

**EFFECTS OF CLASS-SIZE AND FIELD TRIP ON ACADEMIC PERFORMANCE  
OF AGRICULTURAL SCIENCE STUDENTS IN SENIOR SECONDARY  
SCHOOLS IN KADUNA STATE, NIGERIA**

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**JULY, 2017**

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**A THESIS SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES  
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**DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION,  
AHMADU BELLO UNIVERSITY,  
ZARIA NIGERIA**

**JULY, 2017**

## **DECLARATION**

I, declare that the work in this dissertation entitled Effects of Class-size and Field Trip on Academic Performance of Agricultural Science Students in Senior Secondary Schools in Kaduna State, Nigeria has been performed by me in the department of Vocational and Technical Education, Ahmadu Bello University, Zaria. The information derived from literature sources has been duly acknowledged in the text and in the list of references provided. No part of this dissertation was previously presented for another degree or diploma at this or any other institution.

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PRISCILLA MUSA

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Date

## CERTIFICATION

This dissertation titled EFFECTS OF CLASS-SIZE AND FIELD TRIP ON ACADEMIC PERFORMANCE OF AGRICULTURAL SCIENCE STUDENTS IN SENIOR SECONDARY SCHOOLS IN KADUNA STATE, NIGERIA by Priscilla MUSA meets the regulations governing the award of the Degree of Masters of Agric. Education (MSc. Ed.) of the Ahmadu Bello University Zaria, and is approved for its contribution to knowledge and literary presentation.

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## **DEDICATION**

This research work is dedicated to my husband, Kolosok Bulus Magaji and all members of Agricultural Education Students Associations in Nigeria.

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## **OPERATIONAL DEFINITION OF TERMS**

**Normal class size:** This is a class that consists of 35- 40 students per teacher.

**Large class size:** This is a class that consists of 50 and above students per teacher.

**Field Trip:** This is the process of taking students outside the classroom setting to have first-hand experience of what happens in the environment or real life situation.

**Academic Performance:** This refers to the learning outcomes of an individual with the knowledge, skills and ideas acquired and retained through their course of study within and outside the classroom situation.

## **Abstract**

This research work was conducted to determine the effects of class-size and field trip on academic performance of agricultural science students in senior secondary schools in Kaduna state. The study raised four (4) specific objectives, research questions and null hypotheses each to guide the study. With and without quasi-experimental design was adopted for the study. The population for the study was 12,370 SS III students of agricultural science. Purposively sampling technique was employed to select 102 agricultural science students in Government Secondary School, Sabon Tasha. The instrument used for data collection was a multiple-choice test consisting of a 20-item Achievement Test in Agricultural Science (ATAS). Mean and standard deviation were used to answer all the research questions, while T-test statistics was used to test the null hypotheses at 0.05 alpha value of significance. Null hypotheses 1 and 2 were rejected because their T-values were less than the alpha value ( $p < 0.05$ ). Null hypothesis 3 and 4 were accepted and retained because their T-values were greater than the alpha value ( $p > 0.05$ ). The analysis of the findings revealed that field trip and class size had significant effects on the academic performance of agricultural science students and no significant differences in the academic performance of male and female agricultural science students in a normal class size and those taken to field trip. It was concluded that, normal class size was effective in teaching and learning of agricultural science. Field trip broadens and exposed students to real life context in agriculture. It was also concluded that normal class size and field trip do not affect gender academic performance of agricultural science students in senior secondary schools. It was recommended that government should build more classrooms with adequate facilities of agricultural science and curriculum planners should make sure that field trip is made compulsory and relevant in agricultural science curriculum among other recommendations.

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Background to the Study**

In Nigerian secondary schools, agricultural science has been recognized as a core curriculum subject because agriculture remains an important sector of the Nigerian economy. It has a high potential for absorbing unemployed and underemployed persons; provides raw materials for industries; provides food and at the same time generates foreign exchange for the country.

Agricultural science is one of the core vocational curricular subjects taught at both junior and senior secondary schools in Nigeria. According to Egbule (2004) agricultural Education can be defined as a process of training learners in the process of agricultural productivity as well as the techniques for teaching of agriculture. Wikipedia (2009) described agricultural science education as a broad multidisciplinary field that deals with the selection, breeding and management of crops and domestic animals for economic production. It is a subject taught in secondary schools as a means for self- reliance and preparation for further studies. Agricultural science is therefore designed to inculcate the necessary skills for the practice of agriculture for effective citizenship and contribution to food security for national sustainability. The Federal Republic of Nigeria (2009) outlined the major objectives of teaching and learning of agricultural science to reflect ability to: stimulates students' interest in agriculture, enable students acquire basic knowledge of agriculture, develop basic agricultural skills in students, enable students integrate knowledge with skills in agriculture, expose students to opportunities in the field of agriculture, prepare students for further studies in agriculture and prepare students for occupations in agriculture.

The number of students in a class is regarded as class size which can vary. Hoffman (2001) describes class size as the number of students per teacher. Adeyemi (2008) defines class size as an educational tool that can be describe as average number of students per class in a school, while Kedney (1999) describes it as a tool that can be used to measure performance of the education system. The number of students in a class has the potential to affect how much is learned in a number of different ways (Ehrenberg, Brewer, Gamoran and Willms, 2001). For example, it could affect how students interact with each other. This may result in more or less noise and disruptive behavior, which in turn affect the different kinds of activities the teacher is able to promote. It could affect how much time the teacher is able to focus on individual students and their specific needs rather than on the group as a whole. Since it is easier to focus on one individual in a smaller group than in a larger group, the smaller the class size, the more likely individual attention can be given, in theory at least. Class size could also affect the teacher's allocation of time and hence, effectiveness in other ways too, for example, how much topics can be covered.

According to the National Policy on Education, for effective teaching and learning, the teacher students' ratio shall be 1:40 (National Policy on Education, NPE, 2009). But the practice is far from this policy. Cases of a teacher facing a class size of more than 50 students are common (Oafor, 2002). With such a number of students in a classroom much of the instruction time will definitely go into classroom management. If there is any time left for instruction, only a little can be achieved by the teacher. A remedy for this would have been more classrooms and more teachers.

Field trip involves any activity carried out by a group of learners outside the classroom under a close supervision of the teacher (Sanders, 2015). It involves taking students outside the classroom setting to have first-hand experience of what happens in the environment or real life situation. Aliyu (2008) observes that field trip involves taking

students out of the classroom to places where they can see concrete illustration of classroom theories. It also offers direct observation and interpretation of the substance in their natural surroundings. Field trip on the spot requires the use of basic scientific skills that include observation, identification, classification and manipulation of substance in the natural surroundings. Field-trip provide real life context for the material being learned. Studies also conducted by Urulor, (2000) showed that a greater percentage of what is heard, seen and touched during field trip is remembered than what is merely heard. Field trip provides outdoors experiences and observations from which the students learn. It could cover a few hours and could last as long as a couple of weeks.

Field trip could mean visit from the school to farms, wildlife parks, zoos, agro-allied and agro-based industries or public places of interest such as the kings' palace, railway station, airport and post-office, all within the neighbourhood. Experiences acquired during field trip are usually long lasting and cannot be easily forgotten by the students. According to Olayinka (2012), field trip provides opportunities for direct observations and develops the skill for keen observation in the students; it helps to generate and sustain student interest in the subject and help the student to develop interest in certain professions. However, it is time consuming; it could be expensive and disruptive especially when the field trip lasts several days.

Academic performance is an important parameter in measuring success in students. Students' academic performance refers to students' achievement in the topic taught based on the stated objectives. Edinyang and Ubi (2012) define academic performance as the outcome of education which reveals the extent to which a student, teacher or institution has achieved educational goals. Academic performance or achievement is commonly measured by examinations or continuous assessment (Abdulhamid, 2013). According to Denga (2002), learning is says to occur if there is a positive change in behaviour or performance which is a



result of experience and practice and which makes individuals face later situations differently. Hence, an individual is assumed to have learnt techniques and skills if there is a remarkable change in his academic performance during and after the course of his programme (Camilus, 2011). Academic performance is an outcome of interest to both researchers and professionals within the field of education and is generally an outcome desired by many parents, stakeholders, educationist and youth. An important question that is raised by educators, parents and often society is how high academic performance in students can be promoted and what factors or contexts have an influence on academic performance throughout a child's development.

There are several micro and macro contexts that have an impact on students' academic performance and one of the contexts that have been studied is the classroom context. Kounin and Gump (2005) add that the classroom context has distinctive forces or "signals" different to other contexts which pull events and participants along with them. A lot of argument had gone on the impact of class size and field trip on academic performance of students. Wosyanju (2005) maintains that large classes pose some teaching challenges such as difficulty in student control during field trip, delayed feed-back provided to students, no high quality individual feedback resulting in inefficiency and poor quality of students, reduction in teaching, less assignment so as to reduce marking and avoiding assessment which encourages shallow learning.

Class size as one of the sub-variables of school quality exerts significant influence on teachers' task performance in terms of field trip, assessment of students' academic performance and classroom management. Small class size enhances academic performance. Despite the fact that there are those against the notion, mainly due to the financial implications, most professionals in the field believe that smaller classes are conducive for effective learning which makes students to have a better study environment and lead teachers to teach more effectively.

Teaching large classes affects the morale motivation and self-esteem of teachers. When teaching large classes, teachers spend more time in organizing class activities, field trips and not enough time on meeting students need individually. Field trip when conducted in a proper process can improve students' performance in several ways by motivating their learning activities. Considering these relationship between the variables, the researcher examined the "effects of class size and field trip on academic performance of agricultural science students in senior secondary schools in Kaduna State."

## **1.2 Statement of the Problem**

Agricultural science is a practical subject that requires to be taught in conducive classroom and practically by making teaching situation as real as possible. Despite the importance placed on agriculture it is very disappointing to note that students' performance in the subject at both internal (terminal school examination) and external (WASSCE and NECO) examinations has remain consistently poor (Okafor, 2002). The large class size of agricultural science students in senior secondary schools is not encouraging (Blatchford, Bassett and Brown, 2011). Pedder (2006) observes that most students in large class size classrooms do not copy notes because they think that since the class is large the teacher might not notice them. He also adds that noise making is much and setting up of activities; making limited resources go a long way is tedious; making most students to be unserious with their studies.

Field trip involves taking students out of the classroom to places where they can see concrete illustration of classroom theories. Thus, individual differences among the students will be addressed since they are able to see, touch and do. Urulor (2000) observes that few teachers of agricultural science take their students on field trips in senior secondary schools. Throughout the researcher's four years of experience as an agricultural science teacher, the researcher was never opportuned to take students to areas of agricultural interest for studies.

The increase in examination malpractices cannot be separated from poor seating arrangement in classrooms due to large number of students (Pedder, 2006). The quantity and quality of interaction in the classroom and during field trip are likely to be adversely affected, due to lack of space for moving round the class, difficulty in controlling a large number of students during field trip and the overwhelming number of students that the teacher has to deal with and manage within a forty-minute lesson (Pedder, 2006). It is based on these problems that this study is carried out to determine the effect of class- size and field trip on academic performance of agricultural science students in senior secondary schools in Kaduna State with a view to making solutions that could help alleviate the problem.

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

The main objective of this study is to determine the effects of class-size and field trip on the academic performance of agricultural science students in senior secondary schools in Kaduna State.

The specific objectives were to:

1. determine the effect of class size on students' academic performance in agricultural science in senior secondary schools in Kaduna State.
2. determine the effect of field trip on academic performance of agricultural science students in senior secondary schools in Kaduna State.
3. ascertain the effect of normal class size on the academic performance of male and female students in agricultural science students in senior secondary schools in Kaduna State.
4. ascertain the effect of academic performance of male and female students taken to field trip in agricultural science in senior secondary schools in Kaduna State

#### **1.4 Research Questions**

The research work is expected to provide answers to the following specific research questions:

1. What is the effect of class size on academic performance of agricultural science students in senior secondary schools in Kaduna State?
2. What is the effect of field trip on academic performance of agricultural science students in senior secondary schools in Kaduna State?
3. What the effects of normal class size on academic performance of male and female students in agricultural science in senior secondary schools in Kaduna State?
4. What is the effect of academic performance of agricultural science male and female students taken to field trip?

#### **1.5 Research Hypotheses**

The following null hypotheses were formulated and were tested at the significant level of 0.05.

1. There is no significant difference between students' academic performance of normal class size and large class size in agricultural science in senior secondary schools in Kaduna State.
2. There is no significant difference between academic performance of students taken to field trip and those not taken to field trip in agricultural science in senior secondary schools in Kaduna State.
3. There is no significant difference between academic performance of male and female students in normal class size in agricultural science in senior secondary schools in Kaduna State.
4. There is no significant difference between academic performance of male and female students taken to field trip in agricultural science in senior secondary schools in

Kaduna State.

