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Strategies for Improving the Teaching of Practical Agriculture in Senior Secondary Schools in Taraba State, Nigeria

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ABSTRACT
The study was designed to determine the strategies for improving the teaching of Practical Agriculture in Senior Secondary Schools in Taraba State, Nigeria. Five research questions guided the study and five hypotheses were postulated and tested using student t – test at 0.05 level of significance. A sample size of 101 registered Agricultural Science teachers were statistically obtained using Taro Yamane formula for finite population. Random sampling technique was adopted for the study. Data was collected from respondents using validated and tested structured questionnaire with a reliability coefficient of 0.83 based on Cronbach Alpha formula. The results of the analysis revealed that varied strategies; instructional materials and methods; and different types of Continuous Assessment can be used to improve the teaching of practical Agriculture in Senior Secondary Schools in the state. It was recommended that in teaching of practical Agriculture, teachers should activate the magnets of curiosity, knowledge and wisdom in students based on proper demonstration; varied instructional materials and relevant teaching methods. Moreover, adequate time should be allocated to practical agriculture lessons; and regular diagnostic assessment should be employed as a tool for evaluation of the students based on the fact that teaching of practical Agriculture is more than imparting Knowledge but inspiring change and learning of practical Agricultural science is more than absorbing facts but acquiring understanding.
Keywords: Practical Agriculture, Teaching, Strategies

INTRODUCTION
In recent years, Nigeria has placed fresh emphasis on the agriculture sector in its efforts to generate broad-based growth, diversify the economy away from petroleum, create jobs, and achieve food security. The administrations of President Muhammadu Buhari and his

predecessor Dr. Goodluck Ebele Jonathan have made repeated public commitments to revive Nigerian agriculture. A flurry of new policies and programs has been unveiled, aimed at both small holder farmers and large producers. These efforts have been given more urgency by the slump in global oil prices and the drain on foreign currency reserves caused by the crippling cost of food imports. Still secondary school leavers of Agriculture are still roaming on the streets of Nigerian cities in search of white collar jobs rather than being job creators is a real indication of missing link in vocational education and the labor market. Education at all levels and in all its forms constitutes a vital tool for addressing virtually all global problems. Education is not only an end in itself. It is a key instrument for bringing about changes in knowledge, values, behaviors and life styles required to achieve sustainability and stability within and among countries (Kingdom and Maekae, 2013).Education has been seen as the greatest force that can be used to bring about changes.

Aminu (2006) observed that the greatest investment a nation can make for the development of its economic, sociological and human resources is that of education. Education according to him provides us with people possessing the necessary knowledge and skills to win a nation and to even export brains. This explains why the Federal Government of Nigeria geared an education policy towards attaining national development. According to National Policy on Education (2004:8), Education shall continue to be highly rated in the national development plans because education is the most important instrument for change: any fundamental change in the intellectual and social outlook of any society has to be preceded by an education revolution. This shows that education is an important instrument for change and national development, thus the Federal Government reform in education adopted the basic Education system with emphasis on vocational education and the need to attain the Millennium Development Goals (MDGs), with the main aim of achieving the critical targets of the National Economic

Empowerment and Development Strategies (NEEDS) which can be summarized as: value – orientation, poverty eradication, job creation, wealth generation using education to empower the people. This development led the Nigerian Educational Research and Development Council (NERDC) to review and realigned the curricula for senior secondary Schools to fit the reform program (NERDC, 2011). The new curriculum laid emphasis on Vocational Education with the aim of reducing the high rate of youth unemployment. Agricultural Science in the senior secondary schools is indeed an indispensable elective vocational subject which provides skills, knowledge and attitudes necessary for effective employment in agricultural occupations.

