must be addressed but also these must be coupled with good planning procedure in order to bring about change (Weems and Onwuegbuzie, 2001).

Song (2000) stated that the timely effective communication of available instructional materials in secondary schools will improve instructional materials' accessibility by teachers. She also added that the purchasers of instructional materials should be thorough in their selection of Instructional materials vendors that will provide the products in the accessibility format required. Royer (2002), states that identifying and purchasing of instructional materials in most timely way will enhance Instructional materials accessibility need of teachers. He also added that, if products do not exist then the school administrators should have a list of instructional material vendors that can modify existing ones to meet the accessibility need of teachers.

5. **Maintenance**: Keeping the instructional materials running is very important because it ensures continuity in their usage. Members of staff and the administrators should endeavour to draw up regulations to govern the proper use of the instructional materials (Beggs, 2000). Government

should be committed to establishing a full-time position for technicians in all secondary schools. In budgetary allocations a certain amount of money needs to be allocated for the maintenance of instructional materials (Royer, 2002). Glazer, Hannafin and Song (2005), state that instructional materials used by teachers should be returned to school authority immediately after use. School authority should emphasis to teachers that instructional materials are public property and should be appropriately cared for. The author also stated that teachers must pay the replacement cost of any instructional materials lost or damaged beyond ordinary repair. Okon (2002), states that funds should be pay for training of instructional material technicians who are directly involve in the care and maintenance of instructional materials, also the salary and other expenses of an employee who provide technical support for the maintenance of instructional materials should be improved. Okwuanaso (2001) re-affirms that, the more efficient and cost effective maintenance strategies of instructional materials are:

1. Follow the manufacturer's instructions for keeping, using, and maintenance of Instructional materials.
2. Wash and thoroughly dry hands before handling instructional materials.
3. Store and handle instructional materials in a clean environment.
4. Keep food and drink away from instructional material.
5. Do not touch playing surface of audio-visual instructional material.
6. Keep instructional material clean and well maintained.

2.9 Empirical Studies

Daniel (2000) carried out a research study titled Teachers Perception on Utilization of Instructional Materials in the Teaching of Vocational Agricultural Science in Secondary schools in Lagos State. The target population was 300 secondary schools out of which 50 secondary schools were selected as the samples though simple randomization. Four null hypotheses were stated and tested using z-test at 0.05 level of significance with all the four null hypotheses were rejected. The results showed that about 70% of the respondents made use of the instructional materials effectively which had positive relationship in the teaching of vocational agricultural sciences in secondary schools in Lagos state.

The present study is also similar to the work of Daniel (2000) in the aforementioned titled. The present study took place in Kano State SSS in the North Zone, while the previous study was carried out in the South-west Zone of Nigeria. The target population in the present research was 424 agricultural science teachers, while Daniel (2000) used only 300 respondents for his study. Four null hypotheses were formulated by Daniel (2000) while the present research work had five null hypotheses. The previous study made use of random sampling technique, while the present study used the entire population as sample for the study.

Gbenga (2004), carried out a research study titled teachers perception on use of instructional materials in teaching agricultural science in secondary schools in Makurdi Local Government Area (LGA), Benue State. The purpose of the study was to find out the effectiveness of teaching agricultural education using

instructional materials in Makurdi LGA in Benue State. The study was a survey type. The target population was (40) secondary schools out of which 20 secondary schools were selected as the sample by using simple randomization and 35 agricultural education teachers were used. The instrument used in collecting data was questionnaire. Three null-hypotheses were stated which were tested using correlation coefficient test statistics at 0.05% level of significance. All the three null hypotheses were rejected.

The results showed that about 80% of the respondents made use of instructional materials effectively which had positive impact on the students' academic achievement in agricultural education in Makurdi LGA.

The present study is similar with the work of Gbenga (2004) in the aforementioned title, but took place in Kano State senior secondary schools in North West, while the previous study was carried out in Benue in North Central Nigeria. The present study is different with the previous study because in the previous work, 35 agricultural education teachers were used for the study, while the present study used 424 agricultural science teachers. Also in the previous study 20 secondary schools were used for the study, while in the present study 413 senior secondary schools were used. Five null hypotheses were stated and tested in the previous study using correlation coefficient test statistics at 0.08 level of significant, while five null hypotheses were stated and tested in the present research study using t-test statistic at 0.05 level of significance. The present study also differs from the previous study because the present study has a specific level of senior secondary schools, while in the previous study the level was not clearly

stated. The previous study made use of random sampling technique, while the present study used purposive sampling techniques.

Emmanuel (2005) carried out a research titled teachers perception on use of instructional materials in teaching chemistry in selected secondary schools in Delta state. The target population was 25 secondary schools, out of which ten secondary schools were randomly selected to form the study sample by using random sampling techniques. The instrument used in collecting data was a questionnaire. Four null hypotheses were stated and tested using Correlation coefficient test of statistics at 0.08 level of significance and all four null hypotheses were accepted. The results showed that about 85% of the respondents did not appropriately make use of the instructional materials in the teaching and learning which had a negative impact on the students' performance in chemistry in secondary schools of Delta state, Nigeria.

The present study is similar in context with the work of Emmanuel in the aforementioned title, though the two studies differ in subject areas; the previous one was in the field of chemistry, while the present research was in the field of agricultural science. The target population used in the previous study was 25 secondary schools out of which ten secondary schools were selected as the sample size compared to 413 secondary schools that served as the target population in the present research. The present study used five null hypotheses, which were tested using t-test statistics tool at 0.05 level of significance compared with four null hypotheses stated in the previous study which were tested using correlation coefficient test of statistics at 0.08 level of significance. The present study also

differs from the previous study because the present study used specific level of senior secondary schools, while in the previous study the level was not clearly stated. The previous study made use of random sampling technique, while the present study used purposive sampling techniques.

Ishaya and Thankgah (2007), conducted their research study on the effects of using instructional materials on secondary students in the teaching of agricultural science in Jalingo LGA, in Taraba State. The target population used were 14 senior secondary schools. Out of these, 10 secondary schools were selected as the sample by simple randomization. Pre-test/post-test design was employed as an instrument for data collection. Two hundred and forty SSS III students offering agricultural science were used as the sample size. Five null hypotheses were postulated and were tested using z-test statistics at 0.05 level of significance and all the five null hypotheses stated were accepted. The result showed that, 85% of the respondents in the study population did not, fully make use of instructional materials in the teaching of agricultural science to their students, in Jalingo LGA in Taraba State which adversely affected the performance of students in agricultural science subjects.

The present study is similar to the previous study since all the research studies emphasized the use of instructional materials in the teaching and learning of agricultural science in senior secondary schools. But the two studies are different in their locations while the previous was carried out in Taraba State the present study was carried out in Kano State. The previous research study target population was 14 senior secondary schools out of which, 10 Schools were

selected, while the present study used 413 SSS. In the previous study pre-test and post-test design were employed as instruments for data collection, while the present study used questionnaire as instruments for data collection. The previous research study was tested using the z-test statistics, but the present study was tested using t-test statistics. The previous study used sample size of 240 students, while the present research study used 424 respondents. The previous study made use of random sampling technique, while the present study used the entire population as a sample for the study.

Samson (2007), carried out a research study titled, teachers' perception on use of instructional materials for teaching and learning of Biology in Nassarawa State. The purpose of the study was to find out the effectiveness of teaching Biology, using instructional materials in Nassarawa State. The study used a survey design. The target population was 400 respondents, out of which 100 respondents were selected as the samples by using random sampling techniques and 55 Biology teachers were used. The instrument used in collecting data was questionnaire. Four null hypotheses were formulated which were subjected to a statistical test with the use of the chi-square (X^2) statistics at 0.05 level of significance, and all the four null hypotheses stated for the study were rejected.

The result showed that about 80% of the respondents made use of instructional materials appropriately, which had positive effect on the performance of the students in Biology in Nassarawa State. Nigeria. The research findings showed that, the teacher preparations and the correct usage of instructional materials had positively improved the students' performances, in Biology in Nassarawa State.

The present study is similar to the previous one since all the research studies emphasized on the use of instructional materials in teaching and learning processes in the secondary schools. But the present study took place in Kano State SSS, in the North West Zone, while the previous study was carried out in the North Central, Nigeria. The present study is different from the previous because fifty five teachers were used for the study while in the present study used 424 agricultural science teachers were used. The present study also differs from the previous because the present study used of SSS, while in the previous study the level was not clearly stated. The target populations in the present study were 413 SSS. Compared to Samson who worked on four hundred respondents (400), the present study is different from the previous research study because the previous research formulated and tested four null hypotheses, while the present study formulated and tested five null hypotheses. The previous study used random sampling technique, while in the present study the entire population was used as a sample of the study.