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

The findings of this study will be of importance to educational planners, government, teachers, students, parents, agricultural farms, agricultural industries and researchers. This research study will provide useful data and recommendations to educational planners and government as they make decisions in the future to restructure the agricultural science curriculum to make more rooms for field trips in the senior secondary schools. It will provide support for government to maintain the status quo of normal classes in many of the senior secondary schools.

Secondary schools teachers will benefit in this research work in terms of having recommended class sizes to teach and will encourage them to use field trip for difficult concept in agricultural science. It will also provide teachers of agricultural science with information regarding the usefulness of field trip in supplementing theoretical lesson done in the classroom.

The study will encourage the active participation of students in the classroom and field trip which will help in meaningful learning. It will also minimize the high failure rate of senior secondary school students in agricultural science.

Parents will benefit by seeing the importance of the knowledge of field trip on their children/ wards and therefore encourage them to pay for them to go on field trip. The study will provide agricultural farms and industries knowledge on the importance of field trips in teaching and learning of agricultural science and as a result may not hesitate in hosting students who are interested in visiting their farms or industries.

The findings of this research work will lead to further in-depth study on the impact of class size and field trip on the academic performance of students in Nigeria as it will serve

as a contribution to knowledge in the subject area. In this regard, it will be useful for other researchers who might want to carry out research in related areas

### **1.7 Basic Assumptions of the Study**

The study assumed that:

1. class size influences students' academic performances.
2. field trip influences students' academic performance.
3. most schools have large class size.

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

The study was delimited to only SSS III agricultural science students because these set of students had been exposed to agricultural science subject for a long period of two years. It was delimited to public senior secondary school Kaduna State because students from different backgrounds were involved. It was delimited to class size and field trip because students learnt faster when they are exposed to real life context of what is taught theoretically in class. It was delimited to livestock diseases common in the area because they can see the physical signs and symptoms of the diseases when taken out on field trip.

## CHAPTER TWO

### REVIEW OF RELATED LITERATURE

This chapter reviewed literature related to the study under the following sub-headings:-

- 2.1 Theoretical Framework
- 2.2 Class Size and Students' Academic Performance
- 2.3 Impact of Class Size on Academic Performance
- 2.4 Field trip and Students' Academic Performance
- 2.5 Students' Academic Performance
- 2.6 Determinants' of Students' Academic Performance
- 2.7 Empirical Studies
- 2.8 Summary of Literature Review

#### **2.1 Theoretical Framework**

The theories adapted for this study were derived from the system's theory input-output model developed by Ludwig Von Bertalanffy in Dahiru, Shamim, Lukwago (2014) and Piaget in Ahmad's (2014) developmental theory of learning and thinking.

The system theory postulates that an organized enterprise does not exist in a vacuum; it is dependent on its environment in which it is established. He adds that the inputs from the environment are received by the organization, which then transforms them into outputs. As adapted in this study, the class size (inputs) comprises of secondary schools students with different class size and field trip situation. When they get into the school system, the management of the school transforms them through the process of teaching and learning and the students (output) is seen through their academic performance. Most of the worldwide policy discussions on school performance concentrate on the factors influencing education at school. Among the schooling inputs generally considered to be important are class size,

teacher qualification and expenditure on physical resources (Hanushek, 2003). Lazear (2001) opines that the mechanism behind the effect of class size on achievement is classroom disruptions, whereby adding more students to a classroom increases the number of disruptions and consequently decreases the amount of time during which learning can take place because a teacher's time is spent dealing with the students who are causing the disruptions. In other words, classroom education inherently has properties of a public good, in that if one student disrupts his or her class, the learning of all other students within the class is also harmed.

Piaget's developmental theory of learning and thinking states that, the child should be able to explore his environment (field trip) for effective learning. A central component of Piaget's developmental theory of learning and thinking is that both involve the participation of the learner. He says that knowledge is not merely transmitted verbally but must be constructed and reconstructed by the learner. Piaget asserts that for a child to know and construct knowledge of the world the child must act on objects and it is this action which provides knowledge of those objects; the mind organizes reality and acts upon it. Since field trips involve taking the students or learner to the natural environment of the object(s) the learner should have the ability to act on object(s) by observing, identifying, classifying and even by manipulating the object(s) in its natural environment.

In support of Piaget, Bruner in Ahmad (2014) holds the view that learning occurs by self discovery, that is, exploration that is motivated by curiosity. The students are exposed to basic concepts to discover things for themselves. This could be through field trip and practical orientation by science educator and learner. Okafor (2002) contributes that on philosophy of pragmatism it maintains that experience are the center of learning. Thus, experience and the child's environment is a strong base in considering the development of field trip. The field trip must therefore be within the experimental world of the child. Hence,



it involves leaning by doing between the child and his environment. The experiences involve in field trip strategy are thus that of learning by doing, problem solving and practical work which agrees with the pragmatist theory. This study revolves around these input (class-size), exploration of the environment (field trip) and output (performance) variables as it focuses on the class-size (input), the exploration of the environment (field trip) and the understanding and confidence of students at the end of the course (performance).

## **2.2 Class Size and Students' Academic Performance**

Class size refers to the actual number of students taught by a teacher at a particular time. Class size is an educational tool that can be used to describe the average number of students per class in a school. Hoffman (2001) describes it as the number of students per teacher in a class. Kedney (1999) sees it as a tool that can be used to measure the performance of the education system. In relation to size, Stepaniuk (1999) reports that the rational utilization of classroom space depended upon class size. This in turn would depend upon the area of the classroom. He argues that there are approved norms of class-size, 40 pupils per class for grades 1 to 8 and 35 pupils per class for the senior classes; while the standard allocation of class space per pupil is 1:25 square metres. In this regard, Dean (2000) compares class-size in some countries and finds that Turkey, Norway and Netherlands has class-sizes of 20 or more; the UK, USA, Japan, Canada and Ireland has class-sizes of between 15 and 20 while France, Sweden, Denmark, Austria, Italy, Luxembourg and Belgium has sizes of below 15.

According to Valdrien (2001), in developing countries a class of less than 60 pupils was not necessarily large, while the Lancaster- Leeds reports indicated that the perceived average large class for teachers/lecturers is 46-49, this size of class was smaller to that experienced daily by many teachers in countries such as Nigeria, Indonesia and Japan (Coleman, 1999). Mortimore and Blatchford (2005) claim that a class of 30-35 could be

considered large by the British teacher, but experience would be the determining factor. According to NPE (2009) the ratio of a class size is 1-40. However, classes of 30-35 could be 'ideal' for the teacher whose daily experience is to deal with classes of 60 pupils and more. Okoro (2004) reported that the class-size in secondary schools in Nigeria ranges between 35 or 40 students. He argues that few students per class were uneconomical, as they do not make full use of space, teachers and teaching materials.

Adeyemi (2008) reports that average class size influences the cost of education while capital cost could be reduced by increasing the average class size in schools while Nwadiani (2000) argues that the higher the class sizes the lower the cost of education. These points were also supported by Toth and Montagna (2002) who reports that the increase in enrollment in many institutions which has become major concerns of students could definitely lead to an increase in class size. Commeyras (2003) however, disagrees with these arguments and reports that effective teaching seems impracticable for teacher, educators having large class size of 50, 75, 100 or more.

### **2.2.1 Effect of Large class Versus Small class on Academic Performance**

Class size is a very important factor in teaching and learning activities, particularly when students' academic performance is being considered. There is a consensus among various researchers and educationists that, the lower the class size or teacher-students ratio, the greater the academic achievement, since students' achievement decreases as class size increases. Many studies have pointed out the significance of teacher-students ratio to cognitive learning in the school (Fabunmi and Okore, 2000). As a matter of fact, virtually everyone, students and teachers believe that smaller classes would lead to improved students' performance. Various researchers support this fact such as (Ajayi, 2002, Coleman, 1999). McKeachie (1990) has summarizes the theory of the effects of class size on learning, focusing on how instructors and students behave differently in large and small classes. He

notes that discussion time becomes fragmented among students in large classes and instructors may rely on passive lecturing, assign less written homework or fewer problem sets and may not require written papers. In addition, instructors may find it difficult to know each student personally and tailor pedagogy to individual student needs in a large class.

Glass and Smith in Olatunde (2010) in their findings conclude that there is a clear and strong relationship between class size and students' achievement and that students learned more in small classes. They find that the major benefit of reducing class size occurred where the number of students in the class is fewer than 20. They conclude that small classes are superior in terms of students' reactions, teachers' morale and quality of the instructional environment. Keil and Partell (2009) find that increasing class size has a negative effect on students' achievement, that is, it lower students' achievement at a decreasing rate. This means that adding 10 students to a class of 10 has a larger negative impact on grade than adding 10 students to a class of 200. In addition, Dillon and Kokkelenberg (2002) point out from their research that large classes negatively affect some students more than others. According to them, class size had a negative logarithm with relationship to grades and that effect of class size on grades differs across different categories of students. Again, Adeyemi (2008) in his findings reveals that schools having an average class size of 35 and below obtain a better result than schools having more than 35 students in senior secondary schools.

Small classes may benefit students more when instruction relies on discussion, field trip by allowing more students to participate and be recognized, than when lecture and notes taken are the main modes of instruction. According to Nye, Hedges and Konstantopoulos (2000), while small classes benefit all kinds of students, examples had shown that the benefits may be greatest for minority students or students attending inner-city schools. For these students, smaller classes can shrink the achievement gap and lead to reduced grade

retention, fewer disciplinary actions, less dropping out, and more students taking college entrance exams (Krueger and Whitmore, 2001).

In a state-wide class studies, Prime, Time and Star (2003) find out that positive outcomes are found for small classes on such factors as time on task, individualized instruction, well-behaved classes and teacher satisfaction. They further discover that the results for academic achievement were mixed at times, small classes are found to have superior outcomes and at times, the large classes performed better. On the other hand, Robinson and Wittebols in Olatunde (2010) finds that reducing class size is especially promising for disadvantaged and minority students; however, they caution that positive effects are less likely if teachers did not change their instructional methods and classroom procedures in the smaller classes. Ferguson in Olatunde (2010) in his own submission points out that reducing class size naturally alters the classroom environment, classroom atmosphere is better, students receive more individualized attention and teachers have more flexibility to use different instructional approaches. Class size reduction also changes the educational opportunities beyond the classroom. It reduces the level of noise in a class.

Slavin in Olatunde (2010) submits that substantial reduction in class size has small positive effect on students and the effect is not cumulative and even disappears in later years. He further asserts that large effects of class size reduction are not likely to be seen until the class size is reduced to one (that is one-on-one tutoring). Bennett in Olatunde (2010) in a reviewed of research, finds broad agreement among researchers on the following general conclusions:-

1. Smaller class results in increased student-teacher contact.
2. Reductions in class size to less than twenty students without changes in instructional methods cannot guarantee improve academic achievement.
3. No single class size is optimal for all grade level

4. Smaller classes appear to result in greater achievement gains for students with lower academic ability and for those who are economically or socially disadvantaged.
5. Classroom management improved in smaller classes (fewer discipline problems)
6. Smaller classes result in higher teacher morale and reduced stress
7. Individualization is more likely to occur in smaller classes
8. Class size appears to have more influence on student attitudes, attention, interest and motivation than on academic achievement
9. Very small classes of five or fewer students produce considerable higher achievement.

### **2.3 Impact of Class Size on Academic Performance**

Some contributors proposed that what students and teachers do in large and small classes made the most significant impact on student outcomes. Misbehaving students, student attention span, peer pressure, student engagement and teacher attention to students and content are all influenced by class size according to several authors. Resnick (2003) suggests that smaller classes benefit student achievement claiming that teachers in small classes pay greater attention to each pupil. Students in these classes experienced continuing pressure to participate in learning activities and became better, more involved students; attention to learning went up and disruptive and off-task behavior goes down. Pedder (2006) believes that class size might impact classroom processes and pupils' learning. He states that smaller class size allows teachers to cover more curriculum and students to be more cognitively engaged. These two features lead to improved student achievement. Pedder (2006) asserts that in larger classes, more time is needed for non-academic activities related to administrative and organizational procedures and to the management and control of discipline. Reductions in the quantity of learning opportunities constrain teachers from

achieving the necessary pace, depth and breadth of curriculum coverage as class size increase.

