

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/313272687>

Challenges, Attitudes and Academic Performance of Agricultural Science Students in Public Secondary Schools of Ibadan North, Nigeria

Article in Journal of Scientific Research and Reports · January 2017

DOI: 10.9734/JSRR/2017/31216

CITATION

1

READS

4,073

3 authors, including:



Olutosin Ademola Otekunrin

University of Agriculture, Abeokuta

18 PUBLICATIONS 3 CITATIONS

[SEE PROFILE](#)



Oluwaseun A. Otekunrin

University of Ibadan

27 PUBLICATIONS 4 CITATIONS

[SEE PROFILE](#)

Some of the authors of this publication are also working on these related projects:



Eradicating extreme poverty: What is the role of agriculture [View project](#)



Achieving the Sustainable Development Goal 2 Target (Zero Hunger) in Africa and other Continents [View project](#)



Challenges, Attitudes and Academic Performance of Agricultural Science Students in Public Secondary Schools of Ibadan North, Nigeria

Olutosin A. Otekunrin^{1*}, Leah O. Oni¹ and Oluwaseun A. Otekunrin²

¹National Teachers' Institute, Kaduna, Kaduna State, Nigeria.

²Department of Statistics, University of Ibadan, Oyo State, Nigeria.

Authors' contributions

This work was carried out in collaboration among all authors. Author Olutosin A. Otekunrin designed the study and managed the literature searches. Author LOO supervised and revised the manuscript for important intellectual content. Author Oluwaseun A. Otekunrin performed the statistical analysis and wrote the first draft of the manuscript. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JSRR/2017/31216

Editor(s):

(1) Eduardo Dopico, Department of Education Sciences, Faculty of Teacher Training and Education, University of Oviedo, Asturias, Spain.

(2) Ana Paula da Silveira Simões Pedro, Department of Education, University of Aveiro, Portugal.

Reviewers:

(1) B. Chamezky, Ozarks Technical Community College, USA.

(2) Nancy Maynes, Nipissing University, Canada.

Complete Peer review History: <http://www.sciencedomain.org/review-history/17669>

Original Research Article

Received 27th December 2016

Accepted 23rd January 2017

Published 29th January 2017

ABSTRACT

In this study, we considered challenges facing effective teaching and learning of Agricultural Science. Also, we examined whether there were differences in the mean achievement test scores of students in the subject in selected schools. Furthermore, we studied students' attitude to the subject and examined the relationship between their academic performance in Agricultural Science and their attitudes to the subject. The study was a descriptive survey design carried out at Ibadan North Local Government Area (INLGA) of Oyo State, Nigeria. Three public secondary schools were randomly selected from all the public secondary schools in INLGA in 2014. A total of thirty teachers and one hundred Senior Secondary School II (SSS II) students from the selected schools participated in the study. Agricultural Science Achievement Test (ASAT), Constraints facing Agricultural Science in Public Secondary Schools Questionnaire (CASPSSQ) and Students' Attitude towards Agricultural Science Questionnaire (SAASQ) were used for data collection. The data collected were analyzed using descriptive statistics, Chi-square test of independence, one-

*Corresponding author: E-mail: otekunrinolutosin@yahoo.com;

way Analysis of Variance (ANOVA) and multiple comparison techniques. The major challenges confronting the teaching and learning of Agricultural Science in INLGA and their solutions were identified. The ANOVA test was significant ($P=.00$). Least Significant Difference, a multiple comparison technique, on the ANOVA showed that School 1 and School 2 ASAT mean scores; School 1 and School 3 ASAT mean scores were different from each other at 5% significance level respectively. A significant relationship was found between scores obtained by the students in the ASAT and the attitudinal variable of sustained students' interests in Agricultural Science ($P=.02$). The study therefore recommended innovative methods of teaching the subject so as to be able to sustain students' interest in the subject and obtain better academic performance.

Keywords: *Students' scores; innovative teaching techniques; practical-oriented agricultural science; sustained students' interest.*

1. 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 [1]. 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. One of these policies from the educational standpoint is the inclusion of Agriculture as a pre-vocational subject at the primary and junior secondary schools and as a vocational subject in the senior secondary school level [2]. 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. This is to enable interested students to 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 [3] are as follows:

- to stimulate and sustain students' interest in agriculture;
- to provide students the interest to advance in farming;
- to advance food production through improvement of agricultural production techniques in students;
- to provide occupational entry level skills in agriculture to the interested students;
- to prepare students adequately for producing and marketing farm commodities efficiently and profitably; and,
- 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 [4]. 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 no 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 no 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 a 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, [5] 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 [6], can be attributed to poor perception and lack of interest in the subject on the part of the students. Moreover, [7] 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 [8].

In this study, therefore, we examined the challenges facing the teaching and learning of Agricultural Science in INLGA of Oyo State, Nigeria. Also, we examined whether there were significant differences in the average scores obtained by the students in ASAT in the three schools. Furthermore, we examined whether there was any relationship between scores obtained by the students in ASAT and their attitudes to the subject.

1.1 Statement of the Problem

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.

