

EFFECTS OF PROJECT AND DEMONSTRATION TEACHING METHODS ON  
ACQUISITION OF BROODING SKILLS IN POULTRY AMONG STUDENTS IN  
COLLEGES OF EDUCATION IN PLATEAU STATE, NIGERIA

BY

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ZARIA, NIGERIA

June, 2017

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A DISSERTATION SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES,  
AHMADU BELLO UNIVERSITY, ZARIA

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD  
OF  
MASTER DEGREE IN AGRICULTURAL EDUCATION

DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION  
AHMADU BELLO UNIVERSITY,  
ZARIA, NIGERIA

June, 2017

## **DECLARATION**

I declare that the work in this dissertation entitled “Effects of project and demonstration teaching methods on acquisition of brooding skills among students in colleges of education in Plateau state” has been written by me in the Department of Vocational and Technical Education, Faculty of Education, Ahmadu Bello University, Zaria. The information derived from literature has been duly acknowledged in the text and list of references provided. No part of this dissertation was previously presented for another degree or diploma at this or any other institution.

Pangkhinah Wuyep BAKO

Signature

\_\_\_\_\_

Date

**CERTIFICATION**

This dissertation titled EFFECT OF PROJECT AND DEMONSTRATION TEACHING METHODS ON ACQUISITION OF BROODING SKILLS IN POULTRY AMONG STUDENTS IN COLLEGES OF EDUCATION IN PLATEAU STATE, NIGERIA by Pangkhinah Wuyep BAKO meets the regulations governing the award of the degree of Master of Science (Education) of the Ahmadu Bello University, and is approved for its' contribution to knowledge and literary presentation.

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Date \_\_\_\_\_

### DEDICATION

This work is dedicated to my beloved wife, Marvellous Monica; and children, Bapihdak Victory, Bapihvang Praise and Pangpughe Joanna.

## ACKNOWLEDGEMENTS

The researcher humbly acknowledges the Lord God Almighty for his grace and mercy that made it possible for him to live and carry out this research work. To Him be all the glory. The researcher is sincerely grateful to his humble and accommodating supervisors Prof. B. I. Okeh and Dr. C. Uguru who in spite of their tight schedules, were able to patiently read this work several times, and gave useful critiques and suggestions to see the researcher through this work. They are worthy academic mentors indeed. The Lord will reward them and enlarge their borders in their endeavors. The researcher's profound gratitude goes to his internal examiners; Dr. S. S. Amoor and Dr. S. Zubairu, the Head of department Dr. S. Ibrahim, the postgraduate coordinator Dr. H. A. Abdullahi. My gratitude also goes to my lecturers: Prof. A.A. Udoh, Prof. A.Z. Mohammed, Prof. T. O. Ojo, Prof. E. Ike, Prof. P. E. Onuigbo, Prof. S. L. Ajayi, Prof. E. E. Adamu, Dr. M. A. Abubakar, Dr. M. O. Ayorinde, Dr. L. Abubakar, Dr. M.F Ahuwan, Dr. A. Ibrahim, Dr. M. A. Abubakar, Dr. R.T. Umar and other staff of the Department of Vocational and Technical Education, Ahmadu Bello University, Zaria.

The researcher also appreciates his lovely wife, brothers, sisters and friends for their supports and encouragements. The researcher is most grateful to Evangelist Musah Paul-Gindiri and Mr. Putshiwe G. Amos for prayers and supports, my colleagues particularly the 2013/2014 set who were a great inspiration and encouragement. God reward you and see you through all your life endeavors.

## TABLE OF CONTENTS

Cover Page.....	i
Title Page.....	ii
Declaration.....	iii
Certification.....	iv
Dedication.....	v
Acknowledgement.....	vi
Table of Contents.....	vii
List of Tables.....	X
List of Figures.....	xi
List of Appendices.....	xii
Operational Terms.....	Definition .....xiii
Abstract.....	xiv

### CHAPTER ONE: INTRODUCTION

1.1	Background to the Study.....	1
1.2	Statement of Problem.....	4
1.3	Objectives of the Study.....	5
1.4	Research Questions.....	6

1.5	Null Hypotheses.....	6
1.6	Significance of the Study.....	7
1.7	Assumption for the Study.....	7
1.8	Delimitation.....	8

**CHAPTER TWO: REVIEW OF RELATED LITERATURE**

2.1	Theoretical Framework.....	9
2.2	Concept of Teaching.....	11
2.3	Teaching Methods.....	12
2.4	Project Teaching Method.....	19
2.4.1	Types of project teaching method.....	20
2.5	Demonstration Teaching Method.....	23
2.5.1	Types of demonstration teaching method.....	25
2.6	Skill Acquisition.....	27
2.7	Brooding.....	28
2.8	Brooding Skills.....	34
2.9	Acquisition of Brooding Skills.....	35
2.10	Empirical Studies.....	36
2.11	Summary of Literature Review.....	45



### **CHAPTER THREE: RESEARCH METHODOLOGY**

3.1	Research Design.....	47
3.2	Population for the Study.....	48
3.3	Sample Size and Sampling Procedure.....	49
3.4	Instrument for Data Collection.....	50
3.4.1	Validity of the Instrument.....	50
3.4.2	Pilot Testing.....	50
3.4.3	Reliability of the Instrument.....	50
3.5	Procedure for Data Collection.....	51
3.6	Procedure for Data Analysis.....	52

### **CHAPTER FOUR: PRESENTATION AND ANALYSIS OF DATA**

4.1	Answers to Research Questions.....	53
4.2	Test of Null Hypotheses.....	55
4.3	Summary of Major Findings.....	57
4.4	Discussion of Major Findings.....	58

### **CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATION**

5.1	Summary.....	60
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5.2	Contribution	to
Knowledge.....	61	
5.3		
Conclusion.....	62	
5.4Recommendations.....	62	
5.5Suggestion for Further Study.....	63	
References.....	64	
Appendices.....	69	

## LIST OF TABLES

Table 1:Floor space requirement .....	31
Table 2: Feeder space recommendations .....	33
Table 3: Population of agricultural education students in N. C. E. II.....	48
Table 4:Sample for the study.....	49
Table 5: Effect ofproject method and control groups on acquisition of brooding skills .....	54
Table 6:Effect of demonstration method and control groups on acquisition of brooding skill.....	54
Table 7:Effect of project and demonstration methods on acquisition of brooding skill .....	55
Table 8: Difference between project method and control group on acquisition of brooding skills.	56
Table 9: Difference between demonstration method & control on acquisition of brooding skills.	56
Table 10: Difference between the effects of project and demonstration teaching methods.....	57

## LIST OF FIGURES

Figure 1:Distribution of Birds under Brooders .....	30
Figure 2: Illustration of Pretest Post-test Research Design.....	48

**LIST OF APPENDICES**

1. Agricultural Skill Acquisition Test (Pretest and Post-test)..... 69

2. Pretest and Post-test Scores..... 75

## OPERATIONAL DEFINITION OF TERMS

For the purpose of this research, the following definition of terms have been put forward:

- 1. Skills:**refer to the ability to apply knowledge to specific situations or task.
- 2. Brooding Skills:**refer to the abilities to perform different brooding operations such as management of chicks from the period immediately after hatchwhen special care and attention must be given to chicks to ensure their health and survival during the first three weeks of life.
- 3. Acquisition of brooding Skills:**means a measure of accomplished or learned brooding abilities which a person is able to put into practice or display at present as an outcome of learning.
- 4. Teaching method:** the various methods, means or ways through which the content of a given subject area is discussed and systematically communicated to a learner by a teacher.

## ABSTRACT

This research was carried out to determine the effects of project and demonstration teaching methods on acquisition of brooding skills among students in colleges of education in Plateau State, Nigeria. The study had three objectives, three research questions and three null hypotheses which were stated to guide the researcher. The study adopted quasi-experimental, pretest post-test design. The population for the study consist of all the 147 N.C.E. two agricultural education students of the two colleges of education in Plateau State. Purposive sampling was used to select the Federal College of Education Pankshin and 75 N.C.E. two students were selected using simple random sampling technique. A 25-item multiple choice agricultural skill acquisition test was used for data collection. The instrument was administered before and after treatments (pretest and post-test) and the scores obtained were analyse using mean, standard deviation and t-test statistics. All the threeresearch questions were answered using mean and standard deviation while t-test statistics was used to test all the threenull hypotheses at 0.05 level of significance ( $P=0.05$ ). The findings revealed that both project and demonstration teaching methods had significant effects on students' acquisition of brooding skills. The result also showed that, project teaching method was more effective in teaching brooding skills than demonstration teaching method. Therefore, the researcher concluded that, project teaching method will enhance students' acquisition of brooding skills than demonstration teaching method, and that use of project and demonstration teaching methods to teach brooding skills will be more effective in facilitating agricultural education students' acquisition of brooding skills than the conventional lecture method. The researcher recommended among other things that, agricultural education teachers should emphasise the importance of using project and

demonstration teaching methods in colleges of education, and adopt these methods for teaching agricultural education skills areas.



# CHAPTER ONE

## INTRODUCTION

### 1.1 Background to the Study

Agricultural science education as one of the core vocational education courses taught in colleges of education can be a key driver of skills acquisition if the appropriate teaching methods are used to teach students. This is because, vocational education generally is aimed at providing technical competence required for career application. Competency refers to the ability, capability, proficiency, accomplishment, expertise, skill, prowess, mastery and talent one possess through experience and training which can be put to practice or used to do something successfully or efficiently. There are basically three domains of competency viz: knowledge, skill and affective. These three are interwoven in terms of enhancing an individual to perform a given task. Boulet, (2015) defines Knowledge as information acquired through sensory input: Reading, watching, listening, touching, etc. Skills, however, refer to the ability to apply knowledge to specific situations. The concept of knowledge refers to familiarity with factual information and theoretical concepts. Knowledge can be transferred from one person to another or it can be self-acquired through observation and study. Skills are developed through practice, through a combination of sensory input and output. As an example, social skills are developed through interaction with people by observing, listening, and speaking with them. Trial and error is probably the best way to achieve skills mastery. The emergence of career education and rising interest in job related courses and the employers' of labour emphasis on production skills acquisition before job placement have made the need for rapid expansion of employment related education expedient in Nigeria, especially now that the country is under the pressure of high and rising unemployment rate. This work focuses on skills as it sought to determine the effects of project and demonstration teaching methods

on the ability of colleges of education students to apply knowledge to specific situations- brooding.

Teaching methods are tools used by teachers to impart knowledge and competencies to students. There are several teaching methods available to agricultural education teachers in colleges of education such as demonstration, discussion, field trip, lecture etc. most of which are practical methods but not all are effective for teaching agricultural skills. These methods are said to be effective only when they are able to enhance agricultural skills acquisition within the required possible duration of training. A method that promotes hands-on or practical students participation will likely enhance agricultural skill acquisition than those that promote only cognitive reasoning. Amoah (2009) went further to state that agricultural education programme content teaching and learning should be practical oriented. This follows the agricultural pedagogical fact that vocational skills are better acquired when learners (students) learn by doing. The duration for learning a skill and the level a learner attains at the end is also dependent on how the learner is being taught. The desire for functional instructional method to teaching and learning is becoming stronger among teachers at all levels of educational systems which is a proof of the fact that teaching approaches are important to skills acquisition.

The study therefore, looked at how these teaching methods, project and demonstration can have effects on agricultural science skills acquisition in colleges of education. Project method refers to a systematic teaching method that engages students in learning knowledge and skills through an extended inquiry process structured around complex, authentic questions and carefully designed products and tasks (Robert & Harlin, 2007). This process can last for varying time periods and can extend over multiple content

areas. It is a set of teaching approach which enable teachers to guide students through in-depth studies of real world topics. This set of method according to Udofia and Aniefiok(2013) involves experimentation, instructions and illustration. Projects are described as having a complex but flexible structural framework with features that characterize the teaching-learning interaction depending largely on instructional methods. Project method is one of the instructional methods used by vocational and technical instructors as it enables students' participation and fast acquisition of skills (Edu, Ayang & Idaka, 2012). Asuquo (2005) explains that project method is one of the most effective instructional methods which enhances students' participation and quick assimilation of skills in vocational and technical education. It is like assignment method in which a task is given to the students or a number of tasks are shared to students to carry out (written or practical) allowing a great deal of students involvement right from the planning stage, the sketch of the project, the steps of executing it, the tools, equipment and materials to be used, up to the assembling stage of the project. A project seems to be a versatile teaching approach which facilitates teaching and assessing learners' performance simultaneously without impacting negatively on the learner who learns independently.

Project approach seems to have the components to motivate teachers and students to develop a cooperative work mainly aiming at the students to perceive and understand all the necessary stages required to arrive at logical conclusion. Research shows that learners do not only respond by giving useful information, but they also actively use what they know to explore, negotiate, interpret and create. Education has benefited from this teaching approach, as teachers have learned how to effectively select content and activities to amplify and extend the skills and capabilities of students (Edu *et al.* 2012).

Demonstration teaching approach on the other hand, is a method of teaching concepts, principles or real things by combining explanation with handling or manipulation of real things, equipment or materials (Edu, *et al.* 2012). It involves showing by reason or proof, explaining or making clear by use of examples or experiments. Therefore, the greater the degree of participation and sensory involvement by the learner during the demonstration, the more effective learning will be. Demonstration approach can bridge the gap between theory and practice, controls the rate of breakages of tools and equipment, and accidents as students watch the teacher do it before attempting to do the same. It is learning by doing approach and so enables the teacher to teach manipulative and operational skills within a short time using little material. So, this research intended to further examine effects of project and demonstration teaching approaches on agricultural science students' skills acquisition.

