Influence of ICT and Field Work on Senior Secondary School Students' Academic Achievements in Agricultural Science in Oyo Central Senatorial District, Oyo State

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Being an M.Ed. Post-field Presentation Submitted to the Department of Arts and Social Science Education, Faculty of Arts and Education, Lead City University, Ibadan

In Partial Fulfillment of the Requirements for the Award of Master of Education Degree (M.Ed.) in Educational Management

2024

Certification

This is to certify that **Adewumi John Akinrinola** with **matriculation number LCU/PG/000914** carried out this research work titled: Influence of ICT and Field Work on Senior Secondary School Students' Academic Achievement in Agricultural Science in Oyo central Senatorial District, Oyo State in the Department of Arts and Social Science Education, Faculty of Arts & Education, Lead City University, Ibadan, Oyo State, for the Award of Master Degree (M.Ed) in Educational Management and that has not been previously submitted.

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Dedication

This research is dedicated to Almighty God.

Acknowledgement

I am grateful to the management of the Lead City University which allowed me to study Educational Management at this renowned institution. Thank you for providing a healthy environment for all students, as well as encouraging creativity, interaction and participation in academic activities and Oyo State Teaching Service Commission (TESCOM) for the provision of statistics data on the number of Agricultural Science Students in each of the Local Government Area within the Oyo Central Senatorial District in Oyo State. The researcher is also indebted to the Public Senior Secondary Schools Principals and Teachers used in each Senior Secondary School in the Central Senatorial District in the state in the course of the study (who remain anonymous for confidentiality purposes). I acknowledge all researchers whose work featured in the study, the staff of Lead City University Library and Olivet Baptist High School, Oyo for helping with adequate materials and information needed for the study.

My profound gratitude goes to my able supervisor, Prof. Philias, O. Yara for his excellent counseling, concerned, tolerance, patience, kindness and constructive criticism which contribute to the success of this research work. You are a teacher, mentor and father indeed, your wealth of knowledge will not run dry. Thank you sir. My gratitude goes to the Dean of Postgraduate School, Lead City University, Prof. Afolakemi, O. Oredein. Dean of Faculty, Prof. Donald Odeleye, the Head of Department Dr. Pitan O.S, the PG coordinator Dr. Omobola Gambo. Also, to all lecturers and non-academic staff in the Department of Educational Management, Lead City University, Ibadan Prof. S. Iluema, Prof. Babatunde Adeyemi, Prof. Eseza Erwat, Dr. Ukamaka Akuche, Dr. Adepeju Oti, Dr. Toyin Oyedeji, Dr. Oluyomi Pitan, Dr. Monilola Oyetade, Dr. Christianah Sam-Kayode, Dr. Sabina Obi, Dr. Olabisi Killian, Dr. Mojirade Ayantunji, Dr.

Adeyemi Ebo and Mr. Moyosore Beckley. Thank you for your support and undiluted passion to build my career.

Finally, my special thanks to my darling wife Mrs. Adenike Akinrinola and to my lovely daughter Oluwanifemi Oluwasemilore, my siblings Mrs. Mojirade Olayinka, Mrs. Funke Ige,, Mr. Tunde Akinrinola, Mr. Funmilayo Akinrinola and those who have in one way or the other contributed to the success of this research work. May God bless you all.

"Even though the mentioned institutions and person have assisted in this research work, I alone stand responsible for the errors, if any, found in the work".

Abstract

This study investigated the influence of ICT and fieldwork on academic achievement in Agricultural Science among SS2 students in Oyo Central Senatorial District. Using a descriptive survey design. The total population was 924 students. The study used a multi-stage sampling method to select six secondary schools meeting specific criteria. Sample sizes were determined proportionally based on population size, totalling 414 students. Instruments include ICT and Fieldwork Questionnaires (IFQ) and an Agric Science Achievement Test (AAT). Questionnaire reliability was assessed with Cronbach's Alpha (0.891), and AAT reliability with the Kudar Richanson KR20 method (0.883). Data was analysed using simple percentages and multiple regression was used to test the hypotheses. Challenges with ICT facilities in teaching Agricultural Science are notably high ($\bar{x}$ = 2.6148), while fieldwork areas' availability is also extensive ($\bar{x}$ = 2.1734). Relevancy of fieldwork areas scores very high ($\bar{x}$ = 3.186), while challenges related to fieldwork are moderately extensive ($\bar{x}$ = 1.948). The analysis reveals a significant contribution of both ICT facilities and fieldwork factors to students' academic achievement in Agricultural Science ($F_{2, 214}$ = 1.085, Adj. R^2 = 0.158, $P < 0.05$). Computer and Email usage positively impact academic performance (Computer: Beta = 0.106, p = 0.015; Email: Beta = 0.593, p = 0.000), while Radio usage has a negative effect (Beta = 0.335, p = 0.000). Planting Bed and Livestock activities significantly contribute to academic achievement (Planting Bed: Beta = 0.710, p = 0.000; Livestock: Beta = 0.601, p = 0.000), but the Irrigation System does not (p = 0.507). This study reveals that ICT tools and fieldwork activities significantly boost SS2 students' academic achievement in Agricultural Science. Computers, email, and hands-on activities, like planting and livestock care, enhance learning, though challenges with ICT and fieldwork resources remain. Addressing these issues could further improve outcomes in Agricultural Science education. Recommendations included improving ICT infrastructure, providing financial aid, training maintenance personnel, addressing power supply issues, and implementing land allocation strategies.

Keywords: Information Communication Technology, Fieldwork, Academic Achievement, Facilities

Count: 299

Chapter One

Introduction

1.1 Background to the Study

Academic achievement in any educational environment is essential for measuring a country's educational progress globally. Academic accomplishments of students in different official and non-formal education settings, as well as institutional accomplishments, serve as an important criterion for evaluating education performance of any nation at the micro level, showing success factors for that country. Identifying the factors that influence academic achievement is a research study that has been conducted all over the world over the years and has revealed that academic achievement is influenced by a small variety of factors, some of which are school-specific while others can be considered outside the school factors.

At all educational stages, academic success is a metric used to evaluate students' performance1. Academic success is frequently evaluated based on exam results. It measures how well a pupil has done in terms of meeting their scholastic objectives[1]. Performance indicators may include grades earned in examinations and competitions, as well as the number of classes completed or failed. Academic success is the accomplishment of an educational objective over time by a pupil, instructor, or institution[2]. The objective may vary from one person or organization to another and is assessed through exams or ongoing evaluations. In the classroom, it's a term used to characterize a student's scholastic achievement. It has been established that learning has a direct impact on academic success. It's the best sign that someone has learned anything at all. As a consequence, in order to detect learning, achievement in related activities must be shown. Although learning is the most crucial component of scholastic success, low performance does not always indicate insufficient

learning. It is possible to learn a task and then perform badly on it because scholastic task achievement can be influenced by variables other than the learning process[3].

Because of the significance of education for national development, governments have prioritized secondary schools in their efforts to increase the rate of literacy in Nigeria[4]. Students' success at this level is determined by their academic performance following the completion of organized national exams administered by the West African exams Council (WAEC) and the National Examinations Council (NECO). Globalization and the technological revolution are increasing demand for higher education offered by universities and colleges. Secondary school students are these educational institutions' prospective assets. Only students with adequate academic skills and information will be admitted to these prestigious institutions. After completing secondary school education, higher schools rely on the potential academic skills and knowledge of secondary school students[5]. As a result, stakeholders in education regard students' academic achievement at this level to be an essential goal in producing the best quality candidates for higher education institutions.

Academic achievement in Agricultural Science refers to students' degree of knowledge, skills, and competencies in the study of agriculture, related disciplines, and its application to sustainable development. Crop production, animal husbandry, soil science, agricultural economics, and environmental management are all facets of agricultural science[6].

For a number of reasons, student success in Agricultural Science is crucial. The knowledge gained in Agricultural Science can be used to enhance agricultural productivity, food security, and rural development. First, agriculture is a major sector in most countries.

Second, the knowledge and abilities acquired in Agricultural Science can be applied to solve environmental problems like climate change and biodiversity decline[6].

Massive agricultural resources exist in Nigeria, which, if completely utilized and developed, could increase domestic revenue, foreign exchange, employment opportunities, and general quality of life for the populace[7]. The majority of the socioeconomic problems the nation is currently experiencing, such as insecurity, unemployment, and corruption, can be resolved by a strong agricultural sector. The country's innovative agricultural education program aims to increase work and independence. In addition to providing the young with income and economic empowerment, it occupies them and keeps them from getting into trouble or using violence, thereby promoting peace and national security, two factors that are crucial to the Nigerian economy.[8] The capacity of a country to offer its people gainful employment in order to support nation-building is one of the key indicators of a sustainable economy. Agriculture-related programs included in the National Policy on Education improve a country's productive capacity; farm education is one of these programs.

The number of years agricultural science is taught as a school topic varies by school, based on administration and teacher availability. Agricultural Science, as a WAEC subject, is taught both theoretically and practically[9]. Field work on a school farm or garden is frequently used to provide students with practical practice.

Agricultural science is one of the core subjects taught in secondary schools in Nigeria. It was created to build a solid foundation for vocational agriculture, which is intended to train secondary school students to acquire useful occupational skills that will enable them to become future productive farmers. Agricultural science was first taught in Nigerian secondary

institutions in 2008[10]. He went on to add that the Agricultural Science curriculum was co-created by the Nigeria Educational Research Development Council (NERDC) and the West African Examination Council (WAEC).

The objectives of teaching Agricultural Science at senior secondary school level are to:

stimulate and sustain student's interest in agriculture

inculcate in students farming skills.

enable students acquire basic knowledge and practical skills in agriculture.

prepare students for future studies in agriculture and to produce prospective future farmers

The aforementioned goals can be met within the confines of the mandated agricultural science curriculum that is presently being taught in secondary schools across the country. A comprehensive implementation of the agricultural science curriculum in secondary schools is anticipated to include both in-class teaching and hands-on experiences for agriculture students[1]. The teaching and learning of agricultural science in senior secondary schools must also have access to adequate and competent agricultural science instructors, adequate classrooms, an agricultural science laboratory, and school farms[2]. According to West African Examination Council (WAEC), schools should maintain school farms where crops and livestock are grown. These requirements are complementary to normal class room teaching.

as a result, a school farm is a plot of ground and the structures on it that are used for growing crops and/or keeping animals and are managed by students under the supervision of their instructor[11]. School farms are expected to have sufficient equipment, farm

implements/tools, farm structure, and a consistent supply of inputs, in addition to farm space to support crops and livestock managed by students under the supervision of their instructors[12].

Teaching and learning of agricultural science becomes effective with field work on the school farm. That is any school offering agricultural science must have school farm, where each student must have his/her own ridge and a bed to prepare and plant some annual crops such as maize, cassava, okra, pumpkin, tomato, and yam[13].

The concept of school agricultural farming emerged in the developed world in the nineteenth century. During this time, school farms were created throughout Europe, Australia, and the United States to improve educational quality by involving children in the learning process, encouraging involvement, and changing attitudes toward practical experience[14]. School farms were designed to teach farming as well as to serve as experiential learning instruments for children to interact with real-life experiences[15]. School agricultural farms are now commonplace in African nations, and they are incorporated into national education plans and large-scale school garden classes.

The Food and Agriculture Organization encourages the use of school farms for experiential learning in order to enhance education and nutrition. This learning offers a type of non formal education that prepares future farmers outside of the classroom[16]. School farms are a component of school activities that help students gain information and practical skills in agriculture and agricultural-related possibilities. They also create opportunities for students to market agricultural goods by providing them with supervised occupational experience in agricultural productivity and encouraging the use of records and reports. The school farm has

become an important part of agricultural education and student experience, particularly for students with no agricultural background.

The farms enhance educational quality by adding relevant content and provide chances for hands-on learning when students interact with farm activities. They also serve as venues for extracurricular learning while providing excellent educational potential[17]. Farms provide opportunities for those with agricultural backgrounds to acquire in-depth knowledge about agricultural production. Because the principles taught in the classroom are implemented on the farms for practical experience, school farming is intended to increase active learning[18].

Fieldwork in teaching and learning of agriculture helps to eradicate pseudo teaching helps to readdress the formed mindset that must have been in the heart of young learners, the concept of practical agriculture such as clearing grasses, weeding and the likes as punishment, therefore constituting or creating in the students a positive mindset toward the subject. The basic idea behind bringing back man to the farm is practical agriculture. Practical agriculture continues to be an essential element and constituent of agricultural vocational education[19]. Practical Agriculture science has an immeasurable direct effect on the subject. It is therefore not surprising that the WAEC syllabus explicitly states that the practical component must form the basis of teaching the subject. Introduction and inculcation of practical agriculture helps the process of acquiring the vocational skills needed to prepare students for careers in the agricultural sector[20].

Around the globe, changes are constantly being made to how teaching and learning are conducted in classrooms. The use of computers for e-mail, e-learning, and other purposes has a real impact on how students learn in classrooms. Importance of computers in the teaching-

learning process in the modern world was recognized, and computer education was added to the curriculum in Nigerian schools[21]. This effectively means that students can move forward at their own pace, taking a curriculum-based route that suits their interests and abilities. The trainees achieved more when information and communication technology was used in addition to the traditional teaching methods than when the traditional methods were used exclusively. A user-friendly teaching method known as computer assisted instruction typically involves pupils interacting with programmed instructional materials. A computer is used to show the instructional material and track student learning in the interactive instructional method known as ICT[22]. Text, graphics, audio, and video are all combined with ICT to improve learning. The use of a computer as a tool to ease and enhance instructions is also mentioned. The instruction and learning process employs tutorials, drills and practice, simulation, and problem-solving techniques[23].

The present study on the influence of ICT and field work on senior secondary school students' academic achievement in agricultural science is an important research topic that explores the impact of technology and hands-on experiences on students' academic performance in agriculture. This study is grounded in the understanding that ICT and field work are critical components of agricultural science education. The integration of ICT tools such as computers, the internet, and multimedia resources can enhance teaching and learning by providing access to a wealth of information, fostering interactive learning experiences, and promoting critical thinking skills. Similarly, field work activities, such as farm visits, practical demonstrations, and experimental learning, can help students to connect theoretical knowledge to real-world scenarios, and develop skills such as problem-solving, teamwork, and communication

1.2 Statement of the Problem

The integration of Information and Communication Technology (ICT) in the educational system has been an ongoing trend for many years. The use of ICT in teaching and learning has become an essential aspect of education, as it enhances the quality of education and provides students with new and innovative ways to learn. In recent times, the use of ICT in the field of Agriculture Science has become increasingly important, as it has the potential to revolutionize the way we approach agricultural practices

Agricultural science is a subject that is taught in senior secondary schools, and it plays a significant role in the economic development of any country. However, there is a growing concern about the low academic achievement of students in secondary school agricultural science. Various factors that has contributed to this may include the lack of practical and hands-on experience, inadequate learning resources, and the lack of ICT tools in teaching and learning of Agricultural Science. Information and Communication Technology (ICT) can provide an interactive and engaging learning environment for students, which can enhance their academic achievement. ICT tools such as multimedia presentations, online resources, and educational software can provide students with a more comprehensive understanding of the subject matter.

Similarly, fieldwork provides students with practical experience, which can help them to apply their theoretical knowledge to real-world situations. This hands-on experience can help students to understand the practical applications of agricultural science, and it can also help to increase their interest in the subject. Despite the potential benefits of ICT and fieldwork in enhancing students' academic achievement in agricultural science, there is limited research on

the topic. Most of the existing research focuses on the use of ICT in education in general, and there is limited research on the specific impact of ICT and fieldwork on students' academic achievement in agricultural science hence this study.

1.3 Aim and Objectives of the study

The main aim of the study is to investigate on influence of ICT and Fieldwork on Senior Secondary School Students Academic Achievement in Agricultural Science in Oyo Central senatorial. The Specific Objectives of the study are to;

1. examine the availability of ICT facilities (Computer, E-mail and Radio) in teaching Agricultural Science in Oyo central Senatorial District
2. determine the relevancy of ICT facilities (Computer, E-mail and Radio) in teaching Agricultural Science in Oyo central Senatorial District
3. examine the challenges of ICT facilities (Computer, E-mail and Radio) in teaching Agricultural Science in Oyo central Senatorial District
4. examine the availability of fieldwork (Planting bed, Livestock Area, Irrigation System) in teaching Agricultural Science in Oyo central Senatorial District
5. determine the relevancy of fieldwork (Planting bed, Livestock Area, Irrigation System) in teaching Agricultural Science in Oyo central Senatorial District
6. examine the challenges of fieldwork (Planting bed, Livestock Area, Irrigation System) in teaching Agricultural Science in Oyo central Senatorial District
7. determine the combined influence of ICT facilities and fieldwork on students' academic Achievement in teaching Agricultural Science in Oyo central Senatorial District
8. determine the relative influence of ICT facilities and fieldwork on students' academic Achievement in teaching Agricultural Science in Oyo central Senatorial District

1.4 Research Questions

1. What is the availability level of ICT facilities in teaching Agricultural Science in Oyo central Senatorial District
2. What is the relevancy level of ICT facilities in teaching Agricultural Science in Oyo central Senatorial District
3. What are the challenges of ICT facilities (Computer, E-mail and Radio) in teaching Agricultural Science in Oyo central Senatorial District
4. What is the availability level of Fieldwork (Planting bed, Livestock Area) in teaching Agricultural Science in Oyo central Senatorial District
5. What is the relevancy level of Fieldwork (Planting bed, Livestock Area) in teaching Agricultural Science in Oyo central Senatorial District
6. What are the challenges of Fieldwork (Planting bed, Livestock Area) in teaching Agricultural Science in Oyo central Senatorial District

1.5 Hypotheses

$H_0$1: There will be no significant combined influence of ICT facilities and fieldwork on students' academic Achievement in teaching Agricultural Science in Oyo central Senatorial District

$H_0$2: There will be no significant relative influence of ICT facilities and fieldwork on students' academic Achievement in teaching Agricultural Science in Oyo central Senatorial District

1.6 Significance of the study

The findings of this study would be useful to curriculum developers and planners in the educational sector, implementers of the curriculum, agricultural science teachers, students of

agricultural science, parents, and in other perspectives. The result would assist the curriculum developers and planners in educational sectors which is Nigerian Educational Research and Development Council (NERDC) that are responsible for developing curriculum in secondary schools in Nigeria through some modifications. It would be great assistance to implementers of the curriculum who are the general teachers in the secondary school education.

Through publications and seminars, the result of the study would be made available to agricultural science teachers to give more attention and efforts by the use of ICT and fieldwork in the teaching and learning processes. It would also be significant to students of agricultural science in their study since their time were effectively utilized in acquiring the subject matter.

Parent would definitely benefit from the result of the study, which would be brought to their knowledge of the performance of their children and know how to plan ahead in their career choices and job security. The study would also be significant in assisting policy makers in the Federal Ministry of Education (FME) and State Ministry of Education (SME) in domesticating the curriculum across all schools under their management and ensure that the curriculum is aligned with the prescribed content standard among other useful applications.

The findings of this study would bring about improvement in the performance of students in external examination like; West African Senior School Certificate Examination (WASSCE) and National Examination Council (NECO).

1.7 Scope of the study

The study is focused on the teachers and students of Agricultural science in some selected secondary schools in Oyo central senatorial district area of Oyo State. The study is

limited to Secondary School located in Urban Area and Secondary Schools located in Rural Area of Oyo Central Senatorial District.

Agricultural Science: A secondary school subject focused on practical and theoretical learning about crop planting and animal rearing.

Information and Communication Technology (ICT): In this study, ICT includes digital tools such as computers, internet, email, and radio, used to support the teaching and learning of Agricultural Science.

Fieldwork: Refers to a practical farm environment established by the school to facilitate hands-on Agricultural Science education. In this study, fieldwork components include specific school farm areas, such as planting beds, livestock areas, and irrigation systems.

Academic Achievement: The outcomes or scores achieved by students on the Agricultural Science Achievement Tests administered during the study.

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Chapter Two

Literature Review

The review of the related literature for this study was carried out under the following subheadings: conceptual review, theoretical framework, review of empirical studies and summary of literature review.