National Examinations Council, (2014), stated the objectives of teaching Agricultural Science in Nigerian secondary schools which include; stimulation and sustenance of student's interest in Agriculture, Impart functional knowledge and practical skills in Agriculture to students, Prepare students for further studies and for occupation in Agriculture. Shimave, kesiki and Yani (2013) pointed out that, the introduction of agricultural science in the secondary school system is a strategy for increasing agricultural productivity on a long term basis. With these objectives in mind, the education industry is expected to provide effective and adequate practical training in Agricultural science to students in order to enable schools and colleges provide qualified and competent graduates that can ensure food sufficiency in the country. The review of Agricultural Science curriculum has been a real educational innovation, which called for new teaching strategies considering the fact that senior secondary education is indeed a sine qua non to attainment of the new education reform, for it serves as a link between basic education and tertiary education by absorbing the products of the former and supplying entrants into the latter (Egunsola, Denga and Pev 2014).
The researchers observed that agricultural education at the secondary school level has failed to produce graduates that have favorable attitudes to farming. This is a peculiar problem in learning of agricultural science

by students in senior secondary schools in Taraba State. Okorie (2001) also observed that many students have a tendency to develop negative attitudes toward agriculture because of inherent deficiencies in the program. There have been complaints about the poor performance of students in agriculture science in secondary schools due to the use of poor equipment to teach the subject. This has its implication as observed by Egun (2009) that Nigerian education is too theoretical and not preparing students for real life. The goals of teaching Agricultural Science cannot be achieved without practical skills particularly in secondary schools in Taraba State. Taiwo (2001) maintained that schooling is an aspect of the process of developing the abilities, attitudes and other behaviors of an individual. Youths are always seen as the hope of the nation if proper teaching is given to them in schools. The need to come up with strategy for improving teaching of practical agriculture becomes imperative.

As opined by Chinwe (1994) "that teaching of practical skills seems to be neglected as emphasis on theoretical approach seems to dominate the teaching". There is a need for a renewed drive to refocus strategies use in teaching agricultural science practical's at senior secondary school levels. Olatoye (2012) observed that the educational structure and curriculum have not been tailored towards a reawakening of our agricultural heritage as obtainable in some countries. According to Ajiboye (2013) in the secondary schools of old, there were horticultural, arable crops and livestock units essentially maintained by students. Each student was given a plot and was assessed periodical by their teachers. Presently one may ask where are the school farm or the livestock unit? This can affect technological and national development despite the fact that many schools have school farms. However, these school farms are primarily used to generate revenue for the schools and not actively used to train students in practical skills related to field crops, horticulture, livestock production and related agricultural mechanization skills. Amadi, (2001) reported that there are more

qualified teachers of agriculture these days, however the imbalance in skill acquisition remain high. In another development Farauta and Amuche (2013) submitted that the inability of secondary school graduates of Agriculture to secure jobs or be self-employed have sustained the perceived generation gap, which has been blamed on the way and manner in which secondary education Agriculture curriculum is implemented. Pev (2014) supported that, the gap in Taraba State is infested with a number of both potential and manifest violence which are at the roots of the state socio – economic and educational woes and underdevelopment. Farauta, Yaro & Pev (2015) emphasized that; national security cannot be actualized without food security. As a result of the above problems; the researchers deem it expedient to find out the strategies that will improve the teaching of Practical Agricultural Science in Senior Secondary Schools in Taraba State, Nigeria.

The main purpose of this study is to determine the strategies for improving the teaching of practical Agriculture in Senior Secondary Schools in Taraba state. Specifically the Study sought:

1. To determine the teaching strategies to be adopted to foster student's participation in Practical Agriculture in Senior Secondary Schools in Taraba state.
2. To determine the need for teachers to improve the teaching of Practical Agriculture in Senior Secondary Schools in Taraba state.
3. To determine the instructional methods that will be adopted to improve the acquisition of skills in Practical Agriculture in Senior Secondary Schools in Taraba state.
4. To determine the instructional materials to be used in improving the teaching of Practical Agriculture in Senior Secondary Schools in Taraba state.
5. To determine the continuous assessment techniques suitable for improving the teaching of practical agriculture in Senior Secondary Schools in Taraba state.