## **1.2 Statement of Problem**

Most graduates of colleges of education are incapable of using agricultural skills for livelihood application in spite of the lucrative nature of agribusinesses and the quick return on investment. One can attribute this to poor acquisition of agricultural skills by graduates and evident in their reliance on government to employ them instead of gainfully engaging themselves in agricultural vocations after graduation. The proceeding of the 43rd annual conference of Science Teachers Association of Nigeria (STAN) 2002, reports that emphasis is still on cognitive achievement and passing of examinations and not on production ability (Eleobhose & Uhumuavbi, 2002).

The inability to put into practice what is taught is viewed as the cause of relative backwardness of most societies. This observation has raised doubts on the efficacy

of the teaching methods used by teachers considering the fact that the goal of all vocational and technical education as provided by the National Policy on Education is to provide vocational skills necessary for agricultural productivity, development and self-reliance. So, the researcher wonders, whether colleges of education students are generally incapable of understanding and practicing agricultural science skills or the teaching methods used in training them are not appropriate to promote skills acquisition as provided by the curricula.

Furthermore, lecture teaching method has been adopted as a conventional method to teaching almost all courses at the colleges of education. This is the same even among teachers of vocational and technical education. It seems to be the most used in teaching agricultural education in colleges of education. Edu *et al.* (2012) reported that the acquisition of skills and qualifications that are saleable in employment market which are the key expectations of modern learning needs should be the goal of educational institution. Therefore, if the agricultural education students in colleges of education have to acquire skills that make them functional, teaching methods that promote participation and skills acquisition are necessary.

The researcher has also observed that the teaching of agricultural science at the primary and secondary schools levels where most of the N. C. E. graduates are expected to teach require sound background in the practice of agriculture. To effectively teach, they must themselves be well trained using practical methods that promote real world conditions. But previous researchers concentrated most of their work on teaching methods that teachers used at the primary and secondary schools with little attention to how the teachers themselves were trained. Since the method of presentation is so important, teachers including the pre-service teachers should be concerned not only with general

methodology but also with some special methods of teaching various subjects (Ogologo & Wagbara, 2013).

Also, Obanya (2002) reported that improving the quality of delivery of teaching is a system-wide problem in Nigerian higher institutions. In an attempt to proffer the way forward to these identified problems the study seek to find out the effects of project and demonstration teaching methods on acquisition of agricultural skills among students in colleges of education in Plateau state, Nigeria.

### **1.3 Objectives of the Study**

The general objective of the study is to determine the effects of project and demonstration teaching methods on students' acquisition of agricultural skills in colleges of education in Plateau state with specific objectives to:

1. Find out the effect of project teaching method on students' acquisition of brooding skills in colleges of education.
2. Identify the effect of demonstration teaching brooding on students' acquisition of brooding skills in colleges of education.
3. Compare the effect of project and demonstration teaching methods on students' acquisition of brooding skills in colleges of education.

### **1.4 Research Questions**

1. What is the effect of project teaching method on students' acquisition of brooding skills in colleges of education?

2. What is the effect of demonstration teaching method on students' acquisition of brooding skills in colleges of education?
3. What is the difference between skill acquisition of students taught using project teaching method and those exposed to demonstration teaching method?

### **1.5 Research Hypotheses**

The following research hypotheses were generated for the study and tested at 0.05 level of significance ( $p=0.05$ ):

HO<sub>1</sub>: There is no significant effect of project teaching method on students' acquisition of brooding skills in colleges of education.

HO<sub>2</sub>: There is no significant effect of demonstration teaching method on students' acquisition of brooding skills in colleges of education.

HO<sub>3</sub>: There is no significant difference between the effect of project teaching method and demonstration teaching method on students' acquisition of brooding skills in colleges of education.

### **1.6 Significance of the Study**

The finding of this study will benefit teachers, students, college of education curriculum/policymakers and the nation at large.

The study will help teachers to identify most effective teaching method for facilitating skills acquisition. This will make agricultural education programme more functional at the college level. Students of college of education will be able to apply agricultural skills they have been taught for livelihood. Graduates of colleges of education

will effectively teach students at the secondary schools' level with practical methods which will promote agriculture as a vocation. The graduates will also be better engaged in productive agriculture as a means of livelihood.

Also, the research will help national commission for colleges of education (NCCE) to amend the college of education curricula to promote practical instructional methods and discourage the use of lecture method in teaching vocational agricultural science education in colleges of education in Nigeria. Furthermore, students acquire adequate skills needed for taking agriculture as a vocation for self-reliance as stipulated in the national goals of vocational and technical education (NPE, 2004) when taught using appropriate practical approach. This will enhance agricultural growth and development as well as career opportunities in agriculture. Therefore creating employment even for other job seekers; hence, reduced the menace of unemployment in the country and also contribute to the national gross domestic products to improve the national economy.

### **1.7 Assumption of the Study**

The researcher carried the study with assumptions that:

1. Project and demonstration teaching methods can promote brooding skills acquisition among students in colleges of education.
2. Teaching methods determine the level of students' method skills acquisition.
3. Different teaching methods enhances acquisition of skills differently.

### **1.8 Delimitation of the Study**

The research was delimited to the effect of Project and demonstration teaching methods on acquisition of brooding skills among students in colleges of education in Plateau



State. The research was also delimited to the N. C. E students of Plateau state College of Education, Gindiri, and the Federal College of Education, Pankshin. The research was further delimited to N.C.E. II students because they are the ideal practical class at the colleges' level and they have undergone some level of training as they are in their second year of study.

## **CHAPTER TWO**

### **REVIEW OF RELATED LITERATURE**

This chapter is divided into the following headings based on the previous research studies on Agricultural science teaching methods and brooding skills acquisition.

- 2.1 Theoretical Framework
- 2.2 Concept of Teaching
- 2.3 Teaching Methods
- 2.4 Project Teaching Method
- 2.5 Demonstration Teaching Method
- 2.6 Brooding Skills
- 2.7 Acquisition of Brooding Skills
- 2.8 Empirical Studies
- 2.9 Summary of Literature Review

## **2.1 Theoretical Framework**

Teachers provide support for learning and also conceptualize skills' instructions as means of attaining content objectives so that students can become independent learners. So, teachers have to mediate learning in terms of important content information, characteristics of diverse students and how they learn and ways that such information provides the foundations for behavioural changes.

In line with this awareness, the study was based on the classroom teaching model developed by Mitzel (1960) and constructionism learning theory of Papert and Harel (1991). A learning theory refers to the various attempts that psychologists have made to organize knowledge about learning and motivation into theoretical system that would provide general answers to basic questions about, how, what, why and when a learner learns or is motivated to learn (Inyang, 1993).

The model consist of four classes of variables: presage, context, process and product. According to Mitzel (1960), presage is teacher characteristics like intelligence, level of

experience, and methodology. This model recognizes the presage as fundamental in understanding classroom problems and challenges using the experience of the teacher. Product variable of the model relates to the learner. This refers to the effect of instruction while process involves the interaction between students and teachers. The context variable refers to the student characteristics and the classroom environment. The model maintains that the experience and methodology of the classroom teacher (presage) affect classroom environment and learning outcome (context, process and product). Supporting this model, Proctor (1984) concluded that teaching learning process is bidirectional with product as the end result of interest in an educational setting.

Wendy, Shannon, David and Brian (2006) explain that product is also identified as being the foundation for the paradigm. This study centred on teaching methods (presage and process variables) which are key factors in the model and the outcome of learning demonstrated by students (product variable) as it focuses on instructional approach of the teacher in planning and delivery (presage and process) and the acquisition of agricultural skills by students (product).

Constructionism learning theories of Papert and Harel (1991) state that individual learners construct mental models in order to understand the world around them. Papert and Harel (1991) define constructionism as a mnemonic for two aspects of science education. They take a view of learning as a reconstruction rather than transmission of knowledge. To them, learning is most effective when part of an activity the learner experiences is as constructing a meaningful product (Sabelli, 2008). Constructionism advocates student-centred, discovery learning where students use information they already know to acquire more knowledge (Alesandrini & Larson, 2002).

Constructionism holds that learning can happen most effectively when students are active in making tangible objects in the real world. This study revolves around practical and student-centred instructional methods to learning of agricultural skills as it focuses on project and demonstration teaching approaches which are student-centred instructional methods and they promote active participation as advocated by the constructionism learning theory.

## **2.2 Concept of Teaching**

One could argue that contextual teaching has been present in vocational classrooms long before the title became a buzz word in educational research. The very essence of contextual teaching and learning relates to the notion of learning by doing, which has long been a pillar of secondary agricultural education. However, at the post-secondary level agricultural students are often taught the core sciences separately from their applied agricultural courses (Kevin, Wilson, Jim & Charlotte, 2012). Teaching is a set of events outside the learner which are designed to support internal process of learning (Sequeira, 2015). Teaching means the various activities teachers undertake in their efforts to guide and impart knowledge to learners. Wood and Gentile (2003) define teaching as the method of conveying knowledge to learners by the teacher. It is simply an art and act of imparting knowledge to learners by the teacher who can be an individual, or learning resources and experiences that bring about behavioural changes in the learners, and making them more useful to self and their immediate communities. Teaching has been a common concept in the educational environment and involves many activities whether viewed from the nonformal application in informal education or from the classroom teaching learning process (Agatha, 2002). Abimbola (2004) asserts that the definition of teaching is numerous and varied depending on the subject matter in which the concept is used.

Teaching has been variously seen as the art of instilling a sense of curiosity about one's world and in enhancing the skills necessary to perpetuate this curiosity. Duruji, Azuh, Segun, Olanrewaju, and Okorie (2014), see teaching as an arrangement of contingencies of reinforcement; or the presence of mind and person and body in relation to another mind and person and body, a complex array of mental, spiritual and physical acts affecting others. Modebelu & Nwakpadolu (2013) support this characterization of the interactive nature of teaching by describing it as essentially a transactional encounter in which learners and teachers are engaged in a continual process of negotiation of priorities, methods, and evaluative criteria.

### **2.3 Teaching Methods**

Teaching methods constitute an area of higher education that should no longer be a case of 'business as usual' (Rao, 2004). Today's higher education learner lives in a different world and has a different pre-tertiary experience from students a generation ago. The learner's aspirations and expectations of higher education are also different from those of earlier generations. Above all, the goals of higher education have changed over the years from selectivity to optimizing the cultivation of talents which calls for improved teacher-student interaction paying greater attention to the needs of each individual learner, student assessment procedures that eliminate memorization-regurgitation in favour of logical reasoning, analysis, problem solving, and creativity; and all manners of creative teaching on the part of lecturers (Obanya, 2002). Schools are becoming diverse in terms of student backgrounds and abilities, and teachers are being ever more challenged to find effective ways to meet diverse needs of their students. Educators confront classrooms in which students' exhibit assorted academic and behavioural characteristics and they are increasingly looking for successful instructional and classroom management techniques

(Tournaki & Criscitiello, 2003). As educators face more demands and more diverse student needs, research is showing that schools may benefit by using peer-mediated interventions which are consistently producing academic gains (Ryan, Reid & Epstein, 2004). A blend of skills and art in teaching is also manifested in clearly structured lessons and manner of its presentation.

Teaching method can therefore be seen as the active learning guidelines that discuss the benefits of active learning, as well as providing guidelines and sample activities that facilitate active learning (Yin, 2003). It is the various medium and ways through which the content of a given subject area is discussed and systematically communicated to a learner by a teacher (Duruji, Azuh, Segun, Olarenwaju & Okorie, 2014). The term also refers to the general principles, pedagogy and management strategies used for classroom instruction. The choice of teaching method depends on what fits classroom setting and subject philosophy, classroom demography, subject area(s) and school mission statement. Teaching theories primarily fall into two categories or methods: teacher-centered and student-centered.

Teacher-centred methods mean the teacher plays the role of being a master of the subject matter. The teacher is looked upon by the learners as an expert or an authority. Learners on the other hand are presumed to be passive and copious recipients of knowledge from the teacher. Examples of such methods are expository and lecture methods which require little or no involvement of learners in the teaching process. It is also for this lack of involvement of learners in what they are taught, that such approaches are called “closed-ended” making these approaches least practical, more theoretical and memorizing (Teo & Wong, 2000). It does not apply activity based learning to encourage students to learn

real life problems based on applied knowledge. Since the teacher controls the transmission and sharing of knowledge, the lecturer may attempt to maximize the delivery of information while minimizing time and effort. As a result, both interest and understanding of students may get lost. To address such shortfalls, teaching should not merely focus on dispensing rules, definitions and procedures for students to memorize, but should also actively engage students as primary participants (Zakaria, Chin & Daud, 2010).

Learner-centred method sees the teacher as a teacher and a learner at the same time. Elliott and Nigel (2011) reported that the teacher plays a dual role as a learner as well “so that his classroom extends rather than constricts his intellectual horizons”. The teacher also learns new things every day in the process of teaching. The teacher, becomes a resource rather than an authority. Examples of learner-centred methods are discussion approach, discovery or inquiry based approach and the project-based learning. Most teachers today apply the learner-centered approach to promote interest, analytical research, critical thinking and motivation among students (Hesson & Shad, 2007). This method encourages students to search for relevant knowledge rather than the lecturer monopolizing the transmission of information to the learners (Ganyaupfu, 2013).

Duruji *et al.* (2014) classified teaching methods into direct instruction, inquiry based learning and cooperative learning. The direct instruction relies on explicit teaching through lectures and teacher-led demonstrations. Direct instruction is the primary teaching strategy under the teacher-centered approach because, teachers are the sole suppliers of knowledge and information. Direct instruction is effective in teaching basic and fundamental skills across all content areas.

