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Agriculture was the mainstay of the Nigerian economy before the oil boom era of 1970s. The oil boom led to a decline in Agricultural practice and education. To stem the tide, agricultural educationists and agricultural economists have been formulating policies aimed at bringing back Agriculture to its lost enviable position. One of these policies, from the education standpoint, was the inclusion of Agricultural Science as one of the vocational subjects in senior secondary schools. This was to enable students acquire practical agricultural skills that would make them self reliant in future and also contribute significantly to the nation's GDP. This book, therefore, provides an analytical approach to the study of Agricultural Science education in secondary schools of Ibadan, a major city in South-West Nigeria. It conducts studies on challenges confronting the development of the subject, attitudes of students to the subject and their academic performance in the subject. Also, relationship between their academic performance and attitudes was studied. The book creates a platform for informative debate on issues relating to the development of Agricultural Science education in Nigeria.

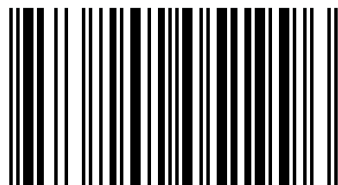


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An Analytical Approach



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1.0 GENERAL INTRODUCTION

The agricultural sector was once the major backbone of the Nigerian economy accounting for more than half of the Gross Domestic Product (GDP) in the 1960s (Izuchukwu, 2011). A steady decline in the revenue accruable from agriculture was however noticed with the emergence of the oil boom era in the 1970s. Since then, educational and economic experts have been devoting a lot of attention to how best to bring agriculture back to its lost enviable position. This led to the formulation of various policies. The National Policy on Education (2004) included Agriculture as a pre-vocational subject at the primary and junior secondary schools and as a vocational subject in the senior secondary school levels. Also, Agricultural Science acquired the status of a vocational subject and it is one of the elective subjects students can choose at senior secondary school levels. According to the National Policy on Education (2004), secondary school education is the form of education children receive after primary education before proceeding to the tertiary institutions. The objectives of secondary education are to prepare the individual, firstly for a useful living in the society and also for higher education. Thus, studying Agricultural Science at the Senior Secondary School (SSS) level will enable interested students acquire practical agricultural skills that would make them self reliant in future. Moreover, this would boost Nigeria's food productivity. The specific objectives of introducing Agricultural Science in secondary schools as listed in the National Policy on Education (2004) are as follows:

- 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.

In spite of all these policies and programmes, records of the West African Examination Council (WAEC), a major examination body in the West African sub-region, showed that Agricultural Science results are generally poor in Nigeria (WAEC, 2015). Table 1a shows summary statistics of results of Agricultural Science students in WAEC May/June Senior Secondary School Examinations from 2008-2013 (2012 and 2014 not reported) for Paper III (Practical). Table 1b shows summary statistics of results of Agricultural Science students in WAEC May/June Senior Secondary School Examinations from 2008-2014 (2012 not reported) for Paper II (Essay).

**Table 1a: Summary Statistics of May/June SSCE Agricultural Science
(Practical Paper) Results (2008-2013)**

Paper III (Practical)			
Year	Total Number of Students	Raw Mean Score	Standard Deviation
2008	1,050,591	31	10.20
2009	1,059,609	32	7.48
2010	1,041,167	23	10.34
2011	1,192,571	21	10.63
2013	1,305,194	33	10.39

Source: WAEC Chief Examiners' Report, 2015

**Table 1b: Summary Statistics of May/June SSCE Agricultural Science (Essay)
Results (2008-2014)**

Paper II (Theory)			
Year	Total Number of Students	Raw Mean Score	Standard Deviation
2008	1,050,591	33	14.56
2009	1,059,609	28	13.48
2010	1,041,167	29	15.03
2011	1,192,571	29	14.73
2013	1,305,194	37	15.17
2014	952,983	38	18.63

Source: WAEC Chief Examiners' Report, 2015

Continuous poor performance of students in Agricultural Science implies that majority of them will not be able to take courses in agriculture in the higher institutions of learning. The ripple effect of this is that many young people will not have interest in taking up a career in agriculture which will eventually lead to the problem of food insecurity in the country. Thus, researchers in Agricultural Science education have been conducting a series of research to ascertain the causes of poor performance in the subject and proffer solutions to these challenges.

For instance, Usman & Memeh (2007) listed students' background, students' negative attitude towards Agriculture, poor teaching techniques among others as causes of poor performance in the subject. The problem, according to Camilus (2011), can be attributed to poor perception and lack of interest in the subject on the part of the students. Moreover, Marsh (1990) affirmed that students' self-perception of academic ability will affect their performance in school. The "perceived self" influences an individual's perception of the world and his or her behaviour which in turn influences his or her academic achievement, Onyejiaku, (1991). In this study, therefore, we examined the challenges facing the teaching and learning of Agricultural Science in Ibadan North Local Government Area (INLGA) of Oyo State,

Nigeria and proffered appropriate solutions to them. Furthermore, we examined the attitudes of the students to the subject. Also, we examined whether there were significant differences in the average scores obtained by the students in Agricultural Science Achievement Test (ASAT) in the three schools. Finally, we examined whether there was any relationship between scores obtained by the students in ASAT and their attitudes to the subject.

Following this background, the rest of this book is structured as follows: chapter two reviews relevant literature on challenges, attitudes and academic performance of students; chapter three identifies the challenges facing Agricultural Science in Secondary schools of INLGA and proffer solutions to the identified challenges; chapter four identifies attitudes of secondary school students towards Agricultural science as a subject; chapter five presents an analysis of the academic performance of selected students in Agricultural Science Achievement Test (ASAT); chapter six presents the relationship between attitude and academic performance of students in Agricultural Science while chapter seven provides the concluding remarks.

2.0 LITERATURE REVIEW

Large numbers of studies have been conducted on challenges, attitudes and academic performance of secondary school students in different subjects in different countries. A review of some of these literatures, using the following outline, is presented below:

- Agricultural Science Education
- Teaching and Learning of Agricultural Science
- Challenges facing Agricultural Science Education in Nigeria
- Review of solutions to the challenges facing Agricultural Science Education in Nigeria
- Attitudes of Students to Agricultural Science
- Relationship between students' attitudes and their performance in Agriculture Science

2.1 Agricultural Science Education

Agricultural Science is one of the core vocational curricular subjects taught at both junior and senior secondary schools in Nigeria. Egbule (2004) defines it as a process of training learners in the process of Agricultural productivity as well as the techniques for teaching of agriculture. Agricultural Science education as a broad multidisciplinary field deals with the selection, breeding and management of crops and domestic animals for economic production. It is a subject taught in secondary schools as a means for self-reliance and preparation for further studies. Agricultural Science is therefore designed for inculcation of the necessary skills for the practice of agriculture for effective citizenship and contribution to food security for national sustainability. The Blueprint for Family Support Programme (1994) outlines seven major objectives of teaching and learning of Agricultural Science to reflect the:

1. ability to stimulate students' interest in agriculture
2. ability of students in acquiring basic knowledge of agriculture.
3. ability to develop basic agricultural skills in students.
4. students' ability to integrate knowledge with skills in agriculture

5. ability to expose students to opportunities in the field of agriculture
6. ability to prepare students for further studies in agriculture and
7. ability to prepare students for occupations in Agriculture.

Attainment of the above objectives depends on teachers' pedagogical approaches. Teachers in this case are Agricultural Science teachers. Agricultural Science teachers are trained and groomed from teacher preparation institutions for quality impact of agricultural skills, knowledge attitudes and values for self-reliance, promotion of agriculture and food security in their future lives. It is therefore the duty of this group of teachers to stimulate and sustain students' interest in agriculture, enable students acquire basic knowledge and practical skills in agriculture, enable students integrate knowledge with skills in Agriculture, prepare and expose students for occupation. Attainment of the goals and objectives of agricultural science depends on effectiveness of teaching and learning going on.