The number of children in a class will decrease the amount of time that can be spent on instruction and time spent dealing with individual children. This expectation is consistent with teachers' views (Bennett and Glass in Olatunde, 2010). However, Shapson *et al* in Olatunde (2010) finds that there is no statistically significant difference between class sizes for most teacher activities, and teachers did not alter the proportion of time spent interacting with the whole class, with groups or with individuals. This conflict with teachers' own experiences and there is, therefore, a gap between professional judgment and observational research findings. In the research (Blatchford, Katnick, Baines, Galton 2003; Blatchford *et al* 2005) find that more teaching take place overall in smaller classes but this is restricted to the youngest age group studied (4/5 year. Perhaps the most consistent finding concerning class sizes effects on classroom processes is that reduced class size is related to individualization of teaching (Betts and Shkolnik, 1999; Ehrenberg *et al*, 2001; Molnar, Smith, Zahorila, Palmer, Halbach and Ehrle, 1999). Results from the systematic observation studies show that although there is a heavy reliance on whole class teaching and individual work in primary schools, pupils in small classes are more likely to experience one-to-one teaching and are more often the focus of a teacher's attention (Blatchford *et al* 2003, Blatchford *et al* 2005). In the same vein a multi-method studied by the NICHD Early Child Care Research Network (2004) summarizes data by arguing that smaller first grade classrooms appear more child-centered than larger classes and that larger classes become more structured. Anderson (2000) says that small classes encourage a more personalized and appropriate curriculum for individual pupils. A number of studies in the USA Finn and Achilles, (1999), Molnar *et al* (1999) and Blatchford *et al* (2003) suggest that class size reduction (CSR) tends to benefit lower attaining and disadvantaged pupils, and it might be

expected that more individual support in smaller classes would be targeted at the lowest attaining pupils. However, it might be expected that as pupils progress through primary into secondary school, the more structured and centralized curriculum and the preparation for public examinations, would reduce any effect of smaller classes on individualized attention.

Larger classes can lead to pupils having a passive role in class. Research in the UK finds that children in large primary classes are more likely to engage in passive behavior, listening to the teacher, while in smaller classes pupils are more likely to interact in an active, sustained way with teachers (Blatchford *et al*, 2005). This can be considered another aspect of classroom engagement. This is a consistent finding at both the beginning and end of the primary stage (4/5 and 10/11 years). In Australia, Bourke in Olatunde (2010) finds more student questions to teachers in large classes but these are mostly request for clarification or for other help from the teacher. In this study he wants to check whether there is more active involvement with the teacher through primary and secondary education, and whether this varies by pupil attainment level. A number of studies have report that pupil discipline tends to be more difficult in large classes and more of an intrusion into the teaching and learning process (Blatchford *et al* 2005, Glass *et al* in Olatunde, 2010). In contrast, smaller classes tend to be quieter and more easily managed. Bourke in Olatunde (2010) finds more non-academic procedural arrangements are necessary in large classes. It is expected that there will be less need for critical comments from teachers in smaller classes, reflecting fewer difficulties in classroom management.

#### **2.4 Field trip and Students' Academic Performance**

Field trip is an outdoor or field work or learning exercise undertaken by teachers and students in certain aspects of a subject, to give students the opportunity to acquire knowledge. It refers to as trips to various places to obtain information directly by seeing things as they really are (Obeka, 2010). Field trips can connect school work with the world,

making it tangible and memorable. Field trip stimulates questions and ideas at the beginning or end of a unit. Field trip also provides an experimental situation for students to study and interrogate. Field trip involves taking students outside the classroom for the purpose of making relevant observations and also obtaining some specific' information. It could be in a nearby school farm, far away, national park, zoo, industry and forest or game reserve. It is an important component of science teaching (Bajah, 2002). According to Obeka (2010) field trip is an outdoor type of laboratory activity or field work or learning exercise undertaken by teachers and students in certain aspects of a subject, to give students the opportunity to acquire knowledge.

In addition Aliyu (2008) observes that field trip involve taking students out of the classroom to places where they can see concrete illustration of classroom theories. It also offers direct observation and interpretation of the substance in their natural surroundings. Field trip on the spot requires the use of basic scientific skills that is observation, identification, classification and manipulation of substance in the natural surroundings. Field-trip provide real life context for the material being learned. Ideas can make more sense and be remembered better if students can actually see where and how it works or takes place in reality. This is in lined with a Chinese proverb cited by Ukairo in Ahmad (2014) that says; what I hear, I forget; what I see, I remember; and what I do, I understand. Ahmad (2014) states that field trip is a method of teaching used to collect first hand information in the course of investigation, this will enable both the teachers and students to create meaningful and productive learning both on the field and school which will enhance students' academic performance.

#### **2.4.1 The Need for Field trip**

With the availability of learning materials on the internet, some teachers and students may question why field trip is needed anymore. Field trip can be troublesome and difficult



to organize and supervise. But they do provide learning opportunities that cannot be experienced in the classroom (Bernardi, 2003). He states that the needs for field trip are as follows:

- i. **Real Life Context:** Field trip provide real life context for the material being learned. Ideas can make more sense and be remembered better if students can actually see where and how it works or takes place in reality.
- ii. **Integrated Learning:** Field trip does not only teach one idea, but many. A field trip to a poultry farm, for example, can bring disparate topics together, such as poultry management, feed and feeding, diseases (signs, symptoms and control/treatment), housing, products and processing.
- iii. **Additional Resources:** Field trip can provide additional resources for learning that neither classroom learning nor computer-assisted learning can. For example, a science field trip can allow for farms, an extended length of time spent in a natural area for students to collect data, experiment and draw conclusions.
- iv. **Tactile:** Field trip allow for actual tactile experiences. Students especially children, learn and remember better through experiences where they are allow to touch and manipulate the material about which they are learning.
- v. **Cooperative:** Field trip is taken by large groups. It can provide a good opportunity for students to work together cooperatively with others.
- vi. **Field trips can add variety to the regular instructional program:** They tend to be special and enjoyable learning experiences, ones which develop positive attitudes in students toward related classroom activities. Field trips are rich in educational

possibilities because students learn from actual firsthand experiences, rather than by simply reading or hearing about something

vii. It enhances the curriculum: Field trips are rich in educational possibilities as students learn from actual hands-on experiences, rather than by simply reading or hearing about something. Involvement in a real world experience makes learning more meaningful and memorable comparing to regular classroom instructional programs.

#### **2.4.2 Role of a Teacher on Field trip**

Christopher (2010) and Ahmad (2014) states that the roles of teacher in preparation for the field trip are to visit the site to find connections to curricula, assess potential problems, and plan how the students could best use their time. Discuss the purpose of the field trip and how it relates to the current unit of study. Introduce visual observation skills, let students describe in detail ordinary objects, like a characteristics of some livestock, detail signs of some livestock diseases, or causal organisms to their class mates. Show photographs or posters of the field trip site or related to exhibits that will be view. Assign students "specialists" roles in one aspect of the topic that they will be studying during the field trip. Students can be grouped in different subject areas related to the field trip topic to research. Discuss with students how to ask good questions and brainstorm a list of open-ended observation questions to gather information during the visit. Record questions on chart paper or in student field trip journals. Give as much context as possible so that the students will understand what they see. Teacher might considered having the students do something like a journal or a K/W/L chart (that is draw three columns with the K column representing what they already know, the W column displaying what they want to learn and the L column for ideas they learned on the field trip). Complete the K and W columns

before embarking on the field trip and complete the L column when you return. Set standards of etiquette and respectful behaviour.

During the field trip, teachers should build in opportunities for students to view the site or work alone, in pairs, or in small groups. On a field trip to a museum, for example, the students could be asked an open-ended question like, "Find a work that represents our theme or time period and sketch it. In class we will share our choices and discuss why we chose them." The students could also choose one aspect or part of the site to explore based on the subject and topic. Consider giving some students disposable cameras, small tape recorders, or mandates to record specific information. When the class is back at school, they can compile a complete picture.

After the Field trip, the teacher should allow the students to synthesize their experience creatively. For example, they might create field trip brochures for other classes or the school library. Through the use of the study guide, the teacher help the students to evaluate what they did, what they see, what they learn and what they should have done that was not done (Callan in Urulor, 2000). The teacher can also ask various students to share their findings with the rest of the class (Bernardi, 2003). They students will be able to make definite statements regarding what they learned in the trip. Olsen, Leroy and Herbert in Urulor (2000) agree that a trip not followed by evaluation is as good as waste. Field trip well planned and carried out will no doubt provide learning experience that will not only be exciting and interesting to students but richly rewarding (Bernardi, 2003).

In evaluating the trip the teacher should complete a "Teacher Journal" regarding the field trip. This will provide a good reference for future field trips. These include what is of unique educational value in this field trip? Did the students meet the bjectives/expectations? Is there adequate time? Is there adequate staff and adult supervision? What might be done differently to make this an even better experience in the future? What special points should

be emphasized next time? What special problems should be addressed in the future? What would improve a visit to this site in the future? Share the evaluation with the students, volunteers, hosts from the field trip site, and school administrators.

### **2.4.3 Role of the Students on Field trip**

Field trips are an interactive and engaging method of learning in environments outside the classroom. Whether planning a zoo expedition with elementary school children or an ecology field, study research with college students, the students have excellent role to play in maintaining a safe atmosphere (Urulor, 2000). Most students need the structure of having rules spelled out for them. Before embarking on the trip, make copies of the rules and regulations for each participant. To ensure each student will follow the guidelines, have each students sign the "rule contract" promising to act respectably. Rules include: Do not run, stay with the group, complete all field coursework in a timely manner, obey all traffic laws, listen to the supervisor, and don't talk to strangers. The students should be of good conduct, ask question and take down notes during the field trip. Through the use of the study guide, the students are evaluated on what they did, what they saw, what they learned and what they should have done that was not done (Callan in Urulor, 2000).

### **2.4.4 Merits and Demerits of Field Trips**

Obeka (2010) outlines the following as merits of field trip:

1. It enables the students to have first-hand experience of real things. Thus it is considered as providing learning experiences which cannot be brought in to the Classroom practically.
2. It tends to relate things studied in the classroom with actual activities outside the classroom that is the society and community. This made class work or subject matter and instruction more meaningful and enhance, students understanding of the subject matter.

3. It afford valuable opportunities to developed interest in some subject areas and career opportunities,
4. It helps to arouse students' interest and increases their motivation to learn a subject and related subjects.
5. It makes the students to be more imaginative and inquest live observers. Hence, they acquire skills for careful observation and objective report of observations.
6. It creates opportunities for the students to interact with experts, and this enhances effective learning and teaching. Most field trip experiences make demand of all senses. This makes the students to gain complete picture of the concept than from any other mode of teaching. Teacher student's relationship becomes more cordial and developed more intimately during field trips.

Also the following are state as the demerits of field trip:

1. Lack of fund: Ahanonu(1995) and Kemakolam in Urulor (2000) point out that lack of fund had been a major militating factor to effective used of field trip in teaching and learning.
2. Difficulty in finding sufficient time to take the students on field trips (Urulor, 2000). Uzoma in Urulor (2000) reports that teachers fear the disruption that may occur to other lesson if the take out students on field trip.
3. Heavy work load of teachers: Kemakolam in Urulor (2000) ascertains that heavy work load of teachers influenced negatively teachers' decision to used field trip. If teachers are compelled to carry much work load as is the case in many public schools, field trips evidently will suffer.
4. Lack of encouragement by schools is also opines as deterrent to the effective use of field trips in schools (Faniron in Urulor, 2000). Faniron in Urulor (2000) also finds that some principals discourage teachers who want to use this technique. Kemakolam

in Urulor (2000), also finds that fear of accident of the field has make teachers to refrain from the used of field trips. Some see it as a waste of time and not really of educational value while others confused it with research (Uzoma in Urulor, 2000).

#### **2.4.5 Effect of Field Trip on Students' Academic Performance**

The mission of field trip is to enhance learning and academic success by providing activities and programs for the students through allowing community resources persons to share their skills, knowledge and expertise. Field trip provides the learners the opportunity to be active learners thereby enhancing academic performance (Yusuf, 2006). Christopher (2010) states that the impacts of field trip on academic performance brought classroom study alive for students and helped them remember and relate to what they had learned. They provide rich resources that can rarely be approximated in the classroom. They also help connect school to the world, provide new cultural contexts for literature and provoke questions, stimulate and focus class work by helping students synthesize information. In field trip, the students observe people and machines, equipment and materials in industries, companies and offices to see for themselves, those things they have been taught and learned theoretically (Aliyu, 2008).

In addition, Urulor (2000) observes that, if field trip is properly planned, it affords the students the opportunity to become actively engaged in observing collecting, classifying, studying relationships and manipulate objects .He states that Field trips can be an essential part of learning, if they are used properly. They provide a hand- on experience that cannot be completely duplicated in the classroom. Furthermore, Urulor, (2000), states that, field trip, when properly used can create enriching experiences that provide meaningful, long-lasting learning in the learner. Field trips early provide the concrete, hands – on experiences that the learner need. Ahmad (2014) also states that field trips are an interactive and engaging method of learning in environment outside the classroom. Field trip by secondary

schools students are expected to enhance students learning experiences through interaction with resource and the environment (Awotua, 1999).