2.1 Conceptual Review

2. 1.1 Agricultural science

2.1.2 Information Communication Technology (ICT)

2.1.3 ICT in Teaching and Learning

2.1.4 Computer Assisted Instruction (CAI)

2.1.5 Fieldwork

2.1.6 School Farm

2.1.7. Academic Performance

2.2 Theoretical Framework

2.2.1. Theory of Planned Behaviour (TPB)

2.2.2 Piaget Cognitive Theory of Learning

2.2.3 TPACK Model (Technological Pedagogical Content Knowledge)

2.3 Review of Empirical Studies

2.4.1 Computer in Teaching and Learning of Agricultural Science

2.3.2 Email in Teaching and Learning of Agricultural Science

2.3.3 Radio in Teaching and Learning of Agricultural Science

2.3.4 School farm (Planting Bed) in Teaching and Learning of Agricultural Science

2.3.5 School Farm (Livestock Area) in Teaching and Learning of Agricultural Science

2.4 Conceptual Model

2.5 Summary of Gap in Literature Reviewed

2.1 Conceptual Review

2. 1. 1 Agricultural Science

Agricultural science is the study of the interactions between soils, plants, and animals in the production and processing of food, fiber, fuel, and any other agricultural commodities with economic, aesthetic, or societal worth.[1] It is an integrated science that combines information and abilities from physical life, social and earth sciences, engineering, mathematics, and economics.[1] Agricultural science seeks to develop the following skills: investigating and analyzing sustainable agricultural practices, indigenous agricultural knowledge and historical development, and interrelated agricultural problems[2]. It is a complex and multidisciplinary field that represents the vital link between human (socioeconomic) systems and the natural environment.

As a result of failing to accomplish the goals it was created to achieve, agricultural education, a subset of VTE, faces the same difficulties as vocational education. Teaching about crop output, livestock management, soil and water conservation, and other agricultural topics is known as agricultural education[3]. Despite, the abundance of wealthy agricultural resources, there are severe food shortages in many developing nations, including Nigeria. Given the issues with food shortages, the governments of the majority of African nations have implemented programs for agricultural instruction[4].

A learner at any level is given agricultural information, skills, and attitudes through the process of agricultural education. It equips the student with solid academic information, practical skills, and numerous opportunities to put that knowledge to use.[5] Agricultural education as a type of instruction used to teach learners the fundamentals of farming while incorporating agricultural education science.

Agriculture education is described as a component of education that promotes the acquisition of applied skills, practical skills, and fundamental scientific information. It is further defined as instruction that directs students toward a specific career in society[6]. It ensures national growth and development and assists in preparing and equipping students for a variety of agricultural occupations, such as crop production, livestock husbandry, and horticulture. Through demonstrations, field trips, excursions, and classroom lectures, agricultural education helps the students be introduced to real-world experience. It is a fundamental vocational topic taught at all educational levels, from elementary to tertiary[7].

Agricultural Science subject is part of the vocational subject taught in primary schools and secondary school which inculcated the process of farming in all its branches and among other things includes the cultivation and tillage of the soil, dairying, the production, cultivation, growing, and harvesting of any Agricultural commodities, the raising of livestock or poultry, and any practices performed by a farmer on a farm as an incident to or in conjunction with some farming operations, and it may include the manufacturing or processing of coconut, tobacco, pineapples or other farm products[8].

The general objectives of Agricultural science subjects are to: stimulate and sustain students' interest in farming; demonstrate that farming in a dignified and paying occupation;

enable students to acquire basic agricultural knowledge, practical skills and attitudes; enable students to integrate agricultural knowledge and skills in solving agricultural problems of their families and societies; and prepare students for employment in farming and/or further study in agriculture[9].

Agriculture is one of the topics given in junior and senior secondary schools as a pre-vocational elective and a vocational elective, respectively, according to the National Policy on Education. The senior school level's program was designed to concentrate on three key areas: food production, agronomy and forestry projections, and economics. To allow the students to discover and utilize the agricultural resources in their immediate environment, the curriculum recommended the "Guided Discovery" technique, which places an emphasis on learning through doing. This will support students' efforts to produce food and other agricultural goods for their own use and the benefit of their society[10].

Nigeria adopted the teaching and learning of the subject at all levels of education in recognition of the significance of agriculture to a country. According to the National Curriculum for Senior Secondary, Agricultural Education is intended to build a strong foundation for vocational agriculture, which is intended to educate people to acquire pertinent job skills that will make them productive farmers[11].

In the 1960s, the farming sector accounted for more than half of Nigeria's Gross Domestic Product (GDP), making it the country's main economic pillar.[12] However, with the advent of the oil boom period in the 1970s, a steady decline in the income derived from agriculture was observed. Since then, academic and business authorities have focused a lot of attention on how to best restore agriculture to its former enviable place. Various rules were

created as a result of this. Agriculture's inclusion as a pre-vocational topic in primary and junior secondary schools and as a vocational subject in senior secondary schools is one of these educational policies[13].

Additionally, Agricultural Science now qualifies as a vocational topic and is one of the electives available to senior secondary school students. This will give interested pupils the chance to learn useful agricultural skills that will help them become independent in the future. Additionally, this would increase food output in Nigeria. The following are the particular goals for teaching agricultural science in secondary schools: a) to stimulate and sustain students' interest in agriculture; b) to provide students the interest to advance in farming; c) to advance food production through improvement of agricultural production techniques in students; d) to provide occupational entry level skills in agriculture to the interested students; e) to prepare students adequately for producing and marketing farm commodities efficiently and profitably; and, f) to enable students to acquire basic knowledge and practical skills required for future studies in agricultural field[13].

Teaching and Learning Strategies in Agricultural Science in Secondary School

In contrast to other subjects, Agricultural Science is unique in that it cannot be learned exclusively in a classroom or on the field. To allow many aspects of agriculture and rural development to be seen in their true context, more formal learning should ideally be combined with practical teaching and learning, such as the traditional apprenticeship learning.[14] Traditionally, teaching and learning techniques have been referred to as teaching and learning methods. The emphasis placed on particular approaches in teaching and learning today determines the methodology that should be used. These strategies include the facilitative

approach, the experiential approach, the transmission strategy, the collaborative approach, and the interactive approach.

The interactive method involves the sharing of ideas by the teacher and the students, or by the students themselves during group projects. In a collaborative method, students collaborate on projects or groups of ideas. With the transmission method, the instructor uses lectures to control the learning experience. Learners explore their life experiences as a basis for developing new knowledge, skills, and making judgments when using an experiential method. The learner's experiences in the society form the basis of their learning.

In a facilitative method, the teacher offers opportunities for the students to learn as well as the stimulus for their interaction with new information. The teacher simply serves as a facilitator and coordinator of instruction[15]. The agricultural science teacher chooses the technique to use based on the aforementioned methods and the material being taught to the students.

Lectures, demonstrations, discussions, educational excursions, projects, question-and-answer sessions, homework assignments, and practical are the instructional methods most frequently employed in agricultural science[15]. When using a lecture as a teaching technique, the teacher must transmit information to the student. When explaining something to the students, the instructor reads the notes to them. The learner's task in this technique is primarily listening and taking notes, which is teacher-centered. A procedure or activity can be effectively explained or described through demonstration. Before instructing the class in a particular task, the teacher models it for them. One of the students may also be used by the teacher to model the exercise.

Discussion is a type of interaction that includes the involvement of the learners through talking or writing and promotes an open discussion of the benefits and drawbacks of a procedure or object. In addition to giving students the chance to experience new environments, educational visits give them the chance to have thrilling experiences that would not be possible in a typical classroom setting. This makes learning more enjoyable and allows students to investigate new environments. However, some educators feel that field trips are not adequately prepared and scheduled[16].

Students are suitable for implementing the practical elements of Agricultural science in secondary schools due to the projects' practical orientation and educational value. Most colleges regularly give out assignments. This entails a study of the literature and, occasionally, an interview or field observation. When studying literature, students receive assistance in learning how to gather data from books and reports and to write a concise report on their discoveries.[17] Assignments are now a highly effective instructional tool that help students improve their communication abilities. Although secondary school agricultural science teaching and learning have been around for a while, the methods used are still far from ideal because they are primarily concerned with imparting information that will be considered helpful in exams. Most information is simply memorized, and students follow instructions from their instructors or tutors exactly[18].

Problems of Agricultural Education in Nigeria

The problems of agricultural education can be viewed from two perspectives-namely the fundamental problems and the emerging global problems.

a) Pre-tertiary Level: In Nigeria, the majority of secondary school agricultural science teachers are educated in agriculture rather than receiving post-graduate or background education. Agriculture is taught in classrooms as biology without any adequate application to real-world production. The youth who should be urged to pursue farming as a career are discouraged from having positive attitudes. The main goal of agricultural education for young people in schools is to expose them to different agricultural occupations and prepare them for those occupations.[19]

b) A lack of properly developed curricula. The importance of Agriculture education curricula in the growth of Nigeria's agricultural industry cannot be understated. The Nigerian school curriculum does not appropriately include agricultural instruction. Even though it is widely thought that Nigerian tertiary institutions are well-equipped with sufficient curricula and technical know-how to teach agricultural science. However, a large portion of the curriculum in classrooms is imported from developed nations.[20] Ibrahim found that the education of agricultural graduates is not commercial sector-oriented because there is a breakdown in the relationship between what is taught, the agricultural labor market, and the requirements of the farmers.

c) A lack of high-quality teachers: Teachers play a crucial role in societal survival because they have a direct impact on the standard of education in any community. The quality of agricultural science teachers, which is also reliant on their professional and pedagogical competence, plays a significant role in the development of agriculture in any country. However, agricultural educators have not reconstructed agricultural skills in a manner that keeps up with

the current world of production's rapid change as well as the rapid advances in scientific and technological knowledge[21].

d) Poor Method of Instruction: The teaching techniques used in agriculture classes include demonstration, project, questioning, field excursion, debate, assignment, and lecture. However, the majority of instructional techniques use the lecture-based approach. In reality, a more knowledgeable person (the instructor) provides information and ideas to a less knowledgeable person using the lecture method of teaching[20]. With this technique of instruction, the teacher controls the conversation in the classroom, giving the students very little opportunity to contribute. This approach is teacher-focused. This approach typically lacks thorough demonstration and does not allow for the efficient development of expertise. Agriculture education can still be taught using a competency-based approach, and qualified instructors serve as the conduit between the curriculum and the students[22].

d) Insufficient Teacher Motivation: There is poor work satisfaction on the part of the instructor due to low or absent motivation, a lack of teaching resources, insufficient educational resources, inadequate educational facilities, and the organizational structure of agricultural learning. This results in poor agricultural teacher training programs, weak connections between schools and the workforce, and poor agricultural educational programs.

e) **The absence of uniform educational policies**: Nigeria's current low educational standards are a product of the government's inconsistent educational policies. The Ministry of Agriculture and its departments are in charge of managing Nigerian agriculture. However, because they lack training, the employees whose appointments were made on political grounds are unable to turn abstract ideas into workable realities[23]. Educational policy is the

government's declaration of intentions and the intended means of achieving those parts of the country's goals that depend on the use of education as a tool.

f) Inadequate Funding: There is not enough money available to create an atmosphere that is conducive to learning and teaching and that supports research. According to law, tertiary institutions must conduct research to advance societal development rather than focusing solely on instruction.[24] Due to insufficient funding, this expectation cannot be fully met because agricultural study necessitates significant financial investments that most people are unable to make. The effort put into study has also been hampered by the bureaucratic delay in the release of funds.

2.1.2 Information Communication Technology (ICT)

Information and communication technology (ICT) is a management method used in the handling of information and its application to social, economic, and cultural issues.[25, 26] Information and communication technology, is becoming an essential component of the educational system. ICT has altered how the educational system is governed and how it operates. Learning to use computers progresses gradually, moving from learning about computers to actually using them to learn[27]. According to a survey of the literature, there are three important issues to think about when analyzing how ICTs will affect education[28].

Many teachers lack the required IT skills and are uneasy about using the new resources in the classroom. They also lack the necessary training[29]. The rapid adoption of ICT apps led to profound changes in technology, society, and the economy. These modifications have forced educational institutions, administrators, and instructors to reconsider their positions, methods

of instruction, and future goals[30]. An efficient educational system is essential to a country's economic viability in the information age. It is regarded as a study of inputs and outputs in comparison. ICTs have transformed how people operate today and are currently changing educational systems. Teachers, student study resources, teaching aids, and instructional techniques are all inputs into the educational system. Outputs include both the quantity and quality of student learning[31]. The likelihood of obtaining education as well as productivity increases are improved with the correct integration of ICT with the teaching/learning environment. ICT gives students a variety of chances and educates teachers about their new roles and responsibilities in the educational system. Numerous teaching and learning strategies used by both teachers and students will alter as a result of the increased use of ICT. ICT will continue to play a significant and unavoidable part in educational administration[32].

The most significant type of technology in the modern age is Information and Communication Technology (ICT). It is a power that has a significant impact on all facets of human existence. It has united the world and changed every aspect of the commercial, social, political, and educational landscape on the planet. A skilled workforce is essential for the growth and advancement of the world as a whole, and this can be attained through high-quality education[33]. ICTs have the ability to increase access to education in developing nations while also enhancing its relevance and quality[34]. Despite being a tool for education, ICT has mainly been used by institutions of commerce. The mindset and practices in all facets of business, society, governance, and education have undergone significant change. It gradually changed education from being conventional to high-bred and had an effect on teaching and learning strategies as well as scientific research and information access.

All forms of technology used to govern telecommunications, broadcast media, intelligent building management systems, audiovisual processing and transmission systems, and network-based control and monitoring functions are collectively referred to as information and communications technology (ICT). Information and communication technology (ICT) in education is the approach to education that makes use of ICT to assist, improve, and optimize information delivery. For many people, ICT is now a crucial aspect of daily living[35]. It is anticipated that this tendency will continue, making ICT literacy a functional requirement for people's job, social, and personal lives. It is becoming more and more important in people's lives. By improving learning effectiveness or by introducing a previously unattainable dimension to learning, the use of ICT in education adds value to both instruction and learning. ICT can support students' involvement in collaborative learning and may also play a significant motivating role in students' learning.

The term "mobile learning" (or "e-learning") refers to a growing trend in which education has moved beyond the physical confines of the classroom and gained mobility[35]. Students can obtain information whenever and wherever they want, and the number of institutions offering such cutting-edge technological environments is growing daily[36].

2.1.3 Computer Assisted Instruction (CAI)

Computers are already in use in banks, big corporations, schools, transportation companies, the armed forces, and other related fields. The Ministry of Education is engaged in decision-making through the use of computers in education, teacher training, and educational technology development[37]. Teachers use instructional materials to make teaching more effective, lasting, and enjoyable. Computers are used in groups and businesses for a variety of

activities, as well as in the classroom. It is used as a material, technique, and instructional medium to help students focus on, comprehend, and approve of the teaching and learning process. It has been noted that instructional programs that are backed by a variety of sound, image, and animations make teaching and learning more lasting, enjoyable, and effective[37]. For these reasons, the development of software that is supported by visual and audio instructional material, such as CAI, will attract students' attention, promote their interest, motivate, interact, and enhance the teaching and learning process.

Students nowadays are maturing with visual gadgets such as television, video, computer, and internet. It is not possible to pique these students' interest using conventional methods that have been used in the past[38]. As a result of technological advances in the last quarter of the twentieth century, a significant difference emerged between the methods of introducing information in schools and the methods of acquiring knowledge in society. Students gain a lot of information from visually enriched resources such as computers and televisions, which are commonly used in our everyday lives. Students can learn through a variety of audio devices, making it difficult to teach them using conventional methods[39]. Visual materials are clearly used in all fields of study and by all pupils nowadays.

As a result of supporting instructional materials with sound, image and animation, more lasting, enjoyable, motivating and effective instruction occurs[40,41]. Students are affected more by visual stimulus than auditory ones[42]. Developments in technology bring new educational and instructional opportunities together. Students learn by reading the text material given or by observing the graphic information exhibited. The main advantage of a computer over other audio-visual devices is the computer's ability to provide automatic interaction and feedback.

Depending on the progress of the particular student, multiple paths through the course material can be taken[43].

CAI provides opportunity for students to access the learning program in segments, with each section containing knowledge and questions or problems for the students to answer. The correctness of each answer is instantly indicated, and remedial or new information is presented. Students may also seek assistance or skip ahead at times. Although this tutorial (information-practice-feedback) version of CAI is the most common, other forms include drill and practice exercises, simulations, and games. Therefore, CAI can be defined as computer-assisted teaching that is individualized, interactive, and guided. He believes that CAI is not a teaching technique. It employs a variety of techniques, such as direct and exploratory lessons, drills, games, and simulations[44]. Also, CAI as an educational medium in which a computer delivers instructional material or activities. Students learn by interacting with the computer, and appropriate feedback is given[45]. CAI was described as the use of computers in the classroom[46]. CAI is a method of individualized teaching that employs a computer-presented program as the learning medium[47]. All of the definitions of CAI given agreed that the computer acts as a tutor, imparting instructions through tutorials, simulations, or any other method of presentation. Computer hardware and specially designed software development require a teacher with excellent teaching abilities and a broad vision.

CAI learning incorporates text, graphics, sound, and video into the learning experience. It is particularly useful in distance learning situations. The explosion of the Internet, as well as the demand for remote learning, has created a great deal of interest in and expansion of computer-Assisted Instruction. The computer serves many functions in the classroom and can

be used to assist students in all areas of the curriculum[48]. CAI refers to the use of a computer as a tool to facilitate and enhance instruction. CAI program use tutorials, drills and practice, simulation and problem solving approaches to present topics and they test the students understanding these programs and students progress at their own pace, assisting them in learning the material, the subject matter taught through CAI can range from basic facts to more complex concepts in mathematics, history, science, social studies and language arts[50]. However, the computer is introducing some exciting innovations to education.

Computer-assisted programs can be characterized by many attributes suitable to enhance learning. Some of the special characterized are as following.

I. Individualization: Computer software can offer different learning paths that are adapted to individual needs[51]. Students discover a variety of paths to take; each student selects a path based on his or her requirements, including prior subject knowledge, aptitude, interest, and intellectual capacity. A game structure can boost inspiration and fantasy while keeping learners' interest. With the help of illustrative animation, dynamically generating illustrations, and interspersing verbal explanations, concepts can be given in tutorials. Simulations can offer fresh perspectives on relationships and experiences that would not be feasible otherwise.

ii. Flexibility: This refers to having access to educational resources at a variety of times and places. Computers have greatly increased the variety of resources that are accessible to students as well as the ease of access to information. One method for addressing the growing number and diversity of pupils is to make education more flexible. A computer application might let the user select from a range of educational approaches. An completely different and distinctive approach can be used to present material to a student who does not learn in a certain

way. In order to get the right answers from pupils, instructional programs may make use of a variety of prompts and cues[52].

iii. Self Pacing: It is important that students move at a speed that corresponds to their individual levels of learning. With self-pacing, students can choose how long they have to solve problems and how quickly the solutions ar e presented. They can also spend several weeks working on remedial material before the testing period. For those students who have used the program before or have prior understanding of the topic, self-pacing can aid in tailoring the instruction. Self-placement testing in conjunction with self-facing can help students get started in the right location and at the right pace.

(iv) Options for correction: After examining students' answers, the computer makes adjustments for individual differences. The order of instruction is decided on the basis of student achievement history. In one form of remedial program, the instructor uses a computer program to identify the student's cognitive style, learning skills, and achievement level. The instructor selects content that is tailored to the pupil based on the diagnosis. Programs for computer-assisted instruction can readily offer corrective measures by adhering to the branching strategy and/or by incorporating hyperlinks to present text, graphics, or any other kind of corrective material[51,52].

v. Visuals and Sound: An essential part of instruction is graphic presentation. Computer graphics also include the use of screen formatting tools like arrows, boxes, and drawings to highlight concepts in addition to the use of images. In places where other instructional methods are challenging to use, this nonverbal mode of instruction aids in building comprehension. A program's use of sound can help pupils focus, be reminded, or be reinforced, which improves

instruction. Some CAI programs feature speech synthesizers that generate words or phrases at a more advanced level[53]. Particularly with software for very young or disabled users, synthesizers are available. A program is given movement and animation by computer graphics and music.