Inquiry-based learning focuses on student investigation and hands-on learning. Here the teacher's primary role is that of a facilitator, providing guidance and support for students through the learning process. Inquiry-based learning falls under the student-centred method because, students play active and participatory role in their own learning process.

Cooperative Learning emphasizes group work and a strong sense of community. Cooperative model fosters students' academic and social growth and includes teaching techniques such as reciprocal teaching. It falls under the student-centred approach because learners are placed in responsibility of their learning and development. This method focuses on the belief that students learn best when working with and learning from their peers. The most productive collaborations involve a fair division of labour and relevant and complex projects that cannot be completed by an individual working alone which implies that this approach requires interdependence.

Literatures have diversely outlined various teaching methods which can be drawn from in the course of classroom instruction. These methods at the college level include: lecture, discussion, field trip, project/inquiry and demonstration teaching approaches. A lecture is an oral presentation of information by the instructor. It is the method of relaying factual information which includes principles, concepts, ideas and all theoretical knowledge about a given topic. In a lecture the instructor tells, explains, describes or relates whatever information the trainees are required to learn through listening and understanding. It is therefore teacher-centred. The instructor is very active, doing all the talking. Trainees on the other hand are very inactive, doing all the listening. Despite the popularity of lectures, the



lack of active involvement of trainees limits its usefulness as a method of instruction (Ganyaupfu, 2013).

According to Adekoya and Olotoye (2011), the lecture method of instruction is recommended for trainees with very little knowledge or limited background knowledge on the topic. It is also useful for presenting an organised body of new information to the learner. To be effective in promoting learning, the lecture must involve some discussions and, question and answer period to allow trainees to be involved actively. The trainees merely listen to the instructor. It is therefore very important to consider the attention span of trainees when preparing a lecture. The attention span is the period of time during which the trainees are able to pay full attention to what the instructor is talking about. It is difficult to hold the trainees attention for a long period of time and careful preparation of lectures is very necessary. The instructor should have a clear, logical plan of presentation, work out the essentials of the topic, organise them according to priorities and logical connections, and establish relationships between the various items. Careful organisation of content helps the trainees to structure and store or remember it. When developing a theme in a lecture, the instructor should use a variety of approaches. A useful principle in any instruction is to go from the *known* to *unknown*; *simple* to *complex*, or from *parts* to a *whole* (Edu, et al. 2012).

Knowing the trainees and addressing their needs and interests is very important. For example, in explaining technical processes the instructor should search for illustrations that will be familiar to the trainees. Unfamiliar technical words should be introduced cautiously. New terminologies should be defined and explained and examples given. In order to gain and focus the attention of trainees, the instructor should be adequately prepared, fluent in his/her presentation and should use various teaching aids and illustrations such as charts,

transparencies, codes and even the real objects during presentation. Question and Answer periods should be included in the lecture (Auwal, 2013).

There are qualities which are considered vital for effective good lecture delivery. These qualities range from a lecture delivered within a duration not longer than the trainees' attention span and should address a single theme that should be carefully explained with familiar examples and analogies given to established fluency in its technical content. Employing a variety of approaches, using illustrations and building on existing knowledge will also enhance a good lecture.

Discussion method involves two-way communication between participants. In the classroom situation an instructor and trainees all participate in discussion. During discussion, the instructor spends some time listening while the trainees spend sometimes talking. The discussion therefore, is a more active learning experience for the trainees than the lecture. A discussion is the means by which people share experiences, ideas and attitudes. As it helps to foster trainees' involvement in what they are learning, it may contribute to desired attitudinal changes (Ganyaupfu, 2013). Discussion may be used in the classroom for the purpose of lesson development, making trainees apply what they have learnt or to monitor trainees learning by way of feedback.

Duruji *et al.* (2014) opined that in areas that trainees already have some knowledge or experience, discussion may be used to develop the main points to be covered in a lesson. For example, in agricultural production training many of the procedures and behaviour that should be observed can be established through discussion with trainees. Trainees can draw on their experience of working in farms to contribute to the discussion. In discussing some issues, differences of opinion arise. The discussion can help to clarify the different points of

view and may assist each trainee to define his or her own opinion. Used in this way, discussion may be more effective in motivating trainees than lectures. Trainees can see that some importance is attached to their contributions. Discussion may also be used, following a lecture or demonstration, to help trainees apply what they have learned. The instructor can ask questions, which help trainees to relate concepts and principles to contexts that are familiar to the trainees or in which they will ultimately be needed (Sola & Oloyede, 2007). The discussion method also provides an opportunity to monitor trainees learning. The answers provided by trainees and the questions they ask, reveal the extent and quality of learning taking place. Instructors can use this information to repeat or modify an explanation to improve learning. They can also provide feedback to trainees, thereby helping to reinforce learning that has taken place. Discussion used in this way should follow after other methods of classroom instruction such as lectures, demonstration or project/inquiry.

Discussion sessions can be led by the instructor, or can take place in groups. In either case, the goal is to meet the lesson objectives by allowing the trainees to relate relevant personal experiences or events which have occurred in the work setting, contribute ideas or personal opinions and apply what has been learned to familiar situations or solving problems.

Whether the discussion is instructor led or takes place in groups it must be guided by the instructor. It must be focused on the objectives of the lesson: it is the instructors' responsibility to see that the objectives are met. If it is not properly guided, a discussion can degenerate into a consideration of inappropriate or unimportant topics adding confusion rather than clarification to the lesson (Mills, 1990).

A field trip is a journey by a group of people to a place away from their normal school environment. The purpose of the trip is usually observation for education, non-experimental research or to provide students with experiences outside their everyday school activities (Greene, Jay & Brian 2015). The aim of this trip is to observe the subject in its natural state and possibly collect samples. Field trips are also used to civilized students who appreciate culture and arts. It is seen that field trip provide a common ground for all categories of students to have the same experiences. Field trips are usually done in three stages: preparation, activities and follow-up. Preparation applies both the students and teachers. Teachers often take the time to learn about the destination and the subject matter before the trip. Activities that happen during the field trips often include: lectures, tours, worksheets, videos and demonstrations. Follow-up activities are usually discussions that occur in the classrooms once the field trip is completed which ends with writing of reports by every student on experiences and possible recommendation for subsequent trip (Kulas, 2015). For agricultural education students, popular sites include: zoos, agricultural farms, plantations and agricultural institutions.

#### **2.4 Project Teaching Methods**

A project is a whole-hearted purposeful activity proceeding in a social environment. It is a bit of real life that has been impacted into school. The project method refers to a set of teaching strategies which enable teachers to guide students through in-depth studies of real world topics. The project approach is not unstructured. There is a complex but flexible framework with features that characterize the teaching-learning interaction. When teachers implement the project approach successfully, students can be highly motivated, feel actively involved in their own learning, and produce work of a high quality (Chard, 2004). A project is

an in-depth investigation of a topic worth learning more about. The investigation is usually undertaken by a small group of students within a class, sometimes by a whole class, and occasionally by an individual student. The key feature of a project is that it is a research effort deliberately focused on finding answers to questions about a topic posed either by the students, the teacher, or the teacher working with the students (Katz & Helm, 2001).

Projects, like good stories, have a beginning, a middle, and an end. This temporal structure helps the teacher to organize the progression of activities according to the students' needs, interests and personal involvement with the topic of study. During the preliminary planning stage, the teacher selects the topic of study (based on the students' interests, the curriculum, the availability of local resources, etc.). The teacher also combines experience, knowledge, and ideas and represents them in a topic web. This web will be adhered to throughout the project and used for recording the progress of the project (Chard, 2004).

Project method is one of the modern methods of teaching in which the students' point of view is given importance in designing the curricula and content of studies. This approach is based on the philosophy of pragmatism and the principle of learning by doing. In this approach, students perform constructive activities in natural condition. It demands work from the students.

#### **2.4.1 Types of project teaching method**

There are three major types of project teaching approach namely: individual and social projects, group projects and simple and complex projects. In individual project, all students solve the problem on their own according to their interest, capacity, attitude and needs. The problem is solved by the group of students in the class in group project.

Here the social, citizenship qualities and synergism are developed. In simple projects the students are completing only one work at a time. It gives the deep information about the project in one angle. The students get deeper and broader knowledge about the problem. In complex project students carry out more than one work at a time. They focus on the work in various subject and angles. Here the students get the knowledge about the work in various activities and dimensions.

According to Udofia and Aniefiok (2013), project method can be carried out by creating the proper situation for the students by the teacher in the class. The teacher puts up the knowledge about the project procedure, steps, and uses to the students. A project should arise out of a need felt by students and it should never be forced on them. It should be purposeful and significant. The teacher helps the students to select the problem and guides them in solving the problem. Students have freedom to choose the topic or problem based on their interest and ability. Before choosing the topic the principles should be taken into an account; school tasks should be real and purposeful in a nature that the student is genuinely eager to carry them out in order to achieve a desirable and clearly realized aim. The teacher should only rouse the students for a particular project by providing a situation but the proposal for the project should finally come from students.

The teacher discussed with the students about the problem in various angles and points. After the free expression of the students' opinion about the problem, the teacher writes down the whole programme of action stepwise on the chalkboard. In the process of planning the teacher has to act only as a guide and should give suggestions at times but actual planning should be left to the students. The students are starting their work in this step. They are collecting the relevant information and materials at first. The teacher should

give the time and right to the students according to their own speed, interest and ability. During this step the teacher should carefully supervise the students in manipulative skills to prevent waste of materials and to guard against accidents. The teacher should constantly checkup the relation between the stated plans and the developing project (Robert & Harlin, 2007).

Evaluation of the project should be done both by the students and the teachers. The students evaluate the task by determining whether the objectives are achieved or not. After that they criticize and express their feeling about the task freely. The evaluation of the project has to be done in the light of plans, difficulties in the execution and achieved results. It is the last step of the project approach in which each and every step of the work is reported. The reported works are recorded in a certain order in a book form. It should include the proposal, plan and its discussion, duties allotted to different students and how far they were carried out by them. It should also include the details of places visited and surveyed guidance for the future and all other possible details (Nsa, 2002).

In project method of teaching the role of a teacher is that of a guide, friend and philosopher. The teacher is not a dictator or a commander but a friend, guide and a working partner. The teacher's role is to encourage students to work collectively/co-operatively, helps his students to avoid mistakes, and makes it a point that each member of the group contributes something to the completion of the project. If students face failure during execution of some steps of the project the teacher should not execute any portion of the project but should suggest some better methods or techniques that may be used by them next time for the success of the project. It is important for the teacher to help students in developing character and personality by allowing them to accept responsibilities and

discharge them efficiently. This can be done by providing democratic atmosphere in the class so that students can express themselves fully without any fear. The teacher should be alert and active all the time to see that the project is running in its right direction and should have thorough knowledge of individual children so as to allot them work accordingly (Grant, 2002). The teacher should always remain alert and active during execution and see that the project goes onto completion successfully.

During execution of the project, the teacher should maintain a democratic atmosphere, must be well – read and well-informed so as to help students successfully complete the project. Students generally work in small, collaborative groups in the project-based learning model. They find sources, conduct research, and hold each other responsible for learning and the completion of tasks. Essentially, students need to be self-managers in this method to instruction (Mergendoller & Thomas, 2000).

According to Proulx (2004), project method is a systematic process which facilitates acquisition and transfer of learning, anticipation, planning, and implementation alone or with pairs under the supervision of a teacher. The task should be an observable activity leading to a final product that can be evaluated. But Grant (2002) reports that common features of project method involved an introduction to set the stage or anchor the activity and a task, guiding question or driving question. To Grant, there should be collaborations, including teams, peer reviews and external content specialists; and opportunities for reflection and transfer, such as classroom debriefing sessions, journal entries and extension activities.

Project method is also characterized by taking the student beyond the walls of the classroom to a natural setting, thus making learning realistic and experiential. It has to encourage investigative learning and solution of practical problems. This should focus on the



students as it enlists active involvement in the task set to promote the spirit of scientific enquiry. Also, it has to involve validation of hypotheses based on evidence gathered from the field through investigation. This method also promotes a better assimilation of the practical aspects of knowledge gained from books. Project method should enhance students' social skills through interaction with the social environment. The teacher plays a facilitative role rather than the role of an expert and therefore, allows students a great degree of freedom to choose from among the options given to them, providing a psychological boost and spirit of research in the student (Grant, 2002).

## **2.5 Demonstration Teaching Methods**

The most effective way to teach an occupational skill is to demonstrate it. Demonstration involves showing by reason or proof, explaining or making clear by use of examples or experiments. Put more simply, demonstration means to clearly show (Sola & Oloyede, 2007). In teaching by demonstration, students are set up to potentially conceptualize class material more effectively as shown in a study which specifically focuses on demonstrations presented by teachers (Bruce, John, Tara, & Rich, 2009). Demonstration method has been shown to be effective with both large and small groups. The greater the degree of participation and sensory involvement by the learner, the more effective learning will be. The teachers can improve the use of demonstration method in the classroom by allowing students to use several senses which involve seeing, hearing and possibly experiencing. Also, ideas should be presented to stimulate interest. If these precautionary measures are not taken, demonstration can limit students' participation.

According to Achounye (2002), demonstration method is a practical method of teaching. It involves showing, doing and telling something. Therefore, the teacher needs to

display the steps in the process and explain them accurately and clearly, while students are expected to practice by repeating the things the teacher has done. Demonstration means any planned performance of an occupational skill, scientific principle or experiment.