Many teachers agree that experiential learning outside of the traditional classroom offers an important variation to the student's learning, although the effect of the trip is mainly effective (Melber, 2008). The major role of out-of-school learning is to maintain an experience with real life situations (Amosa, Ogunlade and Atobateie, 2015). Field trip is a study taken outside the classroom to obtain direct experience in their natural setting. It is organized to improve students' interest in learning, for collecting data, material for classroom lesson as well as to observe objects not possible to bring within the classroom (Amosa *et al*, 2015).The field trip is plan for learners to experience theory in practice. Using field trip in teaching and learning leads to teacher-learners interaction outside the classroom. These interactions take place in a new environment and result in a meaningful student's academic performance (Christopher 2010).

## **2.5 Students' Academic Performance**

Academic performance is define as individual or self-defining complete performance in the domains of school, sports and work, however, "achievement" is conceptualized by meaning of "competence," which has a substantial impact on emotion and well-being (Dweck and Elliott in Olatunde, 2010). Academic performance is how well an individual has done his cognitive tasks (Avosehin, Dahiru, Shamin, Lukwago, 2014). The authors explain further that it is the general ability of students concerning their offered subjects compared to a specified standard called pass mark. To them, this pass mark was relative and can be arbitrarily defined as 40% or 50%. According to Aremu and Adika, (2001) academic performance refer to the criterion of excellence as well as the attainment of success of a student in his/her school work among his/her classmates. Tomporouski, Philip, Catherine, Paricia *et al* (2008) are of the opinion that academic performance is the outcome of

education, the extent to which student, teacher or institution had achieved their educational goals. They further stress that academic performance is commonly measured by examinations or continuous assessment, but there is no general agreement on how it is best tested or which aspects are most important procedural knowledge such as skills or declarative knowledge such as facts.

Academic performance is concerned with the quality and quantity of learning attained in a subject or group of subjects after a long period of instruction. Competence is operative across the life span, and it is obvious in all individuals across cultural boundaries (Dweck, 2005; Geppert and Halisch, 2001). Majority of researchers found that academic performance involved self-efficacy beliefs, which means perceived self-efficacy in one's capabilities for the academic domain that contributed independently to academic performance (Pajares and Schunk, 2001). Moreover, firm belief in one's self-efficacy yields the endurance that is exemplified by children's beliefs, which can regulate their own learning. Hejazi, Shahraray, Farsinejad, and Asgary (2009) demonstrate that academic self-efficacy beliefs had a mediating effect on the association between academic achievement and identity styles. On the other hand, Bandura (1997) define self-efficacy as a cognitive resource that encompasses an individual's belief or confidence in one's capability to effectively function in behaviours toward desired goals.

The indicators for academic performance include standard test scores, grade point average (GPA), and self-perceived academic performance (Ma, Phelps, Lerner and Lerner 2009). Vonstumni, Sophie, Hell, Benedict *et al*, (2011) opine that individual differences influencing academic performance, individual intelligence and personality of student influenced their academic performance. They further emphasized that students with higher mental ability grabbed faster than those with low mental ability in the classroom academic performance were been measured. Academic achievement increased the adolescent's



motivation, well-being, and achievement (Eccles and Roeser, 2009). Additionally, lack of academic performance predicts lower self-esteem, motivation, and dropping out of school (Ma *et al*, 2009). Therefore, academic performance refers to the learning outcomes of an individual with the knowledge, skills and ideas acquired and retained through their course of study within and outside the classroom situation.

All students are required to maintain a satisfactory academic record and meet the obligations of the course in which they are enrolled. Failure to do so will be dealt with as the school and its designated boards shall determine. In educational institutions, success is measured by academic performance or how well a student meets standards set out by local government and the institution itself. Although education is not the only road to success in the working world, much effort is made to identify, evaluate, track and encourage the progress of students in schools (Oludipe and Oludipe 2009). Parents care about their child's academic performance because, they believe good academic results will provide more career choices and job security. Generally, performance referred to an accomplishment of a given task measured against preset known standards of accuracy, completeness, and speed

## **2.6 Determinants of Students' Academic Performance**

The following are justified as some of the various factors that may affect the academic performance of students viz:

(i) **Class size:** Class size refers to the actual number of students taught by a teacher at a particular time. Misbehaving students, student attention span, peer pressure, student engagement and teacher attention to students and content are all influenced by class size. Resnick (2003) suggests that smaller classes benefited student achievement claiming that teachers in small classes pay greater attention to each pupil. Students in these classes experienced continuing pressure to participate in learning activities and became better, more involved students; attention to learning went up and disruptive and off-task behavior went

down. Pedder (2006) believes that class size might impact classroom processes and pupils' learning. He stated that smaller class size allowed teachers to covered more curriculum and students to be more cognitively engaged.

(ii) Family structure: This is one of the factors that affect the academic performance of students in secondary schools, it affect them in a lot of ways such as lack of appropriate role model especially for males (Magnuson and Katherine (2007) says that the nature of parent – child relationship in families might cause emotional and behavioural problems for the child. Bossart, Doumen, Buyse and Verschueren (2011)) also say that the influence of family structure has been found to be weakly associated with educational attainment. Parents have less time to spend with their children in supervising their school work and maintaining appropriate levels of discipline and there are increased responsibilities to children such as children roles in domestic duties which impede the time available for school work and these are mostly common with extended family.

(iii) Types of school: The type of school a child attends is very important in influencing educational outcomes. Research in the “US” has found that socio – economic status influences educational attainment. It says that the school context tends to affect the strength of the relationship between socio – economic status and educational outcomes. Magnuson *et al*, (2007) says that students from independent private schools are also more likely to achieve higher end of school scores. Studies has shown and find out that students that attended private schools are academically sound than students from public schools because they have good qualified teachers, good infrastructures and conducive environment in the school although these factors are indirectly linked to the effect of socio – economic status on the academic performance of the students.

(iv) Field trip: Ahmad (2014) states that field trip is a method of teaching used to collect first hand information in the course of investigation, this will enable both the teachers and

students to create meaningful and productive learning both in the field and school which will enhance students' academic performance.

(v) Background of the learner: students come to school from different backgrounds. Some come from poor while others from rich family. There are also those whose parents are illiterate while others have parents who are educated. In the same manner, children have parents who are civil servants or who work in non-governmental establishments we also have those whose parents are self-employed. Whichever category that the child belongs to, he brings with him to formal schooling a way of functioning which carries the imprint of his upbringing at home.

(vi) Social position of parents: James (2007) stresses that there are 3 levels of parent's social – economic status they are the high class level, middle class level and low class level that “social background remain one of the major sources of educational inequality”. In other words, educational success depends very strongly on the social – economic status of one's parents. Parent's socio-economic condition, which includes parents' academic and professional qualification, revenue and occupational affiliation, is also associated with academic gain of students. The results of many studies confirmed that academic achievement of students was contingent upon parent's socio-economic condition. So the students belonging from higher social economic backgrounds would perform better than other students associated with low social economic backgrounds. Among many research studies conducted on academic achievement, it was not very surprising to observe that Socio-economic status was one of the main elements studied while predicting academic performance. Graetz (1995) conducts a study on socio-economic status of the parents of students and concludes that the socio economic background has a great impact on student's academic performance, main source of educational imbalance among students and student's

academic success contingent varies strongly on parent's socio economic standard. The social position of parents affect the academic performances of students in the sense that students from high and middle class level take education for granted. They are not serious with their academic because they felt that their parents are rich and wealthy so they do not need to work hard while students from low class level work hard to have good academic performance so that they will have high standard of living in the future.

(vii) Environment: Onu, (2007) emphasizes that, the environment in which students live or are brought up also influence their academic performance, it should be noted however that some students from low social – economic background might be higher academic achievers while others from high social – economic background might be low achievers because some of them abuse the opportunities. It is believe that what a child eat, how and where he lives greatly affect his physical development, a child success or failure to a considerable extent may depend on the type of environment he/she lives.

(viii) Family income: The total income of families, monthly or annually and their expenditures also put a great effect on the learning and academic opportunities accessible to youngsters and their chances of educational success (Escarce, 2003). Furthermore, he points out that due to residential stratification and segregation, the students belonging to low-income backgrounds usually attend schools with lower funding levels, and this situation reduced achievement motivation of the students and high risk of educational malfunction in future life endeavors. Considine and Zappala (2002) observe that children who come from those families having low income make known more subsequent models in terms of learning outcomes; low literacy level, low retention rate, problems in school behaviour and more difficulty in their studies and mostly display negative attitude towards studies and school.

(ix) Gender: According to Abdulhamid (2013) gender has remained a burning issue and has also remained relevant in education because, it has been linked to achievement and

participation in certain profession. Amosa *et al*, (2013) remarks that no evidence of superiority is expected to be noticed in the academic performance based on gender if both males and females students are exposed to learning .

## **2.7 Empirical Studies**

Studies on class-size and field trip on students' academic performance have now received a major attention in educational researches. Researches that contributed to the study of class-size and field trip on students' academic performance include:

Michie, (2001) conducted an experiment on "evaluation of field trips for achieving informational gains in an earth science unit in Kano State". Three specific objectives, three research questions and three null hypotheses were formulated. From the population of one hundred and twenty students, sixty (60) were selected as the (the experimental groups) who went for field trip to sites of geologic interest, while sixty (60) students as control groups were reviewed of the content through slides. ANOVA statistic was used to test the research questions and null hypotheses. Based on comparisons of pre-test and post-test results, it was concluded that high ability students tend to profit more from field trips than do students with average to less-than-average ability, but that field trips may contribute to the understanding of scientific principles for all students. The present study is similar to the past study in formulation of objectives, research questions and null hypotheses. They both used experimental research design, control and treatment group. The present study is different from the past study in terms of location which is in Kaduna State and population which is twelve thousand three hundred and seventy (12370) SSS III students. The student gender in normal class size and field trip was considered.

Fabunmi, Brai-Abu, Adeniji (2007) conducted a study on "Class Factors as Determinants of Secondary School Student's Academic Performance in Oyo State, Nigeria". Two research questions were raised and two null hypotheses were also stated. Ex- post

factor under a descriptive survey research design was employed for the study, 200 out of the 336 secondary schools in the state were randomly selected for the study. The multiple regression analysis and one-way analysis of variance were used to analyze the data. The results of the findings revealed that the two null hypotheses were rejected at 0.05 level of significance. The study therefore concluded that class factors determined significantly secondary school students' academic performance, but when taken separately, all except student - classroom space, determined significantly secondary school students' academic performance in Oyo State in Nigeria.

The present study is similar to the past study as it attempted to find the effect of class size on students' academic performance and also in nature of data used for academic performance. The present study is also similar with the past study as it involved senior secondary schools students under investigation. Both the present and past studies formulated null hypotheses and as well used standard statistical tools for testing null hypotheses. However, the difference is that the present study formulated four null hypotheses which was not the case in the past study. The present study used an experimental research design (quasi-experimental) while the past study used a non-experimental research design. So the present study intends to determine the effect of class size on academic performance of male and female students in Agricultural Science in Senior Secondary School.

Prince and Hein (2010) conducted a research on "effect of field studies on learning out come in biology achievement in Ibadan". The design of the study was quasi experimental, pre-test, post-test were administered to the experimental and control group design. The sample of the study consisted of 100 biology students in two interactive classes. Four specific objectives, four research questions were raised and four null hypotheses were tested. The first three null hypotheses were tested with t-test statistic at 0.05 level of significance. The fourth null hypothesis was tested with Pearson Product Moment

Correlation Statistic. The major findings of this study included: a significant difference in process of science scores between pre-test and post- test of field trip students; a significant difference in process of science test scores between students exposed to field trip experiences and those who were not exposed. A significant difference in biology achievement test scores between students exposed to field trip experiences and those who were not; and a strong correlation between process of science score and biology achievement score. It was concluded that field trip experiences enhanced students understanding of process of science, improved students' attitude towards biology and significantly influenced their biology achievement.

The present research study is similar to the past study in terms of the research design, the number of objectives, research question and null hypotheses. The present study is different from the past study in sample which was 102 SSS III students; subject used which was agricultural science and place of the research which was Kaduna State. The on-going research looked into class size and field trip and also considered male and female students academic performance.

Mokobia and Okoye (2011) conducted a study on "Effect of Class Size on the Teaching and Learning of Chemistry in Secondary Schools in Delta State, Nigeria". As a guide to the researchers, two research questions were raised as well as two null hypotheses formulated. Ex-post-facto research design was adopted for the study and the researchers employed stratified random sampling to select 681 students from 16 schools in the stratified educational zones. Data collections were carried out using the Chemistry Achievement Test (CAT). Data collected were subjected to Chi-square statistics and F-test (ANOVA) at 0.05 level of significance in testing the null hypotheses respectively. The result of the findings showed that chemistry students in small size classes performed better in relation to those in large size classes. The results also showed that there was no interaction effect of school

location and class size on the achievement of the considered students. It was concluded that senior secondary school students in small size classes showed higher achievement in chemistry relative to their colleagues in large size classes. Furthermore, there was no interaction effect of location and class size in students' achievement in Senior Secondary School Chemistry.