2.2 Teaching and Learning of Agricultural Science

The education axiom that when a learner has not learnt, then the teacher has not taught is true. This directly relates to the concepts of teaching and learning as a process of inculcating the right values, attitudes, knowledge, modern life, long life skill acquisition necessary to make individuals benefit from the society as well as contribute meaningfully to the same society. Waliki and Usman (2009) see teaching as a systematic, rational and an organized process of transmitting knowledge, skills and so on in accordance with professional principles. The implication is that agricultural science teachers who do not perform the act in accordance with the principles of teaching are therefore not teachers but cheats. Naturally, the outcome of teaching is learning. Learning occurs only where there is relatively positive permanent change in an individual behaviour. Modebelu and Duvie (2012) recommend four innovative teaching methods that could enhance quality and effective teaching and learning of subjects/courses. These could be adopted and applied by Agriculture Science teachers.

These methods are:

1. Information transformation and reception method
2. Cognitive strategies development method
3. Attitudes development method
4. Cognitive and motor skills development method

Combination of these modern methods helps to achieve the required goal. Other relevant methods include: assignment, demonstration, project, field-trip, experimental and so on.

Teaching skills vital for quality teaching and learning are:

- i. qualitative set induction
- ii. quality questioning (lower order, middle, higher order and divergent)
- iii. variation and variety (instructional materials that could take care of individual differences).
- iv. stimulus variation (ensuring that students' senses are involved)
- v. repetition (simple, planned, mass etc).
- vi. demonstration (simple, brief and concise)
- vii. closure (white board summary, written exercises, oral summary etc.).
- viii. adequate non-verbal communication etc.
- ix. reinforcement (reward and relevant punishment).
- x. effective communication
- xi. supervision (closed supervision learning processes and activities).

Effective application of these teaching methods, skills or strategy depends greatly on the teacher's ability to plan the lesson ahead. Teachers should no longer be trained for students' certification alone but for effective inculcation of learning to learn skills. Students, in addition to learning concepts and theme, must have deep understanding and application of the learning skills. This also applies to the teaching and learning of Agricultural Science in Nigerian secondary schools. Obanya (2010) recommends teaching and learning that revolve around the principles of transformational pedagogy. Egbule (2004) emphasizes that every agricultural teacher must be effective, liberally educated, current in subject matter and its pedagogy, aware of what is expected of teachers and schools, skillful and conscientious in

planning, preparing for, carrying out instruction, respectful towards students, concerned about their welfare, actively involved in faculty, professional and community affairs.

As in learner-centered method, agricultural science students should occupy a prominent position in the teaching and learning of agricultural science. Teachers should therefore make these students the centre of all activities. This entails:

- a. encouraging active participation of agricultural science students in the teaching and learning process.
- b. encouraging Agricultural Science students to be actively involved in a manner in which they interact with the teacher, with instructional materials and with the environment.
- c. teaching and learning of agricultural science in a manner that promote students' development of basic life skills.
- d. enabling students to utilize the learnt skills in solving their everyday problems using their own initiatives.
- e. discouraging rote learning and passivity in the classroom.

2.3 Challenges facing Agricultural Science Education in Nigeria

Modebelu and Nwakpadolu (2013) identified seven major challenges facing Agricultural Science teachers in their quest to achieve effective teaching and learning of the subject. These are:

- i. inadequate qualification of teachers
- ii. inadequate technical know-how
- iii. inadequate teaching methods
- iv. inadequate instructional materials
- v. absence of farms for practical
- vi. poor funding
- vii. poor attitudes of students towards the subject.

To corroborate this view, Puyate (2004) asserted that effective teaching cannot be carried out without the adequate provision of learning facilities. Also, in the aspect of

funding, Puyate (2008) opined that teachers must be well remunerated for them to effectively impart the needed knowledge on students. This is a major challenge for the education system in Nigeria. Other challenges include broad curriculum objectives, unclear specification of areas that require practical skills, poor programme delivery system, cases of duplicated topics (Egbule, 1998), poor performance of candidates who enrolled in agricultural science examinations (Mamman, 2000) and high unemployment rate among Agricultural Science graduates (Ikeoji & Agwubike, 2006).

2.4 Review of solutions to the challenges facing Agricultural Science Education in Nigeria

Modebelu and Nwakpadolu (2013) suggested ten possible ways of managing and redressing the challenges. These include ensuring that only professional qualified teachers teach, repositioning of teacher preparation institutions to produce highly relevant manpower that are conscientious and well motivated in the field, provision of relevant instructional materials and so on. Modebelu and Duvie (2012) also recommended innovative teaching methods for effective teaching and learning of agricultural science. Egbule (2004) also suggested that teaching and learning of agricultural science must both be competence-based and production-oriented. Egun (2009) suggested that there is the need for a total overhauling of agricultural administration in Nigeria. Onu and Ikehi (2013) suggested the establishment of Agricultural Students Scholarship Fund (ASSF). This will boost the morale of students to choose and study Agriculture in higher institutions of learning in Nigeria. Otekunrin *et al.* (2017) suggested, among other, the provision of adequate farm lands for public secondary schools so that teachers can teach practical-oriented Agricultural Science.

2.5 Attitudes of Students to Agricultural Science

Individual interest, ability and needs are important factors that contribute to attitudinal life of students studying Agricultural Science, Chang (2005). Also, culture

and gender play a major role in determining the attitude of students to any subject including Agricultural Science (Margolis (2008); Ohiwerei & Nwosu (2009); Turner & Lapan (2002); Mcwhirter *et al.* (1998), Turner *et al.* (2004); Sugahara *et al.* (2009); Wong & Liu, (2010)). Davis (2009) also identified the following external factors as key players in career interest choices:

(i) Teachers' Influence; Parental Pressure

(iii) Economic and Political Condition of the Country, Peer Groups' Pressure; Adequate Vocational Choice Information and Subject Studies/Combination.

So also positive attitude towards a particular task will increase one's performance; choosing not to do the activity will decrease performance (Meece *et al.*, 1990). Ruble & Martins (1998) opined that children who develop more positive competence-related beliefs and values for activities they believe in are appropriate for their gender tend to seek more engagement of such activities in the future. Parental educational and occupational status and critical life event can spur a transformative learning experience that may shape a career development and life direction of children (Fisher & Griggs (1994); Trusty *et al.* (1997)). Dick & Rallis (1991) reported that a young person's belief about a career's value is influenced by the perceptions, attitudes and expectations of others such as parents, teachers and guidance counsellors.

2.6 Relationship between students' attitudes and their performance in Agriculture Science

A student's attitude towards the study of Agricultural Science can affect his performance in the subject. Some students exhibit a dislike for the subject due to the fact that it involves rigorous practical works which are carried out on the farm. This dislike as shown by apathy towards various practical farm activities then leads to low performance and subsequent failure.

So many factors have been known to influence the academic achievement of students in their various school endeavours. These factors can be either be personal (poor self-concept, motive, readiness, emotion, attitude, maturational level of the student) or environmental. The personality of an individual refers to a collection of emotional,

thought and behavioural patterns unique to a person that is consistent overtime. It can also include an individual's thoughts, behaviour, feelings, emotions, attitudes, physique adjustment, unique learning history response patterns, habits and general poise (Denga, 2002).

Low self-concept is related to learning difficulties in students. A student who believes he is incapable of accomplishing his academic task is bound to be an academic failure. Denga (2007) views self-concept as an organized configuration of perceptions of self which are admissible to awareness. He further stated that self-concept is what determines the goals that are set, attitudes, behaviour and responses that one makes towards others. The way an adolescent perceives himself or herself with little or no regards for what one may say or think of him or her is referred to as self-concept.

Many studies have shown that there is correlation between self-concept and academic performance. Wang (2007) stated that there are recent researches that show a causal relationship between academic self-concept and subsequent achievement and that this relationship is reciprocal in nature. Thus, while better student achievement leads to improvement of self-concept, positive self-concept can help increase student achievement concurrently.

Weiner (1979) stated that highly motivated students in any area of interest may perform more difficult task than those who have low motivation in the same area.

Tella (2007) stated that when pupils express lack of interest in a subject, it affects the way they react and listen to the teacher. Thus, interest and attitude of the learner towards a particular subject matter a lot. This agrees with Hansford and Hattie (1982) that stated that motivation has a great influence on students' performance academically.