Research Questions

The following research questions served as a guide to this study:

i. What are the teaching strategies to be adopted to foster students' participation in practical agriculture in Senior Secondary Schools in Taraba State?
ii. Are there needs for teachers to improve teaching of practical Agriculture in Senior Secondary Schools in Taraba state?
iii. What are the instructional methods that would be used to improve the acquisition of skills in practical agriculture in Senior Secondary Schools in Taraba state?
iv. What instructional materials would be used to improve the teaching of practical agriculture in Senior Secondary Schools in Taraba state?
v. What are the continuous assessment techniques suitable for improving the teaching of practical agriculture in Senior Secondary Schools in Taraba state?

Hypotheses

The following null hypotheses were postulated and tested at 0.05 level of significance.

Ho_1. There is no significant difference between the mean responses of male and female teachers on the strategies to be adopted to foster student's participation in practical agriculture in Senior Secondary Schools in Taraba state.

Ho_2. There is no significant difference between the mean responses of male and female teachers on the needs for improving the teaching of practical agriculture in Senior Secondary Schools in Taraba state.

Ho_3. There is no significant difference between the mean responses of male and female teachers on the instructional methods that will be adopted to improve the acquisition of skills in practical agriculture in Senior Secondary Schools in Taraba state.

Ho_4. There is no significant difference between the mean responses of male and female teachers on the appropriate instructional materials to be used to improve the teaching of practical agriculture in Senior Secondary School in Taraba state.

Ho_5. There is no significant difference between the mean responses of male and female teachers on the continuous assessment techniques that could be used to improve the teaching of practical agriculture in Senior Secondary Schools in Taraba state.

MATERIALS AND METHODS

Descriptive survey design was adopted for this research. The target population comprised of 135 Agricultural Science Teachers in 160 Senior Secondary Schools in Taraba State, (Taraba State post Primary School Management Board, 2016). A sample of 101 Agricultural Science teachers was statistically obtained using the Taro Yamane formula for finite population. Random sampling technique was adopted for the study. According to Nworgu (1991) random sampling gives element of the population equal and independent chance of being in the study. An instrument for data collection was structured questionnaire named Questionnaire on Strategy for Improving Practical Agriculture (QOSIPA).

The instrument for data collection was validated by three experts in the Department of Vocational Education, Modibbo Adama University of Technology, Yola and two lecturers at College of Education Zing. Any item that was accepted by at least any three of the five was deemed to be suitable. In essence, the final instrument was made on the basis of the comments and criticisms made by the lecturers. The reliability test was carried out on 41 Agriculture Science Teachers randomly selected in Senior Secondary Schools in Adamawa State, Nigeria. The scores of their responses were analyzed using Cronbach Alpha formula and a reliability coefficient of 0.83 was obtained for the instrument.

Data for this research was collected using structured questionnaire which was administered by the researcher and eight research assistants spread in the eight educational zones in Taraba state. A measure of central tendencies was used to answer research questions whereas t-test was used to test the hypotheses at 0.05 level of significance. The lower limit of 3 which is 2.50 was used for this study as the decision point of acceptance, therefore the mean value $\geq$ 2.50 was considered a factor while mean $\leq$ 2.50 was considered a none factor, similarly when the t-calculated was greater than the t – critical value, the null hypotheses was rejected and vice - versa.

RESULTS

Research Question One

What are the teaching strategies that will be adopted to foster students' participation in practical agriculture in senior secondary schools in Taraba State? From the results presented in Table 1, the respondents agreed with all the Items in relation to the Mean responses of Teachers on the Strategies that would Foster Students Participation in Practical Agriculture in Senior Secondary Schools in Taraba State. The mean responses of the teachers indicated 10 items rated agreed. Base on the decision rule guiding this study. It is an indication that many strategies can be used by teachers to improve students' participation in practical agriculture in Senior Secondary Schools in Taraba state.

Table 1: Mean responses of Teachers on the Strategies that would Foster Students Participation in Practical Agriculture in Senior Secondary Schools in Taraba State.