Demonstration method has emerged to become an instructional approach that is gaining growing interest within the engineering education community (Hadim & Esche, 2002). Duch (2002) describes demonstration method as an instructional strategy that challenges students to "learn how to learn" working cooperatively in groups to seek solutions to real world problems. Prpic and Hadgraft (2009) address the key ingredients of demonstration method and postulate that it should not be confused with design projects or case studies where the focus is predominantly on the application of existing knowledge and integration of what is already known. Demonstration method goes beyond these; students will encounter some concepts for the first time and therefore they need strategies for acquiring this new knowledge (Prpic & Hadgraft, 2009). Demonstration methods has been used extensively in the sciences (Tretter, 2003) and to lesser extent in engineering. For instance, Lee (2004) reported that during demonstration, students were able to identify some difficulties they faced in learning science when they were given problem to solve.

Demonstration method is no substitute for laboratory exercise or for learning proper techniques of handling laboratory equipment, but are effective means of supplementing and clarifying the material being taught. Demonstration instructional method is a method of teaching concepts, principles or real things by combining explanation with handling or manipulation of real things, equipment or materials (Edu, Etelbert & Idaka, 2012).

### **2.5.1 Types of Demonstration Teaching Method**

**i. Method demonstration:** this is used for teaching students agricultural skills. It involves showing students how to carry out a practice or use a tool/implement. Here, students are taught specific skill, techniques required for it uses and procedure involved in carrying out the skill. Olatoye and Adekoya (2011) state the examples of method demonstration as how to use a sprayer, different planting methods, fertilizer application, seed treatment; and different methods of pests and disease control.

**ii. Result demonstration:** Mills (1990) refers to result demonstration as a very useful methods because it explains the reason for undertaking certain task or new practice. This shows the product of a new practice and its feasibility. It shows the result of the new practice (Lambros, 2002). Result demonstration means showing the end process of learning or practice to the learner before he embarks on learning.

Nsa, (2002) states that the teacher can prepare for demonstration by rehearsing the presentation before the lesson delivery to find out difficult steps and possible interruptions. Relevant materials like tools, equipment, visual and teaching aids should be obtained in advance and their useful condition checked during the preparation stage. Timing of the demonstration, removal of all extraneous materials, visibility, students grouping should be ascertained before commencement of demonstration. The teacher should plan to use a skill or method to advantage; work from simple to complex, one step at a time. During presentation, the teacher should make sure that all students can see and hear the lesson, be enthusiastic, professional, effective but not dramatic, relax; use any mishaps or humour to your advantage, observe all safety rules and procedures, keep eye-contact with the class; ask and encourage class questions, explain *why* and *how*: use the techniques of *show* and *tell* and use a medial summary to strengthen your explanation.

Adequate preparation and presentation in demonstration approach comes with some challenges. Therefore, Daluba (2013) reports that the teacher can take precautions by avoiding interruptions to keep demonstration smooth and continuous; not demonstrate on a student's material, working towards one aim and allowing time for possible student participation. In carrying out demonstration, the teacher should give a good performance bearing in mind that the trainees learn by good example, and also, explain each step or process as they proceed following the lesson plan; make sure the trainees see the demonstration from the angle they will perform it themselves; and be sure everyone can see and hear and maintaining eye contact. Emphasis should be on key points, and if possible, prepare beforehand to ask key questions as you go along and allow trainees to ask questions.

The teacher has to pay attention to all safety rules, precautions and procedures; and emphasise them to the students. Use proper instructions, aids such as chalkboard, charts, handouts etc. to support the demonstration. Provide for trainees participation where possible, during and after demonstration. Demonstrate the correct way only. First impressions are important, therefore, make them correct ones and always summarise the steps and emphasise key points again. After demonstration, return all items used during demonstration to their storage places, make arrangements to have the trainees practice the skill as soon as possible in a practical class session, observe and analyse trainee(s) performance and correct mistakes, offer reinforcement where necessary, coach weak or slow trainees, check trainee's completed work for accurate performance and record and allow sufficient time interval before demonstrating another operation (Ogologo & Wagbara, 2013).

It is however, important to note that the choice of any form of teaching method should not be arbitrary, but needs to be governed by the subject matter and the instructional objective that the teacher intends to attain by the end of instruction. At the same time each method is not fool-proof, but has its own advantages and disadvantages (Uhumuavbi & Mamudu, 2009). That is why the use of complementary methods rather than one method is necessary.

## **2.6 Skill Acquisition**

Vocational and technical education is used as a comprehensive term referring to those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life (NPE, 2004). From the mid-1970s, unacceptably high levels of continuing unemployment and the transformation of production processes by information communication technology have pushed the concept of skill and its acquisition to the centre of debates on appropriate employment policies for modernising economies (Rigby & Sanchis, 2006).

Chronic youth un- and underemployment and poverty can be attributed in part to young people's limited access to skills development opportunities. In many developing countries, standard education fails to equip rural youth with the knowledge and skills needed to seize the few available productive and decent employment opportunities. This also limits young

people's capacities to pursue viable livelihood alternatives, including starting their own rural enterprises (FAO, 2017).

The goals of vocational and technical education shall be to provide trained manpower in the applied sciences, technology and business particularly at craft, advanced craft and technical levels; provide the technical knowledge and vocational skills necessary for agricultural, commercial and economic development; and also to give training and impart the necessary skills to individuals who shall be self-reliant economically (NPE, 2004). Achieving these objectives will help to reduce the menace of unemployment and underemployment looming troubles.

Vanpatten and Bennati (2010) define skill as the ability to do rather than underlying competence or mental representation. Business dictionary (online) defines skill as an ability and capacity acquired through deliberate, systematic, and sustained effort to smoothly and adaptively carryout complex activities or job functions involving ideas (cognitive skills), things (technical skills), and/or people (interpersonal skills).

Skill acquisition is a term derived from two words namely, skill and acquisition. Skill simply may imply a given competence, while acquisition means 'learning or development of'. Therefore skill acquisition can be referred to as the form of training by individuals or group of individuals that can lead to acquisition of knowledge, competencies or qualities necessary for self-reliance. This involves the training of people in different fields of trade under a legal agreement between the trainers and the trainees for certain duration and under certain conditions.

Idoko (2014) define skill acquisition as the process of demonstrating the habit of active thinking or behaviour in a specific activity. Skill acquisition is seen as the ability to do or

perform an activity that is related to some meaningful exercise, work or job. The researcher maintains that for skill to be acquired, appropriate knowledge, attitudes, habits of thought and qualities of character are learnt to enable the learner develop intellectual, emotional and moral character. This can be possible only where there is a teacher or trainer.

Similarly, Donli (2004) is of the view that skill acquisition is the manifestation of idea and knowledge through training which is geared towards instilling in individuals, the spirit of entrepreneurship needed for meaningful development. The writer stressed that if individuals are given the opportunity to acquire relevant skills needed for self-sustenance in the economy, it will promote their charisma in any work environment. This will increase competition and cooperation among individuals.

Furthermore, Magbagbeola (2004) reported that skill acquisition requires the accumulation of different skills that enhances task performance through the integration of both theoretical and practical forms of knowledge. So, the guidelines for the sustenance of skill acquisition programme should include provision of training that gives the trainees the opportunities to acquire skills that are appropriate for preparation in a field of trade for gainful employment.

It has to also provide definite skills that relate to each trade that makes one a professional in one field instead of the others, and that training has to be done by competent, experienced and qualified instructors. Skill acquisition requires much practice, patience, interest, ability, aptitude, personality traits, and conducive environment. The principles guiding training in a particular field in terms of attitude, interpersonal relationship, productivity, efficiency, supply and demand needs to be appreciated differs.

Generally, the process of acquiring skills starts from being a novice to competence which will subsequently result in proficiency and expertise, then finally mastery. This happens

through a step-wise improvement of mental processing which the learner has been following in the course of the training. Food and Agricultural Organisation (FAO, 2014) posits that acquisition of skill begin with mental imagery (cognitive stage) which involve majorly, thinking and trying to understand the skill. Then to a stage where the fundamentals and mechanics of the skill have been learnt, and performance is less variable and more consistent (associative stage). But some errors still occur before reaching the period where the skill becomes habitual or relatively automatic as a result of much practice and experience (automotive stage). At this point skill has been fully acquired and the individual applies such skill with easiness.

## **2.7 Brooding**

Brooding refers to the period immediately after hatch when special care and attention must be given to chicks to ensure their health and survival before rearing. Rearing means the remainder of life after brooding until sexual maturity. There are various factors and operations to consider during the stage of brooding starting with housing, brooding rings, temperature control, floor covering, ventilation, lighting, water, feed and feeder space (Saskatchewan, 2015).

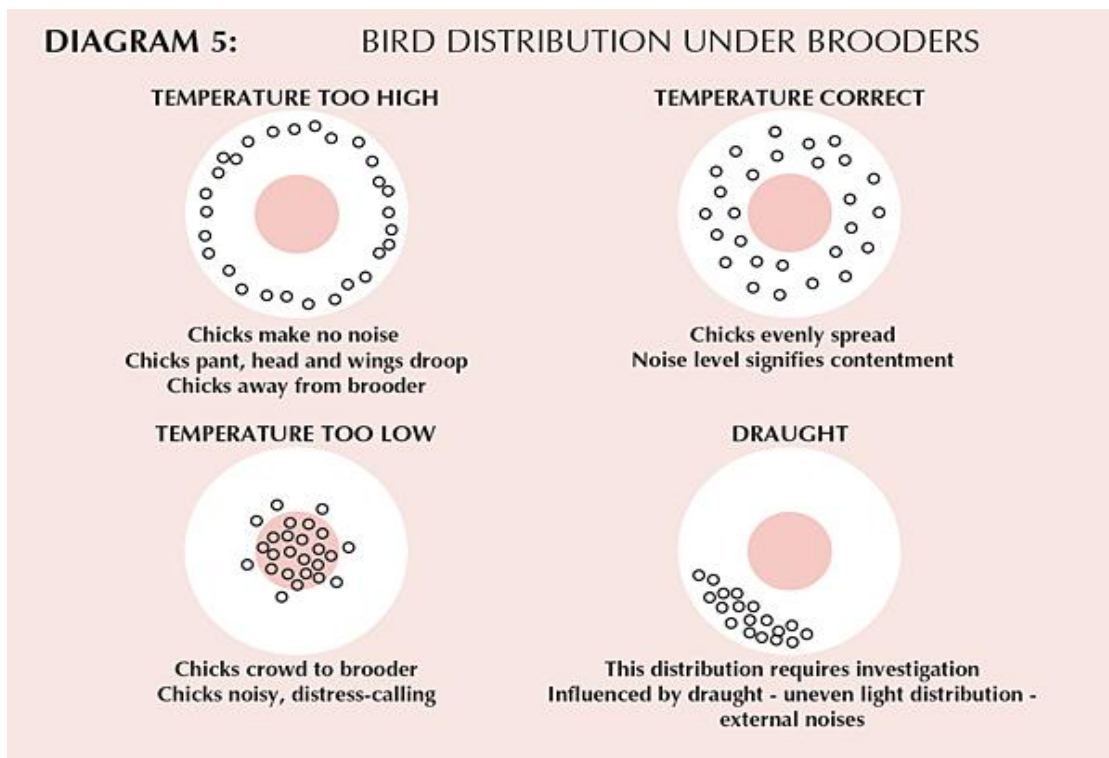
The brooding room should be heated prior to arrival of the chicks. A newly hatched chick requires supplemental heat to maintain its body temperature; therefore, an external heat source must be provided to chicks in the first few weeks. Heat lamps with infra-red bulbs are usually positioned in the centre of a brooder ring. Reheat lamps are used to confine chicks in a small area close to feed and water and ultimately allowing them to select an environment at their own thermal comfort level. Brooder rings usually consist of a 30 to 45 cm (12 to 18 in) wide ) strip of corrugated cardboard which has been cut to an



appropriate length in order to form a ring 2.4 to 3.6 m in diameter (8 to 12 ft.). It is important to note that for turkeys, the height of the brooder ring should be slightly higher. The brooder ring is set up in the pen where the chicks are placed, and is removed once they are five to 10 days old. Size is adjusted for the number of birds to be contained, but the key is to allow room for the chicks to move around so they can select their optimum temperature.

Temperature control is important to chicks, particularly in the first three weeks of life. Brooder rings should provide adequate space for the chicks to select a comfortable temperature. If the chicks are too cold, they will become chilled and uncomfortable, and will not eat or drink. If the chicks are too hot, they will become dehydrated and susceptible to high mortality. Starting temperature requirements for all poultry species are similar. Initial brooding temperature, at the chicks' level, should be 35° C, and reduced by approximately 3° C per week until 21° C is reached. Temperatures may be lowered earlier for waterfowl. If the whole room is heated and there are no heat lamps, the initial brooding temperatures should be slightly lower (30° to 33° C). After six weeks of age, temperatures between 18° and 21° C are desirable. These brooding temperature guidelines should be adjusted according to observations of the chicks. The behaviour and sounds of the chicks will indicate their comfort level. Comfortable birds will be evenly spaced around the pen and will make soft "cheeping" noises. Cold chicks will huddle in the warmest part of the pen and cheep loudly. If the birds are too hot, they will: generally be positioned against the walls away from the heat source and will be panting or possibly sitting with their wings outstretched and feathers fluffed out. The chicks will do a better job than a thermometer of telling you about their comfort level (Tom, 2015).

The diagrams below show how chicks will move away or towards the heat lamp if they are hot or cold. Preventing drafts is also important, as young chicks are easily chilled. Ascites (or water-belly) in broiler chickens can be attributed to cool temperatures early in the brooding period. This disease can cause high mortality and inedible carcasses at slaughter.



Figure

1: Diagram from Ross Broiler Management Manual, August 2, 2007. Reprinted with permission of Aviagen Incorporated, Aviagen Limited, Newbridge, Midlothian, Scotland, UK, and Huntsville, Alabama, USA.