3.0 CHALLENGES FACING THE STUDY OF AGRICULTURAL SCIENCE IN PUBLIC SECONDARY SCHOOLS

3.1 Introduction

Poor performance of students in Agricultural Science examinations has been a major source of concern for decision makers on the Nigerian economy and stakeholders in the Agricultural education sector. This poor performance has been attributed to several factors. These included students' poor attitude to the subject, lack of innovative teaching techniques, inadequate funding and inadequate farmlands to practice Agriculture Science. Also, a huge percentage of those that studied Agricultural Science in schools are either unemployed or are not practicing what they learnt in school. This study, therefore, shed more light on these issues in INLGA so as to be able to make appropriate recommendations to the relevant stakeholders.

3.2 Research Questions

1. What are the challenges facing effective teaching and learning of Agricultural Science in public secondary schools of INLGA?
2. In what ways could the challenges be managed for effective teaching and learning of Agricultural Science in the local government area?

3.3 Methodology

The descriptive survey design was used for the study. Simple random sampling technique was used to select three public secondary schools from all the secondary schools in INLGA. A total of thirty (30) teachers consisting of Agricultural Science teachers, Vice Principals and Principals participated in the study.

3.3.1 Research Instrument

3.3.1.1 Constraints facing Agricultural Science in Public Secondary Schools Questionnaire (CASPSSQ)

This questionnaire was designed to assess teachers' opinion on the challenges facing effective teaching and learning of Agricultural Science in public secondary schools in INLGA. It was also used to seek the opinions of the teachers on possible ways of managing the challenges. It was divided into two parts namely: A and B. Parts A and B contained items placed on a four-point Likert scale of Strongly Agree (4), Agree (3), Strongly Disagree (2) and Disagree (1). The items in Part A contained questions on the challenges facing Agricultural Science in public secondary schools while Part B contained items on suggested ways of managing the challenges. The content and face validity of the questionnaire was established by two experts on Agricultural Science Education and Educational Management. The instrument was pretested in a school that was not part of the schools used for the study and necessary changes were made to the instrument before it was administered on the teachers. The Reliability Index of 0.79 was obtained using Cronbach's Alpha.

3.3.2 Method of Statistical Data Analysis

Data collected were analysed using frequency counts and percentages.

3.4 Results

Table 2 shows the responses of the teachers to challenges confronting effective teaching and learning of Agricultural Science in public secondary schools while *Figs. 1, 2 and 3* are bar charts illustrating some of these responses. From these responses, the major challenges confronting effective teaching and learning of Agricultural Science in public secondary schools of INLGA are traditional methods of teaching, lack of instructional materials, inadequate exposure of the students to practical agriculture and inadequate funds to manage practical-oriented Agricultural Science.

The responses of the teachers on suggested ways of managing the challenges confronting effective teaching and learning of Agricultural Science in the schools are presented in Table 3. All the teachers agreed that better motivation for teachers, adequate funding, provision of farm lands for practical-oriented Agricultural Science and adequate provision of instructional materials are ways of managing the identified challenges.

Table 2 Teachers' Responses to CASPSSQ: Part A

S/No	Items	Strongly Agree (%)	Agree (%)	Strongly Disagree (%)	Disagree (%)
1	Majority of Agricultural Science teachers are not professionals.	-	50	33.33	16.67
2	Majority of the teachers are not holders of B. (Ed.) in Agriculture.	3.33	43.33	20	33.33
3	Majority of the teachers are still holders of NCE or HND in Agriculture.	-	43.33	36.67	20
4	Agricultural Science teachers are not very proficient in the teaching and learning of Agriculture.	-	23.33	33.33	43.33
5	Teachers do not possess adequate modern skills for practical oriented teaching	10	13.33	16.67	60
6	The teachers are less resourceful.	3.33	46.67	20	30
7	These teachers use mainly traditional methods of teaching (lecture in confines of classroom/ laboratory)	13.33	63.33	-	23.33
8	Teaching and learning of the subject are rarely learner-centered.	-	43.33	13.33	43.33
9	Teaching and learning are mainly teacher-centered.	-	40	-	60
10	Instructional materials are not	10	53.33	-	36.67

	available.				
11	Instructional materials available are not adequately utilized.	13.33	30	6.67	50
12	Teachers rarely improvise.	6.67	43.33	10	40
13	There is adequate farm lands for practical lessons.	-	10	40	50
14	Students do not regularly practice on farms.	16.67	60	3.33	20
15	There is inadequate fund to manage practical oriented Agricultural Science.	36.67	53.33	10	-
16	Students do not show adequate interest in the subject.	26.67	26.67	10	36.67

these teachers use mainly traditional methods of teaching (lecture in confines of classroom/laboratory)

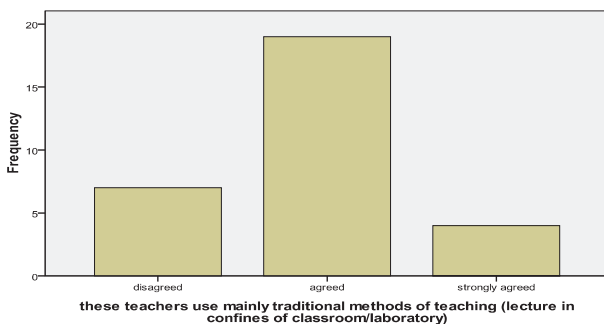


Fig. 1: Responses to “these teachers use mainly traditional methods of teaching”

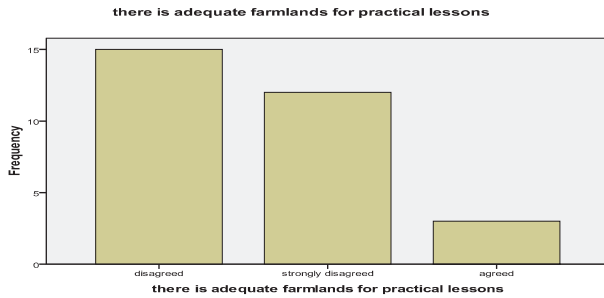


Fig. 2: Responses to “there is adequate farmland for practical lessons”

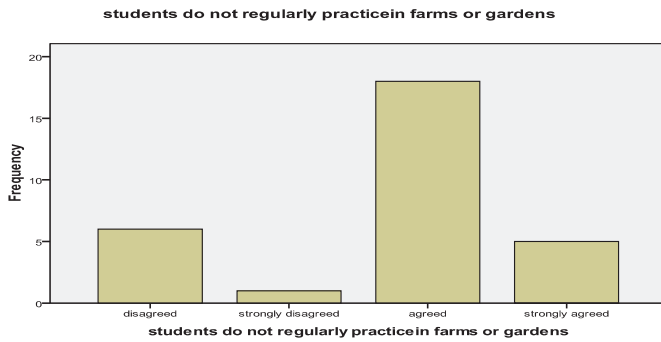


Fig. 3: Responses to “students do not regularly practice in farms or gardens”

Table 3: Teachers' responses to CASPSSQ: Part B

S/N	Items	Strongly Agree (%)	Agree (%)	Strongly Disagree (%)	Disagree (%)
1.	Agricultural Science teachers should be professionals and holders of B.(Ed.) in Agriculture.	23.33	66.67	10	-
2.	Repositioning teacher preparation institutions for qualitative Agricultural Science teachers' production.	23.33	76.67	-	-
3.	Teachers should be sound in concepts and pedagogy.	33.33	66.67	-	-
4.	Agricultural Science teachers should be adequately motivated through improved working conditions.	56.67	43.33	-	-
5.	The teachers should be given opportunities for updating of knowledge and skills so as to move with the new trends.	50	50	-	-
6.	Every school must have adequate farm lands.	46.67	53.33	-	-
7.	Agricultural Science should be adequately funded.	63.33	36.67	-	-
8.	Instructional materials should be made available by government.	43.33	56.67	-	-
9.	Teachers should be adequately sensitized on the importance of Agricultural Science as a subject.	26.67	73.33	-	-

3.5 Discussion

From the findings of this research, the four (4) major challenges identified to be confronting Agricultural Science education in INLGA are:

- i. the use of traditional methods of teaching that is lecturing in confines of classroom;
- ii. inability of students to regularly practice on farms;
- iii. inadequate farmlands for practical lessons; and
- iv. inadequate funds to manage practical oriented Agricultural Science.