The present study is similar to the past study as it attempted to find the effect that class size had on students' academic performance and also in nature of data used for academic performance. The present study is also similar with the past study as it involved senior secondary schools students under investigation. Both the present and past study formulated null hypothesis and as well as used standard statistical tools for testing null hypotheses. However, the present study formulated four null hypotheses while the past study formulated two null hypotheses. The present study used an experimental research design (quasi-experimental) while the past study used Ex-post-facto research design. So the researcher intended to determine the effects of class size and field trip on academic performance of male and female students in Agricultural Science in Senior Secondary School.

Owoeye and Yara (2011) conducted a study on "Class Size and Academic Achievement of Secondary School in Ekiti State, Nigeria". One null hypothesis was formulated for the study. Ex-post-facto research design was adopted for the study and the researchers randomly selected four federal unity schools and 64 public schools out of a total of 350 secondary schools to form the target population. Data collections were carried out using Students' Class Size Questionnaire (SCSQ). Data collected were subjected to mean and t-test at 0.05 level of significance in testing the null hypotheses respectively. The result showed that there was no significant difference in the academic achievement of students in small and large classes from urban schools ( $t = 1.49$ ;  $p < 0.05$ ); there is no significant



difference between performance of students from rural large and rural small classes ( $t = 0.58$ ;  $p < 0.05$ ).

The present study is similar to the past study as it attempted to find the effect of class size on students' academic performance. Both the present and past study formulated null hypotheses as well used standard statistical tools for testing null hypotheses. However, the present study formulated four null hypotheses which was not the case in the past study. The present study used an experimental research design (quasi-experimental) while the past study used a non-experimental research design (Ex-post-facto). The on-going research looked into class size and field trip and also considered male and female students academic performance.

Majanga, Nasongo, Sylvia (2011) conducted a study on "Effect of Class Size on Classroom Interaction during Mathematics Discourse in the Wake of Free Primary Education (FPE): A Study of Public Primary Schools in Nakuru municipality, Kenya". The study adopted ex post facto research design. It targeted all the 59 Public Primary Schools in Nakuru Municipality. Random sampling was used to select four schools for the study. Mathematics lessons in classes 1 and 6 were chosen from the selected schools to represent the lower and upper classes respectively. The data were processed and analyzed using descriptive and inferential statistics. The findings of the study revealed that FPE policy led to increase in enrolments in schools which created increasing class sizes and Pupil-Teacher Ratios. The increased in class sizes had influenced teacher-pupil interactions and pupil-pupil interactions.

The present study is similar to the past study as it attempted to find the effect that class size has on students' academic performance. However, the present study formulated four null hypotheses while the past study did not use. The present study used an experimental research design (quasi-experimental) while the past study used a non-

experimental research design. The researcher intended to determine the effect of class size on academic performance of male and female students in agricultural science in senior secondary school.

Osim, Chika, Uchendu and Ubi. (2012) conducted a study on “Class size pressure: An impediment to teachers’ work quality” in Cross River State, Nigeria. The design adopted for the study was Ex-post Facto. One research question and one hypothesis were formulated to guide the study. Two sets of researchers developed instruments named class size pressure questionnaire (C.S.P.Q) and Teachers’ Work Quality Questionnaire (T.W.Q.Q) were responded to by teachers and students respectively after being validated. The (C. S. P. Q) with items on class size which were categorized into four: below 30, 31-40, 41-50 and 51 and above were administered to 500 teachers while, the (T.W.Q.Q) consisting of 18 items were responded to by 2000 students randomly selected through stratified random sampling technique. The data were analyzed using one way analysis of variance (ANOVA). The major finding of the study revealed a significant influence of class size on teachers’ work quality. Based on the findings it was concluded that there were no enough classrooms and qualified teaches so as to reduce students class population and reduce teachers’ work load. In this way, teachers’ work quality was reduced.

The present study is similar to the past study as it attempts to find the effect class size on students’ academic performance. Both the present and past study formulated null hypotheses as well used standard statistical tools for testing null hypotheses. However, the present study formulated four null hypotheses while the past study formulated one null hypothesis. The present study used an experimental research design (quasi-experimental) while the past study used a non- experimental research design. So the researcher intended to determine the effect of class size and field trip on academic performance of students in Agricultural Science in Senior Secondary School as well as their effect on gender.

Tobih, Akintaro and Osunlana (2013) conducted a study on “Effect of Class Size Reduction on Students’ Performance in Mathematics in JSSCE examination in Ibadan municipal Oyo State, Nigeria”. One null hypothesis was formulated for the study, the researchers used ex-post-facto research design, four schools were randomly selected from each of the local government and the JSSCE results of the selected schools for the years (2003 -2005, 2006-2009) were used for the study. The data for the study were subjected to percentages and descriptive statistics. Analysis of variance was used to test for the null hypotheses. The results of the findings revealed a significant difference between class size and students’ academic performance, it was concluded that class size played a crucial role in determining the academic performance of Junior Secondary Students in Ibadan municipal.

The present study is similar to the past study as it attempted to find the effect of class size on students’ academic performance and also in the used of secondary schools. However, the present study involved senior secondary school students as subjects under investigation while the past study used junior secondary schools students. The present study used an experimental research design (quasi-experimental) while the past study used a non-experimental research design (ex-post-facto). The present study formulated four null hypotheses while, the past study formulated one null hypothesis. So the researcher intends to determine the effect of normal class size and field trip on academic performance of male and female students in Agricultural Science in Senior Secondary School.

## **2.8 Summary of Literature Reviewed**

In this chapter, the researcher reviewed the literature related to the study. In doing this, the theoretical framework was highlighted. Class-size and students’ academic performance and how large and small class sizes affect students’ academic performance were highlighted. The impact of class size on students’ academic performance was also considered. Field trip and students’ academic performance, the need for field trip in teaching

by relating theory to reality, the role of a teacher and students in field trip to make it a success. The need for field trip in teaching by relating theory to reality, the role of a teacher and students in field trip to make it a success. Merit and demerit of field trip in the aspect of its importance and problems were highlighted. How field trip affect students' academic performance. Determinants' of students' academic performance which include: Gender, field trip, class size, types of schools, background of the students determines how well students performed in their academics. Literatures on class size and field trip were reviewed to expose the students to better learning condition and greater academic achievement. Haven gone through the literature review and previous research works on class size, field trip and students' academic performance, the current research intends to bridge the gap in the area of gender and academic performance with regards to the normal class size and field trip in agricultural science which most researchers did not cons

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

This chapter presents the research design and methodology of the study under the following sub-headings:

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

#### **3.1 Research design**

Quasi-experimental research using with and without design was used in this study. An experimental research design is an empirical study used to estimate the causal impact of an intervention on its target population, and is a type of evaluation which determines whether a programme or intervention has the intended effect on a study's subjects (Gribbson, Barry and Harmann, 2014).

#### **3.2 Population of the study**

The population of this research comprised of 12370 SSS III students offering agricultural science in 285 public Senior Secondary schools offering agricultural science in Kaduna State. Kaduna State is made up of three (3) Senatorial zones. Kaduna North Zone has (65) public senior secondary school, Kaduna Central Zone has (99) senior secondary schools and Kaduna South Zone has (121) senior secondary schools. Kaduna North Zone

has (3,039) students taking agricultural science, Kaduna Central Zone has (4160) students taking agricultural science and Kaduna South Zone has (5171) students taking agricultural science as shown in Table 3.1.

**Table 3.1 Population of the Study.**

SN	Kaduna State senatorial zones	Number of schools	SSSIII students
1.	Kaduna North Senatorial Zone	65	3,039
2.	Kaduna Central Senatorial Zone	99	4,160
3.	Kaduna South Senatorial Zone	121	5,171
	<b>TOTAL</b>	<b>285</b>	<b>12,370</b>

**Source:** *Department of Statistics and Planning, Ministry of Education, Kaduna state, (2015)*

### 3.3 Sample Size and Sampling Procedure

The sample size for the study comprised of (102) SSS III students offering agricultural science. One school was purposively selected as sample from Kaduna central, the school is Government secondary school Sabon Tasha. One arm (SSIIIA) was purposively selected, the arm has (56) male and (46) female students. Purposive random sampling technique was used in selecting students from the school. The students were grouped into male and female. 20 Yes and 36 No were written on pieces of paper, also 20 Yes and 26 No were written on pieces of paper. All shuffled very well, students were asked to pick one after the other from the two groups. Those that picked yes were combined and used as experimental group (normal class) while those that picked no were combined and used as control group (large class).

**Table 3.2 Sample Size for the Study**

<b>Name of School/Class</b>	<b>Groups</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>
GSS Sabon Tasha SSS III	experimental	20	20	40
GSS Sabon Tasha SSS III	control	36	26	62

*Source: Field work (2015).*

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

The instrument that was used for Data collection was a multiple-choice test consisting of a 20-item Achievement Test in Agricultural Science (ATAS) each for class size and field trip variables which was developed by the researcher. This is in line with Edinyang and Ubi (2012), Abdulhamid and Daluba (2013) who adopted the instrument in their studies. The test items focused on Livestock diseases. Each item had option A-D on livestock disease. All instruments were pilot tested and necessary adjustment was made before administration.

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

In order to ensure the face validity of the instrument that was used for the study, the researcher gave the instrument to five (5) experts in Agricultural Education Department of Vocational and Technical Education. The adequacy and relevancy of the test items were judged by the experts through corrections, observations and suggestions.

#### **3.4.2 Pilot study**

The Pilot study was conducted in Government Secondary School Barkin-Ladi, Plateau State. The school was located outside the study area. Sixty (60) students were used for the Pilot study. This was because they have similar characteristics with the target population. The pre-test was administered using 40 minutes at the beginning of the week before exposing them to the treatment (teaching) and (field trip) and post- test was administered at the end of the week after exposing them to the treatment. This helped the researcher to check difficulties of the instrument and made all necessary adjustment, before

using it on the population for the actual research. The data collected was subjected to reliability test.

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

The data collected from the pilot study were subjected to reliability test using test-re-test method. In order to calculate the reliability coefficient (r) Cronbach's alpha statistical method was used. Reliability Coefficient (r) calculated was 0.85 alpha value. Therefore, the result 0.85 was found to be reliable in line with Olayiwola (2007) who said that the reliability coefficient of 0.05 and above is adequate for the analysis of two different results collected for a quasi- experimental design study.

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

The data collection lasted for five weeks, from 1<sup>st</sup> March, 2016 to 5<sup>th</sup> April, 2016. An introductory letter from the Head of Department Vocational and Technical Education, Faculty of Education Ahmadu Bello University Zaria was used to obtain permission from the authorities of the school and farm visited for data collection on 1<sup>st</sup> and 2<sup>nd</sup> March, 2016. The researcher administered pre-test to experimental and control group on 4<sup>th</sup> March, 2016 using thirty minutes in the first week. Two lesson plans were designed on the topic (meaning and causes of livestock diseases) based on the minimum standard of Ministry of Education, Kaduna State. The researcher used the first lesson to teach the experimental group for 40 minutes (8:40am- 9:20am) and the control group for 40 minutes (11:00am- 11:40am) on the 8<sup>th</sup> March, 2016. The researcher used the second lesson to teach the experimental group for 40 minutes (8:40am- 9:20am) and the control group for 40 minutes (11:00am- 11:40am) on the 10<sup>th</sup> March, 2016. The researcher used the third week to administer the post-test for thirty minutes to the experimental and control group on class size variable on 16<sup>th</sup> March, 2016 and the test were marked over 20 and the scores were used for analysis. The researcher used the fourth week to take the experimental group on field trip to Dala Farm, Kaduna for 120



minutes (10:00am – 12:00am) on 22<sup>nd</sup> March, 2016. The researcher used 5<sup>th</sup> April, 2016 in the fifth week to administer the post-test for forty minutes to experimental and control group. The result was marked over 20 and the scores were used for analysis.

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

Descriptive statistics in the form of Mean and Standard deviations were used to answer all the research questions. All null hypotheses were tested using t-test, at 5% alpha value ( $p=0.05$ ).

Decision rule: When the T-calculated is less than the alpha value of 0.05, the null hypothesis is rejected and if the T-calculated is greater than the alpha value of 0.05, the null hypothesis is retained. This is supported by Baba, (2009) and Ozioma, (2011) who observe that if t-calculated is less than the alpha value of 0.05, the null hypothesis is rejected.

## CHAPTER FOUR

### PRESENTATION AND ANALYSIS OF DATA

This chapter presents the analysis of the data collected for the study. The data was based on test scores obtained from students exposed to experimental groups and control groups on class size and field trip variables. The chapter is presented under the following sub-headings.

4.1 Answers to Research Questions

4.2 Hypotheses Testing

4.3 Summary of the Major Findings

4.4 Discussions of Findings

#### 4.1 Answers to Research Questions

Answers to the four research questions were shown using means and standard deviations. The analysis of each of the four research questions is as presented in table 4.1 to 4.4.

