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## Limiting factors in stimulating and sustaining interest in psycho-productive skills acquisition in secondary school agricultural science

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In the study reported on here we investigated factors impeding the stimulation and sustenance of students' interest in the acquisition of psycho-productive skills in senior secondary school agricultural science. We used the classical design for change experiments or before-after measures as the research design. Two methods of teaching, namely demonstration and conventional teaching were used with the experimental and control groups (87 subjects) from 2 schools in the Ijebu-East Local Government Area, Ogun State, Nigeria. A self-reporting scale exposed the students' perceptions of limiting factors such as seeing agriculture as a dirty job, a school subject meant for never-to-do-well, dull students, and as punishment for erring students. Of the 12 factors listed as stimulating and sustaining students' interest, the subjects identified 8 as limiting ones. The results from the mean, standard deviation and *t*-test indicate that there was significant difference between the factors identified by the experimental and control groups. The results also reveal that there was a significant difference in the factors identified by male and female subjects. This could have been as a result of gender stereotyping regarding agricultural practices in some parts of the study area. It was suggested, among others, that the agricultural science teacher should make efforts to incorporate innovative teaching approaches like demonstration methods in classroom practice coupled with infusion of practical periods to enhance psycho-productive skills acquisition. The vocational agriculture curriculum should include an approach to easily measure a combination of psycho-productive, affective and cognitive skills rather than mere cognitive skills.

**Keywords:** classical design; interest; limiting factors; psycho-productive skills; sustenance

### Introduction

Agriculture has contributed greatly to the economic stability of Nigeria and various governments have encouraged agriculture through various programmes. In not too recent times, about 70% of the Nigeria work force was employed in Agriculture (Njoku, 2001). Agriculture is a very important discipline and needs to be encouraged. There appears to be a continuous need to get young people interested in taking up farming as an occupation to maintain the continuity of food and fibre production globally. Agriculture used to be Nigeria's greatest source of income prior to the lopsided dependency on petroleum.

The neglect of agricultural activities has brought with it untold hardship to the country. However, agriculture is one of the surest ways to curb the downward trend of any economy since agriculture has been recognised as the cradle of world's civilization. In general, the attitude of Nigerian adults towards agriculture has been negative and this has extended to secondary school students. Agriculture is not only farming, it is also a business. A good agricultural programme trains individuals for a rewarding business in farming. The farmer must, in addition to being a good herdsman or crop producer, be able to organise his farm so that production costs are as low as possible.

Generally, the purpose of vocational agriculture has been reported (Olaitan & Uwadiae, 1993) to prepare students to be effective individuals and members of the society through appreciation of values, creation of proper attitudes, development of skills, acquisition of saleable skills, and the formulation of good habits in agriculture. Although vocational agriculture education has its broad and general goals, each level of study has certain specific objectives associated with it. These sets of objectives differ depending on the location, coupled with the needs of students and the conditions in their immediate locality. At primary school level, the objectives include a general awareness of a career in agriculture and developing basic skills in agricultural activities. In secondary schools students are prepared for employment in an occupation involving agricultural education, knowledge, and skills (Fatunsin, 1996). In specific terms, the first objective of senior secondary school agricultural science is to stimulate and sustain students' interest in agriculture (Nigeria Educational Research and Development Council, 2008).

The vocational agriculture programme at senior secondary school level is skills oriented. Skill is defined as the ability to use one's knowledge effectively and readily in execution or performance (Merriam-Webster, 2014). It is a learned prowess of doing something competently. Succinctly, it is a developed aptitude or ability. The vocational agriculture programme is built around psycho-productive activities or skills and requires abilities for performing tasks adequately with the muscles in response to sensory stimuli (Olaitan & Ali, 1997).

Psycho-productive skills are manipulative skills or acquired abilities which emphasise performance. They are necessary for all students who are expected to effectively perform the tasks in their chosen occupations upon graduation. Coincidentally, the Nigeria National Economic Empowerment and Development Strategy (2005) has identified the agricultural sector, industries, commerce and technical education as the sectors that need training and retraining of new and old workers, for nation building and in promoting technological development strategies. It is against this background that it has become imperative to attend to issues that surround and support the training of secondary students for skills acquisition.