These results are in agreement with the works of Modebelu & Nwakpadolu (2013); Puyate (2008); Egbule (1998). The teachers suggested the following as solutions to the identified challenges facing Agricultural Science in INLGA:

- i. Every school must have adequate farm lands;
- ii. The teachers should be given opportunities to update their knowledge and skills through participation in conferences and seminars so as to move with new trends in their fields;
- iii. Agricultural Science teachers should be adequately motivated through improved working conditions;
- iv. Agricultural Science education should be adequately funded by the government;
- v. Agricultural Science teachers should be professionals and holders of Bachelor of Education in Agriculture Science Education;
- vi. The Colleges of Education should be repositioned so that academically sound teachers would be graduating from these Colleges;
- vii. Teachers should be sound in concepts and pedagogy;
- viii. Instructional materials should be made available by the government; and
- ix. Teachers should be adequately sensitized on the economic importance of Agricultural Science as a subject.

These findings are in line with the works of Modebelu & Duvie (2012) who recommended the use of innovative teaching methods. Egbule (2004) recommended that an Agricultural Science teacher must be current in subject matter and its

pedagogy while Ladele & Agbeba (2006) suggested adequate exposure of students to the practice of farming within the provision of available technology.

4.0 ATTITUDES OF SECONDARY SCHOOL STUDENTS TO THE STUDY OF AGRICULTURAL SCIENCE

4.1 Introduction

Poor perception and lack of interest in the subject on the part of the students are major challenges facing Agricultural Science generally. Individual interest, intellectual ability and needs are important factors that contribute to attitudinal life of students generally. This chapter therefore presents an analysis of the attitudes of secondary school students to the study of agricultural Science in INLGA.

4.2 Research Question

What are the students' attitudes to the study of Agricultural Science in INLGA?

4.3 Methodology

The descriptive survey design was used for the study. Simple random sampling technique was used to select three public secondary schools from all the secondary schools in INLGA. One hundred (100) SSS II students in the selected schools participated in the study.

4.3.1 Research Instrument

4.3.1.1 Students' Attitude towards Agricultural Science Questionnaire (SAASQ)

SAASQ was a structured questionnaire designed to assess students' attitudes towards Agricultural Science as a subject. It contained items placed on a four-point Likert scale of Strongly Agree (4), Agree (3), Strongly Disagree (2) and Disagree (1). The content and face validity of the questionnaire was established by two experts on Agricultural Science Education and Educational Management. The instrument was pretested in a school that was not part of the schools used for the study and necessary changes were made to the instrument before it was administered on the one hundred (100) students.

4.3.2 Method of Statistical Data Analysis

Data collected were analysed using frequency counts and percentages.

4.4 Results

The responses of the students to some attitudinal variables captured on Agricultural Science as a subject are presented in Table 4 while graphical illustrations for some of the students' responses are presented in *Figs. 4, 5 and 6*. Seventy-four percent (74%) of the students think that their Agricultural Science teachers give too many notes during lessons while ninety-one percent (91%) of the respondents are of the opinion that practical-oriented Agricultural Science is interesting and fascinating. Also, sixty percent (60%) of the respondents believe that their interest in the subject is sustained throughout the lesson periods while seventy-one percent (71%) of them are of the opinion that the population of students who take Agricultural Science as a subject is very small.

Table 4: Students' responses to SAASQ

S/No	Items	Strongly Agree (%)	Agree (%)	Strongly Disagree (%)	Disagree (%)
1.	The number of students that take Agricultural Science as a subject is very few.	32	39	10	19
2.	Practicals in Agricultural Science as a subject are interesting and fascinating.	42	49	6	3
3.	Students' interests in Agricultural Science as a subject are sustained throughout the lesson period.	18	42	9	31
4.	Agricultural Science is not a major subject required for gaining admission into higher institution.	10	31	28	31
5.	My parents would want me to take up Agriculture as a career.	7	18	27	48

6	My parents react negatively to my study of Agricultural Science	4	7	53	36
7.	Parents see Agricultural Science subject as the subject for children from poor parents.	4	11	56	29
8.	Agricultural Science is a subject for boys alone	5	4	63	28
9.	Boys want to study core Sciences than Agricultural Science.	17	36	21	26
10.	The School farm is available for Agricultural Science Practicals	46	39	6	9
11.	The teacher is always punctual for Agricultural Science lesson	68	24	1	7
12.	The teacher uses relevant instructional materials for teaching	41	39	12	8
13.	The teacher gives too much note to write during the lesson.	43	31	8	18
14.	The time allotted for the subject on the time-table is too small.	4	22	22	52
15.	The teacher does not know how to teach very well.	4	3	74	19

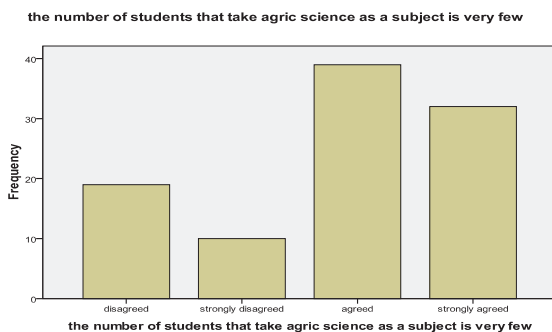


Fig.4: Responses to “the number of students that take Agricultural Science as a subject is very few”

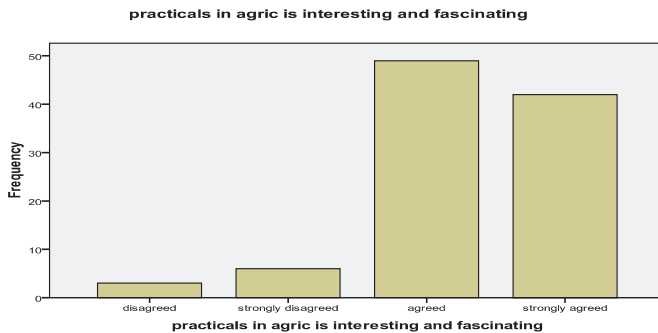


Fig.5: Responses to “practicals in Agricultural Science are interesting and fascinating”

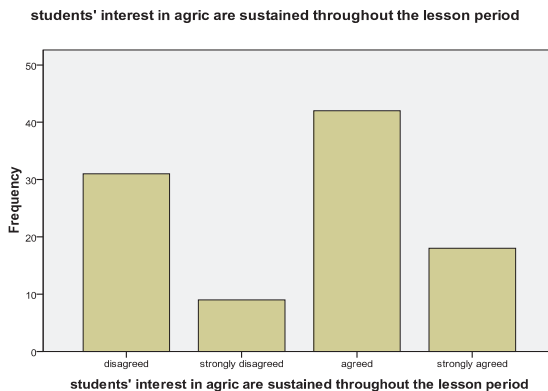


Fig.6: Responses to students’ “interests in Agricultural Science are sustained throughout the lesson period”

4.5 Discussion

Ninety-one percent (91%) of the students believed that practical-oriented Agricultural Science is interesting and fascinating. Furthermore, seventy-one percent (71%) believed that the number of students who take Agricultural Science as a subject is very few when compared to other subjects. These results agreed with the

work of Azubuike (2011) who reported that the number of students who take vocational subjects (including Agricultural Science) is very few and that vocational subjects are interesting and fascinating when they are put into practice. Moreover, ninety-one percent (91%) of the student respondents opined that their attitudes to the subject have nothing to do with their gender while eighty-five percent (85%) of the students believed that their attitudes to the subject have nothing to do with their parents' socio-economic status. This result contrasts sharply with the outcome of the research conducted by Yangben & Seniwoliba (2014) who reported that students' attitude to vocational subjects are related to their parents' socioeconomic status.