Access and Quality: The quality and standards of educational systems and institutions are raised by computer-assisted teaching[54]. Poor lesson presentation, which frequently defines public presentations, is solved by well-developed software. Aspects like exhaustion, boredom, and concentration deficit could be reduced[55].

Benefits for Learners: This gives the learners autonomy over when and where they study as well as the ability to plan their own learning. Additionally, it helps students determine their own rate of study. Even before a class is finished, students can turn off the computer and go for a walk to help them focus again[56]. The likelihood of having enjoyable learning encounters rises with computer assisted instruction. Peer strain and educator pressure are less felt as a result of computer assisted instruction's individualized approach. The learners have more freedom to repeat difficult-to-understand parts or learn from their mistakes.

Benefits for Teachers: Computer Assisted Instruction frees teachers from the repetitive elements of instruction and allows them to act more as facilitators of learning and conversation than as transmitters of knowledge. It gives more opportunity for course development and access to their diligent work.[5 7]

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Challenges in using ICT in Teaching and Learning

ICT integration into teaching and learning is a challenging process that could run into a number of obstacles. These obstacles are referred to as "challenges.[58]. Any situation that makes it challenging to move forward or accomplish a goal is referred to as a challenge.[58] The literature has noted several significant obstacles to instructors using ICT tools in the classroom, some of which are listed below

Accessibility Issues and Network Connectivity

Several research studies indicate that lack of access to resources, including home access, is another complex challenge that prevent teachers from integrating new technologies into education. Various research studies indicated several reasons for the lack of access to technology. Teachers complained about how difficult it was to always have access to computers[59]. The author gave reasons like "computers had to be booked in advance and the teachers would forget to do so, or they could not book them for several periods in a row when they wanted to work on several projects with the students". In other words, since most ICT resources were shared by instructors, a teacher would not have access to them.

There are no systems in place to incorporate technology into the curriculum?

Although providing teachers with tablets and smartboards may help them feel more at ease with educational technology, many teachers simply haven't considered how they can best incorporate technology into their teaching. Indeed, how a history teacher uses laptops in the classroom may vary greatly from how a math teacher uses a smartboard. Both will most likely require a significant amount of time for trial, error, and experimentation to bring their

lesson plans up to speed. A significant barrier to the adoption of new tools is the failure to provide teachers with the guidance they require to make education technology work for them in their particular classroom[60].

Unreliable Hardware and Software

A lack of a robust infrastructure can be exacerbated by a lack of dependable devices and software, all of which can pose significant barriers to the adoption of educational technology. An unreliable device could be a notebook that doesn't work properly, or it could be a bug that prevents students from getting exams or staying logged in at school. In more extreme cases, Common Core test disruptions as well as other test-related technical glitches, marked an unanticipated challenge connected with using education technology to administer testing[61]. Although education technology has the potential to be a powerful instrument, devices and software must be consistent and reliable in order for it to be a viable choice in the future.

Administrators do not believe that more technology is required.

Another challenges that technology in education faces is that many administrators are simply unwilling to embrace it right away. The reasons for this vary, but it is most likely due to budgetary constraints as well as the reality that the benefits of educational technology are not yet well defined. This makes it difficult to pinpoint particular areas where this technology could help improve test scores or other metrics. However, with distance learning on the increase and education technology becoming more widely available, administrators' resistance to adopting technology appears to be fading[62].

Lack of Professional Training

Every day, new and sophisticated educational technology emerges. Teachers must understand not only how to get the most out of each new tool for themselves, but also how to teach their pupils to use it. Giving a shiny new tool to a classroom that neither teacher nor student can use is unlikely to improve any child's educational experience, and requiring busy teachers to educate themselves how to use a new tool can be frustrating and time-consuming. Professionally training teachers, professors, and staff may take time and money, but it is necessary if students are to get the desired results from their technological experience[63].

Inadequate Network Infrastructure

Giving a classroom full of students a box of laptops or notebooks will have no impact if the school lacks the network infrastructure to support them. A strong network infrastructure necessitates fast, high-quality WiFi at school and at home, as well as data privacy and security, access to digital tools, and a variety of other factors. Designing, constructing, and maintaining a strong network infrastructure requires great care and forethought, as it is required for the effective and responsible ongoing use of technology in education.

Change Resistance

Many teachers have shown resistance to change and a reluctance to embrace educational technology[64,65,66]. However, research has shown that this resistance is not due to instructors' dislike of technology. Rather, it's because teachers see learning a new teaching tool as a risky endeavor for which they lack appropriate training. It's also because their school

administrators don't show a united front by emphasizing which specific tools can benefit their students. Although resistance to change can be difficult to overcome, collaborating with teachers to support their adoption of new educational technology can help make them more likely to accept it.

iv) Limited Time

Many teachers, according to recent surveys, are competent and confident in using computers in the classroom, but they don't always use them because they don't have the time.[66] Time constraints and the challenge of scheduling enough computer time for classes were cited by a large number of researchers as obstacles to teachers using ICT in their[67]. The lack of time teachers had to prepare technology lessons, browse the various websites, or consider various facets of educational software was cited by all the teachers as their biggest challenge[68]. The lack of time for teachers to accomplish tasks affects many aspects of their job[69]. Some of the participating teachers specifically mentioned which ICT-related tasks take up the most time. These include the time required to research online guidance, plan lessons, experiment with and practice using technology, resolve technical issues, and obtain the necessary training.

v) Incompetence of instructors

Teachers' capacity to incorporate ICT into pedagogical practice presents another difficulty that is closely related to teacher confidence[70]. Teachers lacked the knowledge and skills necessary to use computers and were unenthusiastic about the adjustments and integration of supplemental learning that would come with integrating computers into their teaching practices. According to recent studies, the severity of this obstacle varies from nation

to nation. According to study, teachers' lack of technological proficiency in developing nations is a major obstacle to their acceptance and adoption of ICT[71]. The lack of understanding and expertise among teachers is a significant barrier to the use of ICT in primary and secondary schools[72].

2.1.3 Fieldwork

A school farm is an area designated by the school for agricultural pursuits. This area typically has the potential for agricultural productivity[73]. It could be in the school or within strolling compound. Agricultural science curriculum in secondary school is practical oriented, aimed at appropriate skill acquisition for a successful academic performance and transition to the world of work in agri-business ventures[74]. However, the focus of integrating productive academic performance and productive work into the educational plan could fail if school farm with farm resources are not available in schools to actualize the vocational goals to which agriculture curriculum in secondary schools is aimed at.

In transforming the agriculture curriculum into practical and/or vocational parlance, various teaching aids, specimen, crop and animal species comprise the main facilities at the disposal of the teacher and students of agriculture must be available[75]. Students and teachers should be aware of the potentials of various instructional materials/farm facilities in the school and should be encouraged to use them in creative ways to further enhance their academic performance and vocational competence in productive agriculture[76]. One of such facilities that is of vital significance to any school running agricultural science program is the school farm[76].

In many school environments the school farm is typically protected from human and animal predators such as human beings, goats, sheep, pigs, etc. The security is in form of fencing with any of the following; oil palm fronds, bamboo poles; live trees, cactus; wire mesh; barb wire.[77] The type of fencing used is determined by the availability of resources and climatic factors; for example, in some arid areas, the school farm is typically protected with cactus, a non-leafy plant. The school farm is of great importance in many dimensions:

1. As a Source of Money to the School:

The crops grow in the school farm could be harvested and sold to the surrounding communities or consumers. It can be done through selling the harvested crops to consumers at the gate of the school farm. The products therefore leave the gate of the school farm in the hands of those who buy them. It can be sold to the students directly. They buy the farm products for themselves or for their parents. This can be done through the school co-operative unit or Young Farmers' Club It can be sold directly to consumers in the local markets through organized harvest sales by the school[78].

In order to realize good returns from the school farm, there must be a careful survey of acceptable food commodities in the community that can be grown on the school farm and there must be sufficient security for the maturity of the crops in the school farm before they are harvested for sale. The security is necessary because it is usually the belief of many students and staff of the school that the school farm belongs to everybody and the crops there-in can be handled as such**.**

2.1.4. Concept of Academic Performance

Academic achievement is regarded to be synonymous with academic performance, and the most common measure of students' academic achievement is credit point average, which can be accurately calculated from the marks of each subject to evaluate students' academic achievement[87]. For instance, the study measured academic success using students' midterm and final grades in language, mathematics, and foreign language courses in a study of personality traits and academic achievement of secondary school students[88].

Academic achievement can be divided into two aspects: cognitive and non-cognitive outcomes, and psychological and behavioral outcomes[89]. Some scholars claimed that academic achievement involves psychological factors such as intelligence, psychological change, and perseverance in addition to cognitive ability[89,90,91].

Several authors have defined and explained academic success as knowledge gained which is assessed by marks by a teacher and/or educational goals set by students and teachers to be achieved over a specific period of time. They added that these goals are measured by using continuous assessment or examinations results[91,92]. They emphasized that it demonstrates and measures the degree to which an educational institution, teachers, and students have met their educational objectives. It is a measurable and observable behavior of a student over a particular time frame. He went on to say that it consists of a student's results in assessments such as class exercises, class tests, mid-semester, mock examinations, and end-of-semester exams[93]. Again, academic achievement is a student's academic success is defined by their performance in an examination, tests, and course work[94]. The authors' definitions demonstrate that academic

performance is dependent on measurable outcomes such as class exercise, test, and examination results.

Student factors that influence academic success

It is clear from the previous study that students play an important part in their academic performance. students' factors such as developing interest in a subject, engaging in co-curricular activities. regular studying, self-motivation, punctuality in school , and students personal goals as well as personality traits affect their academic performance[95,96,97,98]. Students' factors that influence their academic performance can be divided into two categories: internal and external factors. They discovered that internal factors influencing students' academic success included interest in topic content, internal satisfaction, and aspiration[99]. Social prestige and material reward were also among the social variables[100]. The students' interest in a topic affects their academic performance, similarly students' attitudes toward school and interest in learning have an impact on their academic success.[101,102] Furthermore, positive relationship between student attendance and academic achievement. The correlation approach to assess attendance on academic achievement in Nigeria influence a positive relationship between class attendance and academic achievement

Teacher factors that influence academic success

Teachers have a significant impact on students' academic success. Previous studies discovered that teacher experience, age, gender, and professional qualification had no statistically significant relationship with students' academic performance in a research performed on teacher factors influencing academic achievement[103,104]. However, they

discovered that performance goals, syllabus completion, paying attention to weak students, assignments, student assessment, and a teacher's teaching workload all had a significant relationship with students' academic performance. Some Authors on the other hand, claimed that a combination of teacher and student-centered methods improves academic achievement. they concluded that a student-centered strategy is more effective than a teacher-centered approach.[103,104,105] |Teacher experience and professional development have a substantial impact on students' performance[103]. Also, teachers have a significant influence on their students' academic success. however, it should be noted that little is known about the specific teacher factors that add to students' academic performance. In another study, teacher-student ratio, as well as the teacher's experience and qualification, have a substantial effect on academic performance. similarly, teacher's level of experience has a substantial effect on academic performance of student[101,103].

Parental factors that influence academic success

Recent research has discovered that parental involvement has a positive effect on their children's academic performance[106]. For example, discovered that parental involvement influences students' behavior and attitudes directly but indirectly influences their academic success. Parental involvement in their children's academic success is divided into two types: home-based parental involvement and school-based parental involvement[106,107]. The research found that while home-based parental involvement has a positive significant relationship with their children's academic achievement, school-based parental involvement has a negative relationship[107]. Similarly, parental involvement affects their students' academic achievement, but the direction of the effect was not stated. Furthermore, Parental involvement in students'

academic success takes various forms[108]. He discovered that parents are involved in educational activities at school, that there is parent-school contact, and that parents are involved in academic activities at home. The study concluded that parent's involvement in home academic activities have a direct influence on the academic performance of their wards; it was realized that parent's involvement in academic activities at school has an indirect effect on academic performance; and the impact of parent-school communication on academic performance was found not to be a strong predictor[108].

Factors at school that Influence Academic Achievement

Institution-based factors are factors that affect academic performance within the institution. Previous study discovered that modern labs and textbooks are the most important school factors influencing academic success[109]. Also, availability of physical resources such as a library, text books, adequate classrooms, and a large playing field affects students' academic success within the same nation. Instructional materials have an effect on academic success A discovered that students in Nigeria who are taught with instructional materials outperform students who are not taught with instructional materials[110]. Instructional materials have a substantial effect on academic performance in Nigeria[110]. He claimed that using instructional resources facilitates the delivery of a lesson and improves teaching and learning. the use of instructional materials helps students better grasp a subject's idea. as a consequence, students who are taught with instructional materials outperform students who are not taught with instructional materials. The location of a school has also been discovered to have a substantial impact on students' academic performance. The location of a school influences students' academic success[111,112]. He emphasized that the greater the distance between a school and a

student's residence, the more tired and hungry the student becomes, negatively impacting their scholastic performance. He argued students in urban regions outperform those in rural areas. This showed that the school's location has an impact on students' performance.

2.2 Theoretical Framework

2.2.1. The Theory of Planned Behaviour (TPB)

The Theory of Planned Behavior (TPB) was developed by Icek Ajzen as an attempt to predict human behavior[113]. The TPB posits that attitude toward the behavior, subjective norm, and perceived behavioral control influence behavioral intention. The desire to use a new technology is the subject of this theory. It is presumptive that a person must demonstrate a desire to use an innovation before adopting it. The theory names three independent variables that would influence the adoption of an innovation. The first variable is attitude towards the behaviour which refers to the degree to which an individual is for or against the behaviour in question[113].

The second variable is subjective norm which refers to the perceived social pressure to perform or not perform action. This is indicative of the influence the environment has on the subject towards acting in a certain way. Lastly, the model includes observed behaviour control as the third variable. This relates to the perceived ease or difficulty of executing behaviour. Perceived behaviour control is supposed to represent past experiences as well as anticipated impediments and obstacles[113]. The model‟s independent variables closely maps into the independent variables in this study namely; teacher competency, availability of facilities and technical support. Teacher competency decides whether a teacher is willing to use ICTs in teaching and learning process or not. When the school‟s administration or other stakeholders

provide resources they expect the teachers to use the resources in teaching and learning process. The teachers are under some strain to act in the desired manner because of this. The third independent variable of perceived behavior control is mapped into the third independent variable of technical assistance, which helps teachers feel more confident using ICTs.

As evidenced by their opposition to the introduction of laptops for elementary school students in Kenya, teachers may initially be wary of integrating ICTs into their daily instruction out of fear. However, adoption becomes the norm rather than the exception once they realize its benefits, such as effectiveness in lesson preparation and delivery as well as storage of notes (with minimal editing). Teachers will adopt technology and integrate it into their teaching and learning processes as a result of improved teacher competency and evolving lesson delivery strategies. Teachers who have embraced using technology in their daily work could follow this model. Technology adoption among teachers may be influenced by their desire to use it as well as the prevalent peer use of ICTs in the teaching and learning process. ICT users, including instructors, are increasing as a result of the ongoing simplicity of ICT usage.

Therefore, the use of ICTs in the teaching and learning process among teachers is informed by the idea of planned behavior.

2.2.2 Piaget Cognitive Theory of Learning

Piaget cognitive theory of learning says that, for a child to have knowledge of the world the child must act on objects and it is this action which gives knowledge of those objects; the mind organizes reality and acts upon it[114]. The fact that the learner participates is a key aspect

of Piaget's theory of cognitive learning. Piaget points out that learning requires the learner to build and reconstruct information, rather than just communicate it orally.

In the natural environment of the object(s) the student will have the ability to act on object(s) by watching, recognizing, classifying and even by manipulating the object(s) in its natural environment[114]. Piaget further notes that learning happens by self-discovery. Thus, interest serves as the driving force behind travel. The students are exposed to fundamental ideas to find things for themselves. This might be accomplished through an actual introduction by the instructor and the student. As a result, the surroundings and experience of the kid form a solid foundation for learning. The school must therefore be within the experimental universe of the kid. The kid and his surroundings must therefore learn by doing as a result. Constructivism theory of Piaget is a modern learning school of thought which postulates that pupils construct their own maps and theories of the world. The constructivist school of thought sees learning as a process in which students actively construct their own knowledge of the circumstance at hand based on the extant previous information[115] According to constructivism theory, students employ their thoughts very actively in constructing meaning out of their interaction with the world. They make their own connection between events and the words other people are training them to use., and they build their own network of connections and patterns of thinking[113].

Constructivist learning approach has the benefit of boosting students' self-confidence in connection to science, encouraging a more active involvement in science-related activities, and growing interest in the topic as well as comprehension.[116] On the other hand, Prosser's first theory, which was based on the idea that "vocational education will be efficient in proportion

as the environment where the learner is trained in a replica of the environment in which he most subsequently work," was dependent on work environments. According to this theory, a preparation program's room, materials, tools, and supplies must be a copy of those used in the workplace in terms of type, kind, quantity used, and layout. It is closely related to how effectively students transfer their knowledge.

Agricultural science will pique the interest of secondary school pupils who are taught in the school farm, and their academic achievement will also increase. Thus, the experiences associated with the school farm approach involve problem solving, real labor, and learning by doing, all of which are consistent with the theory. These theories are connected to the study studies in that they suggest that exposing agricultural science students to a natural setting (such as a school farm) will improve their understanding of agriculture's practical applications, improving their academic success[117].

2.2.3 TPACK Model (Technological Pedagogical Content Knowledge)

Shulman´s PCK model was later developed that, this time, the infusion of technology into the society had become so prevalent that was almost ubiquitous. Because students are now able to use ICT tools on daily basis, therefore influences the way some specific subjects are taught and also the content knowledge itself[114]. The integration of technology into learning has added complexity to the fundamental knowledge of what constitute the teachers' professional knowledge base[118].

The Technological knowledge (TK) comprises of having a grasp of the basic technologies such as books and pencils and more sophisticated technologies such as the internet and software. This involves knowledge of ICT operating systems and the capacity to use computer

hardware and software. According to some studies, Mishra and Koehler argued that with regards to a more rapid and technological world we now find ourselves in, technological knowledge needs to be included in addition to the content and pedagogical knowledge for the teaching and learning process to be effective[118,119]. According to Mishra & Koehler, successful pedagogical use of ICT is deeply affected by the subject domain to which they are situated. They define technological and content information as Technological Content information (TCK). They noted that teachers now need to have information about the technology tools that are part of the discipline topic field. TCK concentrates on the instruments for the content area being able to repurpose other contents[119].

Accordingly, successful teaching is affected by the way instructors use ICT tools in the teaching and the learning process and not only how they tools functions.[120] The overlap with the technological knowledge and the pedagogical knowledge is termed Technological Pedagogical Knowledge (TPK) which involves how a teacher uses technological tools in teaching, selecting the best tools to use when working to make their instructional practices more successful. A study added that TPK knowledge begins to emerge when the teacher starts to grasp the dynamic connection between the topic and instructional knowledge[121]. Teachers' TPK remains the most crucial area for novice and pre-service teachers because they have not engaged in many learning situations that were enriched by technology[121]. Instructors need understanding of how classes have been planned or developed to incorporate ICT into their classroom activities. This form of knowledge (TPK) include tactics and techniques for organizing classes where technical skills are taught as well as the pacing of lessons.[121] Also building tutorials that support students' use of ICT tools during education becomes an essential teaching skill. Setting up the equipment properly impacts how the instructor uses ICT tools in

the instruction and the learning process. When a teacher is able to combine the selection of suitable tools (TCK) with the appropriate methods and activities to teach ICT enhanced lessons (TPK), it leads to the Technology Pedagogical Content Knowledge (TPCK) or (TPACK). This is also known as teacher´s expertise about education using ICT[121]. Insisted that when instructors are armed with adequate technological knowledge, technological content knowledge, technological pedagogical knowledge, TPACK will be created thereby improving effective instruction with ICT.)