#### Literature Review

On classroom intervention strategies and students skills acquisition, Nsa, Akpan and Williams (2012) revealed a significant effect of instructional strategies (discovery-learning, guided demonstration and expository) on students' skills acquisition in layout for vegetable crop production. In other words, the treatment effect was a significant one. Furthermore, gender had no effect on the students' skills acquisition in layout for vegetable crop production when taught using discovery-learning, guided-demonstration and expository strategies. In pursuit of looking at gender difference and students' skills acquisition, the study by Onanuga and Bada (2014) showed that there was significant gender difference in psycho-productive skills performance between male and female undergraduates (agriculture internship students) in vegetable production.

A study by Daluba (2013) carried out in Nigeria, showed that the subjects that were taught through the demonstration method performed better in the achievement tests than those taught using the conventional method in agricultural science. It further revealed a significant difference between the mean achievement scores of students taught through the demonstration method and the conventional method. Students taught using the demonstration method recorded higher test mean scores than those taught using the conventional method. Additionally, with regard to gender, Daluba (2013) found a significant difference in the academic achievement scores of students separately taught agricultural science using the demonstration method to those taught using the conventional method. The results of a study by Abdulhamid (2013) reveal that there was no significant difference between the mean scores of students taught using the discussion method and those taught through the demonstration method. The results were obtained from an achievement test administered at the conclusion of the instructional unit on the retention of knowledge in agricultural science in Bauchi State, Nigeria. In a related study,

Olatoye and Adekoya (2010) indicate that there was a significant main effect of treatment (discussion and demonstration methods) on students' achievement in an aspect of agricultural science. It was also found that gender had no significant effect on students' achievement in pasture and forage crops.

A vocational agriculture programme is capable of equipping students with job entry skills. A few studies like those conducted by, Agbelemoge, Adedoyin and Salami-Ottun (2000) and Onuekwusi and Njoku (2000) have shown that students with an interest in agriculture displayed both positive and negative attitudes towards agriculture. In two separate studies Darko, Yuan, Opoku, Ansah, Liu and Anash (2016) and Joshua, Pur and Gwary (2008) discovered that there was no significant difference between male and female attitudes towards agricultural science subjects in Nigeria and Ghana respectively. The findings implied that neither interest nor performance in the subject necessarily depended on gender as male and female students were favourably disposed to agricultural science. On the association between students' scores and sustained interests in agricultural science, Otegunrin, Oni and Otegunrin (2017) found an association between the scores obtained by the students and their sustained interest in agricultural science throughout a lesson period. This implies that for better performance, teachers should devise innovative methods of teaching to sustain the students' interest throughout the lesson period. From the foregoing, therefore, the delivery of agricultural science instruction and sustaining interest in the subject can be attributed to various factors which limit or inhibit the acquisition of psycho-productive skills and competencies that are essential for building and continuing in agricultural occupations.

Arguably, a poor educational system and practice would use school farms as punishment centres where late comers and truants are given portions of land to clear. Such farms are supposed to be demonstration farms but they are abused and are regarded as places where students who violate school rules and regulations are sent for punishment. This practice undoubtedly kills the interest of young ones who should succeed the ageing farmers (Mgbada, 2000). Such practices will negate the national desire to stimulate and sustain students' interests in agriculture in Nigeria.

Investigating the stimulation of students' interest in agriculture, Agbelemoge et al. (2000) found that students were stimulated to take agriculture in the school by the involvement and intervention of their parents. Laogun, Ogbimi and Ariyo (2000) conclude that failure to develop positive attitudes towards agriculture in the younger generation would imply a failure of our educational goals. The results of a study by

Onuekwusi and Njoku (2000) show that almost all the respondents showed a positive interest in taking up agriculture as occupation.