5.0 ACADEMIC PERFORMANCE OF SECONDARY SCHOOL STUDENTS IN AGRICULTURAL SCIENCE

5.1 Introduction

Academic achievement is the observable manifestation in persons that is attributed to knowledge, skills, concepts, understanding and ideas, Tuckman (1975). Examination performance through acquiring particular grades in examinations is an indication that a candidate has enough ability and mastery of the generally judged competencies, Boa (2014). Thus, academic performance is measured by examination results.

Academic achievement tests are tests usually conducted using standard scales got from a comprehensive scheme of work for a particular category of students. This test gives us a true picture of the knowledge retention ability of the students in a particular subject.

5.2 Research Question

Are there significant differences in the mean scores obtained by the students in ASAT for the three schools used for the study?

5.3 Hypotheses

H_0 : There are no significant differences in the mean scores obtained by the students in ASAT for the three schools used for the study.

H_1 : There are significant differences in the mean scores obtained by the students in ASAT for the three schools used for the study.

5.4 Methodology

The descriptive survey design was used for the study. Simple random sampling technique was used to select three public secondary schools from all the secondary schools in INLGA. A total of one hundred (100) SSS II students in the selected schools participated in the study.

5.4.1 Research Instrument

The research instrument used for data collection was:

5.4.1.1 Agricultural Science Achievement Test (ASAT)

ASAT was used to measure the students' Academic Achievement in Agricultural Science. The test is 25 - item multiple choice questions with duration of 30 minutes. The questions were selected using item analysis technique. The ASAT was administered on 100 students who participated in the study. The performance of the students in the ASAT was categorized using the Standards in Subjects format of the West African Examinations Council. This is presented in Table 5.

Table 5: Standards used for ASAT

<i>Score (%)</i>	<i>Grade</i>	<i>Interpretation</i>
80% - 100%	Grade A ₁	Excellent
70% - 79%	Grade B ₂	Very Good
65% - 69%	Grade B ₃	Good
60% - 64%	Grade C ₄	Credit
55% - 59%	Grade C ₅	Credit
50% - 54%	Grade C ₆	Credit
45% - 49%	Grade D ₇	Pass
40% - 44%	Grade E ₈	Pass
0% -39%	Grade F ₉	Fail

Source: www.mywaectimetable.com

5.4.2 Methods of Statistical data analysis

The data collected were analysed using one-way Analysis of Variance (ANOVA) and a multiple comparison technique – the Least Significant Difference (LSD).

5.5 Results

The results of the one-way ANOVA test to determine if there are significant differences in the mean scores of the students in ASAT for the three schools are shown in Table 6. Since $P = .00$ is less than $\alpha = .05$, we conclude that there are significant differences in the mean scores of the students in ASAT among the three schools. Multiple comparison tests on the ANOVA using LSD showed the School 1 and School 2 mean scores; School 1 and School 3 mean scores were different from each other at 5% significance level. Fig. 7 shows the mean plots of the ASAT scores of the students for the three schools while the multiple comparison test results are displayed in Table 7.

Table 6: ANOVA Test on the three Schools

	Sum of Squares	Df	Mean Squares	F	Sig.
Between Groups	8983.733	2	4491.867	35.036	.000
Within Groups	12436.267	97	128.209		
Total	21420.000	99			

Table 7: Multiple Comparisons (Least Significant Difference) Test

(I) (Variable 1)	(J) (Variable 2)	Mean Difference (I - J)	Std. Error	Sig.	95% Confidence Interval	
School 1	School 2	19.80000(*)	2.73475	.000	14.3723	25.2277
	School 3	18.86667(*)	2.73475	.000	13.4389	24.2944
School 2	School 1	-19.80000 (*)	2.73475	.000	-25.2277	-14.3723
	School 3	-.93333	2.92357	.750	-6.7358	4.8691
School 3	School 1	-18.86667(*)	2.73475	.000	-24.2944	-13.4389
	School 2	.93333	2.92357	.750	-4.8691	6.7358

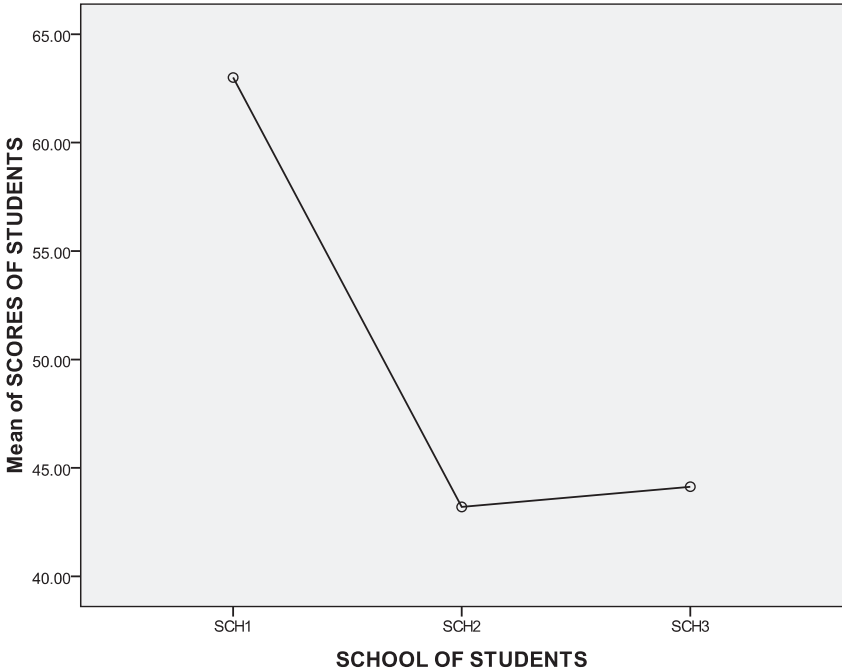


Fig. 7: Mean plots of the scores of students in ASAT for the three schools

5.6 Discussion

In the ASAT scores, fifty-two percent (52%) of the students scored 50% and above but just 9% had 80% and above scores. This suggests that further encouragement needs to be given to the students to enhance better academic performance in Agricultural Science. Weiner (1979) stated that highly motivated students in any area of interest perform difficult tasks better than lowly motivated students. There exist significant differences in the ASAT mean scores obtained by the students for School 1 and School 2; School 1 and School 3 respectively while no significant differences exist between Schools 2 and School 3. School 1(single-sex school; female) performed better than Schools 2 and 3(co-educational schools). This might not be unconnected with the fact that public School 1 is one of the highly rated public schools in INLGA and Oyo State generally with better teaching and infrastructural facilities when compared to most public schools in the State. Also, the result from School 1 corroborates the works of Smithers & Robinson (2006); Busari (2016) and Otekunrin (2014) that showed that students in single-sex schools perform better than students from co-educational schools.

6.0 RELATIONSHIP BETWEEN ATTITUDE AND ACADEMIC PERFORMANCE OF STUDENTS IN AGRICULTURAL SCIENCE

6.1 Introduction

Attitude as a psychological concept is a relative term. It could be viewed as the way one reacts towards an object or situation. It could be favourable or unfavourable. Inyang–Abia (1988) asserts that attitude is a desire or tendency to approach or avoid something. He stated further that attitude of an individual can either be positive or negative. When it is positive, the individual approaches the object. Otherwise, the object is avoided. According to Jegede (1981), there is a positive relationship between students' attitude and their performance in academics. In a study carried out by Bassey (2002) to determine the degree of co-variation between students' test attitude and their test performance, the results showed that there was a significant difference in performance in the different attitudinal groups. Umoinyang (1999) carried out a study to establish the relationship between student's attitude and their academic achievement in Mathematics. A positive and significant correlation was found between students' attitude towards Mathematics and their academic achievement in the subject. This suggested that attitude to the subject is related to performance if it is based on the assumption that positive attitude leads to higher performance of the students in their academics.

6.2 Research Question

Is there any relationship between academic performance of students in Agricultural Science and their attitudes to the subject?