Aliyu (2007) carried out a research study titled teachers perception on use of instructional materials in the teaching of Mathematics in Jigawa state secondary schools. The target population was 280 secondary schools out of which 53 secondary schools were selected as samples by using simple random sampling techniques; also forty two Mathematics teachers were used. The instrument used for data collection was questionnaire. Five null hypotheses were postulated and were tested using z-test statistical tool at 0.05 level of significance and all the five null hypotheses were accepted for the study. The result showed that 85% of the

respondents in the study population did not fully make use of instructional materials in the teaching of Mathematics to their students in the Jigawa State which adversely affected the performance of students in Mathematics subject.

The present study is similar to the previous study because they both emphasized on the use of instructional materials in teaching and learning processes in secondary schools. The target population in the present research was four hundred and twenty four (424) respondents. While, the previous study had a target population of 280 secondary schools out of which 60 secondary schools were selected as the sample size. In the present study null hypotheses were tested using t-test statistics while the previous research study null hypotheses were tested using chi-square at 0.05 levels of significance. The present study also differs from the previous study because the present study used senior secondary schools, while in the previous study the level was not clearly stated. The previous study made use of random sampling technique, while in the present study the entire population was used as a sample of the study.

Dominic (2017) conducted a research on topic titled teacher perception on utilization of instructional materials in teaching of Social Studies in JSS in Calabar Municipality of Cross River state, Nigeria. The study had one objective, the study was a survey type. The population for study were 53 social studies teachers. Instrument for data collection was structured questionnaire, mean and standard deviation was used as tools for data analyses. The result shows that 75% of respondents perceive instructional materials as necessary for effective teaching and learning.

The present study is similar to the previous being that all the research studies emphasized the use of instructional materials in teaching and learning processes in the secondary schools. But the present study took place in Kano State SSS in the North West Zone, while the previous study was carried out in Calabar, Cross River in South-South, Nigeria. The present study is different from the previous because 53 social studies teachers were used for the study while in the present study used 424 agricultural science teachers were used. The present study also differs from the previous because the present study used of SSS, while in the previous study the JSS. The target populations in the present study were 413 SSS. Compared to Dominic who worked on 100 respondents, the present study is different from the previous research study because the previous research formulated and tested one null hypothesis, while the present study formulated and tested five null hypotheses. The previous study used random sampling technique, while in the present study the entire population was used as a sample of the study.

2.10 Summary of Literature Reviewed

The study of agricultural science is very important. The rate of unemployment is increasing this can be reduced to the barest minimum, when agricultural production is increased with involvement of trained labour force. However, the unfortunate thing is that many school authorities have lukewarm attitude towards the provision and utilization of the tools, equipment, and farm inputs required for the training of the students. This trend consequently makes them hate agricultural science thereby resulting in mass importation of food and raw materials by government. The negligence of innovations on instructional

materials usage have also resulted in the general decline in the agricultural science teaching and learning processes.

The study reviewed concepts of the terms instructional materials, also the study reviewed the rationale for using instructional materials in the teaching and learning processes in SSS. The study highlighted the problems of using instructional materials by teachers in teaching and learning of agricultural science in SSS. The study provided some insight on the solution of the identified problems of using instructional materials in the teaching and learning processes.

The study also reviewed characteristics of instructional materials, criteria for selecting instructional materials and guidelines for using instructional materials and those concepts to the best of the researcher's knowledge were absent in the previous studies. The review also provided insight into studies that are similar to the present study in order to buttress the point, this researcher had in mind. This research study used purposive sampling techniques in the processes of selecting the respondents for the study, while none of the previous study used purposive sampling techniques in the process of selecting respondents. The present study also reviewed strategies for improving the usage of instructional materials, strategies for effective utilization of instructional materials, while in the previous studies there was negligence of innovations on instructional materials usage. Lastly six empirical studies were reviewed and it was observed that to the best of the researchers` knowledge, that none of the six empirical studies reviewed highlighted on the strategies for improving the usage of instructional materials for teaching of agricultural science in senior secondary schools in Kano state, Nigeria hence these form the gap this study filled.

CHAPTER THREE
RESEARCH METHODOLOGY

This chapter presents the methodology employed to carry out this study. It is presented 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 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 survey research design was employed in conducting this study. The choice of the design was based on the opinion of Douglass (2008) who highlighted that descriptive survey research design is the most dominant technique used for educational research.

3.2 Population for the Study

The target population for the study comprising 424 agricultural science teachers from 413 SSS offering agricultural science in Kano State.

Table 1: Population for the Study

Senatorial Zone	Zonal Education Office	№ of Schools Offering Agricultural Sci.	№ of Agricultural Science Teachers (Sample)
Kano North	Bichi	24	24
	Gwarzo	23	26
	Dambatta	32	33
Kano Central	Dala	27	28
	Dawakin Kudu	32	34
	Kura	29	30
	Minjibir	35	35
	Municipal	31	31
	Nassarawa	29	32
Kano South	Karaye	32	33
	Gaya	36	35
	Rano	28	28
	Tudun Wada	29	30
	Wudil	26	25
Total		**413**	**424**

Source: Kano State Ministry of Education (2013).

3.3 Sample Size and Sampling Procedure

The entire 424 agricultural science teachers were used for the study. Glenn (2009) recommends that at precision level of ±3% for population of <1,000, the entire respondents should be used. Sheka (2011) also states that a researcher is expected to study the entire population as against sampling when the entire size of the population to be studied is small.

3.4 Instrument for Data Collection

The instrument for data collection was the use of a structured questionnaire. Four point rating scale was used to generate the opinions of the respondents. The questionnaire was divided into six sections, A, B, C, D, E and F (appendix II). Section A focused on the bio-data of the respondents, while section B to F consisted of 39 items used to collect data that answered the research questions and for the test of null hypotheses. A break-down of sections B to F of

the questionnaire items with respect to each research questions is as follows: section B with items 1 - 9 was centred on training modes for improving the usage of instructional materials for the teaching of agricultural science. Section C consisting of items 10 – 15 was centred on motivators for teachers to improve the use of instructional materials for teaching agricultural science. Section D with items 16 – 25 was based on administrative approaches for improving the usage of instructional materials for teaching agricultural science. Section E with items 26 – 33 was centred on ways of increasing access and improved usage of instructional materials for teaching agricultural science. Section F, contained items 34 – 39 was based on the maintenance practice for improving the usage of instructional materials for teaching agricultural science. In all sections, the respondents were required to tick the best option. The rating scale in section B to F had four options, namely; Strongly Agree' (SA), 'Agree' (A), 'Disagree' (D) and 'Strongly Disagreed' (SD), with points allocated thus:

Strongly Agree - 4 points
Agree - 3 points
Disagree - 2 points
Strongly Disagree - 1 point

In order to facilitate data analysis, better judgment, and general conclusion, all the agricultural science teachers responded to the same questionnaire items.

3.4.1 Validation of the Instrument

Face validity of the instrument were established by giving the questionnaire items to three experts in the Department of Vocational and

Technical Education Ahmadu Bello University, Zaria for vetting and for comment, suggestions and possible amendment. Their corrections and suggestions in areas of grammar, appropriateness, and spellings were incorporated into the final copy of the instrument.

3.4.2 Pilot Study

In order to establish the reliability of the instrument, pilot study was conducted in Jigawa State. This is because the state has some common characteristics and distinctive features with Kano state. Sixteen copies of the questionnaire were administered to 16 agricultural science teachers for this pilot study. The filled copies of the questionnaire were collected back by the researcher within a stipulated period of two weeks. The data obtained were used to carry out statistical analysis to determine the reliability co-efficient of the instrument.

3.4.3 Reliability of Research Instrument

Data collected were soughed by the use of test-retest method. All data collected from the pilot study were subjected to statistical analysis using SPSS. The result gave reliability co-efficient of 0.71. Warren (2003) observes that an average measure value of reliability co-efficient must not be less than 0.60. A reliable co-efficient of this value implies that the instrument is internally consistent and valid for the study.

3.5 Procedure for Data Collection

The researcher obtained a letter of introduction from the Head, Department of Vocational and Technical Education, Ahmadu Bello University, Zaria which was used to introduce himself to the concerned persons in all the

SSS covered by the study. The collection of data lasted for a period of seven weeks within working hours. Two educational zones were covered per week. All the 424 copies of questionnaire were administered to the agricultural science teachers in their schools. The researcher administered the instruments to the respondents with the help of two trained research assistants from each of the fourteen educational zones. Area which needed further clarification was explained to the respondents and all the copies of the questionnaires were retrieved immediately.

