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Strategies for Enhancing Effective Teaching and Learning of Agricultural Science in Senior Secondary Schools in Osisioma Ngwa Local Government Area

Dr. Chika Nnoye Eziamaka
Department of Educational Management and Policy, Faculty of Education, Nnamdi Azikiwe University, Awka.
Cn.eziamaka@unizik.edu.ng

Dr. Enwezor Chibogwu Helen
Faculty of Education, Department of Educational Foundations, Chukwuemeka Odumegwu Ojukwu University, Igbariam.
chiogewino@yahoo.com

Dr. Ndidiamaka Okeke-James
Department of Educational Management and Policy, Faculty of Education, Nnamdi Azikiwe University, Awka.
nj.okeke-james@unizik.edu.ng

Abstract

This study examined the strategies for enhancing effective teaching and learning of agricultural science in senior secondary schools in Osisioma Ngwa LGA. The study was guided by two specific purposes and two research questions. The study adopted a survey research design. The population of the study comprised of 6531 students in the study area with a sample size of 150. The instrument used for data collection was a structured questionnaire. The collected data was analyzed using mean and frequency table. 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: Strategies, Teaching, Learning, Agriculture Science, and Secondary.

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

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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 (Oguejiofor and Obiakor 2020)

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 (2012) 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 (2014),
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

National 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

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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).

Agriculture Education

It is not sufficient to make one sentence definition of agricultural education. The world book Encyclopedia defines agricultural education as instruction in agriculture useful to farmers, to those engaged in non-formal agricultural occupation and to all persons as part of the general education.

It is the training of learners in the processes of agricultural productivity as well as in the techniques for the teaching of agriculture. "It is teacher preparation in agricultural production and in pedagogical skills in agricultural subject areas" (Olaitan, 2018). Agricultural education refers to the teaching of skills, values, attitudes, and related products (Egbule, 2014). Therefore, agricultural education is the type of education that is employed in training learners in the improved agricultural production process as well as in the techniques for the teaching of agriculture. It therefore, takes place at two levels, namely formal level which would take place at primary, secondary to graduate study in the university; and at informal level which goes on outside the formal school system.

Objectives of Agricultural Science Programmes at Secondary School Level.

The teaching of agriculture at the secondary school level in Nigeria today is done at two levels; at the Junior Secondary (J.S.S.) and at the Senior Secondary School (S.S.S). At the junior Secondary school, that is first three years of secondary education, 'practical agriculture' is recommended as one of the core subjects. According to Egbule (2014), the objectives of agricultural science Education at Secondary school level include

i. To stimulate students interest in agriculture
ii. To develop basic agricultural skills in students.
iii. To enable students acquire basic knowledge of agriculture
iv. To enable students to integrate knowledge with skills in agriculture Pristine
v. To expose students to opportunities in the field of agriculture
vi. To prepare students to opportunities in the field of agriculture
vii. To prepare students for further studies

Hindrance to Effective Teaching of Agricultural Science in Secondary School Level

Misconception of Young Farmers' Club - Experience has shown that here is always the tendency for students to see the farm products as nobody's property. There is also a strong

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tendency on the part of the students to misuse the club by imposing unauthorized levy, giving improper account, using the club activities as a camouflage to organize dances or parties with students of opposite sex, all lead to indiscipline in school thereby hindering the students exposure to agricultural programmes.

Incompetency of Teachers - The strength of any education system depends on the quality of its teachers. It is the teacher who eventually implements the curriculum through the interaction with students who are the immediate beneficiaries of the system. Agwubuike (2012), noted that there are not enough, competent graduate teachers or agricultural science in our schools. Madubuike (2014), stated that teachers who lack interest in farm activities but still qualified in agriculture because of their high grades in the theory aspect are not sufficiently qualified to teach agriculture in our schools. Lack of skill full agricultural science teachers in schools has resulted in the production of theory oriented agricultural science graduates. The shortage of qualified teachers has resulted in the following.