6.3 Hypotheses

- a. H_0 : There is no association between students' scores and sustained interest in Agricultural Science throughout a lesson period.
 H_1 : There is association between students' scores and sustained interest in Agricultural Science throughout a lesson period.

- b. H_0 : There is no association between students' scores and teachers' use of relevant instructional materials.
 H_1 : There is association between students' scores and teachers' use of relevant instructional materials.
- c. H_0 : There is no association between students' scores and Agricultural Science as a major requirement for admission.
 H_1 : There is association between students' scores and Agricultural Science as a major requirement for admission.
- d. H_0 : There is no association between students' scores and Agricultural Science teachers' punctuality for lessons.
 H_1 : There is association between students' scores and Agricultural Science teachers' punctuality for lessons.
- e. H_0 : There is no association between students' scores and teachers giving copious notes.
 H_1 : There is association between students' scores and teachers giving copious note

6.4 Methodology

The descriptive survey design was used for the study. Simple random sampling technique was used to select three public secondary schools from all the secondary schools in INLGA. A total of one hundred (100) SSS II students in the selected schools participated in the study. ASAT and SAASQ were used for data collection.

6.4.1 Methods of Statistical data analysis

The data collected were analysed using Chi-square test of independence to ascertain if there existed any relationship between the students' academic achievement in Agricultural Science and their attitudes to the study of Agricultural Science as a subject.

6.5 Results

The distribution of scores obtained by the students in the ASAT is presented in Table 8. Nineteen (19) students obtained scores below 40%. Also, nineteen (19) students had between 40% and 44%. Seventeen (17) students scored between 60% and 64%. One (1) student had 68% while nine (9) students scored 80% and above.

Table 8: Distribution of Scores obtained by the students in ASAT

<i>Scores</i>	<i>Frequency</i>	<i>Percentage</i>
80% - 100%	9	9
70% - 79%	3	3
65% - 69%	1	1
60% - 64%	17	17
55% - 59%	6	6
50% - 54%	16	16
45% - 49%	10	10
40% - 44%	19	19
0% - 39%	19	19
Total	100	100

Table 9 shows the Chi-square results of the relationship between academic performance of the students in ASAT and their attitudes to the subject. The result shows that there exists association between scores obtained by the students and sustained students' interest in the subject throughout a lesson period ($P = .02 < .05$). Also, there is no association between scores obtained by the students and the subject not being a major requirement for admission into higher institutions. Furthermore, there is no relationship between scores obtained by the students and the use of relevant instructional materials by teachers.

Table 9: Results of Chi-Square tests of independence between students' scores in ASAT and students' responses to SAASQ

	Hypothesis H_0	Chi-Square Statistic	P -value	Decision
1.	<p>H_0: There is no association between students' scores and sustained interest in Agricultural Science throughout a lesson period.</p> <p>H_1: There is association between students' scores and sustained interest in Agricultural Science throughout a lesson period.</p>	40.594	0.02	Reject H_0
2.	<p>H_0: There is no association between students' scores and teachers' use of relevant instructional materials.</p> <p>H_1: There is association between students' scores and teachers' use of relevant instructional materials.</p>	24.887	0.41	Accept H_0
3.	<p>H_0: There is no association between students' scores and Agricultural Science as a major requirement for admission.</p> <p>H_1: There is association between students' scores and Agricultural Science as a major requirement for admission.</p>	25.455	0.38	Accept H_0
4.	<p>H_0: There is no association between students' scores and Agricultural Science teachers' punctuality for lessons</p> <p>H_1: There is association between students' scores and Agricultural Science teachers' punctuality for lessons</p>	27.099	0.30	Accept H_0
5.	<p>H_0: There is no association between students' scores and teachers giving copious note.</p> <p>H_1: There is association between students' scores and teachers giving copious note.</p>	20.536	0.67	Accept H_0

6.6 Discussion

There is association between the scores obtained by the students and sustained students' interest in Agricultural Science throughout a lesson period. This implies that for better performance, teachers should device innovative methods of teaching to sustain the students' interest throughout the lesson period.

On the other hand, from this study, no association was found between scores obtained by the students and the use of relevant instructional materials by teachers. This might be due to the fact that instructional materials only do not necessarily lead to better performance of the students.

7.0 CONCLUDING REMARKS

The major challenges confronting effective teaching and learning of Agricultural Science in public schools in the local government area are inadequate farmlands for practical lessons, inadequate funds to manage practical-oriented Agricultural Science, the inability of students to regularly practice on farms and the use of traditional methods of teaching.

The proposed solutions to the challenges included, among others, provision of adequate farm lands, provision of avenues and resources for teachers to update their knowledge and proper motivation of Agricultural Science teachers through improved working conditions.

There existed a significant relationship between scores obtained by the students in ASAT and the attitudinal variable of sustained students' interests in Agricultural Science lessons throughout a lesson period.

There were significant differences in the ASAT mean scores obtained by the students in School 1 and School 2 and School 1 and School 3 respectively while no significant differences existed between Schools 2 and School 3. Thus, School 1, (girls' only School) has the best performance among the three schools.

Based on these findings, we propose the following recommendations:

- i. Students should be exposed to the practical aspects of the subject using modern technology. This will highly motivate the students towards making a career in Agriculture.
- ii. Teachers should be creative and innovative while teaching Agricultural Science students in class so as to be able to sustain students' interest in the subject.
- iii. Awareness campaigns on the socio-economic importance of Agricultural Science as a vocational subject should be intensified. This may lead to better perception of the subject by students at the secondary school level.

- iv. Government should provide adequate human resources, infrastructural facilities and relevant instructional materials for the teaching and learning of Agricultural Science

REFERENCES

- Azubuike, O. C. (2011). Influential factors affecting the attitude of students towards vocational/technical subjects in secondary schools in south-eastern Nigeria. *Journal of Educational and Social Research* 1(2), 49-56.
- Bassey, B. A. (2002). Students' Evaluation of Instruction, Attitude Towards Mathematics and Mathematics Achievement of SSS3 Students in Southern Cross River State. *Unpublished Masters' Degree Thesis, Faculty of Education, University of Calabar, Calabar.*
- Blueprint on Family Support Programme, (1994). Federal Republic of Nigeria. Lagos, *NERDC Press.*
- Boa, Y. P. (2014). Determinants of high academic performance in secondary schools in Kilimanjaro region. *An Unpublished M.Ed. Dissertation, Open University of Tanzania.* Available online: http://repository.out.ac.tz/473/1/YOLANDA_SET_UP_4.pdf
- Busari, D. A. (2016). Comparative evaluation of the academic performance of single sex and Co-educational secondary school students in Ibadan, South West Nigeria. *African Journal for the Psychological Study of Social Issues* 19(1), 37-46.
- Camilus, B. B. (2011). Student's personality characteristics and their academic performance in Agricultural Science in Secondary Schools in Uyo Municipality, Akwa-Ibom State, Nigeria. *Journal of Education and Leadership Development* 3, 36-53.
- Chang, A. J. (2005). Ethnic identity and social cognitive determinants of Korean-American career choices in the science and non-sciences domains. *Purdue University.*
- Davis, N. L. (2009). Factors influencing career choice among students enrolled in a four-year tourism administration program. *PhD dissertation, Southern Illinois University Carbondale.*