3.6 Procedure for Data Analysis

The data obtained were analyzed, using descriptive statistics in the form of frequencies and percentages to analyze the educational qualification of the respondents. Opinions of the respondents were calculated by the use of mean and standard deviation of each item in the questionnaire to answer the research questions. All the five null hypotheses stated in the study were tested at 0.05 alpha levels of significance using t-test statistic. The mean rating of 2.50 was used as the decision rule, score of 2.50 and above was regarded as agree while a score of less than 2.50 was regarded as disagree. Where the results of the calculated t-value was greater than the critical t-value, the null hypotheses was accepted, and vice-versa (Baba, 2009).

CHAPTER FOUR
DATA PRESENTAION AND ANALYSIS

This chapter is on the analysis of data and presentation of results of this study and presented under the following sub-headings.

4.1 Analysis of Respondents` Educational Qualification

4.2 Answer to Research Questions

4.3 Testing of Null Hypotheses

4.4 Summary of Major Findings

4.5 Discussion of the Findings

4.1 Analysis of Respondents Educational Qualification

Table 2: Distribution of respondents' according to educational qualification

Qualification	Frequency	Percentage (%)
NCE	152	36
Bsc	32	8
Msc	4	1
Bsc. Ed	98	23
Msc Ed	8	2
PGDE	30	7
OND	40	9
HND	60	14
Total	**424**	**100**

The analyses of respondents presented in Table 2 shows that 98 (23%) of the respondents were B.Sc. Ed holders. Respondents with NCE stood at 152 representing 36%, those that had M.Sc. Ed were 8 in numbers representing 2%.

Yet, 30 respondents had PGDE representing 7%, while, 40 of them had OND (9%). And also 60 respondents representing 14% were HND holders. Thirty two respondents had B.Sc, whereas, 4 of them had M.Sc representing 8% and 1%, respectively. By implication, most of the respondents are NCE holders.

Table 3: Distribution of respondents by professionalism

Professionalism	Freq.	Percentage
Qualified	288	68
Unqualified	136	32
Total	**424**	**100**

Field Study, 2017

The analysis of responses by professionalism in Table 3 shows that 288 (68%) of the respondents were qualified agricultural teachers, while, 136 (32%) of them were unqualified teachers of agriculture science. The finding shows that most of the respondents are trained agricultural science teachers.

4.2 Answer to Research Questions

The Summary of result of the data used to answer research questions 1 – 5 is presented in Tables 4 to 8. Details of the result are as presented in the Appendix v.

Research Question One: What are the teachers' perceptions on training modes for improving the use of instructional materials for agricultural science in Senior Secondary Schools in Kano State, Nigeria?

Analysis of data used to answer research question one is presented in Table 4.

Table 4: Mean score and standard deviation showing teachers' perception on training modes for improving the use of instructional materials for teaching agricultural science in SSS in Kano state, Nigeria?

Teachers' perception of training modes for improving the use of instructional materials	X	SD	Decision
Organizing conferences for agricultural science teachers on the use of instructional materials in each zonal education offices will improve the usage of instructional materials.	2.9	1.7	Agreed
Providing long vacation training programme for agricultural science teachers on the use of instructional materials by Kano state government will improve the usage of instructional materials	3.1	1.7	Agreed
Organizing workshops for agricultural science teacher on the use of use of instructional materials.	2.8	1.6	Agreed
Organizing in-house discussion and sharing of ideas for agricultural science teachers on the use of instructional materials in each zonal education officers will improve the instructional materials in senior secondary schools will improve the usage of instructional material.	2.9	1.7	Agreed
Organizing symposiums for agricultural science teachers in the each zonal education offices on the use of instructional materials will improve instructional materials usage.	2.8	1.6	Agreed
Organizing seminars for agricultural science teachers on the use of instructional materials in all the senior secondary schools will- improve the use of instructional materials.	2.7	1.6	Agreed
Organizing orientation programmes for newly recruited agricultural science teachers on the use of instructional materials in each zonal educational office will improve the use instructional materials.	2.6	1.6	Agreed
Reviving the culture of excursion in all the SSS in Kano state will improve the use of instructional materials.	3.3	1.8	Agreed
Massive mobilization programs to awaken agricultural science teachers on the use of instructional materials in SSS by Kano state government will improve the use of instructional materials.	2.9	1.7	Agreed
	3.2	**0.77**	

Field Study, 2017

The summary of the result in Table 4 revealed 3.2 average weighted mean with 0.77 standard deviation for the respondents with the view that organizing conferences, workshops, excursions, symposiums, enlightenment campaign, seminars, in house discussion, induction course to newly recruited teachers and long vacation training on the use of instructional materials had positively improved agricultural science teachers usage of instructional materials. From the analysis the calculated mean was greater than the benchmark for agree (3.2 > 2.5). Hence, it was concluded that training on the use of instructional materials had positively improved agricultural science teachers usage of instructional materials for the teaching of agricultural science in SSS in Kano state, Nigeria. (see Appendix v).

Research Question Two:	**What are the teachers' perception on motivators for teachers to improve the usage of instructional materials for teaching Agricultural science in Senior Secondary Schools in Kano state, Nigeria?**

Analysis of data used to answer research question two is presented in Table 5.

Table 5: Mean score and standard deviation showing teachers' perception on motivators for teachers to improve the usage of instructional materials for the teaching of Agricultural science in SSS in Kano state, Nigeria.

Teachers' perception of motivators for teachers to improve the usage of instructional materials	X	SD	Decision
Giving recommendation letter to agricultural science teachers that adequate use of instructional materials will improve the use of instructional materials.	1.97	1.4	Disagreed
Paying stipends to agricultural science teachers that use instructional materials will improve the use of instructional materials.	1.53	1.2	Disagreed
Promoting agricultural science teachers with one grade level that use instructional materials in SSS will improve the use of instructional materials.	2.27	1.5	Disagreed
Praise to agricultural science teachers that use instructional materials will improve the use of instructional materials.	1.88	1.37	Disagreed
Merit pay for agricultural science teachers that use instructional materials will improve the use of instructional materials.	2.72	1.65	Agreed
Enhancing salary by one step to agricultural science teachers that use instructional materials will improve the use of instructional materials.	2.39	1.54	Disagreed
	3.1	**0.68**	

Field Study, 2017

The data analysis used to answer research question two is as presented in Table 5, indicated a weighted mean with standard deviation of 0.68 for the respondents who endorsed that commendations, promotion, praises, financial motivations, and salary enhancement had positively improved the teachers' usage of instructional materials for the teaching of agricultural science. 0.68. From the result, the calculated mean of 3.1 was greater than the benchmark of 2.5 for agree (3.1>2.5). Hence, the study showed that motivational strategies had positively improved the teacher's usage of instructional materials for the teaching of agricultural science in SSS in Kano state, Nigeria.

Research Question Three: **What are the teachers' perception of administrative approaches required for improving the usage of instructional materials for teaching agricultural science in SSS in Kano state, Nigeria?**

Analysis of data used to answer research question three is presented in Table 6.

Table 6: Mean score and standard deviation showing teachers' perception of administrative approaches required for improving the usage of instructional materials for the teaching agricultural science in SSS in Kano State, Nigeria.

Teachers' perception of administrative approaches required for improving the usage of instructional materials	X	SD	Decision
Provision of adequate time for practical use of instructional materials will agree improve the use of instructional materials	2.26	1.50	Disagreed
Installation of technological related agricultural science instructional materials will improve the use of instructional material	2.26	1.50	Disagreed
Drawing regulation to govern the proper usage of instructional materials will improve the use of instructional materials	2.97	1.72	Agreed
Supervising agricultural science teachers that use instructional materials in the classroom will improve the use of instructional materials	3.91	1.78	Agreed
Allocation of fund for the purchase of instructional materials in Senior Secondary schools will improve the use of instructional materials.	2.84	1.68	Agreed
Introducing instructional materials levy in the SSS will improve the use of instructional materials.	3.09	1.75	Agreed
Ensuring adequate supply of needed instructional materials to agricultural science teachers will improve the use of instructional materials.	3.23	1.79	Agreed
Making the use of instructional material by agricultural science teachers to form part of the condition for their promotion will improve the use of instructional materials	3.48	1.86	Agreed
Acquisition of agricultural science instructional materials through organizations such as; ETF and PTA will improve the use of instructional materials	3.38	1.83	Agreed
Setting of instructional materials task fund to be funded by companies and NGOs in all the SSS will improve the use of instructional material	2.94	1.71	Agreed
Field Study, 2017	**3.2**	**O.65**	

Table 6 presents the result of the data used to answer research question three and the summary of the result revealed 3.2 weighted mean and standard deviation value of 0.65 of the respondents opined that provision of adequate time for practical, installation of technology related to agriculture, monitoring of teachers, provision of funding for procurement of instructional materials, regulations to govern the use of instructional materials and procurement of instructional materials had positively improved the usage of instructional materials for the teaching of agricultural science in SSS Kano state, Nigeria. . From the analysis, calculated weighted mean was (3.2 > 2.5) index for agree. The result therefore, shows that good administrative approach had significantly improved agricultural science teachers use of instructional materials for the teaching of agricultural science in SSS in Kano state, Nigeria.