**Research Question One:** What is the effect of class size on academic performance of agricultural science students in senior secondary schools in Kaduna State?

To answer research question one, the test scores of students in normal class and those in large class were used.

**Table 4.1: Mean distribution of test scores of students in normal class and those in large class**

Group	N	Mean	Std. Dev.	Mean diff.
Experimental	40	15.7000	2.64284	3.075
control	62	11.9250	2.91229	

*Source: Field work, 2016.*

The results in Table 4.1 showed the effect of class size on students' academic performances in agricultural science. The analysis revealed that students in normal class size score mean of 15.7000 and standard deviation of 2.64284 while those in large class size scored 11.9250 mean and standard deviation of 2.91229. A mean difference of 3.075 was obtained which indicate a greater difference in the academic performance of students in normal class and those in large class. This implied that students performed better academically in a normal class size than in a large class size. The reasons for the differences in the performance is as a result of distractions such as noise making, attention, discussion and inability for the teacher to manage the class.

**Research Question Two:** What is the effect of field trip on the academic performance of agricultural students in senior secondary schools in Kaduna State?

To answer research question two, the test scores of students taken to field trip and those not taken to field trip were used.

**Table 4.2: Mean difference of test scores of students taken to field trip and those not taken to field trip.**

<b>Group</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Mean diff.</b>
Experimental	40	16.0196	2.44532	3.5294
control	62	12.4902	2.85918	

Source: Fieldwork, 2016

The results in Table 4.2 showed the effect of field trip on students' academic performances in agricultural science. The analysis revealed students scored mean and standard deviation of 16.0196 and 2.44532 while those that were not taken to field trip scored 12.4902 mean and standard deviation of 2.85918. A mean difference of 3.529 was obtained which indicate a greater difference in the academic performance of students taken to field trip. This is because more of theoretical lesson is seen practically on field trip and

the real life context of classroom situation is observed. This implied that students taken to field trip performed academically better than those not taken to field trip.

**Research Question Three:** What is the effect of normal class size on the academic performance of male and female students in agricultural science in senior secondary schools in Kaduna State?

To answer research question three, test scores for male and female students in normal class were compared.

**Table 4.3: Mean difference of male and female students in normal class size.**

<b>Group</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Mean diff.</b>
Male students in normal class	20	15.2500	2.78860	0.900
female students in normal class	20	16.1500	2.47673	

*Source: Field work, 2015*

The results in Table 4.3 showed the difference between the academic performance of male and female students in normal class size in agricultural science. The analysis revealed that male students under normal class size scored mean of 15.2500 with standard deviation of 2.78860 while female students under normal class size scored 16.1500 mean with standard deviation of 2.47673. A mean difference of 0.900 was obtained which is less significant. This implied that female students performed better than male students in normal class size.

**Research Question Four:** What is the effect of academic performance of male and female students taken to field trip in agricultural science in senior secondary school in Kaduna State?

To answer research question four, the test scores of male and female students taken to field trip were compared.

**Table 4.4: Mean difference of male and female students taken to field trip**

<b>Group</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Mean diff.</b>
Male students taken to field trip	20	16.3913	2.10495	0.2144
female students taken to field trip	20	16.6078	2.06131	

Source: Fieldwork, 2016

The results in Table 4.4 showed the difference between the academic performances of male and female students taken to field trip in agricultural science. The analysis revealed that male students scored mean and standard deviation of 16.3913 and 2.10495 while female students scored 16.6078 mean and standard deviation of 2.06131. A mean difference of 0.2144 was obtained which is not significant. This is because students are given equal opportunity to learn irrespective of gender. This implied that male and female students performed academically equal when taken to field trip.

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

Results to test the null hypotheses were presented in Table 4.5 to 4.8.

**Null Hypothesis One:** There is no significant difference between students' academic performance and class size in agricultural science in senior secondary schools in Kaduna State.

To test null hypothesis one, test scores of students exposed to normal class size and large class size were compared using T-test analysis at 0.05 alpha value

**Table 4.5: Effect of class size on students' academic performance in agricultural science**

<b>Group</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Df.</b>	<b>T</b>	<b>Sig</b>
experimental group	40	15.7000	2.64284	39	7.42	0.000
Control group	62	11.9250	2.912296	61		

*Source: Field work 2015*

**$p \leq 0.05$**

The T-test analysis used to test null hypothesis one as presented in Table 4.5 revealed that, T-calculated was 7.42 at Sig. level of 0.000. The Significant value obtained was less than the alpha values of 0.05 which implied that the null hypothesis that there is no significant difference in the academic performance of students between experimental and control group was rejected.

**Null Hypotheses Two:** There is no significant difference between academic performances of students taken to field trip and those not taken to field trip in agricultural science in senior secondary schools in Kaduna State.

To test null hypotheses two, test scores of students taken to field trip and those not taken to field trip were compared using T-test statistics at 0.05 alpha value.

**Table 4.6: Effect of field trip on students' academic performance in agricultural science**

<b>Group</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Df.</b>	<b>T</b>	<b>Sig</b>
experimental group	40	16.0196	2.44532	39	7.08	0.000
Control group	62	12.4902	2.85918	61		

*Source: Field work 2015*

**$p \leq 0.05$**

From Table 4.6 the T-calculated was 7.08 at Sig. level of .000. Since the Sig. value of .000 is less than the alpha value of 0.05. It implied that the null hypothesis that there is no significant difference in the academic performance of students taken to field trip and those not taken to field trip was rejected.

**Null Hypothesis Three:** There is no significant difference between academic performance of male and female students in normal class size in agricultural science in senior secondary schools in Kaduna State.

To test null hypothesis three, test scores of male and female students in normal class size were compared using T-test statistics at 0.05 alpha value.

**Table 4.7: Difference between the academic performance of male and female students in normal class size**

<b>Group</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Df.</b>	<b>T</b>	<b>Sig</b>
experimental group	40	15.2500	2.78860	38	1.10	.285
Control group	62	16.1500	2.47673			

*Source: Field work 2015* **p ≥ 0.05**

The T-test analysis used to test null hypothesis three as presented in Table 4.7 revealed that, T-calculated was 1.10 at Sig. level of .285. The Significant value obtained was greater than the alpha value of 0.05. Although the analysis of research question three indicated a difference in the academic performance of male and female students in normal class size, but the test of hypothesis three showed that the difference in the academic performance is not statistically significant hence, the null hypothesis that there is no significant difference between academic performance of male and female students in normal class size in agricultural science in senior secondary schools is accepted and retained.

**Null Hypothesis Four:** There is no significant difference between academic performance of male and female students taken to field trip in agricultural science in senior secondary schools in Kaduna State.

To test null hypothesis four, test scores of male and female students taken to field trip were compared. The scores were analyzed using T-test analysis at 0.05 alpha value

**Table 4.8: Difference between the academic performance of male and female students taken to field trip.**

Group	N	Mean	Std. Dev.	Df.	T	Sig
experimental group	40	16.3913	2.10495	38	.380	.708
Control group	62	16.6087	2.06131			

*Source: Field work 2015* **p ≥ 0.05**

From Table 4.8 the T-calculated was .380 at Sig. level of .708. Since the Sig. value of .708 is greater than the alpha value of 0.05, the null hypothesis that there is no significant difference in the academic performance of male and female students taken to field trip was accepted and retained.

### 4.3 Summary of the Major Findings

The findings of this work which was carried out to determine the effects of class size and field trip on academic performance of Agricultural science students in Senior secondary schools, Kaduna state were based on the results of descriptive statistics (means and standard deviation) and T-test analysis. The major findings of this research work were summarized as follow;

1. The study indicated that class size has significant effect on the academic performance of agricultural science students (p = .000).
2. The result of this work also indicated that field trip has significant effect on the academic performance of agricultural science students (p = .000).



3. The study also revealed that there is no significant difference in the academic performance of male and female agricultural science students in normal class size ( $p = .285$ ).
4. The study also revealed that, there is no difference in the academic performance of male and female agricultural science students taken to field trip ( $p = .708$ ).

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

Table 4.1 showed a mean score of students exposed to normal class size (15.7000) to be greater than the mean score of student engrossed to large class size (11.9250). The  $t$ -calculated (7.427) at Sig. level of 0.000 was also less than the alpha value of 0.05. This therefore revealed that, class size has a significant effect on the academic performance of agricultural science students. This also agrees with the findings of Ehrenberg *et al.*, (2001) who report that class size is a tool that can be used to measure performance of the education system. The number of students in a class has the potential to affect how much is learned in a number of different ways. For example, normal class size affects how students interact with each other and result to less noise and disruptive behavior in class thus increase their performance. This also agrees with the findings of Keil and Partell (2009) find that increasing class size has a negative effect on students' achievement, that is, it lowers students' achievement at a decreasing rate. Also normal class give them opportunity to pay attention and be actively involve since the teacher can easily notice them than in a large class. This concord with the findings of Pedder (2006) who reports that class size impact classroom processes and learning. He stated that smaller class size allowed teachers to covered more curriculum and students to be more cognitively engaged. These two features led to improved student achievement.

The study revealed that, field trip has significant effect on the academic performance of agricultural science students in senior secondary schools. This was revealed by the

findings in Table 4.2 in which the mean score for students taken to field trip (16.0196) is greater than the mean score for students not taken to field trip (12.4902). The result of T-test analysis on Table 4.6 also revealed that field trip has significant effect on the academic performance of agricultural science students in senior secondary schools. This is because; T-calculated (7.086) at Sig. level of .000 was less than the alpha level of .05. This finding agrees with what was obtained by Aliyu, (2008) who observes that field trip involved taking students out of the classroom to places where they can see concrete illustration of classroom theories, It also offers direct observation and interpretation of the substance in their natural surroundings hence, improve and widen their academic performances. It also concord with the findings of Amosa *etal* (2015) that states it provide learners with opportunity to be active learners instead of passive learner which is a major hindrance of effective academic performance. It also agrees with Yusuf (2006) who says field trip is organized to improve students' interest in learning.

Another finding in Table 4.3 showed a mean score of male students exposed to normal class size (15.7500) to be statistically equal to mean score of female students engrossed to normal class size (16.1500). The T-calculated (1.101) at Sig. level of .285 was also greater than the alpha value of 0.05. This therefore revealed that, normal class size does not affect genders' academic performance of agricultural science students. This also agrees with the findings of Resnick, (2003) who suggests that small class size in a school setting benefited male and female students' achievement claiming that teachers in small classes paid greater attention to each student. Students in these classes experienced continuing pressure to participate in learning activities and became better more. It also agrees with the findings of Abdulhamid (2013) which concludes that male and female students have remain a burning issue and have also remain relevant in education because, it has been linked to achievement and participation in certain profession.

Another finding of this study revealed that, there is no significant difference in the academic performance of agricultural science male and female students taken to field trip in senior secondary schools. This was revealed by the findings in Table 4.4 in which the mean score for male students taken to field trip (16.3913) is equal to the mean score for female students taken to field trip (16.6087). The result of T-test analysis on Table 4.8 also revealed that no significant difference exists in the academic performance of agricultural science male and female students taken to field trip in senior secondary schools. This is because, T-calculated (.380) at Sig. level of .708 was greater than the alpha level of 0.05. This finding also concord with the report of Obeka, (2010) who observes that field trip is an outdoor type of laboratory activity or field work or learning exercise undertaken by teachers and students in certain aspects of a subject, to give students the opportunity to acquire knowledge irrespective of the students' gender. This finding also agrees with the report of Bernardi (2003) who states that field trips can add variety to the regular instructional program, tend to be special and enjoyable learning experiences, ones which develop positive attitudes in students toward related classroom activities including males and females. He also reports that field trips are rich in educational possibilities because all genders learn from actual firsthand experiences, rather than by simply reading or hearing about something.

## CHAPTER FIVE

### SUMMARY, CONCLUSION AND RECOMMENDATIONS

The summary, conclusion and recommendations as well as suggestion for further studies were presented in this chapter as follows;

#### 5.1 Summary

This research work was carried out to determine the effects of class size and field trip on students' academic performance in Agricultural science in senior secondary schools, Kaduna state. With and without quasi- experimental design was adopted for the study. The study had four (4) specific objectives four (4) research questions and four (4) null hypotheses as guide. The entire 12,370 SS III agricultural science students formed the population for the study and 102 students were purposively selected for the study. Data collection phase lasted for five weeks, where pre-test was given before exposing the students to the treatment variables and post- test was also administered.

In data analysis mean and standard deviation were used to answer all the research questions, while T-test statistics was used to test all the four (4) null hypotheses. All hypotheses were tested at 0.05 alpha value. The analysis of data used to answer research question one revealed that students exposed to normal class size scored mean (15.7000) greater than the mean score of student engrossed to large class size (11.9250). The t-calculated (7.427) at Sig. level of 0.000 was also less than the alpha value of 0.05. This therefore revealed that, class size has a significant effect on the academic performance of agricultural science students.