The results of a study by Mgbada (2000) reveal that although students indicated an interest in agriculture, the level of interest was not sufficient for them to pick agriculture as a profession. The students indicated the tediousness of farm work resulting from a lack or improved technology and good teaching methods (e.g. demonstrations, field trips, agricultural shows) as the major problem militating against their interest in farming. The results of a study by Darko et al. (2016), signify that students had a generally positive attitude towards agriculture and they acknowledged that the nation was dependent on those whose work was related to agriculture. The study found that the greatest motivators of Ghanaian students to study agriculture in senior high school were themselves. In a study by Joshua et al. (2008) the students admitted that agricultural science was an acceptable subject, that it was easy to learn and that it was important in their lives.

In seeking opinions on factors that militate against the teaching and learning of agricultural science in public secondary schools in Ghana, Darko et al. (2016) opine that some teachers are lazy, which negatively affects the teaching and learning of the subject, resulting in students regarding practical work in agricultural science as a form of punishment. Still stemming from wrong perceptions, it was also found that many students were not interested in agricultural science as they believed that it was not a well-paid job and that farmers did not enjoy prestige in the society.

In a study at the Mandlethu Further Education and Training (FET) School in the Mpumalanga province, South Africa, Mbajiorgu, Oguttu, Maake, Heeralal, Ngoepe, Masafu and Kaino (2014) found that the learners who were interviewed identified a number of factors that influenced their attitudes towards learning agriculture science. The authors divided these factors into three themes. Theme 1 included factors regarding the learners' social lives, namely social media, sports activities and influence of friends (peer pressure). Theme 2 comprised factors related to actual teaching and learning, which centred on a lack of education resources, poor time management, language barriers and poor attendance of classes by educators. The third theme involved factors related to conditions at home, specifically having to do household chores after school. The learners pointedly identified two more factors that did not fit this thematic categorisation. The learners regarded a lack of educational resources such as textbooks and other study materials as being a hindrance to effective teaching and learning at the Mandlethu FET School. Secondly, the language barrier was mentioned as a

problem which hindered the effective learning of agricultural science.

Kidane (2013) found that students held positive attitudes towards farming and the study of agricultural science at secondary school, as many students opted to take agriculture science as a subject of choice at school. Kidane (2013) also found that students' attitudes to Agricultural Education and Training (AET) may be dependent on the amount of student awareness about agriculture and the prospects thereof. The results show that a one unit increase in involvement in discussions concerning agricultural science and its future educational and job prospects was associated with a 2.9 unit increase in the predicted value of student attitudes towards AET. Students who have opportunities and access to discussions about AET, job prospects and opportunities in agriculture, have positive attitudes towards agricultural sciences. This effect was found to be positive and significant.

Hope for the future of agriculture in Nigeria lies in developing and sustaining the interest of the youth in taking up agriculture as a future career. Therefore, there is a need to stimulate and sustain the interest of secondary school students in vocational agriculture. This can be better accomplished by investigating the different limiting factors against stimulating and sustaining students' interests in agriculture. Hence, our study evolved around desirable information on factors militating against the stimulation and sustenance of secondary school students' interests in agriculture. We also suggest ways of improving students' negative attitudes towards agriculture. This can be regarded as conscious efforts to sensitise young Nigerians and enkindle in them the love for agriculture as a worthy investment in the future of the nation.

#### Theoretical Framework

##### *Constructivist learning theory*

The theoretical foundation of this study was experiential and constructivist learning theory. This theory could support a sort of learning undertaken by students who are given a chance to acquire and apply knowledge, skills, attitudes and feelings in an immediate and relevant setting. Such type of experiential learning could naturally align with a contemporary agricultural education programme that prepares students for advanced level occupations in post-secondary education or the workplace. Salandanan (2012) defines experiential learning as a basic means of obtaining knowledge or skills through experience. It can be referred to as learning-by-doing, learning through experience, and learning through action, discovery, and exploration. Experiential learning encourages progression and improvement of critical thinking skills in solving problems and decision making among learners inside and outside the classroom.