Research Question Four: What are the teachers' perception of ways of increasing access to improve the use of instructional materials for teaching agricultural science in SSS in Kano state, Nigeria?

Analysis of data used to answer research question four is presented in Table 7.

Table 7: Mean score and standard deviation on teachers' perception of ways of increasing access and improvement in the usage of instructional materials for teaching agricultural science in SSS in Kano state, Nigeria

Teachers' perception of ways of improving the usage of instructional materials	X	SD	Decision
Provision of constant electricity supply in Senior Secondary Schools will improve the access of instructional materials.	3.6	1.8	Agreed
Dissemination of information to agricultural science teachers by Kano State SSS Management Board about newly acquired instructional materials will improve the usage of instructional materials.	3.4	1.8	Agreed
Making the instructional materials location to be easily accessible by agricultural science teachers in Senior Secondary schools will improve instructional materials usage.	3.3	1.8	Agreed
Establishing agricultural science instructional materials comets in all the SSS classes equipped with local materials will improve the access of instructional materials	3.1	1.7	Agreed
Provision of adequate agricultural science audiovisual laboratories in SSS will improve the use of instructional materials	2.6	1.6	Agreed
Provision of technology related to teaching of agricultural science will improve the use of instructional materials	2.5	1.6	Agreed
Establishing agricultural science zonal resource centers at the zonal education offices to produce low cost instructional materials will improve the use of instructional materials.	3.6	1.8	Agreed
Establishing agricultural science mini resource development centres with enough local materials will improve the access of instructional materials	3.4	1.8	Agreed
Field Study 2017	**3.2**	**O.77**	

From Table 7, respondents opined that, constant supply of power, dissemination of information to teachers on newly acquired instructional materials, supply of audio, visual and audio visual instructional materials, establishing of resource development centre, provision of technological gadgets and making the location of instructional material easily accessible had positively improved instructional materials usage by agricultural science teachers. Those that had divergent views 0.9 weighted mean. From the analysis, calculated weighted mean was (3.2 > 2.5) indexes for agree. The result therefore, shows that

improving accessibility of instructional materials had positively improved agricultural science teachers use of instructional materials. (see Appendix II).

Research Question Five: **What are the teachers' perception of maintenance practices for improving the use of instructional materials in teaching agricultural science in SSS in Kano state, Nigeria?**

Analysis of data used to answer research question five is presented in Table 8.

Table 8: Mean score and standard deviation on teachers' perception of maintenance practices for improving the use of instructional materials for teaching agricultural science in SSS in Kano state

Teachers' perception of maintenance practices for improving the use of instructional materials	X	SD	Decision
Providing adequate storage space for agricultural science instructional materials will improve the use of instructional materials	2.8	1.6	Agreed
Proper servicing of available agricultural science instructional materials in all the SSS will improve the use of instructional materials.	3.2	1.7	Agreed
Providing adequate funding by Kano state government for the maintenance of instructional materials in all the SSS will improve the use of instructional materials	3.1	1.7	Agreed
Establishing a full time position for Instructional Materials Technicians in all the SSS by Kano state government will improve the use of instructional materials	2.7	1.6	Agreed
Provision of rules and regulations guiding the usage of agricultural science instructional materials will improve the use of instructional materials.	3.2	1.7	Agreed
The involvement of professionals in the field of instructional materials in the physical planning of instructional materials storage facilities will improve the usage of instructional materials.	2.7	1.6	Agreed
Field Study, 2017	**3.O**	**O.73**	

The analysis of the result presented in Table 8 revealed that 3.0 average weighted mean with 0.73 standard deviation for agricultural science teachers who disclosed that provision of adequate storage space, servicing of instructional

materials, adequate funding, making rules and regulations guiding the usage and maintenance of instructional materials and involvement of professionals to take proper care of instructional materials had positively improved the usage of instructional materials for the teaching of agricultural science. The result of the analysis shows that calculated mean value was greater than the benchmark for agree (3.0 > 2.5). Based on this analysis, it is therefore, concluded that maintenance practices had positively improved the usage of instructional materials for the teaching of agricultural science in SSS in Kano state, Nigeria. (see Appendix II).

4.3 Test of Null Hypotheses

Result of data collected from field work were used to test the null

hypotheses 1 – 5 as presented in Table 9 to 13

Null Hypothesis One: **There is no significant difference between the mean responses of qualified and unqualified agricultural science teachers' perception on training modes required to improve the use of instructional materials for teaching agricultural science in SSS in Kano state, Nigeria.**

T-test analysis to null hypothesis one is as presented in Table 9.

Table 9: t-test analysis on the mean responses between qualified and unqualified agricultural science teachers' perception of training modes for improving the use of instructional materials for teaching agricultural science

Groups	N	X	SD	t-cal	t-value	Df	Sig. (2-tailed)
Qualified	288	3.1	0.31	1.88	1.96	424	0.061
Unqualified	136	2.9	0.28				

Field Study, 2017

The result in Table 9 indicates that the t-calculated value of 1.88 was less than t-critical value of 1.96 at 0.05 level of significance and at the same degree of freedom (1.88 < 1.96). This can also be seen in the alpha value of the result (0.061 > 0.05). The result therefore shows that there was no significant difference on the opinions of qualified and unqualified agricultural science teachers on the training modes for improving the use of instructional materials for teaching agricultural science in SSS in Kano state, Nigeria. The null hypothesis was therefore uphold/retained.

Null hypothesis Two: **There is no significant difference between the mean responses of qualified and unqualified agricultural science teachers' perception of motivators for teachers to improve the use of instructional materials for teaching agricultural science in SSS in Kano state, Nigeria.**

T-test analysis to null hypothesis two is as presented in Table 10.

Table 10: t-test analysis in the mean responses between qualified and unqualified agricultural science teachers' perception of motivators for improving the use of instructional materials for teaching agricultural science

Groups	N	X	SD	t-cal	t-value	Df	Sig. (2-tailed)
Qualified	288	2.9	0.56				
				1.64	1.96	424	0.072
Unqualified	136	3.1	0.53				

Field Study, 2017

The result in Table 10 indicates that t. calculated value of 1.64 was less than t. critical value of 1.96 at 0.05 level of significant and at the same degree of freedom. This can be seen in the alpha value 0.072 > 0.05. The result revealed that there was no significant difference on the opinions of the qualified and unqualified agricultural science teachers on motivators for improving the use of

instructional materials for teaching agricultural science in SSS in Kano state, Nigeria. The null hypothesis two was therefore retained.

Null Hypothesis Three: **There is no significance difference between the mean responses of qualified and unqualified agricultural science teachers' perception of administrative approaches for improving the use of instructional materials for teaching agricultural science in SSS in Kano state, Nigeria.**

T-test analysis to null hypothesis three is as presented in Table 11

Table 11: t-test analysis on the mean responses between qualified and unqualified agricultural science teachers' perception of administrative approaches for improving the use of instructional materials for teaching agricultural science

Groups	N	X	SD	t-cal	t-value	Df	Sig. (2-tailed)
Qualified	288	2.9	0.57				
				1.86	1.96	424	0.058
Unqualified	136	3.3	0.59				

Field Study, 2017

From Table 11, the computations indicated that the calculated t-value of 1.86 was less than the t-critical value of 1.96 at 0.05 level of significant and at same degree of freedom. This can be seen at the alpha value 0.058 > 0.05. The result therefore, shows that there was no significant difference on the opinions of the qualified and unqualified agricultural science teachers on administrative approaches for improving the use of instructional materials for teaching agricultural science in SSS in Kano state, Nigeria. The null hypothesis three was therefore retained.