The analysis of data used to answer research question two revealed that field trip has significant effect on the academic performance of agricultural science students in senior secondary schools. This was revealed by the findings in Table 4.2 in which the mean score for students taken to field trip (16.0196) is greater than the mean score for students not taken

to field trip (12.4902). The result of t-test analysis on Table 4.6 also revealed that field trip has significant effect on the academic performance of agricultural science students in senior secondary schools. This is because; t-calculated (7.086) at Sig. level of .000 was less than the alpha level of 0.05.

Answer to research question three showed a mean score of male students exposed to normal class size (15.7500) to be statistically equal to mean score of female students engrossed to normal class size (16.1500). The T-calculated (1.101) at Sig. level of .285 was also greater than the alpha value of 0.05. This therefore revealed that, class size does not affect genders' academic performance of agricultural science students.

However, the analysis of data used to answer research question four was revealed in Table 4.4 in which the mean score for male students taken to field trip (16.3913) was equal to the mean score for female students taken to field trip (16.6087). The result of T-test analysis on Table 4.8 also revealed that no significant difference exists in the academic performance of agricultural science male and female students taken to field trip in senior secondary schools. This is because; T-calculated (.380) at Sig. level of .708 was greater than the alpha level of 0.05.

## **5.2 Contribution to Knowledge**

The study established that:

1. Normal class size has significant effect on the academic performance of agricultural science students in senior secondary schools (0.000). The average score of students in normal class performed better than those in large class (15.700 and 11.925 respectively).
2. Field trip has significant effect on the academic performance of agricultural science students in senior secondary schools (0.000).

### **5.3 Conclusion**

Based on the finding of the study, the following conclusions were drawn:-

1. Normal class size is effective in teaching and learning of agricultural science and enhances students' academic performance.
2. Field trip broadens and exposes students to real life context of agriculture and enhances reasoning among students.
3. Normal class size does not affect gender academic performance of agricultural science students.
4. Field trip does not affect gender academic performance of agricultural science students.

### **5.4 Recommendations**

Based on the findings and conclusion of the study, the following recommendations were made by the researcher

1. Federal and State governments should build enough classrooms in schools with adequate facilities needed for effective classroom teaching and learning.
2. Curriculum planners should make sure that field trip is made compulsory and relevant in the curriculum of agricultural science students in the senior secondary schools, if it is to make the necessary impact.
3. Both male and female students in agricultural science should be aware that normal class size provides them with equal opportunities to learn.
4. Both male and female students in agricultural science should be aware that field trip provides them with equal opportunities to practically learn what they have been taught in the class.

## **5.5 Suggestions for Further Study**

- a. Similar study can be conducted in other parts of the country to see if similar result will be obtained for proper comparison.
- b. Further study can be carried out on effect of field trip on students' achievement, attitude and school location in other subjects at senior secondary school level.
- c. Impact of class size and school population on the academic performance of students in Nigeria

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

Telephone: 069-51755, 50692

Vice Chancellor: Professor. Abdullahi Mustapha B.Sc. (Hons) Pharm(ABU), Ph.D (London) FPSN

Head of Department : Professor A.A Udoh B.Ed. (Hons) Nsukka M.Ed. & Ph.D Bus Edu. (ABU)

Your Ref: \_\_\_\_\_

11<sup>th</sup> August, 2014

Our Ref: \_\_\_\_\_ M.SC/EDUC/45877/2012-2013

Date: \_\_\_\_\_

*Letter of Introduction*

**MUSA PRISCILIA --M.SC/EDUC/45877/2012-2013**

This is to certify that the above mentioned name is a Postgraduate student (M.Sc Agric Education) in the Department of Vocational and Technical Education, Ahmadu Bello University, Zaria, carrying out a research topic: **Effect of Class Size On Academic Performance of Students In Agricultural Science In Senior Secondary Schools in Kaduna State, Nigeria.**

Please, kindly give her every assistance she may require

  
\_\_\_\_\_  
**Professor A.A. Udoh**  
**HEAD OF DEPARTMENT**



## Appendix II

### First Lesson Plan for Class Size

#### General information

<b>Date:</b>	8 <sup>th</sup> March, 2016
<b>Name of the School:</b>	GSS Sabon Tasha
<b>Subject:</b>	Agricultural Science
<b>Topic:</b>	Meaning and causes of Livestock diseases
<b>Class:</b>	SSS III
<b>Gender:</b>	Males and Females
<b>Students' population:</b>	40 and 62 students
<b>Period/Time:</b>	Second/40 minutes

**Instructional resources:** Concept map on animal health and management

**Behavioural Objective** At the end of the lesson; student should be able to:

- (i) define Livestock diseases
- (ii) list 5 economic importance of Livestock diseases
- (iii) list and explain 4 factors that cause Livestock diseases

**Previous Knowledge:** The students have learnt about animal improvement

#### Introduction:

**Teacher's Activities:** Teacher introduces the lesson by asking the students questions

based on the previous knowledge

- i. Define animal improvement
- ii. List the aims of animals' improvement
- iii. List the process of animal improvement

**Learners Activities:** The learners are to answer the teacher's questions

**Presentation:** Teacher presents the lesson by the following steps:

**Step I:**

**Teacher's Activities:** The teacher display the concept map on animal health and management

**Learners Activities:** Observe the map on animal health and management

**Step II:** Discussion by the entire class

**Teacher's Activities:** i. Leads the learners to define and describe the concept of Livestock diseases

ii. List the causes of disease

iii. List and explain the economic importance of diseases to Livestock

iv. Lists and explain the factors that could predispose Livestock to diseases

**Learners Activities:** Carry out the activities guided by the teacher

**Step III:**

**Teacher's Activities:** Ask the learners to:

i. define the concept of Livestock diseases

ii. List and explain the economic importance of Livestock to diseases

iii. Lists and explain the factors that could predispose Livestock to diseases

**Step iv:** Evaluation by individual

**Teacher's Activities:** Teacher evaluates the lesson by asking the students to carry out the following:

(i) Define Livestock diseases

(ii) List 3 economic importance of Livestock diseases

(iii) List 4 factors that cause Livestock diseases

**Learners Activities:** Answer the above questions orally

**Conclusion:** The teacher concludes the lesson by summarizing the lesson taught and given the learners assignment.

**Assignment:**

1. List and explain three economic importance of Livestock diseases
2. Explain three factors that can cause Livestock diseases

## Appendix III

### Second Lesson Plan for Class Size Variable

#### General information

<b>Date:</b>	10 <sup>th</sup> March, 2016
<b>Name of the School:</b>	GSS Sabon Tasha
<b>Subject:</b>	Agricultural Science
<b>Topic:</b>	Meaning and Causes of Livestock diseases
<b>Class:</b>	SS III
<b>Students' population:</b>	40 and 62 Students
<b>Period/Time:</b>	Second/40 minutes

**Behavioural Objective:** At the end of the lesson; student should be able to:

- (i) discuss 1 viral and 1 bacterial diseases based on Livestock affected, Causal organisms, symptoms, method of transmission and control
- (ii) discuss 1 fungal and 1 protozoa diseases based on Livestock affected, Causal organisms, symptoms, method of transmission and control
- (iii) list 4 ways of preventing and controlling livestock Diseases

**Previous Knowledge:** The students have learnt about livestock diseases and causes of livestock diseases

#### Introduction:

**Teacher's Activities:** Teacher introduces the lesson by asking the students questions based on the previous knowledge:

- i. define Livestock diseases
- ii. list 3 factors that causes diseases to livestock

**Learners Activities:** The learners are to answer the teacher questions

**Presentation:** Teacher presents the lesson by the following steps:

**Step I:**

**Teacher's Activities:** Teacher lists some diseases:

- i. Foot and mouth disease
- ii. Anthrax.
- iii. Aspergillosis
- iv. trypanosomiasis
- v. coccidiosis

**Learners Activities:** The learners listen to the teacher as the teacher list some livestock diseases

**Step II:** Discussion by the entire class

**Teacher's Activities:** i. Lead the learners to name some important diseases which affect

Livestock and the causal organisms such as:

- a. Anthrax and Brucellosis (bacterial)
- b. Foot and mouth, Rinderpest, Newcastle (viral)
- c. Aspergilosis, Ringworm (fungal)
- d. Coccidiosis (protozoa)

ii. describe their mode of transmission such as:

- a. infected material like urine, faeces and milk
- b. contaminated feed, water and equipment
- c. blood sucking tsetsefly
- d. virus

iii. describe the symptoms of the diseases such as:

- a. high fever
- b. lack of appetite
- c. inflammation of teats and udder
- d. difficulty breathing.
- e. sleepiness

iv. list the control and preventive measures such as:

- a. regular vaccination.
- b. proper sanitation.
- C. isolation of infected animal.
- d. regular disinfectant of pens.
- e. spraying bush with insecticides to kill vectors

**Learners Activities:** Carry out the activities guided by the teacher

**Step III:**

**Teacher's Activities:** Ask the learners to:

- i. name some important livestock diseases and their causal organism
- ii. describe their mode of transmission
- iii. describe the symptoms of the diseases
- iv. list the control and preventive measures of the diseases

**Step iv:** Evaluation by individual

**Teacher's Activities:** Teacher evaluates the lesson by asking the students to carry out the following:

- (i) discuss 1 viral and 1 bacterial diseases based on animal affected, causal organisms, symptoms and method of transmission
- (ii) discuss 1 fungal and 1 bacterial diseases based on animal affected, causal organisms and symptoms
- (iii) List 4 ways of preventing and controlling Livestock diseases

**Learners Activities:** Answer the above questions orally

**Conclusion:** The teacher concludes the lesson by summarizing what had earlier being taught and given the learners assignment.

**Assignment:** Discuss one fungal and bacterial disease under the following:  
i. Animal affected. ii. Causal organisms. iii. Symptoms.  
iv. Method of transmission. v. Method of control.

## Appendix IV

### Field Trip Activities

#### General information

<b>Date:</b>	22 <sup>nd</sup> March, 2016
<b>Name of the farm visit:</b>	Dala farm Kaduna
<b>Subject:</b>	Agricultural Science
<b>Topic:</b>	Meaning and Causes of Livestock diseases
<b>Class:</b>	SS III
<b>Students' population:</b>	40 Student
<b>Time:</b>	120 minutes

**Behavioural Objective:** At the end of the field trip; student should be able to:

- (i) discuss 1 viral and 1 bacterial diseases based on Livestock affected, Causal organisms, symptoms, method of transmission and control
- (ii) discuss 1 fungal and 1 protozoa diseases based on Livestock affected, Causal organisms, symptoms, method of transmission and control
- (iii) list 4 ways of preventing and controlling livestock Diseases

#### Introduction:

**Teacher's Activities:** Teacher introduces the field trip to the learners by telling them the aim and asking them to pay attention to the guide.

**Field trip guide:** Asked the learners to pay attention and listen carefully as they are taken round the farm to see the animals and the various signs/symptoms of the diseases

**Learners Activities:** The learners are to observe and write down note as they are carry round the farm.

#### Presentation:

**Step I:** Discussion on the type of diseases

**Field trip guide:** Lists some diseases:

- i. Foot and mouth disease
- ii. Anthrax.
- iii. Aspergillosis
- iv. trypanosomiasis
- v. coccidiosis

**Teacher's Activities:** The teacher ask the learners to list the diseases mention by the field trip guide

**Learners Activities:** The learners list the livestock diseases

**Step II:** Discussion on signs and symptoms

**Field trip guide:** Lead the learners to see the physical signs and symptoms of the animals that are affected by the diseases and discuss them such as: high fever, lack of appetite, inflammation of teats and udder, difficulty breathing, sleepiness.

**Teacher's Activities:** The teacher asks the learners to observe and list the physical sign and symptoms of the diseases they have seen as shown by the field trip guide.

**Learners Activities:** The learners observed and see the signs physically and write them in a note book

**Step III:** Discussion on mode of transmission of the diseases

**Field trip guide:** Describe and show the mode of transmission of the diseases such as: infected material like urine, faeces and milk, contaminated feed, water and equipment, blood sucking tsetsefly.

**Teacher's Activities:** The teacher ask the learners to state the mode of transmission mention by the field trip guide

**Learners Activities:** The learners state the mode of transmission mention by the field trip guide

**Step IV:** Discussion on prevention and control

**Field trip guide:** Describe and show the learners how the diseases can be prevented and control such as: regular vaccination, proper sanitation, isolation of infected animal, regular disinfectant of pens, spraying bush with insecticides to kill vectors

**Teacher's Activities:** The teacher asks the learners to observe and carry out the activities done by the field trip guide.

**Learners Activities:** Observe and carry out the activities done by the field trip guide as guided by the field trip guide.