Innovative ideas on teaching and learning emerged and have been progressively introduced in the last few decades; whereas, traditional views have been difficult to change. Such traditional views often consider students as “empty vessels” waiting to be filled with knowledge. Students are now learners who come to the classroom with their unique backgrounds, experience, conceptual understanding, learning styles, and personal circumstances. It emphasises that teachers now become learning facilitators rather than reservoirs of knowledge. The guiding principle of constructivist learning theory is the learner’s own active initiative and control of learning, and personal knowledge construction, i.e. the self-regulation of learning (Bandura, 1993; Deci & Ryan, 1985). The learner does not passively take in knowledge but actively constructs it on the basis of his/her prior knowledge and experiences (Piaget, 1972). Invariably, from a pedagogical point of view, learners’ learning activities should be directed at examining their own prior conceptions and relating those to the new knowledge. The learning environment should provide learners with opportunities to test and try out their new conceptual understanding in various applied circumstances like problem solving (Bandura, 1993). This theory is relevant to this study in that it guided us in designing the lesson in such a way that it enhanced the readiness and interest of the learner. It also helped us to arrange the materials sequentially from known to unknown so that the teaching of productive skills in crop production (for example) through the application of constructivist-based learning would enhance effective teaching/learning processes and improve the performance of students of agriculture in senior secondary schools.

#### Research Questions

This research was aimed at determining the limiting factors in stimulating and sustaining students’ interest in psycho-productive skills acquisition in secondary school agricultural science teaching. In order to realise this purpose of study, the research questions were:

- 1) What are the limiting factors that would be identified by the subjects?
- 2) Would there be a difference in the factors identified between subjects in the experimental and control groups.

#### Hypotheses

We tested the following null hypotheses at 0.05 level of significance:

- 1) There is no significant difference in the identification of limiting factors in stimulating and sustaining students’ interest in acquisition of psycho-productive skills in agricultural science between experimental and control groups.
- 2) There is no significant gender difference in the identified limiting factors in stimulating and

sustaining students’ interest in acquisition of psycho-productive skills in agricultural science.

- 3) There is no significant difference in the performance test (Agricultural Psycho-productive Skill Performance Test [APSPT]) mean scores of the experimental and control groups.

#### Method

The classical design for change experiments, before-after measures, was adopted for the purpose of the research. Demonstration and conventional methods of teaching were used for teaching the experimental and control groups. The 14 public schools within the Ijebu-East Local Government Area of Ogun State, Nigeria constituted the area of study. The sample size for both the experimental and control groups is shown in Table 1.

**Table 1** Breakdown of sample population for the study

School by type of teaching method	Group	Number of subjects
Conventional method	Control	48
Demonstration method	Experimental	39
Total		87

The population for the study consisted of 87 students in Senior Secondary (SS) Two (2014/2015 session). The sampling was purposive in the sense that only students from the science class were involved in the research. The two schools sampled were randomly selected using a ballot from all existing and old schools that were established in no fewer than 20 years prior and had functional school farms, poultry, piggery, fishery or goat and sheep units. The groups (experimental and control) were assigned using the lot procedure. The control group was exposed to conventional teaching methods and the experimental group was subjected to the demonstration method of teaching.

#### Instructional Topics

Three major topics were taught:

- Forage and pasture crops
- Fish farming
- Crop improvement

These topics were chosen from the agricultural science curriculum because they were in the production content to satisfy the psycho-productive domain learning function. The instructions revolved around the enumerated topics for a period of 4 weeks, although the research lasted 6 weeks.

#### Research Instruments

The instruments used in the research were:

- 1) APSPT, which consisted of 30 multiple-choice items on the topics for instructions. The subjects were tested on their understanding of terminologies, scope of task, job specification, instruments and materials; and on how tasks were to be executed.
- 2) A self-reporting-scale (SRS); a questionnaire consisting of 15 items structured on a 5-point Likert-

scale, for assessment of the subjects' attitudinal behaviour.