S/No	Items	Mean	SD	Remark
1.	Individual plot allocation to students enhances participation in practical agriculture	4.08	0.78	Agree
2.	Use of concrete objects enables students' participation in practical agriculture	4.02	0.61	Agree
3.	Effective training enhances students' participation in practical agriculture	3.77	0.88	Agree
4	Practical in the morning enhance participation in practical agriculture	3.85	0.68	Agree
5.	Grouping of students enable them participate in practical agriculture	3.36	0.91	Agree
6.	Use of agriculture laboratory encourages students' participation in practical agriculture	4.05	0.52	Agree
7.	Teachers personality enhances students' participation in agriculture	2.99	0.95	Agree
8.	Use of community resources enhances students' participation in practical agriculture	3.29	0.86	Agree
9.	Quality teaching methods enhance students' participation in agriculture	3.93	0.67	Agree
10	Lack of instructional materials affect students' participation in agriculture	4.04	0.60	Agree

Source: Field Survey 2016

Research Question Two

What are the needs for improving teaching of Practical Agriculture in Senior Secondary Schools in Taraba State? Table 2 presented the mean responses of teachers on the needs for improving teaching of practical agriculture. All the items were accepted by the respondents as the needs for improving teaching of practical agriculture. Item one has the highest rating of 4.18 while item four has the lowest rating 2.78.

Table 2: Mean responses of Teachers on the Need for Improving Teaching of Practical Agriculture in Senior Secondary Schools in Taraba State

S/No	Items	Mean	SD	Remark
1.	It enables students acquire basic knowledge and Skills.	4.18	0.68	Agree
2.	To make students become self-reliant	4.11	0.55	Agree
3.	It enhances students' performance in the world of Work.	3.20	1.00	Agree
4	To enable students productivity.	2.78	1.03	Agree
5.	To make vocational career more attractive.	3.57	0.89	Agree
6.	To complement theoretical knowledge.	3.95	0.48	Agree
7.	To increase the economy of Nigeria.	3.43	0.84	Agree
8.	To encourage students to farming activities.	3.98	0.45	Agree
9.	To increase the yield per unit area or per unit animal.	3.82	0.78	Agree

Source: Field Survey 2016

Research Question Three

What are the instructional methods that would be used to improve the acquisition of skills in practical agriculture in Senior Secondary Schools in Taraba State? Table 3 showed the mean responses to questionnaire items on suggested instructional methods used by teachers to improve acquisition of skills in practical agriculture. Ten items were suggested and all of them were accepted by the respondents as instructional methods that would be used to improve acquisition of skills in practical agriculture in Senior Secondary Schools in Taraba State. Item one has the highest rating of 4.75 while item six has lowest rating of 2.69.

Table 3: Mean responses of Teachers on an Instructional Method that would be used to Improve Acquisition of Skills in Practical Agriculture.

S/ No	Items	Mean	SD	Remark
1.	Demonstration method	4.75	0.64	Agree
2.	Project method	3.48	0.93	Agree
3.	Discussion method	3.49	0.92	Agree
4	Field trip method	3.78	0.72	Agree
5.	Problem solving method	3.53	0.90	Agree
6.	Lecture method	2.69	1.09	Agree
7.	Role playing method	4.00	1.09	Agree
8.	Simulation	3.59	0.92	Agree
9.	Reward and punishment	2.90	4.05	Agree
10	Use of instruction and exercise	4.33	4.05	Agree

Source: Field Survey 2016

Research Question Four:

What instructional materials would be used to improve the Teaching of practical agriculture in Senior Secondary Schools in Taraba State?

Table 4: showed the mean responses to questionnaire items on suggested instructional materials to be used by teachers to improve teaching of practical agriculture. All the ten items suggested were accepted by the respondents as instructional materials that can be used for improvement of teaching practical agricultural science in senior secondary schools in Taraba state. Item one has the highest rating of 4.07 while item three has lowest rating 3.30.