1.2 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?
3. What are the students' attitudes to the study of Agricultural Science in INLGA?
4. Are there significant differences in the mean scores obtained by the students in ASAT in the three schools used for the study?
5. Is there any relationship between academic performance of students in Agricultural Science and their attitudes to the subject?

Specifically, our hypotheses are:

- a. 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.
- b. 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.
- c. 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.
- d. 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.
- e. H_0 : There is no association between students' scores and Agricultural

Science teachers' punctuality for lessons.

H₁: There is association between students' scores and Agricultural Science teachers' punctuality for lessons.

f. H₀: There is no association between students' scores and teachers giving copious notes.

H₁: There is association between students' scores and teachers giving copious notes.

2. 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 and one hundred (100) SSS II students in the selected schools participated in the study.

2.1 Research Instruments

Three research instruments were used for data collection. They were:

2.1.1 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 2.

Table 2. Standards used for ASAT

Score (%)	Grade	Interpretation
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

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

This questionnaire was designed to assess the 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 obtained using Cronbach's Alpha was 0.79. The Questionnaire was administered on 30 teachers comprising the School Principals, Vice-Principals and Agricultural Science teachers from the three schools.

2.1.3 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.

2.2 Method of Statistical Data Analysis

Data collected were analysed using frequency counts and percentages. Also, relevant hypotheses were formulated. One-way ANOVA was used to test for significant differences in

mean scores of students from the three different schools. Chi-square tests of independence were conducted to ascertain if there exists any relationship between the students' academic achievement in Agricultural Science and their attitudes to the study of Agricultural Science as a subject.

3. RESULTS

The results of the study are presented in the order of the research questions:

3.1 Research Question 1

What are the challenges to effective teaching and learning of Agricultural Science in secondary schools?

Table 3 shows the responses of the teachers to challenges confronting effective teaching and learning of Agricultural Science in public secondary schools. 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.

3.2 Research Question 2

In what ways could the challenges be managed for effective teaching and learning of 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 4. 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 3. Teachers' responses to CASPSSQ: Part A

S/No	Items	Strongly agree (%)	Agree (%)	Strongly disagree (%)	Disagree (%)
1	Majority of Agricultural Science teachers are not professionals.	-	50.00	33.33	16.67
2	Majority of the teachers are not holders of B. (Ed.) in Agriculture.	3.33	43.33	20.00	33.33
3	Majority of the teachers are still holders of NCE or HND in Agriculture.	-	43.33	36.67	20.00
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.	10.00	13.33	16.67	60.00
6	The teachers are less resourceful.	3.33	46.67	20.00	30.00
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-centred.	-	40.00	-	60.00
10	Instructional materials are not available.	10.00	53.33	-	36.67
11	Instructional materials available are not adequately utilized.	13.33	30.00	6.67	50.00
12	Teachers rarely improvise.	6.67	43.33	10.00	40.00
13	There are adequate farm lands for practical lessons.	-	10.00	40.00	50.00
14	Students do not regularly practice on farms.	16.67	60.00	3.33	20.00
15	There is inadequate funding to manage practical oriented Agricultural Science.	36.67	53.33	10.00	-
16	Students do not show adequate interest in the subject.	26.67	26.67	10.00	36.67

Table 4. 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	10.00	-
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.	50.00	50.00	-	-
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	-	-

3.3 Research Question 3

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

The responses of the students to some attitudinal variables captured on Agricultural Science as a subject are presented in Table 5. 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.

3.4 Research Question 4

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

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. 1 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.

3.5 Research Question 5

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

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 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 5. 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' interest in Agricultural Science as a subject is 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 lessons.	68	24	1	7
12.	The teacher uses relevant instructional materials for teaching.	41	39	12	8
13.	The teacher gives too many notes to write during the lessons.	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

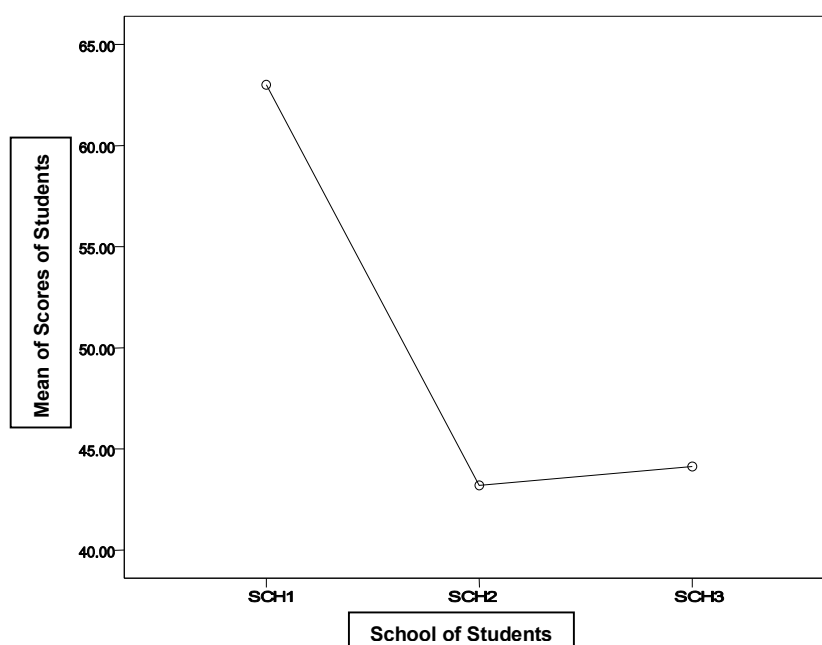
**Fig. 1. Mean plots of the scores of students in ASAT for the three schools**