Further TPACK also represents for the concept that what teachers understands about effective teaching, their subject matter and educational technology must be used together for them to be successful in their classrooms assisting students learning[122]. It is clear from different studies that actively using ICT tools does not develop TPK, TCK and TPACK. For teachers to build their TPACK, they have to concentrate on their learning experiences not by conquering them, but by getting themselves familiar with a range of instruments that is suitable for their instructin[122]. Instructors need to be introduced to a range of action tasks that can be used in a lesson plan and how to properly use them in their classes for successful teaching and learning to take place. Strongly felt that TPACK is a helpful paradigm that have the ability to manage the interplay of technology, pedagogy, and material making learning more efficient and effective and more engaging. They noted that TPACK develops when the teacher starts to grasp the dynamic connection between CK, PK and TK as well as the knowledge between TPK, TCK and PCK. Excellent instructional technology use is based on the ideals of excellent teaching. In an effort to investigate design-based approaches for ICT integration in African education.

Using ICT to educate is situational. For it to be successful, instructors must be flexible enough to build knowledge about the school, the students, and the setting they find themselves in coupled with the infrastructure and tools at their command[123]. 21st-century teachers have to start developing innovative classroom practices where students are stimulated to participate in active knowledge creation.

The survey's goal was to investigate the educational approaches that influence teachers' decisions about how to use ICT in the classroom.[124] After a review of the analysis, it became evident that the pedagogical techniques that subject teachers often used for example inspiring students (coaching) and creating and environment which enhances constructivist teaching often determined the teacher's choice of integrating ICT with the help of pedagogical content knowledge. Additionally, it was discovered after reviewing the TPACK paradigm that there is a connection between technological and teacher-related pedagogical ideas. However, teacher's choice to use ICT in 21 education is influenced by their beliefs about a specific ICT instrument. Active participation in ICT-integrated courses was discovered to be the key approach for assisting teachers in developing their TPACK expertise to promote successful teaching in the twenty-first century.

2.3 Empirical Review

2.3.1 ICT and Agricultural Science Achievement

Contribution of information communication technology to effective teaching and learning of agricultural science in some selected public and private secondary schools in Ibadan North East Local Government in Oyo State was investigate in a study[125]. A self-

structured questionnaire was used to collect information and a simple percentage and frequency count was used to analyses the collected data also the 4 point likert scale analysis was used to identify various contribution of ICT to effective teaching and learning of agricultural science among both the teachers and students in the study area. The results of the findings showed that the use of computer technology in teaching and learning of agricultural science makes the subject more simple, understandable and improves the understanding of the students. It also revealed that students do not have adequate access to Information and Communication Technology (ICT) facilities in their schools except on their phones. Furthermore, the finding showed that majority of the private secondary schools are using computer technology effectively. In-service training on the use of computer technology and Information and Communication Technology (ICT) should be organized for the teachers and students in public secondary schools by the government.

A study carried out on Information and communication technologies (ICTs) usage among agricultural extension officers and its impact on extension delivery in Ghana . The main objective of this study is to assess the use of Information and Communication Technologies (ICT) among agricultural extension workers and its implications on extension service delivery. A simple random sampling technique was used to select 153 field extension workers, and a structured questionnaire was used to elicit information from the respondents. The data obtained were analysed using IBM SPSS Statistics software version 22. The study revealed that agricultural extension officers use ICT for personal communication, but not mainly for extension activities. It was recommended that the agricultural extension services provide intensive ICT training for the agricultural extension workers to enhance ICT incorporation into extension advisory service[126].

Role of Information and Communication Technologies (ICT) for Managing Sustainable Agricultural Practices was carried out on a study. The aim of this study was to analyze the use of Information and Communication Technologies (ICT) in the management of agricultural sustainability among Colombian technical assistants and agricultural extension workers (AEWs). For this purpose, a survey was applied to seven content managers and 73 AEWs as part of the Linkata strategy. Since 2012, Linkata uses ICT to manage knowledge in the territories of Colombia. Thus, it was possible to show that the leading digital device used by managers and AEWs was the cellphone. Besides, the media used by managers to disseminate content are WhatsApp™, e-mail, and the Linkata website. Meanwhile, AEWs access information mainly through the YouTube™ channel, e-mail, and the Linkata website. Also, at least 19 practices acquired by the AEWs via Linkata and appropriate for their fieldwork were identified. In conclusion, the experience in the use of ICTs for knowledge management and the promotion of sustainable, productive systems is positive. The AEWs have not only acquired knowledge but have also implemented it with farmers in the field. In this way, ICTs represent a new way for AEWs to update, train, acquire, adapt and apply knowledge in agricultural education and extension, with an environmental, social, and economic sustainability approach[127].

Ibrahim and Ayorinde assessed the impact of Information and Communication Technology (ICT) on the academic performance of students in agricultural science in secondary schools in Bauchi State, Nigeria. The summary of the findings showed that the availability and accessibility of ICT equipment affected the academic performance of students in agricultural science in secondary schools in Bauchi state. It is hence concluded

that provision of ICT equipment in schools can be one way by which teachers efficiency, school learning situation and students learning outcome can be improved[128].

A study on Factors that influence teachers' adoption and integration of ICT in teaching/learning process. The study revealed that Information communication technology (ICT) is becoming increasingly important in our daily lives and in our educational system. There is a growing demand on educational institutions to use ICT to teach the skills and knowledge students need for the digital age. The adoption and integration of ICT into teaching and learning environment provides more opportunities for teachers and students to work better in a globalised digital age. ICT has the potential to play an increasingly important role in education be it in classroom, administration and online instruction or other activities. There is tremendous potential for teachers and students to harness the power of ICT to improve the quality of teaching and learning in the classroom. its great potential, to transform the ways in which teaching is carried out in the classroom. It provides opportunities for greater flexibility, interactivity and accessibility for engaging teaching and learning at the individual, group and societal levels[33].

2.3.2 Computer and Agricultural Science Achievement

The integration of computer technology in educational settings has had a significant impact on student achievement across various disciplines, including agricultural science. The use of computers in agricultural education has provided students with access to information, tools, and resources that enhance their learning experience. Here is an overview of the key findings from the literature:

Computers and the internet have revolutionized the way students access information in agricultural science. Through online databases, digital libraries, and educational websites, students can explore a wide range of agricultural resources, research articles, case studies, and multimedia materials. This increased accessibility to information allows students to deepen their understanding of agricultural concepts and practices. Computers offer interactive learning opportunities that engage students in hands-on experiences. Educational software, simulations, and virtual laboratories provide students with practical, real-world scenarios where they can apply agricultural concepts and problem-solving skills. These interactive tools facilitate active learning, critical thinking, and the development of practical skills necessary for success in agricultural science.

Computers enable students to collect, analyze, and visualize data in agricultural science. Students can use spreadsheet software and statistical analysis tools to process and interpret data collected from experiments or agricultural surveys. By visualizing data through graphs, charts, and maps, students can better understand trends, patterns, and relationships within agricultural contexts. Computers facilitate collaborative learning experiences in agricultural science. Online platforms, discussion forums, and virtual classrooms allow students to connect with peers, share ideas, and collaborate on agricultural projects. Through online collaboration, students can benefit from diverse perspectives, engage in peer feedback, and develop teamwork skills essential for success in agricultural science careers.

The previous study investigated on Perceptions of teachers, learners and school principals on the integration of ICT in teaching and learning of secondary school agriculture. The purpose of this study was to establish the teachers' perception on use of ICT in the

teaching of secondary agriculture in Bungoma County. The study was conducted to ascertain the teachers' perceived usefulness of ICT, ease of use and adoption of ICT and their preparedness to use the same as a pedagogical tool in secondary schools in Bungoma County. The study also gathered the perceptions of learners and school Principals on the use of ICT in teaching and learning of agriculture. A descriptive survey research design was employed. The target population of the study consisted of all Form three agriculture students, 498 agriculture teachers and 252 Principals of secondary schools in Bungoma County. Purposive sampling was used to select 65 Principals, 120 secondary school agriculture teachers and 780 Form Three agriculture students as respondents for the study. A questionnaire was used to collect information from the agriculture teachers and school Principals. An observation checklist was used to ascertain the state of ICT in the schools and a discussion guide was used for the focus group discussion with students of agriculture. To establish reliability of the instruments a pilot study was carried out using 30 secondary school agriculture teachers, 10 school Principals and 120 Form Three agriculture students selected through purposive sampling technique in Kakamega County. Validity of the instruments was established by the supervisors from the Department of Agricultural Education and Extension at Egerton University. Quantitative data were coded and analyzed using the Statistical Package for Social Sciences. Qualitative data was analyzed using document report analysis. The results were presented in frequencies, means and percentages. The study established that the perception of agriculture teachers, head teachers and students towards the use of ICT in teaching was positive. The study established that few teachers used ICT in teaching of agriculture as compared to other subject[129].

2.3.2 Email and Agricultural Science Achievement

Email has become a widely adopted communication tool in various educational settings, including agricultural science. Its impact on student achievement has been a subject of interest among researchers and educators. The use of email in agricultural education offers unique opportunities for communication, collaboration, and information exchange. Email enables efficient and timely communication between students and teachers in agricultural science. Students can seek clarification, ask questions, and engage in discussions with instructors beyond the confines of the classroom. Moreover, email allows teachers to provide timely feedback, share additional resources, and address individual student needs, which can positively impact student achievement in agricultural science

The study on Gender and Performance Expectancy of Agriculture Teachers towards ICT Integration was investigated .The study was a descriptive correlational study employing quantitative approach in data collection. A census of 314 agriculture teachers was a target population for the study and 284 responded to the questionnaires that were used to collect data. Descriptive statistics and correlations were used to analyse data. Findings revealed a negligible to low positive association between gender and performance expectancy of agriculture teachers towards ICT integration in teaching secondary school agriculture. There was no significant difference between male and female agriculture teachers in their performance expectancy towards ICT integration in teaching. The ICT integration competency possessed by agriculture teachers has contributed to positive perception and usefulness in job performance. It was recommended that teacher education institutions should be informed to include ICT integration in teaching as a major component of

instructional delivery strategy so that both male and female teachers are competent when they graduate[130].

2.3.3 Radio Programme and Agricultural Science Achievement

Empirically, radio is capable of delivering high quality educational program to highly diversified audience located across broad geographical expanses-all at a low per unit production cost. Also, United Kingdom Universities have demonstrated that when used as supplementary learning tools, they benefit weaker students. The Agency for International Development has shown educational radio and television to be more cost effective and capable of exerting greater learning effect on secondary school students than textbook or teacher education. Furthermore, the study showed that teachers' attitudes towards new educational technologies such as radio and television in process were positive. Similarly, previous found that teachers agreed that the educational radio or television has a positive impact on their experience[125].

Radio is a powerful communication tool that has also proved to be the most effective media in promoting agriculture and development in rural areas. Radio and television are the most effective tools in communication for the support of development. Radio is acknowledged as the most important medium for communicating with the rural populations of developing countries.

In rural development, information and knowledge are two significant factors. Local knowledge provides different ideas for agricultural as well as other changes. The information brought to the area contains fresh ideas, and introduces new opportunities. Knowledge obtained from a specific research can motivate thinking and practices. Among the mass media,

informal education, radio and television have a specific value. Due to their vast use, the media are among the best educational and cultural instruments. Based on their educational requirements different countries can take advantage of radio and television in terms of informal education. On the other hand, the lack of specific research in this field as well as the obligation and commitment of Iran to the World Session of Information Society, which aims at applying information and communication technology in all parts and areas including villages and agricultural affairs, makes conducting this study inevitable[133].

More so, educational radio and television can provide instruction for one group of students whilst the teacher is occupied with another. As a medium that can be listened to in the privacy of one's home or room, they are often the preferred choice for those seeking information on culturally taboo topics such as HIV/AIDS or STDS. Four main advantages of educational radio and television: improve education quality and relevance; lower per student educational costs; Improve access to education particularly for disadvantaged students or groups and; It provides a crystal-clear audio and visual signal, which is particularly important in instructional programs. Therefore, the broadcast media (radio and television) remain a channel that had proven educational worth in terms of both pedagogical importance and geographical reach. Interactive radio instruction (IRI) consists of broadcasting lessons to audience on a daily basis, on a particular topic and aimed at specific level[133].

It provides regular structure assistance to teachers and serves to improve the quality of teachers and serves to improve the quality of teaching and enhance learning. IRI also serves to expand access to education, by bringing ready-made lessons to remote schools and learning centers which have few resources and teachers. It is also a cost-effective means of

delivering educational content to a large number of people. Television lessons can be used to supplement other course materials or can be stand-alone lessons. Such lessons have progressed over the years from simply being television programs showing teachers talking, to being more engaging and interactive programs which incorporate issues relevant to the learners. Educational television programs are often accompanied by printed materials and other resources to enhance learning and interaction. These are mostly practiced in advance country or any civilized world. In Nigeria, the studies showed that although video, radio, and television are the major sources of information for the farmers of this country, in the case of establishing the foundations, it is also possible to use other developed equipment[132].

2.3.4 School Farm (Planting Bed) and Agricultural Science Achievement

Planting beds allow students to apply the theoretical knowledge they acquire in the classroom to real-life situations. They can observe firsthand how agricultural principles, such as soil preparation, plant nutrition, and pest management, impact plant growth and development. This application of knowledge strengthens their understanding and retention of agricultural science concepts. Working with planting beds requires students to analyze, evaluate, and make decisions regarding plant care, crop rotation, and disease management. This fosters critical thinking and problem-solving skills as students encounter challenges and develop strategies to ensure optimal plant growth and productivity. Planting beds often involve group work, encouraging students to collaborate, communicate, and coordinate their efforts. Students learn to work as a team, share responsibilities, and effectively communicate ideas and observations related to the planting beds. These collaborative skills are essential in agricultural science, where teamwork is often required in various contexts

Research titled: Growing minds: the effect of a school gardening program on the science achievements of elementary students was carried out in Texas. A sample of 647 was used for the study. Quasi experimental design was used. Two objectives and one research question were used. Analysis of variance (ANOVA) was used to analyze the data. The result of the study showed that science achievement of students who participated on school gardening program was higher than that of students who did not participate in gardening activities as part of their science curriculum.[131]

Also, a research study titled: Social Benefits of Secondary School Farms in Rivers State, Nigeria was carried out. Three (3) specific objectives and two (2) research questions were stated. 560 samples were used; questionnaire was the instrument for data collection. The data were analyzed using simple percentages. Social benefits derived from school farms among others include enabling students to develop their farming skills, helping students form a useful background as future agriculturalists, helping students appreciate the fact that profitable farming was possible within the provision of available technology[132].

A research study titled: Effects of teaching method on retention of agricultural science knowledge in senior secondary schools of Bauchi Local Government Area, Nigeria was investigated. The study was guided by two research questions, two objectives and three null hypotheses. The pre- test post- test control group quasi-experimental design was employed. The findings revealed that both the two teaching methods (demonstration and discussion)have significant effect on student's retention of Agricultural Science knowledge. Demonstration method was found to be more effective in making the students to remember Agricultural Science knowledge[133].

A research titled: effective utilization of school farm as instructional initiative for developing agricultural interest among primary school children in Nigeria was carried out. Survey design was used for the study, random sampling was used in selecting the population of the study and questionnaire was the instrument for data collection. Mean was used to answer research questions. The finding of the study revealed that school farm add agricultural orientation to children especially those without agricultural background and increased pupils interest in agriculture[134].

2.3.5 School Farm (Livestock Area) and Agricultural Science Achievement

A livestock area provides students with practical, hands-on learning experiences in agricultural science. Working with animals allows students to apply theoretical knowledge, gain practical skills, and understand the intricacies of livestock management, including feeding, breeding, health care, and handling. The presence of a livestock area enables students to develop animal husbandry skills. They learn about proper nutrition, housing requirements, and health management for various livestock species. These skills are crucial for success in agricultural science and can be transferable to careers in animal agriculture or veterinary sciences[134].

Students in a livestock area have the opportunity to observe animal behavior, growth patterns, and reproductive cycles. They can collect data on factors such as weight gain, milk production, or egg production. Analyzing this data enhances their understanding of animal science principles and improves their ability to make informed decisions. Caring for animals in a livestock area requires students to be responsible for their daily care and well-being. They must adhere to feeding schedules, maintain clean living environments, and

monitor animal health. This cultivates a sense of responsibility, time management, and organization skills. Working in a livestock area exposes students to ethical considerations and the importance of animal welfare. They learn about appropriate handling techniques, humane practices, and the ethical implications of livestock production. This knowledge fosters a deeper understanding of responsible animal management and ethical decision-making[133].

"Measures to improve the declining usage and operation of school farm in secondary schools in Ekiti State" was instigated in a research work. It was observed by that only few secondary schools has operational standard school farms, where practical agriculture can be learnt to complement classroom instructions in secondary schools. The main focus of Famiwole (2013) research study was to evolve the measures that can be adopted to improve the declining usage and operation of standard school farm in all secondary schools in Ekiti state. The study was a descriptive survey research. The population used was 160 agricultural science teachers in both public and private secondary schools in the state. Constructed questionnaires were used for generating data. Frequency counts, percentages, ranking order, mean, standard deviation and t-value were used to analyze the data used for the study. The findings of the study revealed that, the major cause in the usage of operational school farm is lack of farm implements. The present research is similar to the past research in the use of school farm[135].

2.4 Conceptual Model

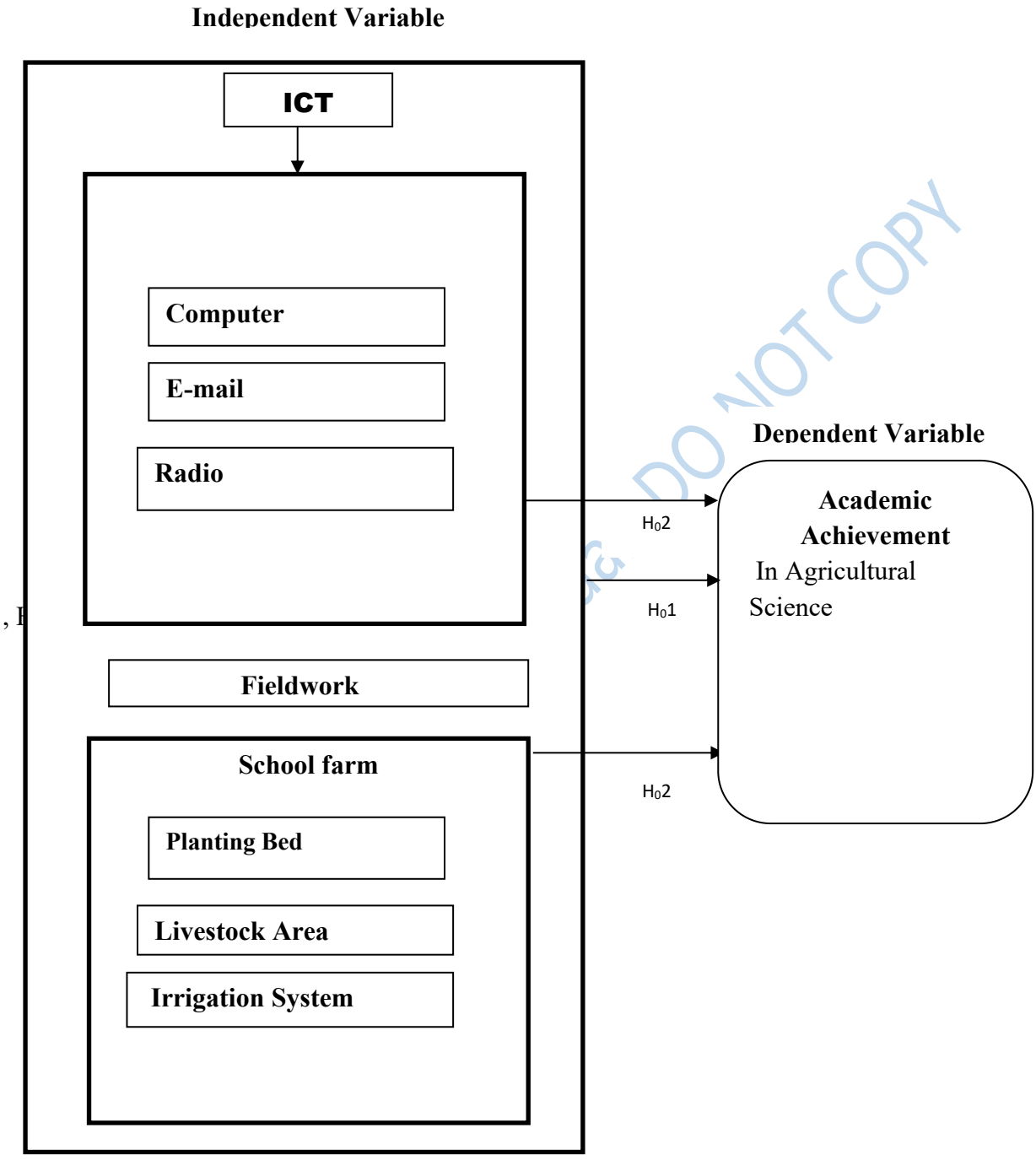

Figure 2.3 : Conceptual Framework of ICT and Fieldwork on Academic Achievement in Agriculture science
Source: This Research Work 2023

2.5 Summary of the Gap in the Literature Reviewed

The review of literature is divided into three sections: conceptual concerns, theoretical framework, and preceding empirical studies. It is self-evident Agricultural science is the study of the relationship between soils, plants and animals in the production and processing of food, fibre, fuel and any other agricultural commodities that have an economic, aesthetic or cultural value. In the National Policy on Education, Agriculture is one of the subjects offered in Junior and Senior Secondary Schools, as a pre-vocational elective and vocational elective respectively.[136] The curriculum content of the senior school level was structured to focus on three major areas: production (food production), projection (agronomy and forestry) and economics (agricultural economics and farm management). 'Guided Discovery' a method that lays emphasis on learning by doing was recommended in the curriculum to enable the students explore and harness the agricultural resources within their local environment. Agricultural science subject is special in comparison with other subjects in that it cannot be learned solely in the field or solely in the classroom. Practical teaching and learning such as traditional apprenticeship learning should ideally be complemented by more formal learning.[137]

The theoretical framework comprises The Theory of Planned Behaviour (TPB), Technological Pedagogical Content Knowledge) model as well as Piaget cognitive theory of learning. It is clear from the literature that a well-facilitated ICT classroom and articulated school fieldwork enhances student academic performance in Agricultural science.