Null Hypothesis Four: **There is no significance difference between the mean responses of qualified and unqualified agricultural science teachers' perception of ways of increasing access to improve the use of instructional materials for teaching agricultural science in SSS in Kano state, Nigeria.**

T-test analysis to null hypothesis four is as presented in Table 12

Table 12: t-test analysis on the mean responses between qualified and unqualified agricultural science teachers' perception of ways of increasing access to improve the use of instructional materials for teaching agricultural science

Groups	N	X	SD	t-cal	t-value	Df	Sig. (2tailed)
Qualified	288	3.2	0.76				
				1.71	1.96	424	0.077
Unqualified	136	3.0	0.59				

Field Study, 2017

From Table 12, the computations indicated that the calculated t-value of 1.71 was less than the t-critical value of 1.96 at 0.05 level of significant and at the same degree of freedom. This can also be seen in alpha value $0.077 > 0.05$. The analysis therefore, shows that there was no significant difference on the opinions of the qualified and unqualified agricultural science teachers on ways of increasing access to improve the use of instructional materials for the teaching of agricultural science in SSS in Kano state, Nigeria. The null hypothesis was therefore retained.

Null Hypothesis Five: **There is no significance difference between the mean responses of qualified and unqualified agricultural science teachers' perception of maintenance practise for improving the use of instructional materials for teaching agricultural science in SSS in Kano state, Nigeria.**

T-test analysis to null hypothesis five is as presented in Table 13

Table 13: t-test analysis on the mean responses between qualified and unqualified agricultural science teachers' perception of maintenance practices for improving the use of instructional materials for teaching agricultural science

Groups	N	X	SD	t-cal	t-value	Df	Sig. (2-tailed)
Qualified	288	2.8	0.63				
				1.88	1.96	424	0.074
Unqualified	136	3.3	0.83				

Field Study, 2017

From Table 14 the computations indicated that the t-calculated value of 1.88 was less than t-critical value of 1.96 at 0.05 level of significant and at the same degree of freedom. This can be seen in alpha value of 0.074 > 0.05. The result therefore, shows that there was no significant difference on the opinions of the qualified and unqualified agricultural science teachers on maintenance practices for improving the use of instructional materials for the teaching of agricultural science in SSS in Kano state, Nigeria. The hypothesis was therefore retained.

4.4 Summary of the Major Findings

The major findings of this study are summarised as follows:

The finding of research question one which was further affirmed by null hypothesis one revealed that trainings modes such as organizing conferences,

workshops, symposiums, excursion, enlightenment campaign, induction course for newly recruited teachers, long vacation programs and seminars had positively improved the use of instructional materials for teaching agricultural science in SSS in Kano state.

The result of research question two shows that motivational strategies such as commendations, financial motivation, promotion, praises, and salary enhancement are essential strategies required by teachers to improve the usage of instructional materials in teaching agricultural science in SSS in Kano state.

The result of research question three shows that administrative approaches such as provision of adequate time for practical, installation of technological gadget, monitoring of agricultural science teachers, provision of funding for procurements of instructional materials and adequate supply of needed instructional materials had positively improved the usage of instructional materials for teaching agricultural science in SSS in Kano state, Nigeria.

The outcome of research question four and null hypothesis four indicated that ways of increasing access to improve the usage of instructional materials such as constant supply of power, dissemination of information, making the instructional materials location easily accessible, supply of audio, visual and audio-visual instructional materials, provision of technological gadgets and establishment of resources development centres had positively improved the usage of instructional materials for teaching agricultural science in SSS in Kano state.

Research question five and null hypothesis five indicates that maintenance practices for improving the usage of instructional materials in teaching agricultural science in secondary schools in Kano state include provision of adequate storage space, servicing of instructional materials, adequate funding, making rules and regulation guiding the usage, maintenance of instructional materials in the schools and involvement of professionals to take proper care of instructional materials had positively improved the usage of instructional materials for teaching of agricultural science in SSS, in Kano state, Nigeria.

4.5 Discussion of Findings

The finding of research question one which was further affirmed by null hypothesis one revealed that trainings modes such as organizing conferences, workshops, symposiums, excursion, enlightenment campaign and seminars will help to improve the use of instructional materials for teaching agricultural science in SSS in Kano state. Similarly, John (2002) maintained that successful training is the training which provides the desired result, he also pointed out that the measures of the success of the training on the use of instructional materials is the relationship that develop between trainers and trainees, in sound and productive training situation there is mutual respect and trust between them. This finding agrees with that of Jocob (2000) who reported that a teacher who is enthusiastic, energetic and genuinely interested in the training will evoke the greatest response from the trainees. CEO (2000) maintained that training is the instructing of others in information new to them and its application. Ely (1990) also observed that, to facilitate teaching and learning of the students using instructional materials, the

teacher proceeds from known to unknown; simple to complex; whole to part and back to whole; concrete to abstract; particular to general; observations to reasoning and, point to point in logical order, training on the use of instructional materials can be done in both pre-service or initial training programs and in-service programs.

The result of research question two shows that motivation such as commendations, financial motivation, promotion, praises, and salary enhancement are essential strategies required by teachers to improve the usage of instructional materials in teaching agricultural science in SSS in Kano state. This was also the same with test of null hypothesis two. This finding agree with that of Koontz and Weihrich (1990) and Edwin (1993) who maintained that the way to use money as a reward for accomplishment of learning objective, is by giving teachers compensation as much as possible. Similarly, Armstrong (1996) emphasized the value of extrinsic motivation, this author observed that money provides means to achieve a number of different ends. Similarly, Jocob (2000), opined that pay is one of the powerful motivating tools. In the same line, Mullins (2005) pointed out that intrinsic motivation such as salary and fringe benefits and promotion have significant effects on teachers' performance. Furthermore, Green and Awoyu (2001) revealed that teachers who are well motivated in the teaching and learning process tend to do well in their line of duty, even when the learning environment is not ideal. Ukaejiofo (2013) observe that motivation in the form of wages financial incentives and bonuses have improved the performance of teachers in their working environment. Peterson and Keneeth (1995) reported that current

school environment are reward scarce setting for professional work and often seem to work against teachers' best effort to grow professionally and improve students' learning. The study of Hope (1997) postulated several ways by which incentives can be given as follows (i) pay stipends to teachers to explore educational computing and related instructional materials; (ii) provide instructional materials role models for teachers; (iii) lend various configurations of instructional materials to teachers for their use; (iv) encourage and praise teachers for using instructional materials; (v) schedule convenient instructional staff development session; and (vi) set-aside time during the work day for teachers to explore computer and related instructional materials. According to Johnson (2000) measures developed to boost teacher motivation are based on three theories of motivation and productivity :- (i) expectancy theory: individual are more likely to strive in their work if there is an anticipated reward that they value, such as a bonus or a promotion than if there is none; (ii) equity theory: individual are dissatisfied if they are not properly compensated for their effort and accomplishment, and (iii) job enrichment theory: workers are more productive when their work is varied and challenging.

Spodark (2003) also reported that recognizing and rewarding teachers that use instructional materials enhance instructional materials integration in the teaching and learning process. Johnson (2002) believes that rewards may be more effective in motivating teachers and improving their use of instructional materials. Recognition of teacher effort have been cited as important motivators in the use of instructional materials also evaluation is an obvious vehicles for using these

incentives to direct the teacher on the path towards professional growth and improvement of instructional materials usage (Begg, 2000). Similarly Daniel (2006) revealed that well implemented school improvement plans can increase collegiality and give teacher the satisfaction to committing themselves to school improvement goal. Frase et al (1992) stated that teacher enter teaching to help young people learn, that there is gratifying reward to accomplishing this goals. Dick, Carry, and Carey (2000) maintained pay raise across teacher board work environment premium for difficult assignment, grant for research will improve performance of agricultural science teachers.

The result of the study shows that administrative approaches such as adequate time for practical, installation of technological gadgets, monitoring of teachers, procurements of instructional materials and provision of needed instructional materials, and provision of funding for procurement of instructional materials will improve the usage of instructional materials for teaching agricultural science in SSS in Kano state. This finding agrees with the study of Hope (1997) who observed that, leadership must foster on environments where teachers are encouraged to be creative and innovative to explore instructional materials. Hope added that, without leadership with a vision, instructional materials usage cannot reach its potential in schools.

Beggs (2000) affirmed the need for teachers to first use instructional materials, the friendly and helping hand can make the experience easier. Peer support can be one of the easiest and most available ways that teachers can get help, but also calls for collaboration with colleagues, when those who know how

to work with a particular instructional materials are willing to render the support needed. Francis (2003) argued that a sense for team spirit develops when the administrative approach and energy is directed towards the use of instructional materials. Frances (2003) added that school administrators control what happens at the school level and without their support the continuity of instructional material usage is uncertain. The study of Billy and Staples *et al*. (2005) and (2005) shows that school administrators can help to ensure that the use of instructional materials is prioritized, and that teachers feel comfortable trying new things. Strong leadership in an educational setting means that school principals and other school leaders must play multiple roles in the change process, including role model, leader, motivator, resource provider, and facilitator (Ukaejiofor, 2013). Hubbard (2007) maintained that administrative approaches facilitate success, continuity, and access to instructional material.