To ensure face validity of the instruments, experienced agricultural science teachers scrutinised the items and ensured that the items selected measured the objectives of the study. The content validity was achieved by ensuring that the items selected matched with the table of specifications, and shown to correspond with each objective. The performance test (APSPT) items were of appropriate difficulty level and discriminatory power because they were selected from past West African Examination Council question papers and Joint Admission Matriculation Board preparatory textbooks, which are standardised examinations. The concurrent validity was established by correlating the scores of the students in the control group with their last promotional examination marks.

A small sample of 18 students in a school that was not included in the final research was used for trial testing of the SRS. For reliability of the instruments, the test-retest method was used to find the reliability of the test items from the scores of the students, which resulted in a coefficient value of 0.82 using the Pearson Product Momentum Correlation. The item analysis for APSPT was conducted by subjecting it to required processes. The first step was the drawing of a table of specification showing the number of categories of test items prepared from the various topics. The second step was conducting the reliability test with the use of split-half, which resulted in a co-efficient value of 0.79. Initially, we generated a set of 120 items which was surrendered to test item analysis. Thirty of the set of items were found fit because they discriminated and distracted well, and were thus administered for the study.

#### Data Collection

Prior to the experimentation in the first week of the research, the agricultural science teachers were trained for 2 days on the intervention strategies. Each topic was taught for two periods (double periods) per week with the use of the trained strategies given to the teachers as research assistants. The instruction delivery was preceded by the administration of the pre-test (APSPT & SRS) immediately after the training. The APSPT

was applied under strict examination conditions to avoid bias. This was followed by the administration of the SRS, which was immediately collected back from each student on completion. The same exercise was repeated in the sixth week of the research as a post-test. All the activities, which included classroom instructions, tests and questionnaire administration were personally supervised by the researchers for both experimental and control groups.

#### Data Analysis

The data collected were analysed using both descriptive statistics (mean and standard deviation) and inferential statistic of the student's *t*-test.

### Results and Discussion

#### Research Questions

*RQ 1: What are the limiting factors that would be identified by the subjects?*

In all we outlined 12 factors in a checklist, but the subjects identified eight as the limiting factors, namely, a) to h), while the subjects did not identify i) to l) as limiting factors.

- a) Tediousness of farm work due to inadequate improved technology.
- b) Agriculture is seen to be rural in nature.
- c) Agriculture makes someone become dirty.
- d) Agriculture has a low status in the society.
- e) Agriculture should be for never-to-do well students.
- f) Only those who did not go to school should practice agriculture.
- g) Agriculture is meant for those who cannot do academic subject.
- h) Improper use of teaching methods in agricultural science class.
- i) The teaching of agricultural science prepares one as unorganised person.
- j) School farming programmes are designed on self-development.
- k) It is not easy to understand the various agricultural skills in secondary school.
- l) Agricultural science does not make the individual to fit well in society.

*RQ 2: Would there be a difference in the factors identified between subjects in the experimental and control groups?*

The pre-test and post-test ranking of limiting factors identified by the subjects varied but were mostly ranked from highest to the lowest in the order shown in Tables 2 and 3.

**Table 2** Pre-test ranking of identified limiting factors by the subjects

Treatment group	Subjects	Identified factors	Number	<i>f</i>	Ranking
Experimental	39	Tediousness of farm work due to inadequate improved technology	35	                   	1
		Agriculture is seen to be rural in nature	32	                   	2
		Agriculture makes someone become dirty	30	 	3
		Agriculture has a low status in the society	27	 	4
		Agriculture should be for never-to-do well students	24	 	5
		Only those who did not go to school should practice agriculture	21	 	6
		Agriculture is meant for those who cannot do academic subject	20	 	7
		Improper use of teaching methods in agricultural science class	18	 	8
Control	48	Tediousness of farm work due to inadequate improved technology	45	                   	1
		Agriculture is seen to be rural in nature	42	                   	2
		Agriculture makes someone become dirty	40	                   	3
		Agriculture has a low status in the society	37	                   	4
		Agriculture should be for never-to-do well students	32	                   	5
		Only those who did not go to school should practice agriculture	30	 	6
		Agriculture is meant for those who cannot do academic subject	27	 	7
		Improper use of teaching methods in agricultural science class	22	 	8

The two groups of subjects showed comparable standards at the beginning of the experiment. The ranking of the perceived limiting factors between the experimental and control groups did not differ much at the pre-test stage.