The present day, students are maturing with visual devices like television, video, computer and internet. It is not possible to draw these students interest by using traditional method that were used in the past. As a result of technological developments that appeared in

the last quarter of the 20th century, a big difference occurred between the ways of introduction of knowledge at schools and the ways of getting knowledge in the society. Students get a lot of information by visually enriched resources like computers and televisions that are mostly used in our daily life. The way of gaining knowledge of students through various audio devices are many and so it becomes difficult to teach them with traditional methods,

The rapid spread of ICT applications which have brought drastic technological, social and economic transformations. These changes have caused educational institutions, administrators, teachers to rethink their roles, teaching and vision for the future. Computer-assisted programs can be characterized by many attributes suitable to enhance learning. Some of the special characterized of CAI includes; Individualization, Flexibility, Self Pacing and Remediation Options

Conceptual frameworks of influence of fieldwork on academic performance of student in agricultural science focused on concept of school farm, The purpose of school farm includes: To provide meaningful and life like experiences to the students which will assist in developing operational and managerial skill which the real farmers must have, to demonstrate recommended practices on the school farm. This will be useful to the students and to the community, to provide experiences in cooperation to the students, to provide the opportunity for conducting individual farming programmes for boys who have inadequate facilities elsewhere.

Many writers centered their investigations on specialized subjects other than Agricultural science, according to both theoretical and empirical data. This is mostly owing to their conceptual and computational areas of interest. Previous studies, such as those conducted,

compared one or two factors other than the ones included in this study to their study's accomplishment. As a result, no previous research has looked at the two variables of ICT indices and fieldwork indices as predictors of academic success in secondary school Agricultural science in a single study like this one. This is a void that this research aims to fill. It is this gap that arouses the researcher's interest to undertake a study on influence of ICT and Fieldwork on Senior Secondary School Students Academic Achievement in Agricultural Science in Oyo Central senatorial District, Area of Oyo State, Nigeria.

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Chapter Three

Methodology

The procedures adopted in carrying out this study are presented in this chapter under the following sub-headings; research design; population of the study; sample and sampling technique; sample size; method of data collection; research instruments; method of data analysis.

3.1 Research Design

The descriptive survey design was used to carry out the study. The design allowed data to be collected from a small sample of the target population to enable the researcher to describe in a systematic manner the characteristic features and facts about the phenomena examined in

the study. The descriptive survey research design was used because the variables under consideration were not manipulated as they were already existing.

3.2 Population of the Study

This study focused on the population of SS2 students enrolled in Agricultural Science across public senior secondary schools within the Oyo Central Senatorial District Area of Oyo State. The study encompasses eleven local government areas, namely Afijio, Atiba, Akinyele, Oyo East, Oyo West, Lagelu, Egbeda, Ogo-Oluwa, Oluyole, Ona Ara, and Surulere, making the total student population 924.

Table 3.1 Population Distribution

S/N	Selected Schools	Number of SS 2 Agric Students
1	Ogbomosho Grammar School	80
2	Baptism Secondary School Ogbomosho	70
3	Olivet High School, Oyo	78
4	Anglican Methodist School Ajagba, Oyo	65
5	Ladigbolu Grammar School, Oyo	55
6	Ojongbodu Grammar School, Oyo	40
7	Community Grammar School Ilale Oyo, Oyo	50

8	School of Science Oyo	50
9	Ilora Baptism Grammar School, Oyo	65
10	Community Secondary School Ilora Oyo	75
11	Apomode Secondary School Moniya Ibadan	215
12	Akinyele Community Secondary School Ibadan, Oyo State	81
	Total	**924**

Source: Principal's office of each school (2023)

3.3 Sample Size and Sampling Technique

The study utilized a multi-stage sampling technique. In the first stage, six out of the eleven Local Government areas within the Oyo Central Senatorial District were chosen randomly.

In the second stage, within each selected Local Government area, one secondary school was chosen based on specific criteria: the selected schools had to have a minimum establishment history of 55 years, a proven accreditation history of 25 years for WAEC, employ graduate agric science teachers, and be of a mixed-gender composition. This process yielded a total of six secondary schools. Finally, in the third stage, the sample size for each of these six selected secondary schools was determined proportionally based on the individual school's population size. Based on the above criteria, the following schools were selected.

Table 3.2 Sample Distribution

S/N	Selected Schools	Number of SS 2 Agric Students
1	Baptism Secondary School Ogbomosho	70

2	Olivet High School, Oyo	78
3	Anglican Methodist School Ajagba, Oyo	65
4	Ladigbolu Grammar School, Oyo	55
5	Ilora Baptism Grammar School, Oyo	65
6	Akinyele Community Secondary School Ibadan, Oyo State	81
	Total	**414**

Source: Principal's office of each school (2023)

3.4 Method of Data Collection

The method of data collection is both primary and secondary sources. The primary sources employed the use of questionnaires. The questionnaires were personally administered to the people in their various secondary schools. An explanation was given to them on what they are expected to do and collection of data made on the spot to avert loss of questionnaires since most respondents are itinerant.

3.5 Description of Research Instruments

The instruments for this study are ICT and Fieldwork Questionnaire (IFQ) and Agric Science Achievement Test (AAT). The IFQ is a structured tool designed to collect data on various aspects related to ICT, fieldwork, and their influence on the academic achievement of senior secondary school students in Agricultural Science.

The research instrument used in this study is the ICT Field Work Questionnaire (IFQ). The IFQ is designed to gather data for a research study assessing the influence of ICT (Information

and Communication Technology) and fieldwork on the academic achievement of senior secondary school students in Agricultural Science in the Oyo Central Senatorial District of Oyo State.

Section A: Socio-demographic Characteristics of Respondents This section collects socio-demographic information from the respondents, including the name of their school, school type (private or public), school location (rural or urban), age, gender, and educational qualifications.

Section B: Significance of ICT in Enhancing Agricultural Science Education This section addresses the importance of Information and Communication Technology (ICT) in improving the quality of teaching and learning in agricultural science. Participants are requested to express their agreement with these statements by choosing from response options such as Strongly Agree, Agree, Disagree, and Strongly Disagree. These statements cover various aspects of ICT use in education, such as the utilization of computers, email, and radio. Section B comprises items 1 to 19 of the survey.

Section C: Accessibility and Utilization of School Agricultural Farms and Fieldwork This section evaluates the presence and utilization of agricultural farms or fieldwork within schools for teaching agricultural science. It includes statements related to how teachers make use of school farms, the existence of standardized school farms, and the impact of these farms on teaching and students' comprehension. Respondents are asked to indicate their level of agreement or disagreement with these statements. Section C encompasses items 20 to 29 of the questionnaire.

Section D: Challenges Associated with School Agricultural Fieldwork This section delves into the challenges associated with agricultural fieldwork at schools and its effect on students' academic performance. It includes statements addressing issues like land scarcity, the absence of farm managers, and the distance of school farms from the school premises. Participants are requested to specify their agreement or disagreement with these statements. Section D comprises items 30 to 34 of the survey.

Agricultural Achievement Test (AAT): Multiple-Choice Questions the AAT consists of multiple-choice questions sourced from WAEC standard questions, aligning with the SS 2 curriculum. Respondents are required to select the correct answer from the provided options labeled A to E. The AAT covers a broad spectrum of topics related to agricultural science, encompassing subjects such as soil erosion, animal husbandry, livestock management, and agricultural practices. Participants' performance on this test offers insights into their understanding and knowledge of agricultural concepts.

This instrument is designed to assess the academic achievement of respondents in the field of agricultural science and can be useful for research aimed at understanding the level of knowledge and expertise among students or individuals in this domain.

3.6 Validity of the Research Instrument

The face content validity of the instruments was ascertained through the approval of the supervisor. The initial draft of the instrument, with the objectives of the study was given to the supervisor for his critique and inputs. And two other lecturers from the department of science Lead City University Ibadan. The inputs reflected in the final draft of the instrument as presented in appendix

3.7 Reliability of the Research instruments

The instruments were administered within a two-week interval. The scores obtained from these administrations underwent a test-retest analysis to establish the instrument's reliability for the study. Specifically, the questionnaire's reliability was assessed using Cronbach's Alpha, yielding a result of 0.817, while the Kuder-Richardson KR20 method was employed to evaluate the reliability of the Agricultural Achievement Test (AAT), which measured academic achievement in agriculture and yielded a result of 0.881.

3.8 Method of Data Analysis

The data were analyzed through the utilization of descriptive statistics, including percentages and frequency, as well as multiple regression analysis.

Endnotes

1. S. K. Jilcha, *Research Design and Methodology*, **Rijeka**, 2019.
2. C. Kajohnsak & N. Sintao. "*Sample Size Estimation Using Yamane and Cochran and Krejcie and Morgan and green Formulas and Cohen Statistical Power Analysis by G* Power and Comparisions*." **Apheit International Journal,** (10)2, 2021, 76-86.

Chapter Four

Results and Discussion

The purpose of this study was to determine influence of ICT and field work on senior secondary school students' academic achievements in Agricultural Science in Oyo Central Senatorial District, Oyo State**.** This chapter therefore deals with the presentation of data analysis for the study. The results were presented in tables on the basis of the research questions and null hypotheses formulated for the study. Descriptive statistics of percentage mean and frequency were used to answer the research questions while multiple regression

analysis was used to test the null stated hypotheses at a 0.05 level of significant. The findings were outlined and discussed accordingly.

4.1 Demographic Profile of the Participants

4.2.1: Gender of the Respondents

The study sought information on gender of the respondents. Table 4.1 presents a summary of the gender distribution for all the categories.

Table 4.1: Frequency Distribution of Respondens of Gender

Table 4.1: Demographic Characteristics of Gender	N	Total (%)
Male	139	33.6
Female	275	66.4
Total	414	100.00

Source: Fieldwork, 2024

Table 4.1 illustrates the demographic distribution of respondents based on gender. Out of the total 414 respondents surveyed, 139 were male, constituting approximately 33.6% of the total sample. On the other hand, the majority of respondents, totaling 275, were female, representing approximately 66.4% of the total sample. This gender distribution provides insights into the composition of the surveyed population, indicating a higher representation of females compared to males.

4.2.3 Age of the Respondents

The study sought information on age of respondents. Table 4.2 presents a summary of distribution table for all the age groups.

Table 4.2: Demographic Characteristics of Respondents' Age

Age Group	Frequency	%
12-15 years	162	391
16-25 years	231	55.8
26-35 Years	21	5.1
35-45 Years	0	0
46-55 Years	0	0
56 years Above	0	0
Total	414	100

Source: Fieldwork, 2024

Table 4.2 presents the demographic characteristics of respondents' age in a study. The table is divided into different age groups, ranging from 12 to 56 years and above. The majority of respondents, constituting 55.8%, fall within the age range of 16 to 25 years. The next largest group comprises individuals aged 12 to 15 years, accounting for 39.1% of the total respondents. There is a smaller representation of respondents in the age group of 26 to 35 years, making up 5.1% of the total. Interestingly, there are no respondents in the age categories of 35-45 years, 46-55 years, or 56 years and above.

4.2 Analysis of Research Questions

Research Question 1 What is the availability level of ICT facilities in teaching Agricultural Science in Oyo central Senatorial District ?

Table 4.3: Descriptive Statistics on Availability Level of ICT Facilities in Teaching Agricultural Science

S/N	Statement	A (%)	NA (%)	N	Mean	Std. Dev	Remark
1	My school is equipped with computer system	136 (32.9)	278 (67.1)	414	1.351	0.432	LE
2	There is internet connectivity in my school	144 (34.8)	270 (65.2)	414	1.873	0.552	ME
3	Students and Teachers are allowed to use the internet facilities in my school	168 (40.6)	246 (59.4)	414	1.774	0.456	ME
4	The I.C.T centre in my school is equipped with computers and other I.C.T relevant facilities	163 (39.4)	251 (60.6)	414	2.003	0.567	ME
5	The use of computers and internet connectivity is taught in my school	189 (45.7)	225 (54.3)	414	1.876	0.674	ME
	Weight Mean				**1.975**		***Moderate Extent***

Source: Fieldwork, 2024

R: Remarks; A%: Percentage Available; NA%: Percentage Not Available VHE: Very High Extent (3.50 – above); HE: High Extent (2.5.00-3.49); ME: Moderate Extent (1.50-2.49); LE: Low Extent (Below 1.49)

Table 4.3 provides descriptive statistics regarding the availability level of ICT (Information and Communication Technology) facilities in teaching Agricultural Science. The first statement assesses the presence of computer systems in schools. Among the respondents, 32.9% indicated that their schools are equipped with computer systems, while 67.1% reported the absence of such facilities. The mean score for this statement is 1.351 ($\bar{x}$ = 1.351), suggesting a low extent (LE) of availability. This implies that, on average, computer systems are available to a limited extent in the surveyed schools. The second statement examines the

existence of internet connectivity in schools. According to the data, 34.8% of respondents confirmed the presence of internet connectivity, while 65.2% stated its absence. The mean score for this statement is 1.873 ($\bar{x}$ = 1.873), categorized as a moderate extent (ME). This indicates that, on average, internet connectivity is available to a moderate extent in the surveyed schools. Furthermore, the third statement investigates whether students and teachers are permitted to use internet facilities in schools. Among the respondents, 40.6% affirmed such permission, while 59.4% indicated otherwise. The mean score is 1.774 ($\bar{x}$ = 1.774), also classified as a moderate extent (ME). This suggests that, on average, permission for internet use is granted to a moderate extent in the surveyed schools. Additionally, the fourth statement evaluates the equipment in the I.C.T centers, with 39.4% affirming the presence of computers and other relevant facilities, while 60.6% reported their absence. The mean score for this statement is 2.003 ($\bar{x}$ = 2.003), falling within the moderate extent (ME). This implies that, on average, the I.C.T centers are equipped to a moderate extent. Moreover, the fifth statement explores whether the use of computers and internet connectivity is taught in schools. Among the respondents, 45.7% confirmed that it is taught, while 54.3% reported otherwise. The mean score is 1.876 ($\bar{x}$ = 1.876), also categorized as a moderate extent (ME). This indicates that, on average, the teaching of computers and internet connectivity occurs to a moderate extent in the surveyed schools. The weighted mean score for all items combined is 1.975 ($\bar{x}$ = 1.975), suggesting a moderate extent (ME) of availability for various ICT facilities. This indicates that, on average, respondents perceive the availability of ICT facilities to be moderately significant in teaching Agricultural Science.

Research Question 2: What are the challenges of ICT facilities (Computer, E-mail and Radio) in teaching Agricultural Science**?**

Table 4.5: Descriptive Statistics on Challenges of ICT Facilities (Computer, E-mail and Radio) in Teaching Agricultural Science in Oyo central Senatorial District.

S/N	Statement	Mean	Rank
1	Epileptic power supply impedes the use of I.C.T in school.	3.45	1st

2	The relative expensiveness of the I.C.T gadgets also impedes I.C.T usage in school.	2.873	3rd
3	Lack of maintenance culture in Nigeria is another factor that militates against the usage of I.C.T in school.	2.874	2nd
4	Lack of computer and internet affect education among students and teachers.	2.003	4th
5	Inadequate usage of computer and internet among students and teachers	1.876	5th

Source: Fieldwork, 2024

Table 4.5 outlines the perceived challenges associated with ICT usage in schools, providing valuable insights into the obstacles faced in integrating ICT into educational practices. The findings reveal a range of challenges, each with varying degrees of impact on ICT usage in school settings. "Epileptic power supply" emerges as the most significant challenge, with a mean score of 3.45, indicating that respondents perceive power supply issues as the primary obstacle to ICT usage in schools. This challenge is followed closely by "Lack of maintenance culture in Nigeria," which received a mean score of 2.874, highlighting the importance of proper maintenance practices in ensuring the effective functioning of ICT infrastructure. Additionally, the relative expensiveness of ICT gadgets is identified as a significant impediment, with a mean score of 2.873. This underscores the financial barriers that schools may face in acquiring and maintaining ICT equipment, limiting their usage in educational settings. Furthermore, the lack of computers and internet access is recognized as a notable challenge, albeit to a lesser extent compared to power supply and maintenance issues. This

suggests that while access to ICT resources is essential, other factors such as power supply and maintenance may have a more significant impact on ICT usage in schools. Finally, inadequate usage of computers and the internet among students and teachers is identified as a challenge, albeit with the lowest mean score of 1.876. This indicates that while usage levels may contribute to the overall effectiveness of ICT integration, they are perceived as less critical compared to other challenges such as infrastructure and maintenance issues. These findings highlight the multifaceted nature of challenges associated with ICT usage in schools, emphasizing the need for comprehensive strategies to address barriers such as power supply, maintenance, affordability, and usage levels. In comparison to other studies, these findings align with existing literature on the challenges of ICT integration in education, providing valuable insights for educators, policymakers, and stakeholders striving to promote effective ICT usage in schools.

Research Question 3: What is the availability level of Fieldwork (Planting bed, Livestock Area) in teaching Agricultural Science in Oyo central Senatorial District **?**

To answer the Research question 4 above Table 4.6 below is used.