The pens where the chicks are to be raised should be thoroughly cleaned and disinfected at least one week prior to chick placement. Any equipment to be used should also be cleaned and disinfected. Fresh, mold-free bedding (litter) should be spread over the whole floor area, including the brooder ring. The bedding will provide insulation from the floor and will soak up moisture from the bird droppings. It will also help to prevent damage to the birds' legs due to slipping on wet surfaces. Types of material which can be used for bedding include straw and wood shavings. The depth of the bedding should be seven to 10

cm (three to four inches). During the rearing period, bedding should be removed and replaced routinely in areas which become wet. This is often necessary next to the water source and helps to prevent ammonia build-up in the air.

Space requirements for the brooding and rearing of poultry are different for each species. Table 1 gives recommendations for chickens. These are guidelines, and judgment must be used based on the size of the chicks. The listed space requirements also require adequate ventilation, with fans and inlets.

**Table 1. Floor space recommendations**

**Chickens (meat and laying strains)**

Age (weeks)	0 - 3	3 - 8	>8
m <sup>2</sup> /bird	0.05	0.07 - 0.09	0.14 - 0.19
ft <sup>2</sup> /bird	0.5	0.75 - 1.0	1.5 - 2.0

Chicks require an abundance of fresh air with low contaminants such as dust and ammonia. During the first few days of brooding, little ventilation is required; however, proper ventilation is very important as the chicks are growing. In commercial barns, fans and inlets are manipulated to provide uniform air distribution. Fans draw air out of the barn and inlets let fresh air in, thereby removing dust and ammonia. Humidity can be reduced and excess heat eliminated if necessary. As noted previously, drafts should be avoided with chicks.

Constant bright light of 20 to 50 lux (the measurement term lux being the International System of Units or SI for illuminance and luminous emittance), should be

provided from hatch to seven days of age. The constant lighting allows chicks to adjust to their new environment and find their feed and water sources. After seven days, the light intensity may be lowered to five lux. At five lux, it is difficult to read a newspaper inside the barn, but if desired, light intensity can be measured using a photographic light meter. The lower light intensity will help prevent cannibalism. However, if heat lamps are used, there are windows in the barn, or the chicks are in an outside run, it is difficult to control the light intensity. In these situations, it is suggested that intensity be reduced when feasible or if problems with cannibalism arise at a later date. After seven days, a period of darkness is recommended for all types of poultry to reduce the incidence of metabolic (especially heart) diseases and leg problems. The use of natural daylight is sufficient, or providing 12 to 16 hours of artificial light per day will result in adequate exposure to darkness. After six weeks of age, chickens raised for egg-laying purposes should be provided a maximum of eight to 10 hours of light per day until they are about 18 to 20 weeks of age. The day length is then increased to stimulate egg production. It is very important that day length not be reduced once the hens are laying eggs, or production will drop.

During the first week of brooding, deaths due to dehydration can be reduced by providing additional water sources in the brooder ring. Several shallow trays, such as ice cube trays, can be placed throughout the ring. It is also helpful to dip the chicks' beaks into the water when initially placing them into the brooder ring. Fresh water should be available at all times, and the water containers should be cleaned routinely. As with the feeders, the height of the water source should be regularly adjusted to be even with the back of the chicks.

During the first week of brooding, in addition to the feeding troughs, small amounts of feed should be provided in shallow trays (such as box lids or egg flats) which the chicks can easily access. This helps the chicks find the feed more successfully in the first few days. It is also beneficial to place the feed and water close together during this time to ensure the chicks eat and drink. Adequate feeder space is necessary to prevent crowding at feeders and to promote uniform growth. After initial brooding, feed should be placed away from the waterers to prevent wet feed and dirty water. Table 2 provides guidelines for feeder space for different poultry species, but discretion must be used based on bird size. Feeder height should be adjusted regularly so that the lip of the feeder is even with the backs of the chicks.

**Table 2. Feeder space recommendations**

**Chickens (meat and laying strains)**

Age (weeks)	0 - 3	3 - 8	>8
cm/bird	2.5	5.0 - 7.5	7.5 - 15.0
in/bird	1.0	2.0 - 3.0	3.0 - 6.0

Feed can be provided continuously or mildly restricted. Metabolic diseases and leg problems can be reduced in broiler chickens by withholding feed for part of the day. Feed should not be restricted during the first week of brooding. Chicks are generally fed a starter diet that can be purchased from a local feed supplier. The size and texture of the feed provided is

important when raising chicks, as newly hatched chicks cannot eat the large feed pellets provided for older poultry.

## **2.8 Brooding Skills**

Poultry and game bird producers realize that chicks must be kept warm or brooded during the first weeks of life. Surprisingly, improper brooding is one of the most common causes of stress in poultry flocks (Tom, 2015). Brooding skills therefore refer to the various abilities necessary for performing different brooding operations. It refers to the ability to raise or manage chicks from period immediately after hatch when special care and attention must be given to chicks to ensure their health and survival to the time of rearing. A learner is considered to have brooding skill if such learner has attained a level of ability in chicks' management. That is, if the learner is able to brood chicks successfully at least during the first three weeks of the birds life. This management include taking care of the chicks' housing, feeding, health, temperature control, ventilation and hygiene.

## **2.9 Acquisition of Brooding Skill**

Skill acquisition refers to a form of prolonged learning about a family of events. Through many pairings of similar stimuli with particular responses, a person can begin to develop knowledge representations of how to respond in certain situations. These representations have some form of privileged status in memory because they can be retrieved more easily and reliably than memories of single events. Thus, skilled behaviors can become routinized and even automatic under some conditions. Acquisition is a measure of what a person has learned within or up to a given time (Edmond & Ayodele, 2004). It is a

measure of accomplished skills and indicates what a person can do at the present as an outcome of learning. So, acquisition of brooding skills mean development of abilities in brooding management and operation or the ability to apply knowledge of brooding in the practice of brooding. This means what a student or a graduate of agricultural training institution is able to do as a result of learning instructions received during the periods of learning.

### **2.10 Empirical Studies**

Sola and Oloyede (2007) conducted a research on: Effects of Project, Inquiry and Lecture-Demonstration Teaching Methods on Senior Secondary Students' Achievement in Separation of Mixtures Practical Test. A pre-test, post-test experimental design with a control group was used. Random sampling technique was used for selecting the sample. Three objectives, three research questions and three null hypotheses were stated. The instrument used for data collection was a twenty-five Chemistry Achievement Test (CAT). The data was analysed using t-test analysis, one way ANOVA and Scheffe post-hoc analysis at 0.05 significant level. The study reported that the project method enhanced better performance in chemistry practical than either inquiry or lecture-demonstration method.

The researcher should have stated and tested four null hypotheses since the study had three teaching methods. That is similar to saying you have three experimental groups to be compared each with the control group and finally comparing the three methods with each other. Two statistical tools (t-test and ANOVA) would have been used to test the hypotheses to get a desired result instead of three tools. T-test statistics would have been used to determine the significant difference between project and control, inquiry and

control and the lecture-demonstration and control; then ANOVA can be used to compare the three.

The above research work is related to the ongoing research because it used pretest, post-test experimental design, t-test statistics which are similar, and the treatment variables will be teaching approaches. The past research however, used three teaching approaches and the ongoing used two teaching approaches. The research is also different from the ongoing research in the population for the study. The present research will use colleges of education students as population for the studies.

Auwal (2013) also carried out a research on: Effects of Teaching Method on Retention of Agricultural Science Knowledge in Senior Secondary Schools of Bauchi Local Government Area, Nigeria. The researcher stated two objectives, two research questions and three null hypotheses tested at 0.05 level of significance. Pretest post-test non-equivalent control group research design was used. The population for the study were all students that offered agricultural science in all the secondary schools in the area of study and random sampling technique was used to obtain the sample. Achievement test and retention test were developed and used as instrument for data collection which were analyse using mean, standard deviation, t-test and ANOVA. The result showed that demonstration method of teaching had higher retention.

The researcher did not need achievement test looking at the variables for the study, it pointed to the fact that the researcher was measuring retention not achievement. Two objectives and two research questions were not adequate enough for the study as the research needed to compare the two teaching methods used for the experimental groups. Also, since experimental groups and control group were set up in different environment, the



outcome might have been affected by environmental factors other than the variables under investigation. According to the researcher, three schools were used and two of the schools were designated for experimental groups each and the third school used for control group instead of using the same school environment to set up the experimental and control groups. ANOVA was also used to compare two teaching methods which seem not appropriate as two variables are better compared with t-test statistics.

While the above research was conducted using secondary school students as population for the study, and the instrument for data collection were achievement and retention tests, this study used colleges of education students and only an agricultural skills acquisition test was used for data collection. The data collected for this research were analysed using mean, standard deviation, t-test and Pearson product moment correlation rather than the ANOVA used by past research.

Daluba (2013) conducted a study on: Effect of Demonstration Method of Teaching on Students' Achievement in Agricultural Science in Kogi East Education Zone. Two objectives, two research questions and one null hypothesis were used. Quasi experimental research design was adopted for the study. The population for the study was the senior students of 195 secondary schools in the area of study. Purposive random sampling technique was used for selecting sample. Mean, standard deviation and analysis of covariance (ANCOVA) were used for data analysis at 0.05 level of significance. The result showed that demonstration method had significant effect on students' achievement than conventional lecture method.

The used of 12 intact classes from 6 different schools might have affected the result of these research except the researcher set up experimental and control groups in each of

the 6 schools. Intact classes sometimes may not be appropriate to give a desired result in experimental design as some schools consider performances of their students in class placement. The researcher should have also tested for gender difference in the test of hypotheses since the study considered gender in the problem statement. This would have given rise to two hypotheses instead of one as stated by the researcher.

The above research is related to the ongoing research as it was conducted on teaching methods. Also, the past research focuses on demonstration teaching method in secondary schools only, while the ongoing research will work on project and demonstration teaching approaches in colleges of education. Both research are similar in the research design adopted for the studies.

Ganyaupfu (2013) also carried out a research on: Teaching Methods and Students' Academic Performance in PC Training & Business College, South Africa. The research design for this investigation was an experimental design. The population for the study was undergraduate students from three fields of specialization. The sample consisted of one hundred and nine (n=109) students by stratified random sampling technique. He stated four objectives, four research questions and four hypotheses. Data for the study were generated from students' academic performance assessment test scores prepared by the lecturer. The differential effectiveness of the three teaching methods on student academic performance was analysed using the General Linear Model based univariate ANOVA technique at 0.05 level of significance. The results indicate significant differences on the effectiveness of the three teaching methods. The mean scores results demonstrate that teacher-student interactive method was the most effective teaching method, followed by student-centered method while the teacher-centered approach was the least effective teaching method. The

researcher finds out that learning is more effective if the students are tasked to perform rather than just asked to remember some information. A typical learning environment with a presentation from the course teacher accompanied by a lecture neither promotes learners' participation nor build the required level of reasoning among students. Students build a better understanding of the main concepts more effectively when they are engaged to solve problems during class activities.

The researcher used three teaching methods but did not test for the difference, relationship or influence between the methods with the control group using t-test statistics. This should have been done before the used of ANOVA to compare the three teaching methods. The researcher also failed to identify the three methods by their names and alsodid not show which was better based on the result of the data analysis.

The above research is similar to the ongoing research as both used higher institution students as population for the studies. But while the past research was investigated the effects of three teaching methods on students' performance, the ongoing research will study the influence of two teaching methods on students' achievement of agricultural skills. The method of data analysis will also differ because the above research used the general linear model based univariate ANOVA technique, while the ongoing research will use descriptive and inferential statistics for data analysis.

Udofia and Aniefiok (2013) carried out a research on Project and E-learning Teaching Methods and Students Skills Acquisition in Electrical Installation Works in Technical Colleges in Akwa Ibom State. They used non-randomized pretest post-test control design and outlined four (4) each of objectives, research questions and null hypotheses for the study. The 90 electrical electronics students in the two technical colleges were used as

population/sample for the study. Skill acquisition test (SAT) was developed by the researchers and used for data collection. Four objectives, four research questions and four null hypotheses were stated. Mean and analysis of covariance (ANCOVA) were used to analyse the data. Hypotheses were tested at significant level of 0.05. The researchers found that there was significant difference between students taught with project method and those taught using E-learning. Project method group performed better.

The researcher adopted quasi-experimental control group design, but failed to assign the control group in dividing the students. This therefore means that the conclusion on the basis of the findings of the research was not based on facts because the performance of the control group was not analysed. Actually, the research questions and hypotheses stated by the researcher were similar in every word used. So, one wonders how the analysis were carried out.

The above research is related to the ongoing research because one of the variable (project teaching approach) and college students were used. Though, it differs with this study because it was conducted using electrical electronics students but this study will use agricultural education students. Also, the researchers used ANCOVA to analyse collected data, but this study will use simple descriptive statistics, t-test and correlation. E-learning which was a variable in the research will not be part of the ongoing research rather, project and demonstration approaches will constitute the variables for the study.

Ogologo and Wagbara (2013) in their research work Effect of Demonstration Strategy on Senior Secondary School Students' Achievement in Separation Techniques in Chemistry in Obio/Akpor Local Government Area, Rivers State. The quasi experimental design was adopted for the study. Senior students offering chemistry were used as

population for the study and a sample size of 100 Secondary School (SSII) selected by random sampling technique. Chemistry achievement test (CAT) was used to collect data on the students' achievement in chemistry. Two objectives, two research questions and two hypotheses were raised. The data was analyzed using mean and t-test at 0.05 level of significance. Demonstration method of teaching was found to be potent in raising students' achievement and retention in chemistry. The study also found no significant difference between students taught using demonstration and lecture methods over solving mathematics-related problems in chemistry. Also, there was a significant difference in the retentive abilities of students taught using demonstration and lecture method over ability to understand and apply concept.