Table 4: Mean responses of Teachers on Instructional Materials to be used in Improving Teaching of Practical Agriculture

S/ No	Items	Mean	SD	Remark
1.	Use of simple farm tools to teach practical Agriculture	4.07	0.71	Agree
2.	Use of specimens in teaching practical agriculture	4.00	0.68	Agree
3.	Use of crop protection equipment	3.30	0.98	Agree
4	Use of resource person	3.35	0.95	Agree
5.	Use of models to teach	3.78	0.76	Agree
6.	Use of farm machinery	3.90	0.64	Agree
7.	Use of farm animals	3.93	0.21	Agree
8.	Use of charts and posters	3.63	0.81	Agree
9.	Use of educational media	3.74	0.89	Agree
10	Use of chalk board and illustrations	3.31	1.03	Agree

Source: Field Survey 2016

Research Question Five:

What are the continuous assessment techniques suitable for improving the teaching of practical agriculture in Senior Secondary Schools in Taraba State? Table 5 showed the mean responses to questionnaire items on suggested types of continuous assessment techniques that are suitable for improving teaching of practical agriculture. All the Seven items were accepted by the respondents as the types of continuous assessment suitable for improving teaching of practical agriculture.

Table 5: Mean responses of Teachers on the type of Continuous Assessment Technique suitable for Improving Teaching of Practical Agriculture

S/N	Items	Mean	SD	Remark
1.	The end of course system of continuous assessment	4.07	0.71	Agree
2.	The continuous assessment has to be systematic involving operational plan	4.00	0.68	Agree
3.	The continuous assessment should be based on psychomotor domain rather than cognitive and affective domains	3.30	0.95	Agree
4	The contiguous assessment should involve the use of variety of tools in both the class and the school farm	3.35	0.95	Agree
5.	Regular class assessment, field work and home each practical class	3.78	0.76	Agree
6.	Cumulative assessment is suitable for evaluating learning in practical agriculture	3.90	0.64	Agree
7.	Project and term paper assessment encourages students performance in agriculture	3.93	4.21	Agree

Source: Field Survey 2016

Hypotheses

Table 6 below gives a summary of t- test results at 0.05 level of significance and 99 degree of freedom. Based on these results, Ho_1 and Ho_2 were accepted while null hypotheses 3, 4 and 5 were rejected in favor of their alternatives.

Table 6: Summary of t- test results at 0.05 level of significance

Hypotheses	t -Cal.	t- Cri.	Decision
Ho_1	0.227	1.980	Ho Accepted; H_1Rejected
Ho_2	1.041	1.980	Ho Accepted; H_2Rejected
Ho_3	2.352	1.980	Ho Rejected; H_3Accepted
Ho_4	2.352	1.980	Ho Rejected; H_4Accepted
Ho_5	2.558	1.980	Ho Rejected; H_5Accepted

Source: Field Survey 2016

DISCUSSION

The findings of this study were discussed based on the research questions and hypothesis. The responses of male and female teachers on

strategies that would foster students' participation in practical agriculture indicated that 10 items were all rated above the cutoff point of 2.50. This is an indication that individual plot allocation, use of concrete objects, effective training, practical's during morning lessons, grouping of students, use of laboratories and community resources to teach enhances students' participation in practical agriculture in senior secondary schools. The findings agreed with the view of Ndagana and Onifade (2000) who reported that the entire practical oriented methods of teaching motivate students more. This is supported by the views of individual in the society that a learner cannot forget what he learnt from his teacher if practical aspect of the training is given to him. Oloruntoba (2006) found out that practical teaching is important in any organization because it improves the competencies of learners.

The responses of teachers on the needs for improving teaching of practical agriculture revealed that all the nine items were above the cutoff point. 2.50. This indicated that practicals enable students acquire basic knowledge and skills; it makes students become self- reliant it enhances students' performance in the world of work. It also makes students acquire vocational career, it also complement theoretical knowledge, increase yield and encourage students to farming activities. The findings are line with Yakubu (2010) who emphasized that students need practical skills and knowledge so as to enable them create an impact in the society and the world of work thus practical's should be given more attention in school curriculum.