Table 4.6: Descriptive Statistics on Availability Level of Fieldwork (Planting Bed, Livestock Area) in Teaching Agricultural Science

S/N	Statement	A%	NA%	N	Mean	Std. Dev	Remark

1	Availability of school Agricultural farm/field work used in teaching agricultural science in the school	291 (70.3)	123 (29.7)	414	3.142	0.452	HE
2	Teachers make use of the school farm while teaching agricultural Science	296 (71.5)	118 (28.5)	414	3.023	0.4781	HE
3	Teachers are reluctant to use the school farm while teaching agricultural science	78 (18.8)	336 (81.2)	414	1.023	0.432	LE
4	My school is equipped with Standard School farm within school premises	303 (73.2)	111 (26.8)	414	2.678	0.523	HE
5	My school is equipped with Standard School farm outside school premises	57 (13.8)	357 (86.2)	414	1.003	0.421	LE
	Weight Mean				**2.1734**		**Moderate**

Source: Field Work, 2024

R: Remarks; A%: Percentage Available; NA%: Percentage Not Available VHE: Very High Extent (3.50 – above); HE: High Extent (2.5.00-3.49); ME: Moderate Extent (1.50-2.49); LE: Low Extent (Below 1.49)

Table 4.6 provides descriptive statistics on the availability level of fieldwork areas (Planting bed, Livestock Area) in teaching Agricultural Science. The first statement assesses the availability of the school's Agricultural farm or fieldwork used for teaching agricultural science. Among the respondents, 70.3% affirmed the availability of these facilities, while 29.7% reported their absence. The mean score for this statement is 3.142 ($\bar{x}$ = 3.142), categorized as a high extent (HE). This suggests that, on average, Agricultural farms or fieldwork are readily

available for teaching Agricultural Science in the surveyed schools. The second statement explores whether teachers make use of the school farm while teaching agricultural science. According to the data, 71.5% of respondents indicated that teachers utilize the school farm, while 28.5% stated otherwise. The mean score for this statement is 3.023 ($\bar{x}$ = 3.023), also falling within the high extent (HE). This implies that, on average, teachers actively utilize the school farm for teaching Agricultural Science. Furthermore, the third statement examines teachers' reluctance to use the school farm while teaching agricultural science. Among the respondents, 18.8% acknowledged such reluctance, while 81.2% did not observe this behavior. The mean score is 1.023 ($\bar{x}$ = 1.023), categorized as a low extent (LE). This suggests that, on average, there is a low extent of reluctance among teachers to use the school farm for teaching Agricultural Science. Additionally, the fourth statement evaluates whether the school is equipped with a Standard School farm within school premises. Among the respondents, 73.2% confirmed the presence of such facilities, while 26.8% reported their absence. The mean score for this statement is 2.678 ($\bar{x}$ = 2.678), categorized as a high extent (HE). This indicates that, on average, Standard School farms within school premises are available for teaching Agricultural Science. Moreover, the fifth statement investigates the availability of a Standard School farm outside school premises. According to the data, 13.8% of respondents stated the presence of such facilities, while 86.2% indicated their absence. The mean score is 1.003 ($\bar{x}$ = 1.003), categorized as a low extent (LE). This suggests that, on average, Standard School farms outside school premises are not readily available for teaching Agricultural Science. The weighted mean score for all items combined is 2.1734 ($\bar{x}$ = 2.1734), indicating a moderate (ME) of availability of fieldwork areas in teaching Agricultural Science. This suggests that, on

average, respondents perceive these facilities to be significantly available for enhancing Agricultural Science education.

Research Question 4: What is the relevancy level of Fieldwork (Planting bed, Livestock Area) in teaching Agricultural Science in Oyo central Senatorial District**?**

Table 4.7: Descriptive Statistics on relevancy level of Fieldwork (Planting bed, Livestock Area) in teaching Agricultural Science

S/N	Items	A%	NA%	N	Mean	Std. Dev	Remark

1	School farm makes teaching of agriculture easy	221 (79.1)	193 (20.9)	414	3.672	0.435	VHE
2	The school farm help students develop better understanding of Agricultural concepts	215 (78.5)	199 (21.5)	414	3.682	0.542	VHE
3	Teaching agricultural science in the school farm enhances effective teaching	243 (81.5)	171 (18.5)	414	2.871	0.523	HE
4	Engaging in practical lessons improve students' academic performance	260 (83.3)	154 (16.7)	414	2.672	0.456	HE
5	School farm arose student interest	251 (82.4)	163 (17.6)	414	3.031	0.523	HE
	Weight Mean				**3.186**		**High Extent**

Source: Field Work, 2024.

R: Remarks; A%: Percentage Available; NA%: Percentage Not Available VHE: Very High Extent (3.50 – above); HE: High Extent (2.5.00-3.49); ME: Moderate Extent (1.50-2.49); LE: Low Extent (Below 1.49)

Table 4.7 presents descriptive statistics on the relevancy level of fieldwork areas (Planting bed, Livestock Area) in teaching Agricultural Science. The first item examines how the school farm contributes to the ease of teaching agriculture. Among respondents, 79.1% agreed that the school farm facilitates easy teaching, while 20.9% did not. The mean score for this statement is

3.672 ($\bar{x}$ = 3.672), indicating a very high extent (VHE) of relevancy. This suggests that, on average, respondents perceive the school farm as highly conducive for teaching Agricultural Science. The second item investigates how the school farm aids in students' understanding of Agricultural concepts. According to the data, 78.5% of respondents believe that the school farm enhances students' understanding, while 21.5% do not. The mean score for this statement is 3.682 ($\bar{x}$ = 3.682), also falling within the very high extent (VHE) category. This implies that, on average, respondents consider the school farm highly relevant in fostering students' comprehension of Agricultural concepts. Furthermore, the third item evaluates whether teaching Agricultural Science in the school farm enhances effective teaching. Among respondents, 81.5% agreed with this statement, while 18.5% disagreed. The mean score is 2.871 ($\bar{x}$ = 2.871), categorized as a high extent (HE). This suggests that, on average, teaching Agricultural Science in the school farm is perceived as highly effective by respondents. Additionally, the fourth item examines whether engaging in practical lessons improves students' academic performance. According to the data, 83.3% of respondents affirmed the positive impact of practical lessons, while 16.7% did not. The mean score for this statement is 2.672 ($\bar{x}$ = 2.672), also falling within the high extent (HE) category. This implies that, on average, respondents believe that practical lessons contribute significantly to students' academic performance. Moreover, the fifth item explores whether the school farm arouses student interest. Among respondents, 82.4% stated that the school farm does indeed arouse student interest, while 17.6% disagreed. The mean score is 3.031 ($\bar{x}$ = 3.031), categorized as a high extent (HE). This suggests that, on average, respondents perceive the school farm as highly effective in stimulating student interest in Agricultural Science. The weighted mean score for all items combined is 3.186 ($\bar{x}$ = 3.186), indicating a very high extent (VHE) of

relevancy of fieldwork areas in teaching Agricultural Science. This implies that, on average, respondents consider fieldwork areas to be highly relevant in enhancing Agricultural Science education.

Research Question 5: What are the challenges of Fieldwork (Planting bed, Livestock Area) in teaching Agricultural Science in Oyo central Senatorial District**?**

To answer the Research question 6 above Table 4.8 below is used.

Table 4.8: Descriptive Statistics on Challenges of Fieldwork (Planting Bed, Livestock Area) in Teaching Agricultural Science

S/N	Items	Mean	Rank
1	Scarcity of land	1.945	3rd
2	Lack of farm manager affect school farm	2.324	2nd
3	Lack of qualified teachers to teach Agric science	1.123	5th
4	Lack of school planning	2.567	1st
5	School farm too far from the school	1.783	4th

Source: Fieldwork, 2024

Table 4.8 presents the mean scores and ranks for various challenges encountered in teaching Agricultural Science. Among the listed challenges, "Lack of school planning" received the highest mean score of 2.567, positioning it first in rank. This indicates that respondents perceive the absence or inadequacy of proper planning as the most significant challenge

affecting agricultural education in schools. Following closely is the challenge of "Lack of farm manager affecting the school farm," which obtained a mean score of 2.324, securing the second position in rank. This underscores the importance of effective farm management in ensuring the smooth functioning of school farms. "Scarcity of land" garnered a mean score of 1.945, ranking it third. While land scarcity is acknowledged as a challenge, it is perceived to be relatively less significant compared to other factors such as school planning and farm management. Additionally, "School farm too far from the school" received a mean score of 1.783, placing it fourth in rank. This highlights the impact of geographical distance on agricultural education but suggests it is of lesser concern compared to other listed challenges. Finally, "Lack of qualified teachers to teach Agricultural Science" obtained the lowest mean score of 1.123, positioning it fifth in rank. While the availability of qualified teachers is recognized as a challenge, it is perceived to be the least significant among the factors listed. In conclusion, the findings underscore the multifaceted challenges faced in teaching Agricultural Science, with school planning and farm management emerging as primary concerns. Addressing these challenges is crucial for enhancing the effectiveness of agricultural education in schools.

4.2 Research Hypotheses

$H_0$1: There will be no significant combined influence of ICT facilities and fieldwork on students' academic Achievement in teaching Agricultural Science in Oyo central Senatorial District

Table 4.9: Joint Influence of ICT facilities (Computer, Email and radio) and Fieldwork Variables (Planting bed, Livestock Area and Irrigation System) on Students' Academic Achievement in Teaching Agricultural Science

R	R Square	Adjusted R Square	Std. Error of the Estimate
.407	.164	.158	8.6335

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	2046.328	2	407.721	6.511	.000
Residual	8665.865	412	57.593		
Total	10712.193	414			

Source: Fieldwork, 2024

In Table 4.9, the analysis delves into the combined impact of ICT facilities, encompassing Computer, Email, and Radio usage, alongside Fieldwork Variables such as Planting Bed, Livestock Area, and Irrigation System, on students' academic performance in Agricultural Science. The multiple correlation coefficient (R) stands at 0.407, revealing a moderate positive correlation between these factors and students' academic achievement. This implies that around 40.7% of the variability observed in students' academic performance can be elucidated by considering both ICT facilities and fieldwork variables. With an Adjusted R^2 of 0.158, approximately 15.8% of the variation in students' academic achievement is clarified by the

joint influence of ICT facilities and fieldwork variables. The standard error of the estimate, which measures the average deviation between the observed and predicted values by the regression model, is reflected as 8.6335. This figure provides an indication of the accuracy of the model's predictions, with lower values suggesting a better fit of the model to the data. Moving on to the ANOVA table, it offers a deeper understanding of the statistical significance of the regression model. Here, the F-statistic of 6.511 with a corresponding p-value of .000 indicates a statistically significant relationship between the predictors (ICT facilities and fieldwork variables) and students' academic achievement. In other words, the regression model, collectively considering these variables, serves as a meaningful predictor of students' academic performance in Agricultural Science. The F-statistic is presented as $F(_{2, 214}) = 6.511$, providing additional context by specifying the number of predictors in the model and the degrees of freedom associated with it. With a p-value below the conventional significance threshold of 0.05, the model's significance suggests that the ICT facilities and fieldwork variables considered jointly contribute to explaining variations in students' academic achievement, warranting further exploration and consideration in educational practice and policy.

$H_0$2: There will be no significant relative influence of ICT facilities and fieldwork on students' academic Achievement in teaching Agricultural Science in Oyo central Senatorial District

Table 4.11: Relative Contribution of ICT facilities (Computer, Email and radio) and Fieldwork Variables (Planting bed, Livestock Area and Irrigation System Influence on Students' Academic Achievement in Teaching Agricultural Science

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	25.328	2.813		16.049	.000
Computer	3.961	1.359	.106	2.843	.015
Email	4.125	.788	.593	5.503	.000
Radio	-3.215	1.036	.335	-3.681	.000
Planting Bed	.048	.017	.710	2.450	.000
Livestock	.996	.019	.601	3.389	.000
Irrigation System	-.009	.017	-.023	-.513	.507

Source: Fieldwork, 2024

Table 4.12 provides insights into the relative contribution of ICT facilities, including Computer, Email, and Radio, as well as Fieldwork Variables like Planting Bed, Livestock Area, and Irrigation System, on students' academic achievement in teaching Agricultural Science. The unstandardized coefficients represent the change in the dependent variable for a one-unit change in the independent variable, holding other variables constant. The constant term,

indicating the predicted value of the dependent variable when all independent variables are set to zero, is noted as 25.328. For the Computer variable, the unstandardized coefficient (B) is 3.961, with a standard error of 1.359. The standardized coefficient (Beta) of 0.106 suggests that for every one-unit increase in Computer usage, there is a 0.106 standard deviation increase in students' academic achievement. This relationship is statistically significant, with a t-value of 2.843 and a p-value of 0.015 ($p < 0.05$), indicating the importance of Computer usage in enhancing academic performance. Moving on to the Email variable, it exhibits a higher influence, with an unstandardized coefficient of 4.125 and a standard error of 0.788. The standardized coefficient (Beta) of 0.593 indicates a stronger impact of Email usage on students' academic achievement. This relationship is highly significant, with a t-value of 5.503 and a p-value of 0.000 ($p < 0.05$), underscoring the significance of Email in academic improvement. Conversely, the Radio variable demonstrates a negative influence, with a unstandardized coefficient of -3.215 and a standardized coefficient (Beta) of 0.335. This suggests that increased Radio usage is associated with decreased academic achievement among students. The relationship is statistically significant, with a t-value of -3.681 and a p-value of 0.000 ($p < 0.05$), highlighting the adverse effect of Radio usage on academic performance. Furthermore, the Fieldwork Variables show significant contributions. The Planting Bed variable exhibits a positive influence, with a standardized coefficient (Beta) of 0.710, indicating that higher Planting Bed usage correlates with increased academic achievement. Similarly, the Livestock variable shows a positive influence, with a standardized coefficient of 0.601. Both relationships are highly significant, with respective t-values of 2.450 and 3.389, and p-values of 0.000 ($p < 0.05$), emphasizing the importance of these fieldwork activities in enhancing academic performance. However, the Irrigation System variable does not significantly impact students'

academic achievement, as indicated by its non-significant p-value of 0.507 ($p > 0.05$), suggesting that its inclusion may not be meaningful in predicting students' academic performance in teaching Agricultural Science.

4.3 Discussion of Findings

The demographic findings from Tables above shed light on the characteristics of the respondents in the study, providing valuable insights into the composition of the surveyed population. The gender distribution among the respondents. It reveals that out of the total 414 respondents surveyed, there were 139 males, accounting for approximately 33.6% of the total sample. In contrast, the majority of respondents, totaling 275, were females, representing approximately 66.4% of the total sample. This gender distribution indicates a higher representation of females compared to males in the study cohort. Moving on to Table 4.2, which presents the demographic characteristics of respondents' age, we observe a diverse distribution across different age groups. The majority of respondents, constituting 55.8% of the total sample, fall within the age range of 16 to 25 years. This finding suggests that a significant portion of the respondents are young adults or college-aged individuals. The next largest group comprises individuals aged 12 to 15 years, accounting for 39.1% of the total respondents. This age group likely includes adolescents and younger teenagers, indicating a broad age range among the surveyed population. Interestingly, there is a smaller representation of respondents in the age group of 26 to 35 years, making up only 5.1% of the total sample. This suggests a relative scarcity of respondents in the mid-range adult age group, possibly indicating a focus on younger individuals in the study. Furthermore, it is noteworthy that there are no respondents in the age categories of 35-45 years, 46-55 years, or 56 years and above. This absence of

respondents in the older age brackets may reflect the targeted demographic or recruitment strategy employed in the study. Overall, the total number of respondents surveyed is 414, representing 100% of the sample population. These demographic findings provide important contextual information about the composition of the surveyed population, which is crucial for understanding the generalizability and interpretation of the study's results.

The availability level of ICT facilities for teaching Agricultural Science. The data reveal varying extents of availability across different components. For instance, while computer systems are reported to be available to a limited extent (LE) in schools, internet connectivity and permission for its use are rated moderately (ME). Similarly, the presence of computers and other relevant facilities in ICT centers is perceived to be moderately available (ME). Additionally, the teaching of computers and internet connectivity is also perceived to occur to a moderate extent (ME) in schools. The weighted mean score suggests an overall moderate extent (ME) of availability for ICT facilities, indicating their perceived significance in teaching Agricultural Science, albeit to a moderate degree. In comparing these findings with other studies, it's evident that the availability of ICT facilities for teaching Agricultural Science varies across different contexts. Similar studies conducted in different regions or countries may report comparable trends in the availability and utilization of ICT resources in educational settings. For example, studies conducted in developed countries may generally report higher levels of availability and integration of ICT facilities in schools compared to those in developing nations. Factors such as government policies, infrastructure development, and funding allocations for education can significantly influence the extent of ICT availability in schools[1,2]. Furthermore, studies focusing on specific aspects of ICT, such as computer

availability, internet connectivity, or the presence of ICT centers, may provide more nuanced insights into the overall landscape of ICT in education[3]. For instance, a study that specifically examines the impact of internet connectivity on educational outcomes may reveal different findings compared to a study that assesses the availability of computer labs in schools. While The availability level of ICT facilities for teaching Agricultural Science in the surveyed schools, it's essential to contextualize these findings within the broader literature on ICT in education. By doing so, researchers can identify common trends, challenges, and best practices related to ICT integration in teaching practices, ultimately informing policy decisions and educational interventions aimed at enhancing the quality of agricultural education worldwide.

The perceived relevance of ICT facilities in teaching Agricultural Science, offering valuable insights into their effectiveness and impact on educational practices. The findings reveal that respondents generally perceive ICT tools, such as computers, email, and radio, as beneficial for enhancing teaching and learning experiences in agricultural science. Firstly, the majority of respondents agree that computer usage enhances teaching and learning effectiveness, indicating a high extent of perceived effectiveness. This suggests that computers are viewed as valuable tools for improving educational processes in agricultural science classrooms. Additionally, respondents acknowledge the role of computers in stimulating student interest and facilitating the utilization of instructional materials, albeit to a moderate extent. Furthermore, the application of computer technology, particularly email usage, is perceived to enhance learning permanence and improve student access to educational resources. Email communication is also recognized as a facilitator of timely feedback and support from teachers, further enhancing its relevance in agricultural science education. Moreover, radio usage is deemed effective in

enhancing the presentation of information to students and contributing to their ability to retain and recall information. Respondents also perceive radio as providing unique perspectives on the subject matter, underscoring its significance in agricultural science education. The weighted mean score suggests a high extent of relevance for ICT facilities in teaching Agricultural Science. This indicates that respondents perceive these tools as highly significant in the educational context, with the potential to enhance teaching and learning experiences in agricultural science classrooms. In relation to other studies, these findings align with existing literature highlighting the importance of ICT integration in education for improving teaching quality, student engagement, and learning outcomes[3]. Similar studies conducted in various educational settings may corroborate these findings, emphasizing the role of ICT tools in enhancing educational practices and fostering student success in agricultural science education[4].

The findings shed light on the complex challenges hindering the successful integration of ICT in educational settings. The identified obstacles, ranging from power supply issues to maintenance culture, resonate with the broader discourse on ICT adoption in schools. "Epileptic power supply" emerges as a prominent concern, echoing findings from previous studies that highlight the impact of inconsistent electricity access on ICT utilization in educational institutions. This finding aligns with research emphasizing the critical role of reliable power infrastructure in supporting effective ICT integration in schools. Similarly, the "Lack of maintenance culture in Nigeria" underscores the significance of proactive maintenance practices in sustaining ICT infrastructure. This challenge resonates with existing literature emphasizing the importance of ongoing technical support and maintenance to ensure the longevity and functionality of ICT resources in educational environments. The perceived

expensiveness of ICT gadgets reflects a common barrier reported in numerous studies, indicating financial constraints as a significant impediment to ICT adoption in schools. This finding underscores the need for sustainable funding mechanisms and investment strategies to address affordability challenges and ensure equitable access to ICT resources for all students and educators. Furthermore, the acknowledgment of the "lack of computers and internet access" as a notable challenge highlights the fundamental importance of basic ICT infrastructure in facilitating effective teaching and learning. While access to ICT resources is essential, this finding suggests that addressing broader systemic issues such as power supply and maintenance may be critical in maximizing the impact of available resources.

The "inadequate usage of computers and the internet among students and teachers" underscores the importance of promoting digital literacy and capacity building initiatives to enhance ICT utilization skills among educational stakeholders. While addressing infrastructure challenges is essential, fostering a culture of ICT competency and integration is equally vital in realizing the full potential of ICT in education. These findings contribute to the existing body of knowledge on ICT integration challenges in education, emphasizing the multifaceted nature of barriers faced by schools[4,5].