The outcome of research question four and null hypothesis four indicated that the ways of increasing access by constant supply of power, dissemination of information to teachers, supply of audio, visual and audio-visual materials, making instructional material location easily accessible, provision of technological gadgets and establishment of resources development centres are very essential to improving the usage of instructional materials for teaching agricultural science in SSS in Kano state. This finding agrees with that of Brace and Robert, (1996) who reported that secondary schools teachers need access to instructional materials of all types. Example like networked computer, audio visual equipment must be readily available. It should also be noted that equipment

may be available but kept under strict rules. Hope (1997) reiterated that for instructional materials to be exploited in an environment, it must first exist, from the classroom point of view, the adequacy of classroom and electricity supply increase the usage of instructional materials. Seavers (2002) pointed that for agricultural science teachers to have access to instructional materials, the facilities that accommodate the available resources in the classrooms for example, accessories like sockets should be available and functioning. Frase *et al.*, (1992) added that identifying and purchasing of Instructional materials in most timely way will enhance Instructional materials accessibility need of teachers. He also added that, if products do not exist then the school administrators should have a list of Instructional material vendors that can modify existing ones to meet the accessibility need of teachers. Similarly Frasse (2007) stated that the timely effective communication of available instructional materials in secondary schools will improve Instructional materials accessibility by teachers. Frasse (2007) also added that the purchasers of Instructional materials should be thorough in their selection of instructional materials vendors that will provide the products in the accessibility format required.

Research question five and null hypothesis five indicates that maintenance practices for improving the usage of instructional materials in teaching agricultural science in SSS in Kano state include provision of adequate storage space, servicing of instructional materials, adequate funding, making rules and regulations guiding the usage and maintenance of instructional materials in the schools. The finding agrees with that of Beggs (2000) whose study revealed

that keeping the instructional materials running is very important because it ensures continuity in their usage. Members of staff and the administrators should endeavour to draw up regulations to govern the proper use of the instructional materials. Johnson (2000) stated the when school authority emphasises that Instructional materials are public property and should be appropriately cared for will help to promote its maintenance and usage. This author added that teachers must pay the replacement cost of any Instructional materials lost or damaged beyond ordinary repair. Royer (2002), stated that funds should be made available for training of instructional material technicians who are directly involved in the care and maintenance of instructional materials, also the salary and other expenses of an employee who provide technical support for the maintenance of instructional materials should be improved.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter was presented under the following sub-headings

5.1 Summary

5.2 Contribution to Knowledge

5.3 Conclusion

5.4 Recommendations

5.5 Suggestions for further study

5.1 Summary

The research work was carried out to analyse teachers' perception of the strategies for improving the use of instructional material for teaching of agricultural science in SSS in Kano State, Nigeria. Six Objectives were stated and five research questions were raised to address them. Also five null-hypotheses were tested at 0.05 level of significance.

The study used descriptive survey design. The population of the study consisted of 424 agricultural science teachers from 413 SSS in Kano State. The entire population was studied as a sample using purposive sampling techniques. A structured questionnaire was used as instrument for data collection with a reliability co-efficient of 0.71. The researcher distributed the 424 copies of questionnaire personally to the respondents with the entire questionnaire completed and returned. The data collected were coded using SPSS version 16. Table of frequencies and percentages was used to analyze the bio-data of the respondents. Mean score and standard deviation were used to answer the research

questions, while independent t-test was employed to test the five null hypotheses at significance level of 0.05.

The finding of research question one which was further affirmed by null hypothesis one revealed that trainings modes such as conferences, workshops, symposiums, excursion, enlightenment campaign, induction course for newly recruited teachers and seminars had positively improved the use of instructional materials for teaching agricultural science in SSS in Kano state, Nigeria.

The result of research question two shows that motivational strategies such as commendations, financial motivation, promotion, praises, and salary enhancement are essential strategies required by teachers to improve the usage of instructional materials in teaching agricultural science in SSS in Kano state Nigeria.

The result of the study shows that administrative approaches such as provision of adequate time for practical's, installation of technological gadget, monitoring of teachers, provision of funding for procurements of instructional materials and adequate supply of needed instructional materials had positively improved the usage of instructional materials for teaching agricultural science in senior secondary schools in Kano state, Nigeria.

The outcome of research question four and null hypothesis four indicated that ways of increasing access to instructional materials such as constant supply of power, dissemination of information, making the instructional materials location easily accessible, supply of audio, visual and audio-visual instructional materials, provision of technological gadgets and establishment of resources development

centres had positively improved the usage of instructional materials for teaching agricultural science in SSS in Kano state, Nigeria.

Research question five and null hypothesis five indicates that maintenance practices for improving the usage of instructional materials in teaching agricultural science in secondary schools in Kano state include provision of adequate storage space, servicing of instructional materials, adequate funding, making rules and regulation guiding the usage, maintenance of instructional material in the schools and involvement of professionals to take proper care of instructional materials had positively improved the usage of instructional materials for teaching of agricultural science in SSS, in Kano state, Nigeria.

5.2 Contributions to Knowledge

The study established that:

1. Conferences, workshops, symposiums, excursion, enlightenment campaign, induction course for newly recruited teachers and seminars positively improve the use of instructional materials for teaching agricultural science in SSS in Kano state, Nigeria ($p \geq 0.000$).
2. Commendations, financial motivation, promotion, praises, and salary enhancement are essential strategies required by teachers to improve the usage of instructional materials in teaching agricultural science in SSS in Kano state Nigeria ($p \geq 0.000$).
3. Provision of adequate time for practical's, installation of technological gadget, monitoring of teachers, provision of funding for procurements of instructional materials and adequate supply of needed instructional materials

had positively improved the usage of instructional materials for teaching agricultural science in SSS in Kano state, Nigeria ($p \geq 0.000$).

4. Provision of adequate time for practical's, installation of technological gadget, monitoring of teachers, provision of funding for procurements of instructional materials and adequate supply of needed instructional materials had positively improved the usage of instructional materials for teaching agricultural science in SSS in Kano state, Nigeria ($p \geq 0.000$).
5. Provision of adequate storage space, servicing of instructional materials, adequate funding, making rules and regulation guiding the usage, maintenance of instructional material in the schools and involvement of professionals to take proper care of instructional materials had positively improved the usage of instructional materials for teaching of agricultural science in SSS in Kano state, Nigeria ($p \geq 0.000$).

5.3 Conclusion

Based on the study findings, it is concluded that, training modes, adequate motivation, administrative strategies, access and maintenance culture are the major strategies that positively improve the use of instructional materials for the teaching of agricultural Science in SSS in Kano state, Nigeria. However, ineffective and negative utilization of these strategies will negatively affect the use of instructional materials for the teaching of agricultural science, which will lead to poor performance of students in the subject. Therefore the use of instructional materials is very important in the teaching and learning of agricultural science in SSS in Kano state, Nigeria.

5.4 Recommendations

As a result of the fore going discussions and conclusion, the following recommendations were made:

1. Kano State Government through the ministry of education should organize training modes such as conferences, seminars, symposiums, excursions, induction course, in house discussion and long vacation programs for equipping agricultural science teachers; this will help to update their knowledge on the usage of instructional materials for the teaching of agricultural science.
2. Kano State Ministry of Education through school principals should motivate agricultural science teachers for effective use of instructional materials using promotions and salary enhancement strategies.
3. Kano state educational administrators should improve on administrative strategies such as monitoring of teachers, provision of adequate time for practical, provision of funding for procurement of instructional materials, and installation of technological gadgets to improve the effective utilization of instructional materials among agricultural science teachers in SSS in Kano State, Nigeria.
4. Kano State SSS principals in collaboration with Parent Teachers Association (PTA), should provide enabling environment for agricultural science teachers to have access to instructional materials when need arises, this will encourage them to make effective use of the instructional materials in their teaching and learning process.

5. Policy makers and Kano State ministry of education should design and enforce maintenance practices such as adequate storage space, servicing of instructional materials, adequate funding, making rules and regulation guiding the usage and maintenance of instructional material in teaching schools and involvement of professionals to take proper care of instructional materials this will help to improve the maintenance and usage of instructional materials in SSS in Kano state.