The responses of teachers on instructional methods that would be used to improve skill acquisition in practical agriculture revealed that 10 items suggested, such as demonstration method, project method, discussion method, field trip method, were rated above the cutoff point of 2.50. The findings were in line with Agbulu & Wever (2011) who stated that both formal and informal methods of teaching can be adopted in schools where instruction and exercise, reward and

punishment have control over learners to improve their skills. National Commission for Colleges of Education guide line (NCCE, 2002) stipulated that the mode of teaching agricultural courses should be lectures, tutorials, field trips, excursion, practical's, laboratory work are appropriate for each course which include agriculture. This is an indication that all instructional methods of teaching are effective for improving skill acquisition of students in practical agriculture.

With respect to the responses of teachers on instructional materials to be used in improving teaching of practical agriculture, 10 items such as use of simple farm tools, specimens, protective equipment, resource persons, models, farm machinery, farm animals, charts and posters, chalk board for illustration, educational media like cassette, disks, videos and DVDs, textbooks and laboratory manuals, were all rated above the cut-off point of 2.50.The findings were in line with Nsa, Ikot and Udo (2013) who reported that when instructional charts, pictures, posters, farm tools are used effectively to teach students they can perform better than those taught without instructional materials. Instructional materials offered closed representations of ideas and concepts. It makes students not to forget the facts. As sported by Abinbade (1999) instructional materials help students have longer retention in memory.

The mean ratings of teachers with respect to the type of continuous assessment (CA) suitable for improving teaching of practical agriculture. All items were rated above 2.50 cut off point by the teachers. This indicates that all the suggested items were accepted as suitable C.A for teachers to use them to improve their teaching. The findings corroborate with Daphne (2012) and Pev (2016) that continuous assessment should be used periodically or daily like giving students quizes, essays, assignments, presentation in the class, project/term paper, use of laboratory work, field work. This showed that all methods

of continuous assessment (CA) are ideal for assessment of the progress of students in practical agriculture.

Base on the hypothesis, the study revealed that there were no significant difference in the responses of teachers on hypotheses one and two because their t-calculated values were less than t-critical values. Therefore, the responses of teachers were accepted on the suggested strategies such as individual plot allocation and use of concrete objects. As supported by Anyanwu (1997) the idea of participation in practical work are laid on apprenticeship and supplemented by the direction of teachers involve. However, there is need for teachers to improve the teaching of practical agriculture because it enables students to acquire knowledge and skills so as to become self-reliant. While in hypotheses three, four and five, the study revealed that there were significant difference because their t-calculated values were greater than t-critical value of 1.980, therefore, the hypotheses were rejected on suggested items such as demonstration method, field trip method, use of farm tools, models, resource persons and all forms of continuous assessment can improve the teaching of practical agriculture in senior secondary schools, as opined by Agbulu & Wever (2011) that a school can adopt formal and informal teaching method where teachers use instructions and exercise that have specific control over learners.

CONCLUSION

The study determined the strategy to be adopted by teachers in teaching practical agriculture. Based on the results of the study, it is clear that students' effective participation in practical agriculture largely depends on the strategies employed by the teachers; this enhances skills acquisition which can be transfer into real jobs in the world of work. Based on the result of this study, the need for agricultural Science teachers at the secondary school level to vary the methodology cannot be overemphasized. This would go a long way in creating positive disposition of students to agricultural Science as entrepreneurship

education rather than been seen as academic education. Furthermore, it is evident in this study that instructional materials and methods have positive impact towards teaching of practical agriculture. This enhances retentive memory and the ability to apply theoretical knowledge to practical situations. The last aspect highlights on all the types of continuous assessment technique suitable to improve teaching of practical agriculture to students, this also has positive impact in the cognitive and psychomotor abilities of the students particularly at thesenior secondary schools in Taraba state of Nigeria.

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