- Denga, D. I. (2007). *Moral and Sociological Foundations of Education. London: Dean house Publishers.*
- Denga, D. I. (2002). *Educational and Social Psychology for Schools and other Social Organizations. Calabar. CATS Publisher.*
- Dick, T. P. & Rallis, S. F. (1991). Factors and influences on high school students' career Choices. *Journal for Research in Mathematics Education* 22(4), 281-292.
- Egbule, P. E. (2004). *Fundamentals and Practice of Agricultural Education. Owerri. Totan Publishers Ltd.*
- Egbule, P. E. (1998). Fine-tuning the pre-vocational education programme delivery in Nigerian secondary schools. *Nigerian Journal of Curriculum and Instruction* 6(1), 86-91.
- Egun, A. C. (2009). Focusing Agricultural Education for Better Productivity in Nigeria in the 21st Century. *Int J Edu Sci* 1(2), 87-90.
- Fisher, T. A. & Griggs, M. B. (1994). Factors that Influence the Career Development of African – American and Latino Youth. *Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA April (ED 380 532).*
- Hansford, B. C. & Hattie, J. A. (1982). The relationship between Self and Achievement/ Performance Measures. *Review of Educational research* 52(1), 123–142.
- Ikeoji, C. N. & Agwubike, C. C. (2006). Approaches for effective vocationalization of secondary school agriculture in Nigeria: The views of agricultural science teachers in Delta state, Nigeria. *Journal of Agricultural Education and Extension* 12(3), 213-222.
- Inyang-Abia, M. E. (1988). *Essentials of Educational technology: A Handbook for Educators and Media Practitioners. Uyo. Legacy Nigeria Ltd.*

- Izuchukwu, O. (2011). Analysis of the contribution of agricultural sector on the Nigerian economic development. *World Review of Business Research* 1(1), 191-200.
- Jegede, O. J. (1981). An Evaluation of Nigerian Integrated Science Project (NISP). *Unpublished Ph.D. thesis, University of Wales*.
- Ladele, A. A. & Agbebaku, O. M. (2006). Analysis of entrepreneurial skills development through farm practical training programmes of University of Ibadan and University of Agriculture, Abeokuta. *Journal of Agricultural Extension* 9, 14 -22.
- Mamman, M. G. (2000). Teacher education and teacher effectiveness. *Journal of Teachers and Teaching* 1(2), 25-29.
- Margolis, J. (2008). The attrition of engineering graduates: An exploratory study on influential career choice factors. *Master of Science thesis, University of Colorado*.
- Marsh, H. W. (1990). A multi-dimensional hierarchical self-concept: Theoretical and empirical justification. *Educational Psychology review* 2 (2), 77-172.
- Mcwhirter, E. H., Hackett, G. & Bandalos, D. L. (1998). A causal model of the educational plans and career expectations of Mexican American high school girls. *Journal of Counselling Psychology* 45(2), 166-181.
- Meece, J. L., Wigfield, A. & Eccles, J. S. (1990). Predictors of Math anxiety and its influence on young adolescents' course enrollment intentions and performance in Mathematics. *Journal of Educational Psychology* 82(1), 60 - 70.
- Modebelu, M. N. & Duvie, A. N. (2012). Innovative methods and strategies for effective teaching and learning. *Mediterranean Journal of Social Sciences* 3(13), 145-154.

- Modebelu, M. N. & Nwakpadolu, G. M. (2013). Effective Teaching and Learning of Agricultural Science for Food Security and National Sustainability. *Journal of Educational and Social Research* 3(4), 161-170.
- National Policy on Education, (2004). Federal Republic of Nigeria. *Lagos. NERDC Press.*
- Obanya, P. (2010). Bringing back the Teacher to the African School. *UNESCO International Institute for Capacity Building in Africa, Addis Ababa.* Available Online: <http://unesdoc.unesco.org/images/0021/002160/216061e.pdf>
- Ohiwerei, F. O. & Nwosu, B. O. (2009). Vocational Choices among Secondary School Students: Issues and Strategies in Nigeria. *Asian Journal of Business Management* 1(1), 1-5.
- Onu, F.M. & Ikehi, M. E. (2013). Factors Influencing Students' Choice to Study Agricultural Science in South-South Nigeria. *Journal of Agriculture and Biodiversity Research* 2(4), 80-86.
- Onyejiaku, F. O. (1991). Psychology of Adolescents. *Calabar. Rapid Publishers.*
- Otekunrin, O. A. (2014). Students' attitude and academic performance in Agricultural Science: A case study of public secondary Schools in Ibadan North Local Government Area of Oyo State. *Unpublished Postgraduate Diploma in Education Project, National Open University of Nigeria.*
- Otekunrin, O. A., Oni, L .O. & Otekunrin, O. A. (2017). Challenges, Attitudes and Academic Performance of Agricultural Science Students in Public Secondary Schools of Ibadan North, Nigeria. *Journal of Scientific Research & Reports* 13(1), 1-11.
- Puyate, S. T. (2008). Constraints to the Effective Implementation of Vocational Education Program in Private Secondary Schools in Port Harcourt Local Government Area. *Asia-Pacific Journal of Cooperative Education* 9(1), 59-71.

- Puyate, S. T. (2004). Manpower production for national development. *Paper presented at the Nigerian Association of Teachers of Technology annual conference. Ibadan Oyo State, Nigeria.*
- Ruble, D. N. & Martins, C. L. (1998). Gender development. In W. Damon (Series Ed.) and N. Eisenberg (Vol. Ed.), *Handbook of Child Psychology: Vol.3, Social, emotional and personality development*, 933-1016, New York. Wiley.
- Smithers, A. S. & Robinson, P. (2006). The paradox of single-sex and coeducational schooling. University of Buckingham, U.K. Carmichael Press. Available Online: <https://www.buckingham.ac.uk/wp-content/uploads/2010/10/hmcscsd.pdf>
- Sugahara, S., Hiramatsu, K. & Boland, G. (2009). The factors influencing accounting school students' career intention to become a Certified Public Accountant in Japan. *Asian Review of Accounting* 17(1), 5-22.
- Tella, A. (2007). The impact of motivation on students' academic achievement and learning outcomes in mathematics among secondary school students in Nigeria. *Eurasia Journal on Mathematics, Science and Technology Education* 3(2), 149–156.
- Tuckman, B. (1975). *tuckman forming storming norming performing model*. Available Online:<http://www.businessballs.com/tuckmanformingstormingnormingperforming.htm>
- Trusty, J., Watts, R. E. & Erdman, P. (1997). Predictors of Parents' involvement in their Teens' Career Development. *Journal of Career Development* 23(3), 189-201.
- Turner, S. L. & Lapan, R. T. (2002). Career self-efficacy and perceptions of parent support in adolescent career development. *The Career Development Quarterly* 51, 44-55.

- Turner, S. L., Steward, J. C. & Lapan, R. T. (2004). Family factors associated with sixth grade adolescents' Math and Science career interests. *The Career Development Quarterly* 53, 41-52.
- Umoinyang, I. E. (1999). Student Socio-psychological factors as determinants of achievement in senior secondary mathematics. *Unpublished Ph.D. Thesis, University of Ibadan, Ibadan.*
- Usman, K. O. & Memeh, I. M. (2007). Student and Teacher attitude toward and performance in an Integrated Science/Agriculture Course. *Paper presented at the 47th Annual Central Region Research Conference in Agricultural Education. St. Louis, MO*
- WAEC, (2015). *Chief Examiners' Report*. Lagos, Nigeria.
- Waliki, L. M. & Usman, M. (2009). Achieving the millennium development goals – MDGs by 2015 through Effective Teaching of Agricultural Science of Nigeria. *The Voice of Teachers* 1(1), 32–36.
- Wang, J. (2007). A trend study of self-concept and mathematics achievement in a cross cultural context. *Mathematics Education Research Journal* 19(3), 33-47.
- Weiner, B. (1979). A theory of motivation for some classroom experiences. *Journal of Educational Psychology* 71(1), 3-25.
- Wong, S. C. & Liu, G. J. (2010). Will parental influences affect career choice? Evidence from hospitality and tourism management students in China. *International Journal of Contemporary Hospitality Management* 22(1), 82-102.
- Yangben, P. N. & Seniwoliba, A. J. (2014). Career challenges in construction craft training in technical vocational education and training in Ghana. *International Journal of Vocational and Technical Education* 6(3), 13-29.

APPENDICES

APPENDIX I

CONSTRAINTS FACING AGRICULTURAL SCIENCE IN PUBLIC SECONDARY SCHOOLS QUESTIONNAIRE (CASPSQ)

This questionnaire is for investigating challenges to effective teaching and learning of Agricultural Science in public secondary schools in Ibadan North Local Government Area of Oyo State. It is solely for research purpose and all information shall be treated with utmost confidentiality.