In a summary, the identified factors revolved around wrong values, attitudes and misperception

of agriculture-related activities and poor educational practices. This result can be hinged on the fact that the school used for the control may not have used the facilities or operational infrastructure optimally as did the experimental school at the commencement of the research. This may have adversely affected the subjects' judgement of

agricultural science.

**Table 3** Post-test ranking of identified limiting factors by the subjects

Treatment group	Subjects	Identified factors	Number	f	Ranking
Experimental	39	Agriculture is meant for those who cannot do academic subject	37	                   	1
		Only those who did not go to school should practice agriculture	34	                   	2
		Agriculture should be for never-to-do well students	30	 	3
		Agriculture has a low status in the society	28	 	4
		Improper use of teaching methods in agricultural science class	24	 	5
		Agriculture makes someone become dirty	22	 	6
		Tediousness of farm work due to inadequate improved technology	20	 	7
		Agriculture is seen to be rural in nature	19	 	8
Control	48	Agriculture makes someone become dirty	44	                   	1
		Agriculture should be for never-to-do well students	41	                   	2
		Tediousness of farm work due to inadequate improved technology	40	                   	3
		Agriculture is meant for those who cannot do academic subject	38	                   	4
		Agriculture has a low status in the society	34	                   	5
		Improper use of teaching methods in agricultural science class	31	                   	6
		Agriculture is seen to be rural in nature	28	 	7
		Only those who did not go to school should practice agriculture	25	 	8

Unlike in the pre-test stage, the ranking of the perceived limiting factors between the experimental and control groups differed at the post-test stage.

**Hypothesis 1:** There is no significant difference in the identification of limiting factors in stimulating and sustaining students' interest in acquisition of psycho-productive skills in

agricultural science between experimental and control groups.

**Table 4** The *t*-test score comparison of identified limiting factors between experimental and control groups

Group	<i>N</i>	<i>M</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>p</i>
Control	48	21.14	5.22	85	3.23	Sig.
Experimental	39	19.23	6.17			

Note.  $p > 0.05$ . Sig = Significant.

The hypothesis was tested using the student *t*-test statistic. The *t*-test was employed to determine whether the calculated *t*-value was statistically significant at 0.05 probability level based on a comparison between the experimental and control groups. Table 4 shows that the *t*-calculated was 3.23 while the *t*-tabulated was 1.960 for the two-tailed test at 0.05 level of significance and 85 degree of freedom. The obtained *t*-value of 3.23 exceeded the critical value which implies that the difference between the two means was significant at a 0.05 level of significance. The null hypothesis was therefore not accepted as there was a significant difference between the two groups. This finding corroborates the results of Daluba (2013), Nsa et al. (2012) and Olatoye and Adekoya (2010), but it negates the findings of Abdulhamid (2013).

**Hypothesis 2:** There is no significant gender difference in the identified limiting factors in stimulating and sustaining students' interest in acquisition of psycho-productive skills in agricultural science.

**Table 5** The *t*-test scores comparison of identified limiting factors between male and female subjects

Gender	<i>N</i>	<i>M</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>p</i>
Male	50	17.27	5.2	85	2.73	Sig.
Female	37	19.71	6.86			

Note.  $p > 0.05$ .

Table 5 shows that the *t*-calculated was 2.73 while the *t*-tabulated was 1.960 for the two-tailed test at 0.05 level of significance and 85 degree of freedom. The obtained *t*-value of 2.73 exceeds the critical value which implies that the difference between the two means was significant at 0.05 level of significance. The null hypothesis was therefore not accepted as there was a significant difference in the limiting factors identified by male and female subjects. This result is in agreement with the findings of Onanuga and Bada (2014) but negates the results of the studies by Darko et al. (2016), Joshua et al. (2008), Mbajiorgu et al. (2014), Nsa et al. (2012) and Olatoye and Adekoya (2010). The reason that may be raised to support the result is that the agricultural science teacher's personal characteristics or personality is a great factor to be considered. For instance, an agriculture

teacher whose practical skill is somewhat deficient may not likely let students do practical work in order not to expose his/her own incompetence and deficiency. The reason is that some of the subjects regarded the school crop farm and livestock units as avenues for the students to receive punishment for various offences committed and rather not as teaching facilities.