The findings offer valuable insights into the availability and utilization of fieldwork areas, such as planting beds and livestock areas, in teaching Agricultural Science. Overall, the results indicate a high extent of availability and utilization of these facilities within the surveyed schools, highlighting their importance in enhancing Agricultural Science education. The high percentage of respondents affirming the availability of Agricultural farms or fieldwork for teaching Agricultural Science underscores the significance of hands-on learning experiences in

agricultural education. This finding aligns with existing research emphasizing the importance of practical, experiential learning opportunities in fostering students' understanding and appreciation of agricultural concepts. Similarly, the high percentage of respondents indicating that teachers actively utilize the school farm for teaching Agricultural Science reflects a proactive approach to integrating practical fieldwork experiences into the curriculum. This suggests that educators recognize the value of outdoor learning environments in complementing traditional classroom instruction and engaging students in meaningful learning activities. The low extent of reported reluctance among teachers to use the school farm further supports the notion that educators are generally receptive to incorporating fieldwork experiences into their teaching practices. This finding is encouraging as it indicates a willingness among teachers to embrace innovative pedagogical approaches and adapt their instructional methods to better meet the needs of students.

Furthermore, the presence of Standard School farms both within and outside school premises highlights the efforts made by educational institutions to provide students with access to well-equipped facilities for practical learning experiences. However, the relatively low extent of availability of Standard School farms outside school premises suggests that there may be limitations in accessing off-site fieldwork areas, which could potentially impact the breadth and depth of students' learning experiences in Agricultural Science. The findings underscore the importance of fieldwork areas in teaching Agricultural Science and highlight the need for continued investment in infrastructure and resources to support hands-on learning opportunities. By providing students with access to well-equipped fieldwork areas and encouraging active engagement in practical learning experiences, educational institutions can enhance the quality

and effectiveness of Agricultural Science education. These findings align with existing literature on the benefits of experiential learning in agricultural education and provide valuable insights for educators, policymakers, and stakeholders seeking to promote innovative teaching practices in this field[5,6].

The findings shed light on the perceived relevance of fieldwork areas, specifically planting beds and livestock areas, in teaching Agricultural Science. The results highlight the overwhelmingly positive perception of these fieldwork areas among respondents, indicating their significant contribution to enhancing Agricultural Science education. The high percentage of respondents agreeing that the school farm facilitates easy teaching underscores the importance of practical learning environments in facilitating effective instruction. This finding aligns with existing research emphasizing the benefits of hands-on learning experiences in promoting student engagement and understanding of subject matter. Similarly, the high percentage of respondents affirming that the school farm enhances students' understanding of Agricultural concepts reflects the value of experiential learning in deepening students' comprehension and retention of course material. This suggests that fieldwork experiences play a crucial role in bridging the gap between theoretical knowledge and practical application in Agricultural Science education. Moreover, the perception that teaching Agricultural Science in the school farm enhances effective teaching further emphasizes the role of fieldwork areas in promoting effective pedagogy. By providing educators with opportunities to engage students in real-world, contextualized learning experiences, school farms contribute to the development of critical thinking, problem-solving, and decision-making skills among students. The positive correlation between engaging in practical lessons and students' academic performance

highlights the educational benefits of hands-on learning experiences. Practical lessons not only reinforce theoretical concepts but also foster a deeper understanding of subject matter and promote active student participation in the learning process. Additionally, the finding that the school farm arouses student interest underscores the role of fieldwork areas in promoting student motivation and enthusiasm for learning. By providing students with opportunities to explore, experiment, and interact with agricultural practices firsthand, school farms stimulate curiosity and cultivate a passion for Agricultural Science. The findings suggest that fieldwork areas play a vital role in enriching Agricultural Science education by providing students with meaningful, experiential learning opportunities. These findings align with existing literature highlighting the benefits of fieldwork experiences in enhancing student learning outcomes and underscore the importance of incorporating practical components into agricultural education curricula[7,8]. By leveraging the potential of fieldwork areas, educators can create dynamic learning environments that foster student engagement, deepen understanding, and cultivate a lifelong appreciation for Agricultural Science.

The findings shed light on the significant challenges encountered in teaching Agricultural Science within school settings. "Lack of school planning" emerges as the most prominent challenge, highlighting the critical role of strategic planning in shaping agricultural education programs. This finding aligns with existing literature emphasizing the importance of comprehensive planning in educational contexts to ensure effective program implementation and resource allocation. Moreover, the challenge of "Lack of farm manager affecting the school farm" underscores the vital role of skilled management in agricultural operations within educational institutions. Effective farm management is essential for maximizing the

educational potential of school farms and providing students with hands-on learning experiences. While "Scarcity of land" and "School farm too far from the school" are acknowledged as challenges, they are perceived to be relatively less significant compared to issues related to planning and farm management. Nonetheless, these challenges reflect broader concerns regarding resource availability and accessibility, which can impact the practical aspects of agricultural education delivery. Furthermore, the "Lack of qualified teachers to teach Agricultural Science" highlights the importance of recruiting and retaining skilled educators in the field of agricultural science. While this challenge is perceived as less significant compared to others, it underscores the need for investments in teacher training and professional development initiatives. The findings underscore the complex nature of challenges faced in agricultural education and emphasize the importance of addressing these challenges to enhance the quality and effectiveness of educational programs. By addressing issues related to planning, farm management, resource availability, and teacher qualifications, educational institutions can better support student learning and prepare the next generation of agricultural professionals. These findings align with existing research on the challenges of agricultural education and provide valuable insights for policymakers, educators, and stakeholders seeking to improve agricultural education practices[6,9].

The findings offer insights into the combined impact of ICT facilities and fieldwork variables on students' academic performance in Agricultural Science. The analysis reveals a moderate positive correlation between these factors and students' academic achievement, indicating that a significant portion of the variability observed in academic performance can be explained by considering both ICT facilities and fieldwork variables. This finding aligns with existing

research highlighting the importance of integrating technology and practical fieldwork experiences into educational practices to enhance student learning outcomes. By leveraging ICT facilities such as computers, email, and radio, alongside fieldwork variables including planting beds, livestock areas, and irrigation systems, educators can create dynamic learning environments that cater to diverse learning styles and promote active student engagement. The statistically significant relationship between the predictors and students' academic achievement further validates the importance of the regression model in predicting academic performance. This suggests that the inclusion of ICT facilities and fieldwork variables in the model significantly contributes to explaining variations in students' academic achievement. The findings underscore the value of integrating ICT facilities and fieldwork experiences into Agricultural Science education to enhance student learning outcomes. By recognizing the complementary roles of technology and practical learning opportunities, educators can create holistic educational experiences that prepare students for success in Agricultural Science and related fields. These findings contribute to the growing body of research supporting the integration of technology and hands-on experiences in education and emphasize the need for continued exploration and implementation of innovative teaching practices in Agricultural Science[9,10].

The findings provides valuable insights into the influence of ICT facilities, such as Computer, Email, and Radio usage, as well as Fieldwork Variables like Planting Bed, Livestock Area, and Irrigation System, on students' academic achievement in Agricultural Science. The findings reveal that Computer usage positively impacts academic achievement, indicating its role in enhancing students' performance in the subject. Moreover, Email usage demonstrates an even

stronger positive influence, highlighting its significance in improving academic outcomes. Conversely, Radio usage shows a negative association with academic achievement, suggesting that increased Radio usage correlates with decreased performance among students. Moving on to the Fieldwork Variables, both Planting Bed and Livestock Area exhibit positive influences on academic achievement. This implies that engaging in activities related to Planting Bed and Livestock positively correlates with improved academic performance in Agricultural Science. However, the Irrigation System variable does not significantly impact academic achievement, suggesting its limited relevance in predicting students' performance in the subject. These findings underscore the importance of integrating ICT facilities and fieldwork experiences into Agricultural Science education. By leveraging technologies like computers and email, educators can enhance teaching methods and provide students with valuable learning opportunities. Similarly, engaging students in fieldwork activities related to Planting Bed and Livestock can deepen their understanding of agricultural concepts and improve their academic performance. These results align with existing literature emphasizing the positive impact of ICT integration and fieldwork experiences on students' academic outcomes in Agricultural Science[4,8]. Considering these factors, educators can design more effective instructional practices and curriculum interventions to support student learning in the subject area.

Conclusion

This chapter focused on the general conclusion based on findings from the study. This includes summary of the findings, conclusion, recommendations, contribution to knowledge and suggestion for further studies

5.1 Summary of Findings

The demographic data reveals a predominance of female respondents, constituting approximately 66.4% of the surveyed population. In terms of age distribution, the majority, accounting for 55.8%, fall within the 16 to 25 years age range. Interestingly, there are no respondents in the older age categories. This indicates a significant representation of young females in the surveyed population.

The weighted mean score for all items combined is 2.6148 ($\bar{x}$ = 2.6148), indicating a high extent (HE) of challenges associated with ICT facilities in teaching Agricultural Science in Oyo Central Senatorial District. The weighted mean score for all items combined is 2.1734 ($\bar{x}$ = 2.1734), indicating a high extent (HE) of availability of fieldwork areas in teaching Agricultural Science. The weighted mean score for all items combined is 3.186 ($\bar{x}$ = 3.186), indicating a very high extent (VHE) of relevancy of fieldwork areas in teaching Agricultural Science. The weighted mean score for all items combined is 1.948 ($\bar{x}$ = 1.948), indicating a moderate extent (ME) of challenges associated with fieldwork in teaching Agricultural Science.

The result from null hypothesis one was rejected (F2, 214 = 1.085, Adj. R^2 = 0.158, P < 0.05) which significance suggests that the ICT facilities and fieldwork factors considered jointly

contribute to explaining variations in students' academic achievement in Agricultural Science in Oyo Central Senatorial District, Oyo State.

The Computer variable has a statistically significant positive impact on academic achievement, as indicated by its Beta of 0.106 and p-value of 0.015 ($p < 0.05$). Email usage demonstrates a stronger positive influence, with a Beta of 0.593 and a highly significant p-value of 0.000 ($p < 0.05$). Conversely, Radio usage negatively affects academic achievement, with a Beta of 0.335 and a highly significant p-value of 0.000 ($p < 0.05$). Fieldwork activities, specifically Planting Bed and Livestock, significantly contribute to academic achievement, with respective Betas of 0.710 and 0.601, both with highly significant p-values of 0.000 ($p < 0.05$). However, the Irrigation System does not significantly impact academic performance, with a non-significant p-value of 0.507 ($p > 0.05$). The results indicate significant positive impacts of Computer and Email usage, stronger than the negative influence of Radio usage, on academic achievement. Fieldwork activities, particularly Planting Bed and Livestock, also contribute positively to academic performance in students' academic achievement in Agricultural Science in Oyo Central Senatorial District, Oyo State. However, the Irrigation System does not significantly affect academic achievement

5.2 Conclusion

The findings from the various tables provide comprehensive insights into the dynamics of teaching Agricultural Science, encompassing the perceived relevance of ICT facilities, challenges encountered, availability and utilization of fieldwork areas, and their collective impact on students' academic performance.

The study underscores the significance of ICT integration in Agricultural Science education, with respondents acknowledging the effectiveness of computers, email, and radio in enhancing teaching and learning experiences. These findings resonate with existing literature, highlighting the pivotal role of technology in improving educational practices and student outcomes. Moreover, the challenges identified, such as power supply issues and maintenance culture, underscore the need for systemic improvements to support effective ICT adoption in schools.

Regarding fieldwork areas, the availability and utilization of facilities like planting beds and livestock areas are recognized as valuable assets in Agricultural Science education. Practical, hands-on experiences are deemed essential in deepening students' understanding and interest in the subject. However, challenges such as lack of school planning and farm management issues pose significant obstacles to maximizing the potential of fieldwork experiences.

Furthermore, the study elucidates the combined impact of ICT facilities and fieldwork variables on students' academic achievement. While ICT tools like computers and email positively influence academic performance, practical fieldwork activities also play a crucial role in enhancing student learning outcomes. These findings underscore the importance of a balanced approach to education, integrating both technological advancements and experiential learning opportunities to foster holistic development among students.

5.3 Recommendations

3. Given the challenges identified in ICT facilities, educational stakeholders should prioritize the enhancement of infrastructure. This includes ensuring a consistent and reliable power supply, investing in modern computer systems, and establishing mechanisms for regular maintenance. Adequate financial support should be allocated to sustain these improvements.
4. Recognizing the prohibitive costs associated with maintaining ICT gadgets, policymakers should consider financial support mechanisms for schools. Grants, subsidies, or partnerships with technology companies can be explored to alleviate the financial burden on educational institutions, fostering a conducive environment for effective ICT integration.
5. To address the maintenance challenges associated with ICT facilities, training programs should be implemented for maintenance personnel. This will empower them with the skills and knowledge necessary to troubleshoot and address technical issues promptly, ensuring the sustained functionality of ICT resources.
6. Given the significant impact of power supply disruptions on ICT usage, collaborative efforts with local power authorities or alternative energy sources, such as solar power, should be explored. This will mitigate interruptions, allowing for a more seamless integration of ICT resources into Agricultural Science education.
7. In response to challenges related to the scarcity of land for fieldwork, educational policymakers should consider developing strategic land allocation strategies. Collaborative initiatives with local communities, government bodies, or agricultural stakeholders can help secure adequate land for school farms and hands-on agricultural experiences.

5.4 Contribution to knowledge

The study contributes to the existing knowledge base in Agricultural Science education through its integration of conceptual, theoretical, empirical, and practical frameworks: The study contributes a conceptual framework that illuminates the role of ICT facilities and fieldwork variables in Agricultural Science education. It explores the relevance, availability, and impact of these factors on student learning outcomes, providing insights into how they align with educational goals and curriculum requirements. Additionally, the framework considers the interactions between ICT tools and fieldwork experiences, highlighting their synergistic effects on teaching and learning processes. Overall, this conceptual framework offers a nuanced understanding of agricultural education dynamics, informing future research, policy, and practice in the field.

The study makes theoretical contributions by aligning with prominent educational theories and frameworks. Firstly, it connects with the Theory of Planned Behavior (TPB) by delving into how educators' attitudes, subjective norms, and perceived behavioral control impact their intentions to incorporate ICT tools and fieldwork experiences in teaching Agricultural Science. Through exploring factors like perceived effectiveness, accessibility, and support, the study elucidates the determinants influencing behavioral intentions in agricultural education. Secondly, the study draws from Piaget's Cognitive Theory of Learning, emphasizing the significance of hands-on, experiential learning in fostering cognitive development and knowledge acquisition among students. By highlighting the role of fieldwork activities in promoting active learning and conceptual understanding, it aligns with Piaget's constructivist approach to education, enriching our understanding of effective instructional methods. Lastly,

the study applies the Technological Pedagogical Content Knowledge (TPACK) model to analyze the integration of technological, pedagogical, and content knowledge in agricultural education. It explores how educators leverage ICT tools to enhance the teaching of Agricultural Science content, contributing valuable insights into effective technology integration within subject-specific contexts. Through these theoretical lenses, the study advances our understanding of the complexities involved in integrating ICT and fieldwork experiences into agricultural education practices.

The study makes significant empirical contributions through its rigorous analytical approach, employing descriptive statistics, correlation analysis, and regression modeling. By quantifying the relationships between ICT facilities, fieldwork variables, and student academic performance, the study provides empirical evidence to support its findings. This empirical evidence enhances our understanding of the effectiveness of various educational strategies in Agricultural Science, grounded in real-world data and analysis.

Furthermore, the study offers practical recommendations tailored to educators, policymakers, and stakeholders involved in Agricultural Science education. By identifying key challenges, best practices, and opportunities for improvement, the study provides actionable insights that can inform decision-making and practice in educational settings. These recommendations encompass a range of areas, from addressing infrastructure challenges to promoting innovative teaching methods and enhancing teacher training programs. Ultimately, the practical recommendations outlined in the study have the potential to drive positive change and improve the quality and effectiveness of Agricultural Science education at both institutional and systemic levels.

5.5 Suggestion for Further Studies

1. **In-depth Analysis of Specific ICT Tools:** Future studies can delve deeper into the specific ICT tools used in Agricultural Science education. An examination of the effectiveness of various software applications, educational platforms, and virtual resources can provide insights into the optimal technologies for enhancing learning outcomes in this specific domain.
2. **Comparative Studies Across Senatorial Districts:** A comparative analysis of Agricultural Science education across different senatorial districts in the region could offer insights into regional variations and the factors influencing educational practices. Comparative studies would contribute to a broader understanding of the contextual nuances shaping Agricultural Science education in diverse geographical areas.
3. **Exploration of Student and Teacher Perceptions:** Future research could focus on exploring the perceptions of both students and teachers regarding the integration of ICT facilities and fieldwork in Agricultural Science education. Understanding the perspectives, preferences, and challenges faced by these key stakeholders can inform more tailored and effective educational interventions.

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Appendices

ICT Field Work Questionnaire (IFQ)

I am a postgraduate student of the Lead City University presently conducting a study assessing the influence of ICT and Fieldwork on Senior Secondary School Students' Academic Achievement in Agricultural Science in Oyo Central Senatorial District, Oyo State

. I would be grateful if you could take a few minutes to fill out this questionnaire. You do not have to write your name and identify yourself, so your responses will be anonymous, confidential and utilized for the purposes of this study only.

Section A: Socio-demographic Characteristics of Respondents

i. Name of your School----------

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ii. School Type; Private School ( ) Public School ( )

iii. School Location: Rural Area ( ) Urban Area ( )

iv. Age: below 15 years ( ), 16-25 Years ( ), 26-35 Years ( ) 35-45 Years ( ) 46- 55 Years, 56 year Above

v. Gender: Male ( ) Female ( )

vi. Education Qualifications: Below Primary School ( ), Primary School ( ), Secondary School ( ) Tertiary level ( ).

Section B

Please tick (✓) or response to the following questions according to your opinion: given the options as coded below.

SA = Strongly Agreed, A= Agree, D= Disagreed, SD= Strongly Disagreed

S/N	STATEMENT	SA	A	D	SD
	Relevance of ICT in the effective teaching and learning of agricultural science in secondary schools				
1	The use of computer makes teaching and learning of agricultural science effective.				