This study should have used one of the sample schools, or reconciled the results obtained from the two schools and clearly presented same in the analysis. The researcher seems to be biased in the treatment of the experimental and control groups during data collection because, the experimental groups were given a one week pretreatment training while the control group was not given. This might have affected the performance of the experimental groups as finally seem in the result. But the two stated hypotheses and research questions were adequate to measure achievement of one teaching method.

The researchers used chemistry students as sample population, and mean for data analysis and only one teaching method was compared with the conventional method; while this study will be conducted using agricultural education students and the method of data analysis will also differ because in this study, mean, standard deviation and t-test were used for data analysis.

Duruji, Azuh, Segun, Olanrewaju and Okorie (2014) conducted a research titled, Teaching Method and Assimilation of Students in Tertiary Institutions: A Study of Covenant University, Nigeria. The entire students of the university as at 2014 were used as the population for the study. Stratified sampling technique was used to obtain a sample of 300 students used for the study. The researchers stated four objectives, research questions and null hypotheses. Descriptive survey design was adopted for the study. Questionnaires were used as instrument for data collection and Bivariate and Multivariate linear regression involving ANOVA were used to analyse data at 0.01 level of significance. The researchers found that more participatory teaching stimulate imaginative and conceptual thinking amongst students and impacts positively in their performance.

This work should not have used questionnaires as instrument for data collection because it can only give the views or opinions of the respondents on the teaching methods not the real effects of teaching methods on assimilation of students. The research design should have been experimental not a survey since it is investigating teaching methods and students assimilation. Using survey to get opinions of students taught by different lecturers and subjects contents using the same method cannot give the effect of teaching methods on assimilation of students. The above research similar with the ongoing research as both focus on teaching methods. But it will differ with the ongoing research because it considered general teaching methods and focused on university students while the ongoing research is specific to project and demonstration approaches on agricultural skills achievement in colleges of education. The research also used regression to analyse the data collected while this study will use t-test and correlation for data analysis.

Edmond and Ayodele (2014) carried out a study to determine “Effect of Project Instructional Approach on the Academic Achievement of Building Construction students in Government Technical Colleges in Ogun State, Nigeria”. A quasi experimental research design was adopted for the study. The population comprised 115 second year building construction students in the two technical colleges that run building construction programme in the state. The research stated four each of objectives, research questions and null hypotheses. The instrument used for data collection was building construction achievement test. Mean and standard deviation were used to analyse the data for answering the four research questions while ANCOVA was used to test the four null hypotheses at 0.05 level of significance. The study found that students taught with project instructional approach had higher mean achievement post-test scores than students taught with the conventional method.

The used of ANCOVA as the statistical tool to test the hypotheses which seek to determine difference is not appropriate. Statistical t-test should have been used since it compares teaching approaches. But the used of mean and standard deviation were proper for answering the research questions. Taking sample from the same college would have given a more reliable result than drawing sample from two different location for the experimental and control groups.

This research is similar to the ongoing research because it investigates effect of project approach while the ongoing also investigated project and demonstration teaching methods. The researchers’ worked on effect of project approach only on academic achievement of building construction students in Government Technical Colleges in Ogun;

while this study compared influence of project and demonstration teaching methods on agricultural skills achievement in colleges of education in plateau state.

The empirical studies and the ongoing research are related because they all centred on teaching methods and students learning outcomes. Though, it is clear that the researchers concentrated on the teacher in his place of assignment (classroom). Their work focused more on comparing lecture method and either project or demonstration; and also more attention was given to effects of teaching methods on secondary school students' academic performance. But this research will focus on the potential teachers (teachers in his place of training) in colleges of education. The researcher believe that if effective application of the diverse teaching approaches must be achieved, the teacher needs adequate training by the same approaches. The researcher also observed that there are few work which focus on the achievement of agricultural skills by students of colleges of education, and even the ones conducted in secondary schools, none was conducted in plateau state. The major gap in the previous work was that little was done generally to prepare the potential teacher; and even the few that mention the potential teacher was not conducted in agricultural education. Therefore, the ongoing research is focusing on how project and demonstration teaching approaches can be used to influence acquisition of skills. If the potential teachers are trained by these approaches, applying them for teaching after graduation will not be a problem.

## **2.11 Summary of Reviewed Literature**



Teaching method is the active learning guidelines which provide sample activities that facilitate active learning (Yin, 2003). It refers to various ways through which the content of a given subject area is discussed and communicated systematically to learners by a teacher. There are several teaching methods available to the teacher, but the choice of which to be used will depend on learners' age, level of education, type of learning environment, subject and sometimes the topic to be taught.

Project teaching method is a whole-hearted purposeful activity proceeding in a social or learning environment. This is more or less a real life teaching method where learning takes place under real world environment with teacher as a guide. A project is an in-depth investigation of a topic worth learning more about. The investigation is usually undertaken by a small group of students within a class, sometimes by a whole class, and occasionally by an individual student. The key feature of a project is that it is a research effort deliberately focused on finding answers to questions about a topic posed either by the students, the teacher, or the teacher working with the students (Katz & Helm, 2001). Here, teaching is centred on guiding the learning to make or produce what the learning content intends to make or produce. It is student-centred, teacher-student interactive method.

Demonstration teaching methods involves showing by reason or proof, explaining or making clear by use of examples or experiments. Put more simply, demonstration means to clearly show. In teaching through demonstration, students are set up to potentially conceptualize class material more effectively as shown in a study which specifically focuses on demonstrations presented by teachers (Bruce *et al.* 2009). Teaching-learning here involve showing to the learners how to do or make something using a given content in a classroom environment different from the actual environment in which they are expected

to function or practice their vocation. Brooding skills refer to the practical abilities students need to effectively carry out brooding operations. Acquisition of brooding skills therefore means the extent to which students acquire abilities in brooding management which they can put into practice.

The reviewed literatures and empirical studies showed that most of the past researchers focused on secondary school teaching methods which teachers at that level use for teaching without considering the fact that these teachers are products of a process; majorly in the colleges of education. So, this research sought to bridge the gap by working with the N. C. E. students (potential teachers) in colleges of education to see how instructional methods at the colleges' level can impact on students (future teachers) performance in areas of skill acquisition when they graduate from the colleges. Also, agricultural science education has been designed as a vocational subject in the colleges but, emphasis has so much been given to training the N. C. E. students to be able to teach the concepts of agriculture in the future mostly as teachers in service. Therefore, this research also seek to determine how teaching methods can be used to enhance students acquisition of brooding skills for livelihood and self-reliance as stipulated in the national goal for vocational and technical education in Nigeria.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

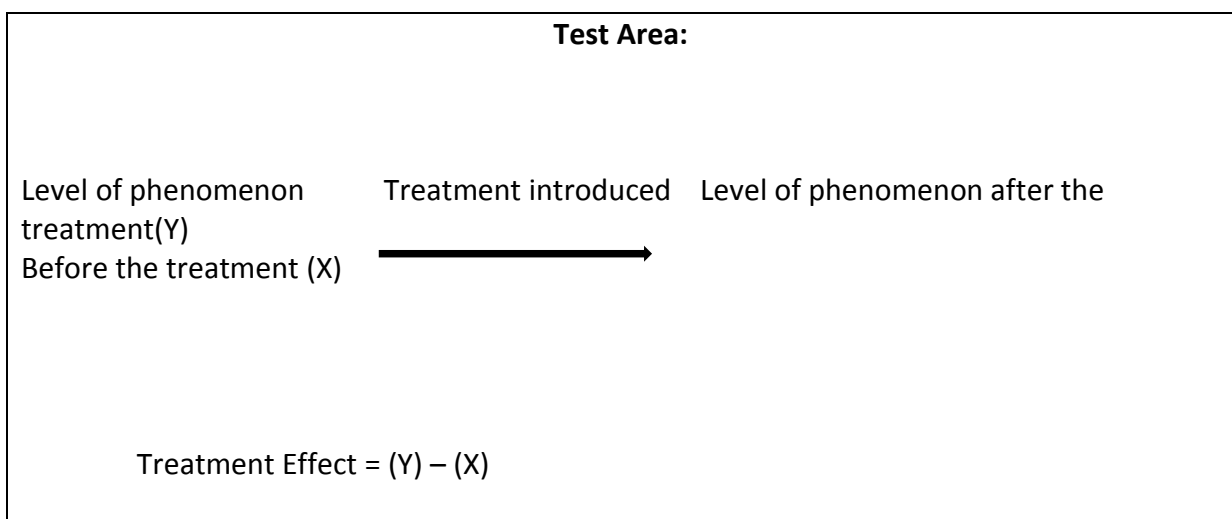
This chapter discusses the methods and procedures that were used to carry out the research. The chapter was discussed under the following headings:

- 3.1 Research Design
- 3.2 Population for the Study
- 3.3 Sample and Sampling Technique
- 3.4 Instrument for Data Collection
  - 3.4.1 Validation of the Instrument
  - 3.4.2 Pilot Testing
  - 3.4.3 Reliability of the Instrument
- 3.5 Procedure for Data Collection
- 3.6 Procedure for Data Analysis

#### **3.1 Research Design**

Quasi-experimental design was adopted for the research. This is a design in which treatment allocation is not random. The control group was used to ascertain whether the observed changes in the experimental groups are due to treatment. The experimental groups were taught using different teaching approaches and the scores compared (Ganyaupfu, 2013 & Daluba, 2013). Quasi-experimental research design also referred to as before-and-after with control design. In this design a single test group or area is selected

and the dependent variable is measured before the introduction of the treatment. The treatment is then introduced and the dependent variable is measured again after the treatment has been introduced. The effect of the treatment would be equal to the level of the phenomenon after the treatment minus the level of the phenomenon before the treatment (Kothari, 2004). The design can be represented thus:



**Figure 2: Illustration of Pretest Post-test Research Design**

(Kothari, 2004).

### **3.2 Population for the Study**

The population for the study consisted of all agricultural education N.C.E. II students from the two colleges of education in the study area namely, Federal College of Education, Pankshin and Plateau State College of Education, Gindiri. The two colleges had eligible N.C.E. II students' population totaling 147. N.C.E II students were used because they were considered to have undergone some level of training in agricultural education as they are in their second year of studies, and the topic to be taught was contained in the curriculum.

**Table 3: Population of agricultural education students in N. C. E. II.**

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**Source:** 2015/2016 College Enrolment.

### **3.3 Sample and Sampling Technique**

The researcher used purposive sampling method to select Federal College of Education, Pankshin and random sampling was used to select 75 out of the 122 N.C.E. II students in the college which served as sample for the study. In selecting the 75 students, the researcher wrote numbers 1-122 on pieces of paper, folded, mixed them thoroughly and asked the students to take numbers 1-122. Those who took numbers 1-75 were selected. The researcher selected Federal College of Education, Pankshin because of the number of students who offer agricultural education in N.C.E II and the availability of poultry farm which was used for the project teaching method group. Also, N.C.E. II students were selected because they had acquired some knowledge of agricultural education as they were in their second year of training; and they were an ideal practical class at the college level whose curriculum content showed that they were taking the topic which the researcher intended to cover. The 75 students were divided into three groups A, B and C each consisting of 25 students and they were designated project teaching method group A, demonstration teaching method Group B and Control group C.

**Table 4: Sample for the Study**

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### **3.4 Instrument for Data Collection**

The researcher studied skill acquisition tests which was used to construct a twenty-fiveitem agricultural skills acquisition test (ASAT) in selected agricultural skill topic/area base on the N.C.E II curriculum. An acquisition test is designed to measure level of skill accomplishment, or knowledge in a specific area (Cherry, 2015; Daluba, 2013; Edmond & Ayodele, 2014 and Ogologo & Wagbara, 2013).

#### **3.4.1 Validation of the Instrument**

The instrument was given to five experts; three from Agricultural Education Section, Department of Vocational and Technical Education and two in Department of Education, Ahmadu Bello University, Zaria, to ensure face and content validity. These experts also ascertained the adequacy and relevancy of the instrument. The experts made corrections and modifications on items of the instrument which were incorporated into the final draft of the instrument as it appears in Appendix 1.

#### **3.4.2 Pilot Testing**

Pilot test was conducted in Kaduna State College of Education, Gidan Waya. The researcher used 20 N.C.E. II students. The college was used because it uses the same curriculum with the target population and it is outside the study area.

### **3.4.3 Reliability of the Instrument**

The data obtained from the pilot test were used to determine the internal consistency and reliability of the instrument. Test-retest method was adopted and the scores were subjected to reliability test which gave a Cronbach's Alpha value of 0.80. Webb, Richard & Edward (2006) state that a reliability coefficients at or above 0.80 are often considered sufficiently reliable to make decisions about an instrument.

### **3.5 Procedure for Data Collection**

The data collection lasted for three weeks starting from 1<sup>st</sup> June, 2016 to 23<sup>rd</sup> June, 2016. On day one, the researcher met the Head of Department, Agricultural Science Education with the letter of introduction obtained from Vocational and Technical Education Department, Ahmadu Bello University, Zaria to seek permission to use the school facilities and students for research and then introduced himself to the students for 20minutes during which the 75 sample students were selected and divided into three groups by writing A, B and C on pieces of paper, putting them in a hat and asking each of the 75 students to pick: Any letter a student picked from the hat became his/her group. Group A was designated for

project teaching method, group B for demonstration teaching method and group C served as the control group and was taught using the conventional lecture teaching method.