5.5 Suggestions for Further Studies

The researcher recommended that further research should be conducted on the following:-

1. Influence of technological skills on usage of modern instruments in teaching among teachers of agricultural science in secondary schools in Kano State, Nigeria.
2. Analysis of factors affecting usage of instructional materials among agricultural science teachers in secondary schools in North-west, Nigeria.
3. Assessment of availability, adequacy, accessibility and usage of instructional materials in teaching and learning of agricultural science in secondary schools in North-west, Nigeria.

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APPENDIX I

LETTER OF INTRODUCTION

DEPARTMENT OF VOCATIONAL & TECHNICAL EDUCATION
AHMADU BELLO UNIVERSITY, ZARIA NIGERIA
FACULTY OF EDUCATION

Telephone: 069-51755, 50692
Vice Chancellor: Professor. Abdullahi Mustapha B.Sc. (Hons) Pharm(ABU), Ph.D (London) FPSN
Head of Department : Professor A.A Udoh B.Ed. (Hons) Nsukka M.Ed. & Ph.D Bus Edu. (ABU)

Your Ref: _____

Our Ref: M.Sc/Educ/09254/2010-2011

Date: 4th February, 2015

Letter of Introduction

ALIYU GAMBO –M.SC/09254/2010-2011

This is to certify that the above mentioned name is a Postgraduate student (M.Sc Agric Education) in the Department of Vocational and Technical Education, Ahmadu Bello University, Zaria carrying out a research topic: Assessment of Strategies for Improving the Usage of Instructional Materials for Teaching Agricultural Science in Senior Secondary Schools in Kano State, Nigeria.

Please kindly give him every assistance he may require.

Professor A.A. Udoh
HEAD OF DEPARTMENT

APPENDIX II

Sample Determination Table

Size of Population	Sample Size (n) for Precision (e) of:			
Population	±3%	±5%	±7%	±10%
500	A	222	145	83
600	A	249	152	86
700	A	255	158	88
800	A	267	163	89
900	A	277	166	90
1,000	A	286	169	91
2,000	714	333	185	95
3,000	811	353	191	97
4,000	870	364	194	98
5,000	909	370	196	98
6,000	938	375	197	98
7,000	959	378	198	99
8,000	976	381	199	99
9,000	989	383	200	99
10,000	1,000	385	200	99
15,000	1,034	390	201	99
20,000	1,053	392	204	100
25,000	1,064	394	204	100
50,000	1,087	397	204	100
100,000	1,099	398	204	100
>100,000	1,111	400	204	100
a= Assumption of normal population is poor (Yamane, 1967). The entire population should be sampled.				

Table 2: Sample size for ±5%, ±7% and ±10% Precision Levels where Confidence Level is 95% and P=5			
Size of Population	**Sample Size (n) for Precision (e) of:**		
	±5%	±7%	±10%
100	81	67	51
125	96	78	56
150	110	86	61
175	122	94	64
200	134	101	67
225	144	107	70
250	154	112	72
275	163	117	74
300	172	121	76
325	180	125	77
350	187	129	78
375	194	132	80
400	201	135	81
425	207	138	82
450	212	140	82

APPENDIX III

QUESTIONNAIRE ON ANALYSIS OF TEACHER'S PERCEPTION OF STRATEGIES FOR IMPROVING THE USAGE OF INSTRUCTIONAL MATERIALS IN AGRICULTURAL SCIENCE IN SENIOR SECONDARY SCHOOLS IN KANO STATE, NIGERIA

Department of Voc and Tech Education,
Faculty of Education,
Ahmadu Bello University, Zaria.
31st October, 2016.

Dear Respondent,

Request to fill Questionnaire

I am a Postgraduate student of the above address, presently on a research study title "Analysis of teachers' perception of Strategies for Improving the Use of Instructional Materials in Agricultural Sciences in Senior Secondary Schools in Kano State". You are requested to please help to answer the questions in the attached questionnaire to the best of your ability. All information you may give will be treated as confidential and used for the purpose of this research work only.

Thank you, for your anticipated cooperation.

Yours Sincerely,

Aliyu Gambo

Section A: Bio-data of the Respondents

Instruction: Please tick (√) as many responses as applied to you:

1. Academic Qualification

(A) N.C.E ( )

(B) B.Sc Educ ( )

(C) M.Sc Educ ( )

(D) HND ( )

(E) ND ( )

(F) B.Sc ( )

(G) M.Sc ( )

(H) PGDE ( )

(I) Others (please specify) _____

Section B

Instruction

The following items relates to the assessment of strategies for improving the usage of instructional materials for the teaching Agricultural Science in Senior Secondary Schools Kano State. Kindly read through and tick the appropriate option.

Agreed ( )

Strongly Agreed ( )

Disagreed ( )

Strongly Disagree ( )

Section B:Teachers perception on Training Modes for Improving the usage of Instructional materials for teaching Agricultural Science in Senior Secondary Schools.		**SA**	**A**	**D**	**SD**
1	Organizing conferences for agricultural science teachers on the use of instructional materials in each zonal education offices will improve the usage of instructional materials.				
2	Providing long vacation training programs for agricultural science teachers on the use of instructional materials by Kano state government will improve the usage of instructional materials				
3	Organizing workshops for agricultural science teacher on the use of instructional materials in each zonal education officers will improve the use of instructional materials.				
4	Organizing in house discussion and sharing of ideas for agricultural science teachers on the use of instructional materials in senior secondary schools will improve the usage of instructional material.				
5	Organizing symposiums for agricultural science teachers in the each zonal education offices on the use of instructional materials will improve instructional materials usage.				
6	Organizing seminars for agricultural science teachers on the use of instructional materials in all the senior secondary schools will- improve the use of instructional materials.				
7	Organizing orientation programmes for newly recruited agricultural science teachers on the use of instructional materials in each zonal educational office will improve the use instructional materials.				
8	Reviving the culture of excursion in all the senior secondary schools in Kano state will improve the use of instructional materials.				
9	Massive mobilization programs to awaken agricultural science teachers on the use of instructional materials in SSS by Kano state government will improve the use of instructional materials.				

	Section C:Teachers perception on Motivators for Improving the usage of Instructional Materials for the teaching of Agricultural Science				
10	Giving recommendation letter to agricultural science teachers that adequate use of instructional materials will improve the use of instructional materials.				
11	Paying stipends to agricultural science teachers that use instructional materials will improve the use of instructional materials.				
12	Promoting agricultural science teachers with one grade level that adequately use instructional materials in SSS will improve the use of instructional materials.				
13	Praise to agricultural science teachers that use instructional materials will improve the use of instructional materials.				
14	Merit pay for agricultural science teachers that use instructional materials will improve the use of instructional materials.				
15	Enhancing salary by one step to agricultural science teachers that use instructional materials will improve the use of instructional materials.				
	Section D:Teachers perception on Administrative approaches for improving the usage of instructional materials for the teaching of agricultural science				
16	Provision of adequate time for practical use of instructional materials will improve the use of instructional materials				
17	Installation of technological related agricultural science instructional materials will improve the use of instructional material				
18	Drawing regulation to govern the proper usage of instructional materials will improve the use of instructional materials				
19	Supervising agricultural science teachers that use instructional materials in the classroom will improve the use of instructional materials				
20	Allocation of fund for the purchase of instructional materials in SSS will improve the use of instructional materials.				
21	Introducing instructional materials levy in the SSS will improve the use of instructional materials.				

22	Ensuring adequate supply of needed instructional materials to agricultural science teachers will improve the use of instructional materials.				
23	Making the use of instructional material by agricultural science teachers to form part of the condition for their promotion will improve the use of instructional materials				
24	Acquisition of agricultural science instructional materials through organizations such as; ETF and PTA will improve the use of instructional materials				
25	Setting of instructional materials task fund to be funded by companies and NGOs in all the Senior Secondary Schools will improve the use of				
	SECTION E: Teachers perception on Ways of increasing access and improve the usage of instructional materials for the teaching of agricultural sciences				
26	Provision of constant electricity supply in SSS will improve the access of instructional materials.				
27	Dissemination of information to agricultural science teachers by Kano State SSS Management Board about newly acquired instructional materials will improve the usage of instructional materials.				
28	Making the instructional materials location to be easily accessible by agricultural science teachers in SSS will improve instructional materials usage.				
29	Establishing agricultural science instructional materials comets in all the SSS classes equipped with local materials will improve the access of instructional materials				
30	Provision of adequate agricultural science audio-visual, laboratories will improve the use of instructional materials				
31	Provision of technology related to teaching of agricultural science will improve the use of instructional materials				
32	Establishing agricultural science zonal resource centres at the zonal education offices to produce low cost instructional materials will improve the use of instructional materials.				
33	Establishing agricultural science mini resource development centres with enough local materials will improve the access of instructional materials				

	Section F: Tercher perception on Maintenance practices for improving the usage of instructional				
34	Providing adequate storage space for agricultural science instructional materials will improve the use of instructional materials				
35	Proper servicing of available agricultural science instructional materials in all the SSS will improve the use of instructional materials.				
36	Providing adequate funding by Kano state government for the maintenance of instructional materials in all the SSS will improve the use of instructional materials				
37	Establishing a full time position for instructional materials technicians in all the SSS by Kano state government will improve the use of instructional materials				
38	Provision of rules and regulations guiding the usage of agricultural science instructional materials will improve the use of instructional materials.				
39	The involvement of professionals in the field of instructional materials in the physical planning of instructional materials storage facilities will improve the usage of instructional materials.				