2	Computer usage arouses students' interest in the class.				
3	Computer makes the use of instructional materials more easier				
4	Application of computer technology such as E-mail makes learning permanent in students.				
5	Uses of e-mail improve student's access to learning resources and materials?				
6	email facilitate timely feedback and support from teachers				
7	The use of radio enhances the presentation of information to students.				
8	Radio contribute to students ability to retain and recall information				
9	Radio provide students with a unique and different perspective on the subject matter				
	Level of available and accessibility of I.C.T in Secondary Schools				
10	My school is equipped with computer system				
11	There is internet connectivity in my school				
12	Students and Teachers are allowed to use the internet facilities in my school				
13	The I.C.T centre in my school is equipped with computers and other I.C.T relevant facilities				
14	The use of computers and internet connectivity is taught in my school				
	The Problems Militating Against the Use of I.C.T in Secondary Schools				

15	Epileptic power supply impedes the use of I.C.T in school.				
16	The relative expensiveness of the I.C.T gadgets also impedes I.C.T usage in school.				
17	Lack of maintenance culture in Nigeria is another factor that militates against the usage of I.C.T in school.				
18	Lack of computer and internet affect education among students and teachers.				
19	Inadequate usage of computer and internet among students and teachers				

Section C

S/N	STATEMENT	SA	A	D	SD
	Availability of school Agricultural farm/field work used in teaching agricultural science in the school				
1	Teachers make use of the school farm while teaching agricultural Science				
2	Teachers are reluctant to use the school farm while teaching agricultural science				

3	My school is equipped with Standard School farm within school premises				
4	My school is equipped with Standard School farm outside school premises				
5	My school is equipped with farm implement				
	the extent at which school farm influences effective teaching of agricultural science in secondary school				
6	School farm makes teaching of agriculture easy				
7	The school farm help students develop better understanding of Agricultural concepts				
8	Teaching agricultural science in the school farm enhances effective teaching				
9	Engaging in practical lessons improve students' academic performance				
10	School farm arose student interest				

Section D

	Challenges of school Agricultural field work towards improving student academic Achievement				
11	Scarcity of land				
12	Lack of farm manager affect school farm				
13	Lack of qualified teachers to teach agric science				

14	Lack of school planning				
15	School farm too far from the school				

Agric Science Achievement Test (AAT)

Attempt all questions by picking the correct answer from the options A to E

1. Soil erosion can be caused by

   (a) High plant density
   (b) Overgrazing
   (c) Strip cropping
   (d) Both A & B
   (e) A, B & C

2. A common agricultural practice is to castrate male bull calves. One of the aims of these practices is to:

   (a) Reduce disease in the verb
   (b) produce disease in the verb

(c) make the animals stronger.
(d) Improve blood circulation in the animal
(e) All of the Above

3. A farmer wants to sell some cattle for meat before they become thin in the dry season. He should not sell:

(a) Old cars
(b) young cows
(c) Sterile Cows
(d) Smalls bulls
(e) old bulls
(e) All of the Above

3. A cow will produce a good supply of milk only if

(a) It is fat
(b) it has no calves
(c) it is milked once in a week
(d) it is fed a balance diet.
(e) It is suckled by its calf

5. Poultry are kept to provide both, meat and eggs for food. However, hens will not produce a good supply of eggs unless
(a) They are given a balanced diet
(b) a cock is prevent
(c) broody has are present
(d) the eggs have been fertilized
(e) their wings are dipped

6. Many of the cattle reared in West Africa belong to people who drive their herds from place to place. One of the advantages of this practice is that

(a) Interbreeding can take place
(b) the spread of disease is minimized
(c) the animals can reach good grazing land.
(d) a larger area of land will be manure the cover cars are less likely to be affected by sleeping sickness
(e) None of the Above

7. A single hen can drink a quarter of a liter of mater per day on the average you have 20 hens on a given day, the weather is particularly hot. You therefore provide them with.

a. 2 litres of water
(b) not more than 4 liters of water

(c) 150g of water per hen
(d) 0.5 liters of water per hen
(e) not less than 5 liters of water

8. After slaughtering a cow, the blood, skin, shanks, head and alimentary canal are removed. What is left over is called the Carcass: the meat and bones. The meat and bone yield of an animal is the ratio of the weight of the live animal. A cow weight 250kg and its Carcass weight 115kg. The meat and become yield of this cow is therefore

(a) At least 75 per cent
(b) much better than the average
(c) 115:100
(d) 46 per cent
(e) 135 kg

9. Trypanosomiasis is a disease

(a) spread by mosquitoes
(b) now eliminated in west Africa
(c) which can be controlled by bush clearing
(d) of poultry
(e) which reduces yield in cereal crops.

10. Animal husbandry is a science concerned with
(a) The analysis of milk and other farm products to ensure consistently high standards.
(b) the production of leather
(c) the development of drugs to increase the meant yield of cattle and other domestic animals
(d) Wildlife conservation
(e) none of these

11. Milk does not keep for a long time because

(a) of the preponderance of disease
(b) cows eats grasses
(c) Warm temperatures encourage the growth of microbes
(d) the humid atmosphere encourages souring

12. All of these below disease are affecting sheep and goat

(a) Bovine mastitis
(b) Lice of mastitis
(c) Erosive Mastitis
(d) Stomach hunger

13. Coccidiosis is a disease of hens caused by parasites which live in the digestive system. To prevent hens from catching this disease, a farmer should.

(a) Ensure that the hens obtain plenty of feed
(b) be very careful about cleanliness in poultry houses and drinking troughs.
(c) Remove all cocks from the flocks
(d) provides amped groundnut oil cake in their feed.
(e) None of the Above

14. Which of the following statements is true?

(a) Ruminants can synthesize the minerals they require
(b) Amino acids are the units from which carbohydrate are built.
(c) Pregnant animals require a protein reduced diet
(d) Animals in the tropics should be fed a diet rich in fat.
(e) All of the Above

15. The one of the parasite that affecting domestic animal

(a) Protozoa
(b) limelight
(c) Butterfly
(d) Rabies
(e) None of the Above

16. Ticks can be controlled by natural means or by

(a) Killing of the animals
(b) Washing of the animals' body
(c) Fumigate with chemical.
(d) Through washing of the animals pens.
(e) All of the Above

17. ---------- is the thick milk secreted by a cow immediately following birth, and it should therefore always be fed to young calves.

(a) Vitamins
(b) Toxic elements
(c) Colostrums
(d) can milk
(e) All of the Above

18. ---------- are the main food constituents from which the body is built. They are therefore essential for young and growing animals, but are also required by adults for the repair of worn out tissues.

(a) proteins
(b) fat and oil
(c) calcium and phosphorus
(d) calcium and phosphorus
(e) iron and copper

19. ---------- are feeds given to animals in order to supply a deficient nutrient.

(a) Supplement
(b) carbohydrate
(c) energy
(d) Roughage feeds
(e) All of the Above

20. ---------- is the act of giving birth to the young and it represents the end of pregnancy.

(a) Secretion
(b) Ovulation
(c) Parturition
(d) Lactation
(e) All of the Above

Appendix 3 - SPSS Computation Results (Raw Scores)

Table 4.1: Demographic Characteristics of Gender

Gender	N	Total (%)
Male	**355**	**38.4**
Female	**569**	**61.6**

Total	**924**	**100.0**

Table 4.2: Demographic Characteristics of Respondents' Age

Age Group	Frequency	%
12-15 years	**357**	**35.7**
16-25 years	**510**	**54.1**
26-35 Years	153	**10.2**
35-45 Years	0	0
46- 55 Years	0	0
56 year Above	0	0
Total	**924**	**100.0**

Source: Fieldwork, 2023

Table 4.3: Descriptive Statistics on availability level of ICT facilities in teaching Agricultural Science

S/N	***STATEMENT***	***A%***	***NA%***	***N***	$\bar{x}$	***Std. Dev***	***R***

1	My school is equipped with computer system	33	67	924	1.351	0.432	*LE*
2	There is internet connectivity in my school	35	65	924	1.873	0.552	*ME*
3	Students and Teachers are allowed to use the internet facilities in my school	43	57	924	1.774	0.456	*ME*
4	The I.C.T centre in my school is equipped with computers and other I.C.T relevant facilities	42	58	924	2.003	0.567	*ME*
5	The use of computers and internet connectivity is taught in my school	46	54	924	1.876	0.674	*ME*
	AVERAGE MEAN	*39.8*	*60.2*	*924*	*1.975*	*0.536*	

R: Remarks; A%: Percentage Available; NA%: Percentage Not Available VHE: Very High Extent (3.50 – above); HE: High Extent (2.5.00-3.49); ME: Moderate Extent (1.50-2.49); LE: Low Extent (Below 1.49) **Source: Field Work, 2023.**

Table 4.4: Descriptive Statistics on relevance of ICT facilities in teaching Agricultural Science

S/N	***Items***	***A%***	***NA%***	***N***	$\bar{x}$	***Std. Dev***	***R***
1	The use of computer makes teaching and learning of agricultural science effective.	51.0	49.0	924	2.942	0.4969	*HE*
2	Computer usage arouses students' interest in the class.	58.6	41.4	924	2.440	0.4971	*ME*
3	Computer makes the use of instructional materials more easier	59.5	40.5	924	2.483	.4999	*ME*

4	Application of computer technology such as E-mail makes learning permanent in students.	62.0	38.0	924	2.494	.5002	*ME*
5	Uses of e-mail improve student's access to learning resources and materials?	67	33	924	2.508	.5001	*HE*
6	email facilitate timely feedback and support from teachers	68	32	924	2.603	0.456	*HE*
7	The use of radio enhances the presentation of information to students.	59	41	924	2.521	0.421	*HE*
8	Radio contribute to students ability to retain and recall information	49	51	924	2.001	0.523	*MR*
9	Radio provide students with a unique and different perspective on the subject matter	63	37	924	3.231	0,456	*HE*
	AVERAGE MEAN			*924*	*2.630*	*0.4811*	

Table 4.5: Descriptive Statistics on challenges of ICT facilities (Computer, E-mail and Radio) in teaching Agricultural Science in Oyo central Senatorial District.

S/N	***STATEMENT***	***A%***	***NA%***	***N***	$\bar{x}$	***Std. Dev***	***R***
1	Epileptic power supply impedes the use of I.C.T in school.	79	21	924	3.45	0.432	*HE*
2	The relative expensiveness of the I.C.T gadgets also impedes I.C.T usage in school.	67	33	924	2.873	0.552	*HE*

3	Lack of maintenance culture in Nigeria is another factor that militates against the usage of I.C.T in school.	68	32	924	2.874	0.456	*HE*
4	Lack of computer and internet affect education among students and teachers.	73	27	924	2.003	0.567	*ME*
5	Inadequate usage of computer and internet among students and teachers	59	41	924	1.876	0.674	*ME*
	AVERAGE MEAN	*69.2*	*30.8*	*924*	*2.6148*	*0.5362*	

Table 4.6: Descriptive Statistics on availability level of Fieldwork (Planting bed, Livestock Area) in teaching Agricultural Science

S/N	***STATEMENT***	***A%***	***NA%***	***N***	$\bar{x}$	***Std. Dev***	***R***
1	Availability of school Agricultural farm/field work used in teaching agricultural science in the school	76	34	924	3.142	0.452	*HE*
2	Teachers make use of the school farm while teaching agricultural Science	73	37	924	3.023	0.4781	*HE*
3	Teachers are reluctant to use the school farm while teaching agricultural science	48	52	924	1.023	0.432	*LE*
4	My school is equipped with Standard School farm within school premises	68	32	924	2.678	0.523	*HE*

5	My school is equipped with Standard School farm outside school premises	35	65	924	1.003	0.421	*LE*
	AVERAGE MEAN	*60*	*40*	*924*	*2.1734*	*0.4611*	

Table 4.7: Descriptive Statistics on relevancy level of Fieldwork (Planting bed, Livestock Area) in teaching Agricultural Science

S/N	***Items***	***A%***	***NA%***	***N***	$\bar{x}$	***Std. Dev***	***R***
1	School farm makes teaching of agriculture easy	89	11	924	3.672	0.435	***VHE***
2	The school farm help students develop better understanding of Agricultural concepts	92	08	924	3.682	0.542	*VHE*
3	Teaching agricultural science in the school farm enhances effective teaching	78	22	924	2.871	0.523	*HE*
4	Engaging in practical lessons improve students' academic performance	69	31	924	2.672	0.456	*HE*
5	School farm arose student interest	74	26	924	3.031	0.523	*HE*
	AVERAGE MEAN	*80.4*	*19.6*	*924*	*3.186*	*0.467*	

Table 4.8: Descriptive Statistics on challenges of Fieldwork (Planting bed, Livestock Area) in teaching Agricultural Science

S/N	**Items**	**A%**	**NA%**	**N**	$\bar{x}$	**Std.**	**R**

						Dev	
1	Scarcity of land	64	36	924	1.945	0.456	**ME**
2	Lack of farm manager affect school farm	68	32	924	2.324	0.534	ME
3	Lack of qualified teachers to teach Agric science	45	55	924	1.123	0.432	LE
4	Lack of school planning	78	22	924	2.567	0.520	HE
5	School farm too far from the school	58	42	924	1.783	0.472	ME
	Average Mean	62.6%	37.4	924	1.948	0.483	

Table 4.10: Joint Influence of ICT facilities (Computer, Email and radio) and Fieldwork Variables (Planting bed, Livestock Area and Irrigation System) on Students' Academic Achievement in Teaching Agricultural Science

R	**R Square**		**Adjusted R Square**	**Std. Error of the Estimate**
.417	.174		.168	9.6335
	ANOVA			
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	3046.328	2	507.721	7.511	.000
Residual	9665.865	922	67.593		
Total	12712.193	924			

Source: Fieldwork, 2023

Table 4.12: Relative Contribution of ICT facilities (Computer, Email and radio) and Fieldwork Variables (Planting bed, Livestock Area and Irrigation System Influence on Students' Academic Achievement in Teaching Agricultural Science

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	35.328	2.813		26.249	.000
Computer	3.961	1.359	.106	2.843	.015
Email	5.125	.788	.593	6.503	.000
Radio	-3.815	1.036	.335	-3.681	.000
Planting Bed	.048	.017	.710	3.450	.000
Livestock	.996	.019	.601	4.389	.000
Irrigation System	-.009	.017	-.023	-.513	.608

Bio-data

PERSONAL DATA

I.	**NAME:**	AKINRINOLA, Adewumi John
II.	**DATE AND PLACE OF BIRTH:**	31ST January, 1980, Ilora, Afijio LGA
III.	**STATE OF ORIGIN:**	Oyo State
IV.	**NATIONALITY:**	Nigeria
V.	**RELIGION AND DENOMINATION:**	Christianity, Baptist
VI.	**PERMANENT HOME ADDRESS:**	Akinrinola House,

VII. **CONTACT ADDRESS:** Power Line, Oke-isanmi Area, Ilora
Cornerstone Baptist Church, Bacotho
P.O. Box 16, Behind Union Bank, Odo-
Eran, Owode, Oyo, Oyo State

VIII. **MARITAL STATUS:** Married

IX. **NAME AND AGE OF CHILD:** Oluwasemilore (7years)

X. **NAME AND ADDRESS OF SPOUSE:** Mrs AKINRINOLA, Adenike Omolayo.
Class Teacher, Baptist Secondary School, Oke-Isanmi, Ilora, Oyo State

XI. **NAME AND ADDRESS OF NEXT OF KIN:** Same as above

XII. **PRESENT POSITION:** Chief of staff (Political Appointment),
Afijio Local Government, Jobele

XIII. **DATE OF PRESENT POSITION:** December 2, 2021

XIV. **PRESENT SALARY:** Local Govt. Appointees Salary Scale

XV. **EDUCATIONAL INSTITUIONS ATTENDED WITH DATES:**

	Name and Location of Institutions	***Year Attended***
a)	Lead City University, Ibadan	January 2019-2023
b)	University of Ado-Ekiti, Ekiti State	2002-2008
c)	Oyo State College of Education, Oyo, Oyo State	1998-2001
d)	National Teachers' Institute Kaduna (Ilora Centre)	1994-1997
e)	Baptist Secondary School, Ilora, Oyo State	1989-1994

XVI. **ACADEMIC QUALIFICATIONS WITH DATES:**

a)	M.Ed Educational Management	M.Ed In view
b)	West African Senior Secondary Certificate (WASSC)	2011
c)	B.Sc (Ed.) (Hons) Agric Science Education with Second Class Lower Division	2008
d)	West African Senior Secondary Certificate (WASSC)	2000
e)	Nigerian Cerificate in Education (NCE)	2001
f)	Teachers' Grade Two Certificate	1997

XVII. **WORK EXPERIENCE POSITION HELD WITH DATES:**

a) I.T. Student, happy Day Konsult and Veterinary Services. Oyo, Oyo State 1999

b) I.T. Student, Agricultural Research and Mechanization Fasola Farm, Oyo, Oyo State 2000

c) Clerical officer, Redemption Academy, Mando Afaka,

Kaduna, Kaduna State 2003

` d) Vice principal Admin; God's Time Model College, Ogbomoso, Oyo State 2004

e) Market Developer, CELTEL Telecoms Nigeria Ltd. 2007

f) Sales Representative, ZAIN Telecoms Nigeria Ltd. 2009

g) Part-time Lecturer, Oyo State College of Education, Oyo 2008

h) Financial planner, Great Nigeria Insurance (GNI), Oyo Branch. 2016

i) SALES Supervisor, BODLINK Telecoms and Services Ltd. Ibadan. 2018

j) Supervisory Councilor for works and transportation, Afijio L.Govt. 2021

k) Chief of Staff, Afijio Local Government, Jobele 2021 to Date

XVIII. PUBLICATIONS

Dissertation and Thesis

i. Effects of adding yeast (Saccharomyces cerevisiae) in the diet of layers birds. (Agric. Science Department, Oyo State College of Education, Oyo. 2000)

ii. An assessment of the effect of the parents socio-economic status on students academics performance in Agricultural Science. A case study of Afijio Local Government Area of Oyo State. (B. Sc Dissertation, University of Ado-Ekiti, Ekiti State). 2008

Post Graduate Thesis Work

Influence of ICT and field work on Senior Secondary School Student's Academic Achievement in Agricultural Science in Oyo Central Senatorial District, Oyo State.

Research work in progress…

XIX. POST GRADUATE STUDY PAPER PRESENTATION

a) The Internal and External Factors Influencing Educational Cost and their Application to Education System.

b) The Scope, Advantages and Disadvantages of Liassez-faire Leadership Style.

c) Various Guiding Principles of Planning Education and Various Strategies Planning Criteria at the School Level.

d) Managing Education in Peculiar Environment, A Case Study of Eastern Nigeria

e) Religion has a Strong Influence on Educational Planning of Nigeria

f) Capacity Building of Teachers in Nigeria

g) Supervision of Instructions in Education

XX. SEMINAR, WORKSHOP AND TRAINING ATTENDED WITH DATES:

a) Result Oriented Performance Management: Federal Republic of Nigeria (I.T.F.) 2015
b) Emotional Intelligence & Customer Service: Lead Consultant, Getting A-head, Ibadan 2018
c) Strategies for Girl-child Involvement in Science, Technology, Engineering and Mathematics (STEM) for Sustainable Development – M.Sc. Research 2021
d) Workshop on overcoming the Challenges of Managing Local Govt. Administration in Critical Situations – Okay Enterprise Production 2022
e) Growth & Development Agenda at the Grassroots - KLOVER HARRIS Innovative Solutions 2022
f) Digital Communication and Team Management – LA PLACE META VERSE INTERNATIONAL 2023
g) Introduction to International Conflicts Resolution - LA PLAGE META VERSE 2023
h) International Volunteering – LA PLAGE META VERSE 2023
i) Leadership Strategies for Good Governance and show-casing govt. Acheivements for Local Govt. Public officers – BlueHorn Global Consult Developing World Class Skills organize by Oyo State Ministry of Local Government and Cheiftancy matters. 2023

XXI. EXTRA CURRICULAR ACTIVITIES AND OTHER RELEVANT INFORMATIONS:

(A) **HOBBIES:** Internet Browsing, Meeting People, Singing, Teaching, Travelling, Watching Nature and Animal Documentaries.

(B) **HONOURS, AWARDS AND PRIZES RECEIVED WITH DATES**

A. Dynamics farmers' society: (2000)
St. Andrew's College of Education
Post held: Deputy Social Director
B. Certificate of Advancement: (2007)
Royal Ambassadors of Nigeria
C. Service Award Certificate: (2008)
Royal Ambassadors of Nigeria
D. Certificate of Honour: (2008)
National Youth Council of Nigeria
E. Certificate of Merit: (2010)
Royal Ambassadors of Nigeria
F. Most Dedicated Staff of the Year: (2014)
Bodlink Limited, Ibadan.
G. CEO Award of the year: (2016)
Bodlink Telecoms & Services Ltd

H. Best ACE Initiative of Year: (2017)
Bodlink Telecoms & Services Ltd

(C) **SPECIAL ASSIGNMENT/ COMMUNITY SERVICES:**

A. Special Marshal (Federal Road Service Corps)
B. Member National Youth Council of Nigeria.
C. Member, Royal Ambassadors Organization of the Nigeria Baptist convention (1992)

(D) **COMPUTER SKILL:**

* Data Base Management

XXII. **NAMES AND ADDRESSES OF REFEREES:**

a) **Prof. Olayinka Ebenezer 'Tunde**
Dean, Faculty of Natural Science
Ajayi Crowther University, Oyo.

b) **Prof. Iluema Esther**
HOD, Dept. of Educational Management
Faculty of Arts & Education
Lead City University, Ibadan.

c) **Oba Stephen Olufemi Oparinde II**
The Akibio of Ilora Land.

_____ _____

AKINRINOLA, Adewumi John. Date

The University Compliance Certification

This is to certify that **Adewumi John AKINRINOLA** carried out this thesis with matric number **LCU/PG/000914** in the department of Education Management, Faculty of Art and Education, Lead City University, Ibadan, is in Full compliance with the approved University format and style.

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Signature Date