**Hypothesis 3:** There is no significant difference in the performance test (APSPT) mean scores of the experimental and control groups.

**Table 6** The *t*-test scores of differences in mean performance test of experimental and control groups

Group	<i>N</i>	<i>M</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>p</i>
Control	48	25.12	8.33	85	2.58	Sig.
Experimental	39	18.79	7.43			

Note.  $p > 0.05$ .

The hypothesis was tested using the student *t*-test statistic. The *t*-test was employed to determine whether the calculated *t*-value was statistically significant at 0.05 probability level based on comparison between the experimental and control groups. Table 6 shows that the *t*-calculated was 2.58 while the *t*-tabulated was 1.960 for the two tailed test at 0.05 level of significance and 85 degree of freedom. The obtained *t*-value of 2.58 exceeded the critical value which implies that the difference between the two means was significant at 0.05 level of significance. The null hypothesis was therefore not accepted, as there was a significant difference between the two groups. These study results are congruent with those from a study by Daluba (2013) and in contrast with the findings of Abdulhamid (2013) and Kidane (2013). This result is strikingly similar to that of Otekinrin et al. (2017) who established that there was an association between the scores obtained by the students and sustained students' interests in agricultural science throughout a lesson period.

## Conclusion

Training for today's farmer should inculcate the desirable attitudes and positive interest in agricultural activities when profitably utilised. This is especially true during this period of consolidating of the gains of national growth and leveraging this opportunity by rekindling an interest in agriculture among Nigerian youths. This has become evident from the fact that the subjects showed a significant difference in the mean performance test and in a comparison of the identified limiting factors based on gender. In other words, agricultural science teachers must be encouraged to apply innovative methods like demonstration in instruction delivery at secondary school level. The attendant result is that if teachers employ innovative methods of teaching, it is likely

to promote positive attitudes and interest in agricultural practices.

This effort would gear at the accomplishment of advancing food production through improvement of agricultural production techniques in secondary school students, having acquired the necessary psycho-productive skills. It is evident from the research that efforts had been made to teach agricultural science students what they are supposed to know through the conventional method of teaching. In spite thereof, little efforts have been geared towards practical preparation of students for vocational agriculture.

### Recommendations

Based on the findings of the study, the following suggestions are made:

- 1) In order to enable students to acquire useful knowledge and practical skill in agriculture, teachers should strive to incorporate both innovative teaching methods like demonstration coupled with practical periods into their teaching schedule. Such practical periods should emphasise exposing students to the acquisition of real practical skills as a great emphasis.
- 2) Through display of the teacher's teaching effectiveness, agriculture can be properly vocationalised. Therefore, teachers should give adequate attention, encouragement, support and contributions towards the efforts and vocationalisation of agriculture. Consequently, agriculture students could perhaps change their negative attitudes towards agriculture and start exhibiting desirable positive interest towards studying agriculture as a career.
- 3) There is the need to change secondary school students' perception towards agriculture because it is more vocational than academic. As such, it can bestow on them employable skills which will make them self-employed, self-reliant and independent to a large extent.
- 4) The agricultural science curriculum should involve an approach that would make it easy to measure a combination of psycho-productive skills, affective skills and cognitive skills rather than mere cognitive skills.
- 5) The agricultural science curriculum should be fashioned in a way that provides on-the-job training and the gathering of work experience.

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### Authors' Contributions

PAO wrote the manuscript and was jointly involved in the data collection and analysis. JOSB was solely involved in the development of the research instrument, and jointly took part in the data collection and analysis. All authors contributed to reviewing the final manuscript.

### Notes

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