APPENDIX IV

Table 4.2: Analysis of data used to determine training modes required for improving use of instructional materials for teaching agricultural science
Statement

RQ1	Statement	SA	A	D	SD	TR	TA	TD	X	Rank
1	Organizing conferences for agricultural science teachers on the use of instructional materials in each zonal education offices will improve the usage of instructional materials.	600	408	102	149	1259	1008	251	3.2	Agree
2	Providing long vacation training programs for agricultural science teachers on the use of instructional materials by Kano state government will improve the usage of instructional materials	680	405	124	109	1317	1086	231	3.2	Agree
3	Organizing workshops for agricultural science teacher on the use of instructional materials in each zonal education officers will improve the use of instructional materials.	520	399	140	153	1212	919	293	3.0	Agree
4	Organizing in house discussion and sharing of ideas for agricultural science teachers on the use of instructional materials in senior secondary schools will improve the usage of instructional material.	404	555	208	92	1259	959	300	3.0	Agree
5	Organizing symposiums for agricultural science teachers in the each zonal education offices on the use of instructional materials will improve instructional materials usage.	396	498	346	44	1194	894	390	3.0	Agree
6	Organizing seminars for agricultural science teachers on the use of instructional materials in all the senior secondary schools will- improve the use of instructional materials.	240	495	300	152	1187	735	424	2.5	Agree
7	Organizing orientation programmes for newly recruited agricultural science teachers on the use of instructional materials in each zonal educational office will improve the use instructional materials.	408	396	126	177	1117	804	303	2.9	Agree
8	Reviving the culture of excursion in all the SSS in kano state will improve the use of instructional materials.	420	603	296	116	1435	1023	412	2.9	Agree
9	Massive mobilization programs to awaken agricultural science teachers on the use of instructional materials in SSS by Kano state government will improve the use of instructional materials.	480	390	226	114	1240	870	370	2.8	Agree
	Total						11626	9327	3.2	Agree

Table 4.3: Analysis of data used to determine motivational strategies required for improving use of instructional materials for teaching agricultural science

RQ2	Statement	SA	A	D	SD	TR	TA	TD	X	Rank
10	Giving recommendation letter to agricultural science teachers that adequate use of instructional materials will improve the use of instructional materials.	412	225	172	29	838	637	201	3.0	Agree
11	Paying stipends to agricultural science teachers that use instructional materials will improve the use of instructional materials.	224	225	172	34	655	449	206	2.7	Agree
12	Promoting agricultural science teachers with one grade level that adequately use instructional materials in SSS will improve the use of instructional materials.	464	297	188	15	964	761	203	3.2	Agree
13	Praise to agricultural science teachers that use instructional materials will improve the use of instructional materials.	288	288	204	19	799	576	223	2.9	Agree
14	Merit pay for agricultural science teachers that use instructional materials will improve the use of instructional materials.	576	459	112	10	1157	1035	122	3.6	Agree
15	Enhancing salary by one step to agricultural science teachers that use instructional materials will improve the use of instructional materials.	496	288	196	34	1016	230	230	3.1	Agree
	Total					4591	3605	984	3.1	Agree

Table 4.4: Analysis of data used to determine administrative approaches required for improving use of instructional materials for teaching agricultural science

RQ3	Statement	SA	A	D	SD	TR	TA	TD	X	Rank
16	Provision of adequate time for practical use of instructional materials will improve the use of instructional materials	400	396	144	19	959	796	163	3.2	Agree
17	Installation of technological related agricultural science instructional materials will improve the use of instructional material	496	288	156	22	962	784	178	3.3	Agree
18	Drawing regulation to govern the proper usage of instructional materials will improve the use of instructional materials	344	642	180	96	1262	986	276	3.1	Agree
19	Supervising agricultural science teachers that use instructional materials in the classroom will improve the use of instructional materials	440	660	194	59	1353	1100	253	3.3	Agree
20	Allocation of fund for the purchase of instructional materials in SSS will improve the use of instructional materials.	220	717	152	116	1205	937	268	3.1	Agree
21	Introducing instructional materials levy in the SSS will improve the use of instructional materials.	484	585	148	96	1313	1069	244	3.3	Agree
22	Ensuring adequate supply of needed instructional materials to agricultural science teachers will improve the use of instructional materials.	760	354	156	100	1370	1114	256	3.3	Agree
23	Making the use of instructional material by agricultural science teachers to form part of the condition for their promotion will improve the use of instructional materials	712	597	116	51	1476	1309	167	3.5	Agree
24	Acquisition of agricultural science instructional materials through organizations such as; ETF and PTA will improve the use of instructional materials	420	603	296	116	1435	1023	412	2.9	Agree
25	Setting of instructional materials task fund to be funded by companies and NGOs in all the Senior Secondary Schools will improve the use of instructional material	444	561	114	131	1250	1005	245	3.2	Agree
	Total					11626	9327	2299	3.2	Agree

Table 4.5: Analysis of data used to determine ways of increasing access for improving use of instructional materials for teaching agricultural science

RQ4	Statement	SA	A	D	SD	TR	TA	TD	X	Rank
26	Provision of constant electricity supply in SSS will improve the access of instructional materials.	804	564	114	40	1522	1368	142	3.6	Agree
27	Dissemination of information to agricultural science teachers by Kano State SSS Management Board about newly acquired instructional materials will improve the usage of instructional materials.	748	513	152	50	1465	1261	204	3.4	Agree
28	Making the instructional materials location to be easily accessible by agricultural science teachers in SSS will improve instructional materials usage.	396	684	134	92	1306	1080	226	3.3	Agree
29	Establishing agricultural science instructional materials comets in all the SSS classes equipped with local materials will improve the access of instructional materials	428	579	202	89	1298	1007	291	3.1	Agree
30	Provision of adequate agricultural science audiovisual, laboratories will improve the use of instructional materials	400	324	198	80	1002	724	278	2.6	Agree
31	Provision of technology related to teaching of agricultural science will improve the use of instructional materials	220	438	322	90	1070	658	412	2.5	Agree
32	Establishing agricultural science zonal resource centres at the zonal education offices to produce low cost instructional materials will improve the use of instructional materials.	800	567	116	39	1522	1367	155	3.6	Agree
33	Establishing agricultural science mini resource development centres with enough local materials will improve the access of instructional materials	748	513	150	53	1464	1261	203	3.4	Agree
	Total					9127	7358	1769	3.2	Agree

Table 4.6: Analysis of data used to determine maintenance practices for improving use of instructional materials for teaching agricultural science

RQ5	Statement	SA	A	D	SD	TR	TA	TD	X	Rank
34	Providing adequate storage space for agricultural science instructional materials will improve the use of instructional materials	208	339	138	104	7899	547	242	2.8	Agree
35	Proper servicing of available agricultural science instructional materials in all the SSS will improve the use of instructional materials.	664	321	134	94	1213	985	228	3.2	Agree
36	Providing adequate funding by Kano state government for the maintenance of instructional materials in all the SSS will improve the use of instructional materials	606	321	198	89	1214	927	287	3.1	Agree
37	Establishing a full time position for instructional materials technicians in all the SSS by Kano state government will improve the use of instructional materials	542	324	204	216	1286	866	420	2.7	Agree
38	Provision of rules and regulations guiding the usage of agricultural science instructional materials will improve the use of instructional materials.	404	309	79	11	903	713	190	3.2	Agree
39	The involvement of professionals in the field of instructional materials in the physical planning of instructional materials storage facilities will improve the usage of instructional materials.	344	333	212	98	987	677	310	2.7	Agree
	Total					5603	4168	1435	3.0	Agree