**Step V:** Questions and observation

**Field trip guide:** Ask the learners to ask questions and mention their observation

**Learners Activities:** The learners ask questions on what they see and observe on the field trip

**Field trip guide and Teacher's Activities:** Answers the learners questions and observation

**Step VI:** Evaluation by individual

**Teacher's Activities:** Teacher evaluates the field trip by asking the students to carry out the following:

(i) discuss 1 viral and 1 bacterial diseases based on animal affected, causal organisms, symptoms and method of transmission

(ii) discuss 1 fungal and 1 bacterial diseases based on animal affected, causal organisms and symptoms

(iii) List 4 ways of preventing and controlling Livestock diseases

**Learners Activities:** Answer the above questions orally

**Conclusion:** The teacher concludes the field trip by summarizing what the learners have learnt on the field trip.

**Assignment:** Discuss one fungal and bacterial disease under the following:

- i. Animal affected.
- ii. Causal organisms.
- iii. Symptoms.
- iv. Method of transmission.
- v. Method of control.



## Appendix V

Achievement Test in Agricultural Science (ATAS) developed by the researcher 2015

### Pre-test (class size field trip variables)

Topic: livestock Disease

Time allowed: 30minutes

Instruction(s): Circle the correct answer

1. Which of the following is NOT described as livestock diseases?
  - A. Abnormality in the mouth only
  - B. Death of the Livestock
  - C. Abnormality in function in any part(s) of the body
  - D. Abnormality in only one part of the body
2. Livestock diseases are generally caused by all the following except.....
  - A. Good sanitation
  - B. Bacterial
  - C. Virus
  - D. Fungal
3. All the following are economic importance of Livestock diseases except
  - A. Bring about poor growth of animals
  - B. Produce low income for farmers
  - C. It lead to adequate growth of the animals
  - D. Bring about low yield in products
4. One of the following is condition that may inactivates pathogen
  - A. Adequate temperature
  - B. High temperature
  - C. minimum PH
  - D. optimum temperature
5. All the following predispose Livestock to diseases except.....
  - A. Health status of the Livestock
  - B. Nutrition
  - C. Favourable climatic
  - D. Management,
6. Unfavourable climatic condition include extreme of .....
  - A. Wind
  - B. Rainfall
  - C. Temperature
  - D. Atmosphere
7. Disease can bring about .....
  - A. Proper growth.
  - B. Adequate health

- C. Poor growth
  - D. Increase productivity
8. An animal can be said to be affected by a disease when.....
    - A. The growth of the animal is normal
    - B. The animal feed properly
    - C. The reproduction rate of the animal is adequate
    - D. The utilization of the feed by the animal is poor
  9. Improper sanitation include.....
    - A. Dirty environment
    - B. Clean environment
    - C. Daily cleaning
    - D. Regular inspection
  10. Low income for farmers in animal production is due to.....
    - A. Reproduction
    - B. Disease
    - C. Inoculation
    - D. Isolation
  11. Poor management of animal includes all the following except.....
    - A. Non-administration of vaccine
    - B. Adequate drugs
    - C. Non-administration of drugs
    - D. Inadequate dose and vaccines at the appropriate time
  12. Unfavourable climatic condition consists of the following conditions except.....
    - A. Extreme temperature
    - B. High rain fall
    - C. Optimum temperature
    - D. Extreme wind
  13. Low pH medium and high temperature could.....
    - A. Activate pathogen
    - B. Multiple pathogen
    - C. Improve pathogen
    - D. Inactivate pathogen
  14. Animals with poor health stand the risk of.....
    - A. Getting infected with disease
    - B. Getting vaccines
    - C. Withstanding disease
    - D. Adjusting to disease
  15. Animal diseases are generally caused by all the following except.....
    - A. Good sanitation
    - B. Bacterial
    - C. Virus
    - D. Fungal

16. Disease lead to poor feed utilization by animals due to .....
- A. low income
  - B. Poor growth
  - C. Loss of appetite
  - D. Low yield of product
17. Well-fed animals are not easily infected with.....
- A. Disease
  - B. Inoculation
  - C. Immunity
  - D. Isolation
18. Malnutrition occurs when the animals are.....
- A. Properly feed
  - B. Adequately feed
  - C. Given balance diet
  - D. Poorly feed
19. Low yield of product is brought about by.....
- A. Vaccination
  - B. Disease
  - C. Isolation
  - D. Quarantine
20. Low relative humidity can .....
- A. Inactivate pathogen
  - B. Activate pathogen
  - C. Produce pathogen
  - D. Increase pathogen

## Appendix VI

Achievement Test in Agricultural Science (ATAS) developed by the researcher 2015

### Post-test (class size)

Topic: livestock Disease

Time allowed: 30 minutes

Instruction(s): Circle the correct answer

1. All the following are economic importance of Livestock diseases except
  - A. Bring about poor growth of Livestock
  - B. Produce low income for farmers
  - C. It lead to adequate growth of the Livestock
  - D. Bring about low yield in products
2. One of the following is condition that may inactivates pathogen
  - A. Adequate temperature
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  - D. optimum temperature
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  - A. Health status of the Livestock
  - B. Nutrition
  - C. Favourable climatic
  - D. Management,
3. Unfavourable climatic condition include extreme of .....
  - A. Wind
  - B. Rainfall
  - C. Temperature
  - D. Atmosphere
4. Low relative humidity can .....
  - A. Inactivate pathogen
  - B. Activate pathogen
  - C. Produce pathogen
  - D. Increase pathogen
5. Disease lead to poor feed utilization by animals due to .....
  - A. low income
  - B. Poor growth
  - C. Loss of appetite
  - D. Low yield of product

6. Low pH medium and high temperature could.....
  - A. Activate pathogen
  - B. Multiple pathogen
  - C. Improve pathogen
  - D. Inactivate pathogen
7. Animals with poor health stand the risk of.....
  - A. Getting infected with disease
  - B. Getting vaccines
  - C. Withstanding disease
  - D. Adjusting to disease
8. Animal diseases are generally caused by all the following except.....
  - A. Good sanitation
  - B. Bacterial
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  - D. Fungal
9. An animal can be said to be affected by a disease when.....
  - A. The growth of the animal is normal
  - B. The animal feed properly
  - C. The reproduction rate of the animal is adequate
  - D. The utilization of the feed by the animal is poor
10. Improper sanitation include.....
  - A. Dirty environment
  - B. Clean environment
  - C. Daily cleaning
  - D. Regular inspection
11. Low income for farmers in animal production is due to.....
  - A. Reproduction
  - B. Disease
  - C. Inoculation
  - D. Isolation
12. Poor management of animal includes all the following except.....
  - A. Non-administration of vaccine
  - B. Adequate drugs
  - C. Non-administration of drugs
  - D. Inadequate dose and vaccines at the appropriate time
13. Unfavourable climatic condition consists of the following conditions except.....
  - A. Extreme temperature
  - B. High rain fall
  - C. Optimum temperature
  - D. Extreme wind

14. Low yield of product is brought about by.....
- A. Vaccination
  - B. Disease
  - C. Isolation
  - D. Quarantine
15. Which of the following is NOT described as livestock diseases?
- A. Abnormality in the mouth only
  - B. Death of the Livestock
  - C. Abnormality in function in any part(s) of the body
  - D. Abnormality in only one part of the body
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  - B. Bacterial
  - C. Virus
  - D. Fungal
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  - B. Produce low income for farmers
  - C. It lead to adequate growth of the animals
  - D. Bring about low yield in products
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- A. Adequate temperature
  - B. High temperature
  - C. minimum PH
  - D. optimum temperature
19. All the following predispose Livestock to diseases except.....
- A. Health status of the Livestock
  - B. Nutrition
  - C. Favourable climatic
  - D. Management,
20. All the following predispose Livestock to diseases except.....
- E. Health status of the Livestock
  - F. Nutrition
  - G. Favourable climatic
  - H. Management,

## Appendix VII

Achievement Test in Agricultural Science (ATAS) developed by the researcher 2015

### Post-test (Field trip variable)

Topic: livestock Disease

Time allowed: 30minutes

Instruction(s): Circle the correct answer

1. Red fever is also called.....
  - A. coccidiosis
  - B. aspergilosis
  - C. ringworm
  - D. piroplasmosis
  
2. Which of the following causes ringworm?
  - A. Bacterial
  - B. Protozoa
  - C. Virus
  - D. Fungal
  
3. Which of the following is a symptom of *aspergilosis*?
  - A. High body temperature
  - B. Increase in appetite
  - C. General thriftiness
  - D. Increase in weight
  
4. Trypanosomiasis is a disease that is caused by
  - A. Fungal
  - B. Mycobacterium
  - C. *Trypanosomaspp*
  - D. *Eimeraspp*
  
5. All the following are protozoa disease except
  - A. Red water fever
  - B. Coccidiosis
  - C. Trypanosomiasis
  - D. Rinder pest
  
6. Quarantine is a way of .....diseases
  - A. Isolating
  - B. Controlling
  - C. Vaccinating
  - D. Breeding

7. Vaccination of farm Livestock should be given.....
- E. At the right time
  - F. To healthy Livestock
  - G. On Monday
  - H. The wrong dose
8. Isolation of sick Livestock involves
- A. Bring Livestock in the same place
  - B. Feeding the infected animal
  - C. Breeding the sick Livestock
  - D. Separating the sick Livestock
9. Anthrax is caused by bacteria called.....
- A. *bacillus anthrax*
  - B. *brucella abortus*
  - C. *aspergillus fumigatus*
  - D. *trypanosoma* spp
10. Viral is Livestock disease that affects .....
- A. Man
  - B. Cattle
  - C. Sheep
  - D. Goat
11. One of the following describe a symptom of viral disease in Livestock
- A. Typhoid
  - B. High blood pressure
  - C. Salivation
  - D. Increase in weight
12. Inflammation of teats and udder is a disease caused by.....
- A. Bacterial
  - B. Virus
  - C. Fungal
  - D. Protozoa
13. Bacterial diseases can be transmitted through these means except.....
- A. Contaminated feed
  - B. Contaminated water
  - C. Infected animal
  - D. Proper sanitation



14. Livestock affected by fungal disease can be controlled in the following ways except.....
- A. Isolation of infected Livestock
  - B. .Feeding of infected Livestock
  - C. .Burying of infected Livestock
  - D. Giving regular vaccination
15. Tuberculosis is a disease caused by.....
- A. Virus
  - B. bacterial
  - C. Fungal
  - D. Protozoa
16. Good hygiene includes all the following except.....
- A. cleaning of pens
  - B. cleaning watering and feeding equipment
  - C. untidy environment
  - D. regular disinfectant
17. Rotational grazing is done so that the build-up of parasites is.....
- A. enhanced
  - B. increased
  - C. introduced
  - D. avoided
18. Newcastle disease is caused by .....
- A. virus
  - B. bacteria
  - C. protozoa
  - D. fungi
19. Trypanomiasis is spread by blood sucking insect called.....
- A. *eimera* Spp
  - B. *babesia* Spp
  - C. *glossina* Spp
  - D. virus

20. Which of the following is a symptom of aspergillosis.....

- A. high body temperature
- B. increase in appetite
- C. general thriftiness
- D. increase in weight

## Appendix VIII

### PRE TEST AND POST TEST SCORES

#### PRE-TEST SCORES Class size and field trip variable

##### Experimental group

3	6	9	4	8	2	6	9	7	5
5	3	6	9	7	7	6	8	3	4
2	5	8	7	4	4	5	6	3	5
7	6	4	3	7	8	6	5	8	4

##### Control group

4	2	3	3	2	6	5	7	8	3
8	9	4	5	6	3	2	4	5	3
1	7	8	3	5	5	4	3	7	6
6	4	5	7	2	9	3	4	6	4
4	3	8	6	5	1	8	5	7	6
10	6	5	7	8	3	9	4	5	8
3	9								

### POST TEST SCORES

#### Class Size Variable

##### Experimental group (normal class)

12	14	11	16	19	14	16	15	18	17
18	12	14	10	15	18	12	14	19	16
14	16	10	15	19	17	18	19	16	18
15	12	17	18	13	15	17	10	19	18

##### Control group (large class)

10	14	12	17	10	9	11	16	14	12
9	13	15	11	15	14	12	18	9	8
12	10	14	13	8	10	7	11	13	6

13	9	8	7	9	12	9	6	12	11
16	12	17	10	11	11	7	13	10	16
14	10	7	11	13	9	12	8	8	12
11	6								

**Field Trip Variable**

**(Experimental group)**

19	14	16	18	17	15	18	19	15	14
16	13	18	12	19	18	15	18	17	16
18	14	16	19	18	17	18	12	19	14
19	17	12	10	16	15	17	14	18	19

**(Control group)**

14	11	11	13	15	14	18	12	13	15
10	9	12	14	13	16	12	14	11	10
12	16	18	12	10	9	7	11	12	14
16	10	9	8	11	15	18	12	13	8
11	14	12	13	18	11	7	8	12	16
13	17	15	16	18	14	18	18	12	12
12	14								