A. *Challenges to effective teaching and learning of Agricultural Science in Public secondary schools in Ibadan North Local Government Area of Oyo State.*

I.	Inadequate qualification	STRONGLY AGREE	AGREE	STRONGLY DISAGREE	DISAGREE
1.	Majority of agricultural science teachers are not professionals				
2.	Majority of the teachers are not holders of B.Sc. (Ed.) in Agriculture				
3.	Majority of the teachers are still holders of NCE or HND in Agriculture				
II.	Inadequate Technical Know-how	STRONGLY AGREE	AGREE	STRONGLY DISAGREE	DISAGREE
4.	Agricultural science teachers are not very proficient in the teaching and learning of Agriculture				
5.	These teachers do not possess adequate modern				

	skills for practical oriented teaching				
6.	The teachers are less resourceful				
III.	Inadequate Teaching Method	STRONGLY AGREE	AGREE	STRONGLY DISAGREE	DISAGREE
7.	These teachers use mainly traditional methods of teaching (lecture in confines of classroom/ laboratory)				
8.	Teaching and learning of the subject are rarely learner-centered				
9.	Teaching and learning are mainly teacher-centred				
IV.	Inadequate Instructional Materials	STRONGLY AGREE	AGREE	STRONGLY DISAGREE	DISAGREE
10.	Instructional materials are not available				
11.	Instructional materials available are not adequately utilized				
12.	Teachers rarely improvise				
V.	Inadequate farms	STRONGLY AGREE	AGREE	STRONGLY DISAGREE	DISAGREE
13.	There is adequate farm lands for practical lessons				
14.	Students do not regularly practice in farms or gardens.				
VI.	Inadequate fund	STRONGLY AGREE	AGREE	STRONGLY DISAGREE	DISAGREE
15.	There is inadequate				

	fund to manage practical oriented Agricultural science				
VII .	Poor students' Attitudes	STRONGLY AGREE	AGREE	STRONGLY DISAGREE	DISAGREE
16.	Students do not show adequate interest in the subject				

B. Managing the challenges facing effective teaching and learning of Agricultural Science.

		STRONGLY AGREE	AGREE	STRONGLY DISAGREE	DISAGREE
17.	Agricultural science teachers should be professionals and holders of B.Sc. Ed. in Agriculture				
18.	Repositioning teacher preparation institutions for qualitative Agricultural teachers production.				
19.	Teachers should be sound in concepts and pedagogy				
20.	Agricultural science teachers should be adequately motivated through improved working conditions				
21.	The teachers should be given opportunities for updating of knowledge and				

	skills so as to move with the new trends				
		STRONGLY AGREE	AGREE	STRONGLY DISAGREE	DISAGREE
22.	Every school must have adequate farm lands				
23.	Agricultural science should be adequately funded				
24.	Instructional aids should be made available by government				
25.	Teachers should be adequately sensitized on the importance of agricultural science as a subject				

APPENDIX II

STUDENTS' ATTITUDE TOWARDS AGRICULTURAL SCIENCE QUESTIONNAIRE (SAASQ)

This questionnaire is for investigating students' attitudes to Agricultural Science in public secondary schools in Ibadan North Local Government Area of Oyo State. It is solely for research purpose and all information shall be treated with utmost confidentiality.

Students' attitude to Agricultural Science

		STRONGLY AGREE	AGREE	STRONGLY DISAGREE	DISAGREE
1.	The number of students that take Agricultural Science as a subject is very few.				
2.	Practicals in Agricultural science as a subject are interesting and fascinating.				
3.	Students' interests in Agricultural science as a subject are sustained throughout the lesson period.				
4.	Agricultural Science is not a major subject required for gaining admission into higher institution				
5.	My parents would want me to take up agriculture as a career				
6.	My parents react negatively to my study of Agricultural Science				
7.	Parents see				

	Agricultural Science subject as the subjects for children from poor parents.				
8.	Agricultural Science as a subject is for boys alone				
9.	Boys want to study core sciences than Agricultural science.				
10.	The School farm is available for Agricultural Science practicals				
		STRONGLY AGREE	AGREE	STRONGLY DISAGREE	DISAGREE
11.	The teacher is always punctual for Agricultural Science lesson				
12.	The teacher uses relevant instructional materials for teaching				
13.	The teacher gives too much note to write during the lesson.				
14.	The time allotted for the subject on the time-table is too small				
15.	The teacher does not know how to teach very well				

APPENDIX III

AGRICULTURAL SCIENCE ACHIEVEMENT TEST (ASAT)

1. Which of these is NOT an importance of Agriculture to the farmer? Provision of.....
(a) clothing materials (b) food for the family (c) income to care for other needs
(d) industrial raw materials
2. The following factors encourage subsistence farming EXCEPT (a) insufficient farm machinery (b) long term loan facility (c) poverty level of farmers (d) small farm land size
3. Which of the following is a physical property of sandy soil? (a) it contains much plant nutrients (b) it has large pore spaces (c) it is granular in structure (d) it is sticky when wet
4. Which of the following is not a soil living organism? (a) centipede (b) earthworm (c) millipede (d) round worm
5. Which of the following is not a way of conserving water in the soil? (a) addition of organic manure (b) clean clearing (c) cover cropping (d) mulching
6. Which of the following is not an organic fertilizer? (a) cow dung (b) decayed waste (c) poultry droppings (d) super-phosphate
7. The movement of nutrients in soluble form beyond the reach of the roots of plants is called (a) erosion (b) irrigation (c) mulching (d) leaching
8. Which of the following crops does not require nursery operations? (a) cocoa (b) coffee (c) maize (d) pepper
9. Which of the following is not a physical method of controlling weeds? (a) crop rotation (b) hand pulling (c) hoeing (d) slashing
10. The following are symptoms of a diseased crop, except (a) chlorosis (b) dormancy (c) patch yellowing (d) stunted growth
11. The inability of an animal to see clearly in dim light is a symptom of disease (a) beri beri (b) grass tetany (c) night blindness (d) scurvy

12. The difference between subsidy and loan is that subsidy..... **(a)** is a short term credit while loan is a long term credit **(b)** is not refundable while loan is **(c)** is only in cash while loan is always in kind **(d)** requires a collateral while loan does not
13. Domestic fowls reared mainly for meat production are called **(a)** breeders **(b)** broilers **(c)** cockerels **(d)** layers
14. The primary organ of reproduction in female farm animal is the **(a)** cervix **(b)** ovary **(c)** oviduct **(d)** uterus
15. Which of the following tools is BEST used for transplanting seedlings? **(a)** cutlass **(b)** handfork **(c)** hand trowel **(d)** hoe
16. The relative proportion of soil particle in a soil sample is called **(a)** catena **(b)** porosity **(c)** profile **(d)** texture
17. The following are chemical processes of weathering EXCEPT **(a)** carbonation **(b)** glaciations **(c)** hydration **(d)** hydrolysis
18. The following are signs of ill-health in farm animals except **(a)** uncoordinated gait **(b)** dull eyes **(c)** high body temperature **(d)** increased appetite
19. Demand is said to be price elastic if the absolute value of price elasticity of demand is **(a)** greater than one **(b)** less than one **(c)** one **(d)** zero
20. The correct sequence for the use of coupled implements for land preparation is **(a)** plough, harrow and ridger **(b)** harrow, ridger and plough **(c)** plough, ridger and harrow **(d)** harrow, plough and ridger
21. The following crops will enrich the soil with nitrates except **(a)** calopogonium **(b)** pueraria **(c)** centrosema **(d)** axonopus
22. In which layer of soil profile do most biological activities occur? **(a)** D-horizon **(b)** C-horizon **(c)** B-horizon **(d)** A-horizon
23. Yellow colouration of the lower leaves of a growing maize plant may be due to deficiency in..... **(a)** potassium **(b)** phosphorus **(c)** zinc **(d)** nitrogen
24. Mating in poultry is known as **(a)** servicing **(b)** treading **(c)** tuppung **(d)** breeding

25. Streak disease of maize is caused by (a) virus (b) nematode (c) fungus (d) bacterium

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