Pretest was administered the next day for both experimental and control groups (A, B and C) and students were introduced to the treatment variables (project and demonstration teaching methods). Group A was taken to the poultry farm by the researcher on the 2<sup>nd</sup> June, 2016 for preparation of the brooder house and schedule of the arrival of day old chicks and students were taught on the use of all the equipment for brooding, group B was taught brooding of chicks using demonstration teaching method and group C was taught the same topic using the conventional lecture method with all lessons lasting 1 hour (12-1pm and 1-2pm each per group) for each group. The researcher brought the day old chicks on the 3<sup>th</sup> June, 2016 (8.00am) and commenced the brooding practical with group A (project method) from 3<sup>rd</sup> to 23<sup>rd</sup> June, 2016. Group B was also taught brooding using demonstration teaching approach and group C (control group) was exposed to lecture approach on the 6<sup>th</sup> June, 2016 (7-8am and 8-9am respectively). That is the second class and lesson was repeated the third time on 16<sup>th</sup> June, 2016 for group B and C (3-4pm and 4-5pm respectively). The researcher entertained questions on the topic from group B and C on the 18<sup>th</sup> June, 2016 at 12-1pm and 2-3pm respectively while group A (project method group) continued with the practical brooding. Chicks became three weeks on 23<sup>rd</sup> June, 2016 (brooding period of three weeks, 3<sup>rd</sup> to 23<sup>rd</sup> June, 2016) and the questions and answer session for the project method group took place on the 23<sup>rd</sup> June, 2016 by 3-4pm. The posttest was administered for group A, B and C on the 24<sup>th</sup> June, 2016 (7-8am, 8-9am and 9-10am). The tests were marked over 25 points and the scores were coded and subjected to statistical analysis.



### **3.6 Procedure for Data Analysis**

Simple descriptive statistics (mean and standard deviation) were used to answer all the research questions. Acquisition of brooding skills was determined by the gain in post-test performances of students. The t-test statistics were used to compare the performances of students taught using project teaching approach and demonstration teaching approach; and also to compare the performances of students taught using project and demonstration teaching methods with those exposed to the conventional method (control group). All the stated null hypotheses were tested at 0.05 level of significance ( $p=0.05$ ). When the calculated t-test value was greater than or equal to the critical t-value ( $t_{\text{calculated}} \geq t_{\text{critical}}$ ) at 0.05 level of significance ( $p=0.05$ ), the null hypothesis was rejected but where the calculated t-value was less than the t-critical value ( $t_{\text{calculated}} < t_{\text{critical}}$ ) at 0.05 level of significance, the null hypothesis was retained (Auwal, 2013; Edmond & Ayodele, 2014 and Ogologo & Wagbara, 2013).

## **CHAPTER FOUR**

### **PRESENTATION AND ANALYSIS OF DATA**

This chapter presents the results and analysis of data collected for the study under the following subheadings:

#### **4.1 Answer to Research Questions**

#### **4.2 Test of Hypotheses**

### 4.3 Summary of Major Findings

### 4.4 Discussion of Major Findings

#### **4.1 Answers to Research Questions**

The answers to the three research questions were arrived at using mean and standard deviation. The post-test scores of students taught by project teaching method and post-test of control group were used to answer research question one, post-test scores of demonstration teaching method group and post-test scores of control group were used to answer research question two; while the post-test scores of project and demonstration teaching methods group were used to answer research question three.

Table 5 showed that the mean and standard deviation of project method post-test scores are 20.16 and 2.85, while the mean and standard deviation for the control group post-test scores are 12.04 and 2.02. This showed that the mean and standard deviation for project teaching method post-test scores are greater than the mean and standard deviation post-test scores for the control group. So it implied that students performed better when they were taught using project method than the traditional lecture method (control group). Therefore, it indicates that project teaching method has effect on students' acquisition of brooding skills.

Table 5: Effect of projectteaching and control groups on acquisition of brooding skill.

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Source: Fieldwork, 2016

Table 6 showed that the mean and standard deviation of demonstration method post-test scores are 16.32 and 2.82, while the mean and standard deviation for control group post-test scores are 12.04 and 2.02. This showed that the mean and standard deviation for students exposed to demonstration method post-test scores are greater than the mean and standard deviation post-test scores for students under the control group. So it implies that students performed better when they were taught using demonstration method than the conventional lecture approach (control group). Therefore, it indicates that demonstration teaching method has effect on students' acquisition of brooding skills.

Tale 6: Effect of demonstration teaching method and control group on acquisition of brooding skill

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Source: Fieldwork, 2016

Table 7 showed that the mean and standard deviation of project method post-test scores were 20.16 and 2.85, while the mean and standard deviation for the demonstration method post-test scores were 16.32 and 2.82. This showed that the mean and standard deviation for project teaching method post-test scores are greater than the mean and standard deviation post-test scores for the demonstration method group. So it implies that students performed better when they were taught using project method than those taught using demonstration method. Therefore, it indicates that project teaching method has more effect on students' acquisition of brooding skills.

Table 7: Effects project and demonstration teaching methods on acquisition of brooding skills.

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Source: Fieldwork, 2016

#### 4.2 Test of Null Hypotheses

The result of the test of null hypotheses are presented in Table 8 to 10. To test the null hypotheses 1 and 2, the post-test scores of students taught using project and demonstration teaching methods were compared with the post-test scores of the control group (lecture method), while hypothesis three was tested by comparing the post-test scores of students taught using project teaching method with post-test scores of those exposed to demonstration teaching method. The t-test statistics was used to analyse the scores at 0.05 level of significance ( $p=0.05$ ).

Table 8 t-test analysis result showed that the t-calculated is 11.36, which is greater than the t-critical value of 2.01 at 0.05 level of significance therefore the null hypothesis that, there is no significant effect of project teaching method on students' acquisition of brooding skills in colleges of education was rejected. Looking at this result, it has established that project teaching method has significant effect on students' brooding skills acquisition.

Table 8: Difference between effect of project teaching method and control group on acquisition of brooding skills

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Source: Fieldwork, 2016

Table 9 t-test analysis result showed that the t-calculated is 6.03, which is greater than the t-critical value of 2.01 at 0.05 level of significance therefore the null hypothesis that, there is no significant effect of demonstration teaching method on students' acquisition of brooding skills in colleges of education was rejected. This result showed that demonstration teaching method has significant effect on students' brooding skills acquisition.

Table 9: Difference between effect of demonstration method and control group on acquisition of brooding skills

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Source: Fieldwork, 2016

Table 10 showed the t-test analysis for the difference between the level of students brooding skills acquisition when taught using project teaching method and those exposed to demonstration teaching method. The t-test analysis result showed that the t-calculated is 4.69 which is greater than the t-critical value of 2.01 at 0.05 level of significance so the stated null hypothesis that, there is no significant difference between students taught using project teaching method and those exposed to demonstration teaching method in their acquisition of brooding skills was rejected. This result implies that there is significant difference in the levels of students' acquisition of brooding skills between project teaching

method and demonstration teaching method. Because, comparing the mean score of project group of 20.16 with the mean score of demonstration group of 16.32, project group mean score was greater with a mean difference of 3.84, which reveals that project method was more effective.

Table 10: Difference between effects of project and demonstration teaching methods

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Source: Fieldwork, 2016

### 4.3 Summary of Major Findings

The findings of this research which was carried out to determine the effects of project and demonstration teaching methods on students' acquisition of method skills in colleges of education, plateau state were based on the results of the descriptive statistics (mean and standard deviation) and t-test analysis. The major findings are summarised as follow:

1. Project teaching method has significant effect on students' acquisition of brooding skills with a mean score of 20.16.
2. Demonstration teaching method also has significant effect on students' acquisition of brooding skills with a mean score of 16.32
3. The research also revealed that project teaching method is the most effective in teaching agricultural skills when compared with demonstration teaching method. This

showed a mean difference of 3.84 (project group mean minus demonstration group mean) as shown in table 5.

#### **4.4 Discussion of Major Findings**

The study revealed that project teaching method has significant effect on students' acquisition of brooding skills in colleges of education. These was shown in table 5 where the mean score (20.16) for students taught using project teaching method is greater than the mean score (12.04) for students under the conventional method (lecture approach). The t-test analysis result on table 8 also showed that project teaching method had significant effect on students' acquisition of agricultural skills in colleges of education as the t-calculated (11.36) was greater than the t-critical value (2.01) at 0.05 level of significance. This finding agreed with Binnie (2002) who found that the use of project teaching method was very helpful in assisting the learning of students. Their active involvement in the tasks motivate them to think and enhanced their learning. Edmond and Ayodele (2014) also found that project instructional method was more effective in enhancing the performance of students. Udofia and Aniefiok (2013) further concluded that project teaching approach facilitates students' skill acquisition.

Table 6 revealed that the mean score (16.32) of demonstration teaching method is greater than the mean score (12.04) of students taught using the conventional teaching method (lecture approach). The t-calculated (6.03) on table 9 was also greater than the t-critical value of 2.01 at 0.05 level of significance. This therefore mean that demonstration

teaching method has effect on students' acquisition of brooding skills. This finding is supported by Ogologo and Wagbara (2013) as they reported that demonstration teaching brooding has effect on students' academic achievement. Amoah (2009) also found that demonstration teaching method was effective in teaching practical agricultural science.

Table 7 presented the mean score of 20.16 and standard deviation (2.85) of students exposed to project teaching method which was higher than the mean score of 16.32 and standard deviation (2.82) of students exposed to demonstration teaching method. The finding revealed that project teaching method was more effective than demonstration teaching method in enhancing students' acquisition of brooding skills. The t-test analysis in table 10 showed a significant difference in the students' acquisition of brooding skills when taught using project teaching method and demonstration teaching method. The analysis result revealed a t-calculated value of 4.69 which was greater than the t-critical value of 2.01 at 0.05 level of significance. This implies that project teaching method was more effective than demonstration teaching method on students' acquisition of brooding skills. This finding agreed with Durujiet *al.* (2014) work which reported that more participatory teaching stimulate imaginative and conceptual thinking amongst students and impacts positively in their performance.

Udofia and Aniefiok (2013) also found that project teaching method facilitates students' skill acquisition. Nsa, (2002) conducted experiment on demonstration and project methods on secondary school students acquisition of production skills using t-test and mean statistics and reported that project teaching method was more effective than demonstration teaching method. Edmond and Ayodele (2014) in their research with building construction students found that project instructional approach was better in enhancing



students' academic achievement. But, this finding disagreed with Amoah (2009) who found that demonstration teaching method was better than project method in teaching practical in agricultural science. Though, it was a perception study and the result may likely be that the students responded based on their preference of the teaching methods instead of learning outcome.

## **CHAPTER FIVE**

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

This chapter presents the summary, conclusion, and recommendations of the study. Suggestions for further studies are also presented in this chapter.

#### **5.1 Summary**

The study was carried out to determine the effects of project and demonstration teaching methods on acquisition of brooding skills among students in colleges of education in Plateau state, Nigeria. Pretest, post-test quasi-experimental design was adopted for the study. The study had three specific objectives, three research questions and three stated null hypotheses which were used as guide for the study. The entire 149 N. C. E. II students from the two colleges of education in the area of study formed the population for the study; and 75 students were randomly selected as sample for the study. The sampled students

were divided into three groups: A, B and C with 25 students each. Data collection phase lasted for a period of threeweeks. Pretest was given before exposing the students to the treatment variable (project and demonstration teaching methods) followed by a post-test after exposing students to the treatment variable.

Mean and standard deviation were used to answer all the three research questions, while t-test statistics was used to test all the stated null hypotheses at 0.05 level of significance ( $p=0.05$ ). The analysis revealed that students taught using project and demonstration teaching methods performed better than those taught using the conventional teaching method(lecture method).The test of stated null hypotheses also revealed a significant difference in acquisition of brooding skills between students exposed to project and demonstration teaching methods and those exposed to conventional method (lecture method); as the calculated t-values of 11.36 and 6.03 were both greater than the critical t-value of 2.01 at 0.05 level of significance.

When the mean scores of students taught using project teaching method and those taught using demonstration teaching method (20.16 and 16.32) were compared with mean score of the conventional method group (12.04), project and demonstration teaching methods were more effective with mean difference of 8.12 (project method) and 4.28 (demonstration method). The t-test analysis revealed a significant difference in acquisition of brooding skills among students from the three different groups. The mean score and t-test result showed that students exposed to project teaching method were better with a mean score of 20.16 compared to those exposed to demonstration teaching method with a mean score of 16.32.

The t-calculated value of 4.69 was also greater than the critical t-value of 2.01 at 0.05 level of significance which means that there was a significant difference between the groups (project group and demonstration group) in acquisition of brooding skills. The findings lead to the rejection of all the three stated null hypotheses at 0.05 probability level of significance. It was also clear from the findings that Project teaching method was the most effective method to use in teaching brooding skills in colleges of education.

## **5.2 Contribution to Knowledge**

The findings of this research contributed in increasing the empirical evidence reported in literatures about teaching methods especially in agricultural education. The followings are identified contributions made by the study:

- i. This study revealed the positive effects of project and demonstration teaching methods with mean scores of 20.16 and 16.32 which were both higher than mean score of conventional method (lecture method) of 12.04.
- ii. The research revealed that project method is the most effective method for teaching agricultural skills in colleges of education with a mean of 20.16 which is higher than the mean score of demonstration method of 16.32.
- iii. This study has reduced the dearth of work done on teaching methods at the higher institutions' level; particularly the colleges of education where these teachers are trained.

## **5.3 Conclusion**

The findings of the study has lead the researcher to conclude that project and demonstration teaching methods are effective in teaching brooding skills in colleges of education and can facilitate acquisition of agricultural skills among students. Project teaching method is the most effective teaching method in teaching brooding skills in colleges of education. But the two teaching methods can be concurrently use in teaching agricultural skill in colleges of education.