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) (Variable1)	(J) (Variable 2)	Mean difference (I - J)	Standard 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

Table 8. Distribution of scores obtained by the students in ASAT

Scores	Frequency	Percentage
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. Results of Chi-Square tests of independence between students' scores in ASAT and students' responses to SAASQ

Hypothesis	Chi-Square (χ^2) statistic	P-value	Decision
1 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.	40.594	0.02	Reject H_0
2 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.	24.887	0.41	Accept H_0
3 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.	25.455	0.38	Accept H_0
4 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.	27.099	0.30	Accept H_0
5 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 notes.	20.536	0.67	Accept H_0

4. 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 [9,10,11].

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 [12] who recommended the use of innovative teaching methods. [13] recommended that the Agricultural Science teacher must be current in subject matter and its pedagogy. [14] suggested adequate exposure of students to the practice of farming within the provision of available technology.

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 [15] 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 [16] who reported that students' attitude to vocational subjects are related to their parents' socio-economic status.

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. [17] 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 [18, 19] that showed that students in single-sex schools perform better than students from co-educational schools.

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.

5. CONCLUSION

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.

6. RECOMMENDATIONS

The findings revealed that most of the student respondents found practical oriented Agricultural Science interesting and fascinating. Therefore, we recommend that 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.

From the findings, there exists a significant relationship between students' scores in ASAT and the attitudinal variable of sustained students' interest in the subject. Thus, 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.

Most of the respondents believed that the number of students who take Agricultural Science is few. Therefore, we recommend that 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.

Poor funding was one of the challenges identified. Therefore, government should provide adequate human resources, infrastructural facilities and relevant instructional materials for the teaching and learning of Agricultural Science.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Izuchukwu O. Analysis of the contribution of Agricultural sector on the Nigerian economic development. *World Review of Business Research*. 2011;1(1):191-200.
2. Federal Republic of Nigeria (FRN). National Policy on Education. NERDC Press, Lagos, Nigeria; 2004.
3. Federal Republic of Nigeria (FRN). National Curriculum for Agricultural Science for Secondary Schools. Lagos, Nigeria; 2007.
4. West African Examinations Council (WAEC). Chief Examiners' Report. Lagos, Nigeria; 2015.
5. Usman KO, Memeh IM. 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; 2007.
6. Camilus BB. 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*. 2011;3:36-53.
7. Marsh HW. A multi-dimensional hierarchical self-concept: Theoretical and

- Empirical justification. Educational Psychology Review. 2004;2(2):77-72.
8. Onyejiaku FO. Psychology of Adolescents. Calabar: Rapid Publishers; 2001.
9. Modebelu MN, Nwakpadolu GM. Effective teaching and learning of agricultural science for food security and national sustainability. Journal of Educational and Social Research. 2013;3(4):161-70.
10. Puyate ST. 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. 2008;9(1):59-71.
11. Egbule PE. Fine-tuning the pre-vocational education programme delivery in Nigerian Secondary Schools. Nigerian Journal of Curriculum and Instruction. 1998;6(1):86-91.
12. Modebelu MN, Duvie AN. Innovative methods and strategies for effective teaching and learning. Mediterranean Journal of Social Sciences. 2012;3(13): 145-54.
13. Egbule PE. Fundamentals and practice of agricultural education. Owerri: Totan Publishers Ltd.; 2004.
14. Ladele AA, Agbebaku OM. Analysis of entrepreneurial skills development through farm practical training programmes of University of Ibadan and University of Agriculture, Abeokuta. Journal of Agricultural Extension. 2006;9:14-22.
15. Azubuike OC. Influential factors affecting the attitude of students towards vocational/ technical subjects in secondary schools in south-eastern Nigeria. Journal of Educational and Social Research. 2011; 1(2):49-56.
16. Yangben PN, Seniwoliba AJ. Career challenges in construction craft training in technical vocational education and training in Ghana. International Journal of Vocational and Technical Education. 2014; 6(3):13-29.
17. Weiner B. A theory of motivation for some classroom experiences. Journal of Educational Psychology. 2006;11:3-25.
18. Smithers AS, Robinson P. The paradox of single-sex and coeducational schooling. University of Buckingham, U.K. Carmichael Press.
(Accessed 24 December 2016)
Available:<http://wordpress.buckingham.ac.uk/wpcontent/uploads/2010/10/hmcscsd.pdf>
19. Busari DA. 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. 2016;19(1):37-46.

© 2017 Otekunrin et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

*The peer review history for this paper can be accessed here:
<http://sciencedomain.org/review-history/17669>*