#### **5.4 Recommendations**

Based on the findings and conclusion of the study, the following recommendations have been considered necessary:

1. Project teaching method should be properly adopted by agricultural education teachers as well as teachers of other applied sciences as the main instructional method to teaching in colleges of education.
2. Demonstration teaching method should also be used in teaching vocational skills and other skill acquisition disciplines in the colleges of education.
3. Agricultural education teachers in the colleges of education should mainly use project and demonstration teaching methods in teaching.

#### **5.5 Suggestion for Further Study**

1. Similar study should be conducted in other colleges of education on experimental basis to ascertain the outcome.
2. Further study should also be conducted to assess the agricultural education curriculum to see whether amendments are required.

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## APPENDIX 1

DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION, FACULTY OF EDUCATION  
AHMADU BELLO UNIVERSITY, ZARIA

Agricultural Skills Acquisition Test (ASAT) developed by the researcher, 2016

**PRETEST**

**Topic:** Poultry Production (Brooding of Chicks)

**Date:** 2<sup>nd</sup> June, 2016

**Instruction:** Answer all questions by ticking the correct objection. **Time Allowed:** 1 Hour

1. Preferably Feeder for chicks at brooding stage should be the.....type?
  - a. Conical
  - b. trough
  - c. Flat tray
  - d. Cup
2. How long will the brooders be kept clean and ready before chicks' arrive?
  - a. 3 weeks
  - b. 1 week
  - c. 2 weeks
  - d. 4 weeks
3. When do you disinfect the brooder house to commence your brooding operation?
  - a. 2 weeks before chicks arrived
  - b. 1 day before chicks arrived
  - c. 1 weeks before chicks arrived
  - d. the day your chicks will arrived
4. What form of feed is best suited for chicks at brooding stage.....?
  - a. Pellet
  - b. Grain
  - c. Crumbled
  - d. Powder
5. What is the final determinant of whether or not temperatures are correct in the brooders?
  - a. Thermometer readings
  - b. Temperature guidelines
  - c. Chicks behaviour
  - d. Stockman feelings
6. What type of feed is given to chicks at brooding age.....?
  - a. Grower finisher
  - b. Finisher
  - c. grower starter
  - d. maintenance mash
7. At what period will the brooders temperature be lowest during brooding?
  - a. 1-7 days
  - b. 8-15 days
  - c. 16-23 days
  - d. 24-27days
8. What is the final temperatures guideline during the last stage of brooding?
  - a. 25-26°c
  - b. 20-22°c

- c. 22-25°c [ ]
- d. 21-22°c [ ]
9. The initial temperature under the brooders should be.....?
- a. 29-31°c [ ]
- b. 25-29°c [ ]
- c. 30-39°c [ ]
- d. 25-35°c [ ]
10. When selecting equipment for brooding, consideration should be given to...?
- a. Young chicks only [ ]
- b. sYoung chicks and growing broiler [ ]
- c. Growing broiler only [ ]
- d. Income of the farmer [ ]
11. Keeping chicks warm at placement is vital. So.....?
- a. Warmth should be achieved at the expense of fresh air [ ]
- b. Fresh air is not important during brooding [ ]
- c. Warmth should not be achieved at the expense of fresh air [ ]
- d. Sealed every gap in a poorly insulated house [ ]
12. Sealing every gap in a poorly insulated house in order to achieved brooding temperatures at least cost will.....?
- a. Cause oxygen depletion and the build-up of noxious gases [ ]
- b. Provide adequate temperature requirement [ ]
- c. Promotes chicks performance [ ]
- d. Enhance appetite [ ]
13. Preferably, immediately after placement lights should be.....?
- a. Off for 12 hours [ ]
- b. Off for 24 hours [ ]
- c. On for 12 hours [ ]
- d. On for 24 hours [ ]
14. Feed for day old chicks should be.....?
- a. Easily accessible but not highly digestible [ ]
- b. Easily accessible, palatable and highly digestible [ ]
- c. Easily accessible and palatable only [ ]
- d. Easily accessible, highly indigestible and not palatable [ ]
15. Suggested feeder space allowances per broiler at different age are.....?
- a. 0-2 weeks 3cm, 3-4 weeks 5cm and >4weeks 8cm [ ]
- b. 0-2 weeks 3m, 3-4 weeks 5m and >4weeks 8m [ ]
- c. 0-2 weeks 4cm, 3-4 weeks 4.5cm and >4weeks 6cm [ ]
- d. 0-2 weeks 4m, 3-4 weeks 4.5m and >4weeks 6m [ ]
16. The following are sources of brooders heat EXCEPT?
- a. Electrical heat [ ]
- b. Kerosene stoves or charcoal [ ]
- c. Centralized heating system [ ]
- d. Firewood heat [ ]
17. The following are vital needs during brooding EXCEPT?
- a. Warmth [ ]
- b. Feed and water [ ]
- c. Protection [ ]

- d. Adequate aeration [ ]
18. Bedding materials (or litter) for chicks at brooding stage should.....?  
 a. Not be slippery [ ]  
 b. Be absorbent [ ]  
 c. Not insulate chicks from the ground [ ]  
 d. Be moldy [ ]
19. Chick guard is used to confine chicks, limit their movement and also act as....?  
 a. Draft wire [ ]  
 b. Draft shield [ ]  
 c. Draft support [ ]  
 d. Draft tool [ ]
20. The reason for maintaining high temperature for chicks is because.....?  
 a. They are warm blooded during the first few weeks [ ]  
 b. They are cold blooded during the first few weeks [ ]  
 c. They have naked skin [ ]  
 d. They have low fat in their body [ ]
21. Where do you take temperature measurement during brooding?  
 a. On the body of chicks [ ]  
 b. Near the source of heat at chick height [ ]  
 c. In the brooder [ ]  
 d. on the floor [ ]
22. What is the minimum space per bird requirement for broilers during brooding?  
 a. 1.5 to 2 square feet per bird [ ]  
 b. 0.75 to 1 square feet per bird [ ]  
 c. 2.5 to 3 square feet per bird [ ]  
 d. At the stockman's discretion [ ]
23. How much space (in feet square) do you need to brood 50 day-old chicks?  
 a. 47ft<sup>2</sup> [ ]  
 b. 40ft<sup>2</sup> [ ]  
 c. 35ft<sup>2</sup> [ ]  
 d. 37.5ft<sup>2</sup> [ ]
24. Most commercial hatcheries vaccinate chicks at hatch for.....?  
 a. Mareks [ ]  
 b. Plague [ ]  
 c. Newcastle disease [ ]  
 d. Coccidiosis [ ]
25. What is your best defense against disease during brooding?  
 a. Good quality feed [ ]  
 b. Good quality breed [ ]  
 c. Proper hygiene and sanitation practices [ ]  
 d. Vaccination [ ]

DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION, FACULTY OF EDUCATION  
 AHMADU BELLO UNIVERSITY, ZARIA

Agricultural Skills Acquisition Test (ASAT) developed by the researcher, 2016

**POST-TEST**

**Topic:** Poultry Production (Brooding of Chicks)

**Date:** 22<sup>nd</sup> June, 2016

**Instruction:** Answer all questions by ticking [v] the correct objection.  
Hour

**Time Allowed:** 1

1. Brooder house is kept clean..... before chicks arrive?
  - a. 3 weeks
  - b. 1 week
  - c. 4 weeks
  - d. 2 weeks
2. Disinfection of the brooder house is done.....?
  - a. 2 weeks before chicks arrived
  - b. 1 weeks before chicks arrived
  - c. 1 day before chicks arrived
  - d. The day your chicks will arrived
3. What form of feed is best suited for chicks at brooding stage.....?
  - a. Pellet
  - b. Grain
  - c. Crumbled
  - d. Powder
4. What is the final determinant of whether or not temperatures are correct in the brooders?
  - a. Thermometer readings
  - b. Temperature guidelines
  - c. Chicks behaviour
  - d. Stockman feelings
5. What type of feed is given to chicks at brooding age.....?
  - a. Grower finisher
  - b. Finisher
  - c. grower starter
  - d. maintenance mash
6. When is the lowest temperature of the brooders during brooding attained?
  - a. 24-27days
  - b. 8-15 days
  - c. 16-23 days
  - d. 1-7 days
7. Final temperatures guideline during the last stage of brooding should be.....?
  - a. 25-26<sup>o</sup>c
  - b. 21-22<sup>o</sup>c
  - c. 22-25<sup>o</sup>c
  - d. 20-22<sup>o</sup>c
8. The initial temperature under the brooders should be.....?
  - a. 29-31<sup>o</sup>c
  - b. 25-29<sup>o</sup>c
  - c. 30-39<sup>o</sup>c
  - d. 25-35<sup>o</sup>c
9. When choosing equipment for brooding, consideration should be given to.....?
  - a. Young chicks only
  - b. Growing broiler only

- c. Young chicks and growing broiler [ ]
- d. Income of the farmer [ ]
- 10. While is it vital to keep chicks warm at placement.....?
  - a. Warmth should be achieved at the expense of fresh air [ ]
  - b. Warmth should not be achieved at the expense of fresh air [ ]
  - c. Fresh air is not important during brooding [ ]
  - d. Sealed every gap in a poorly insulated house [ ]
- 11. Minimizing cost of heat production by sealing every gap in a poorly insulated house?
  - a. Cause oxygen depletion and the build-up of noxious gases [ ]
  - b. Provide adequate temperature requirement [ ]
  - c. Promotes chicks performance [ ]
  - d. Enhance appetite [ ]
- 12. Preferably, immediately after placement lights should be.....?
  - a. off for 12 hours [ ]
  - b. on for 12 hours [ ]
  - c. off for 24 hours [ ]
  - d. on for 24 hours [ ]
- 13. Feed for day old chicks should be.....?
  - a. Easily accessible but not highly digestible [ ]
  - b. Easily accessible and palatable only [ ]
  - c. Easily accessible, palatable and highly digestible [ ]
  - d. Easily accessible, highly indigestible and not palatable [ ]
- 14. Suggested feeder spaces allowances per broiler at different age are.....?
  - a. 0-2 weeks 3cm, 3-4 weeks 5cm and >4weeks 8cm [ ]
  - b. 0-2 weeks 3m, 3-4 weeks 5m and >4weeks 8m [ ]
  - c. 0-2 weeks 4cm, 3-4 weeks 4.5cm and >4weeks 6cm [ ]
  - d. 0-2 weeks 4m, 3-4 weeks 4.5m and >4weeks 6m [ ]
- 15. The following are sources of brooders heat EXCEPT?
  - a. Electrical heat [ ]
  - b. Firewood heat [ ]
  - c. Kerosene stoves or charcoal [ ]
  - d. Centralized heating system [ ]
- 16. These are vital needs during brooding EXCEPT?
  - a. Protection [ ]
  - b. Feed and water [ ]
  - c. Warmth [ ]
  - d. Adequate wind [ ]
- 17. Litter for chicks must.....?
  - a. Be moldy [ ]
  - b. Not be slippery [ ]
  - c. Insulate chicks from the ground [ ]
  - d. Be absorbent [ ]
- 18. Chick guard is used to confine chicks, limit their movement and also act as.....?
  - a. Draft wire [ ]
  - b. Draft tool [ ]
  - c. Draft support [ ]
  - d. Draft shield [ ]

19. The reason for maintaining high temperature for chicks is because.....?
- a. They are warm blooded during the first few weeks [ ]
  - b. They have naked skin [ ]
  - c. They are cold blooded during the first few weeks [ ]
  - d. They have low fat in their body [ ]
20. Temperature measurement is best taken during brooding?
- a. On the body of chicks [ ]
  - b. On the floor [ ]
  - c. Near the source of heat at chick height [ ]
  - d. in the brooder [ ]
21. The minimum space requirement per broiler bird during brooding?
- a. 1.5 to 2 square feet per bird [ ]
  - b. 0.75 to 1 square feet per bird [ ]
  - c. At the stockman's discretion [ ]
  - d. 2.5 to 3 square feet per bird [ ]
22. What is the brooding space requirement of 50 day-old chicks?
- a. 37.5ft<sup>2</sup> [ ]
  - b. 40ft<sup>2</sup> [ ]
  - c. 35ft<sup>2</sup> [ ]
  - d. 47ft<sup>2</sup> [ ]
23. Most commercial hatcheries vaccinate chicks at hatch for.....?
- a. Newcastle [ ]
  - b. Gumboro [ ]
  - c. Mareks [ ]
  - d. Coccidiosis [ ]
24. Preferably Feeder for chicks at brooding stage should be the.....type?
- a. Conical [ ]
  - b. Trough [ ]
  - c. Flat tray [ ]
  - d. Cup [ ]
25. Best disease preventive measure during brooding is.....?
- a. Good quality feed [ ]
  - b. Good quality breed [ ]
  - c. Vaccination [ ]
  - d. Proper hygiene and sanitation practices [ ]



## Appendix 2

### PRETEST SCORES AND POST-TEST SCORES

#### PRETEST SCORES

Group A (Project method)

10	12	11	6	7	12	10	10	9	8	13	9	4
10	3	7	11	6	9	5	6	5	4	8	6	

Group B (Demonstration method)

8	10	12	12	11	13	6	5	7	8	9	9	10
7	8	6	9	10	3	10	11	7	6	5	8	

Group C (Lecture method)

8	10	8	12	10	9	11	12	10	4	7	8	7
9	10	5	6	8	7	10	6	8	7	6	5	

#### POST-TEST SCORES

Group A (Project method)

25	20	19	23	21	24	16	15	18	24	21	17	20
23	21	18	19	22	22	20	21	19	24	18	14	

Group B (Demonstration method)

13	15	19	11	18	20	12	13	15	14	16	15	15
20	17	18	17	19	20	18	14	15	20	21	13	

Group C (Lecture method)

11	10	9	15	10	14	9	10	13	16	14	12	10
15	10	11	12	13	14	15	12	11	12	13	10	