(a) Poor teaching methods - most teachers due to their incompetency lack focus on various teaching methods and materials to be used to enhance learning. Such materials like suitable textbooks, charts, models, projected and non-projected devices even when these materials are provided, they still lack the best teaching method to break the course content.

(b) Students' laissez-faire attitudes - due to poor presentation of the topic by incompetent teachers, students feel it is not important to attend agricultural science classes especially practical.

Number of Period - The time allocated to agricultural science in the time table is not always sufficient for the teachers to lay a good foundation for agricultural science. The nature and significance of agriculture entails special provision of extra- curricular hours to enable the teachers to teach the theoretical and practical aspect. Akinpelu (2011), opined that it is true that agricultural science is an examinable subject by West African Examination Council, but then it cannot be adequately taught within the number of minutes allocated to it.

1. Insufficiency of fun - Schools are starved of funds by the government to enable them to erect and equip modern laboratories, procure adequate equipment, tools, repair and replace faulty equipment, procure fertilizers, drugs, feed etc. also schools are not adequately funded to establish school farms for practical.
2. Over loaded syllabus – the syllabus is overloaded that it does not allow for the proper teaching of the subject. The agricultural science covers the crop, animal, soil, economics, extension etc. the teachers find it difficult to cover the broad areas.
3. Non-cooperative attitude of heads of schools - some heads of schools especially the art oriented ones do not show any interest in practical agriculture in their schools. Whenever the teachers of agricultural science approaches them for financial assistance, they feel reluctant and rather extort the students' money. And in some cases these heads share the school farmland among teachers for farming.

Inadequate Facilities/Equipment - Agricultural science cannot be properly taught without adequate facilities and equipment, such as storage facilities, tractors, machine tools, and modern laboratory, computers etc. all these facilities are lacking in our secondary schools today.

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Osuala (2014) pointed out that the ultimate objective of vocation education is to train qualified technical personnel and skilled work force to meet the requirement of the society, regardless of how well the vocational education curriculum is prepared and how excellent the qualifications of the teachers are, inadequate facilities hamper the students learning in cognitive, affective and psychomotor domain.

Strategies for Improving Teaching/Learning of Agricultural Science at Secondary School Level

Competent teachers - Effective teaching of agriculture must result in improved learning for students. It is a common defect in our educational set-up that most of the subject (Agric) teachers are not competent in the subject concern. Maduike (2017), stressed that at secondary school level, the professional and qualified teachers should stimulate both the students and themselves to enhance efficiencies in performance. Meanwhile, the subject teacher concern in one way or the other must have qualities on farm experience, general technical education character and personality. Orhieve (2015) noted that skilful teachers are vital to every dynamic successful training programme.

Suitable Curriculum - The term curriculum has been conventionally and broadly defined to all the experiences that the student is exposed to under the direction of a school. Egbule (2014) defined curriculum in agriculture to consist of series of courses including extra-curricular activities. The curriculum planners should select learning experiences from the learner's environment, which will help him (learner) to meet his motives and reflect the training needs of job market. To make curriculum efficient and more relevant to needs of the students, the following are important.

(a) Teacher-training programme should include the content of curriculum development on new approaches and method concerning the teacher/instructors' attitude.
(b) The participation of teachers/instructors in planning
(c) A system involving central and local governmental departments should be established to evaluate the curriculum implementation process which aimed at ensuring the quality of the programme offered.

School farm surveying and layout - The knowledge of survey principles and practices are essential for successful farm operations. In order to curtail the encroachment on school land by land – hungry neighbours, school farm are properly surveyed. Farm surveying deals with making measurement by means of figure table or layouts (Ikeoji and Egbule, 2013). It involves measuring vertical and horizontal distance between objects, determining artificial features present on the farm, and using such information as planning purpose.

Adequate funding: School farms are starved of funds. According to Olaitan (2012), it is very important to make use that here is enough fund before embarking on any vocational programmed if it is to meet the standard of vocational education and create awareness in the pupils. Development of vocational skills in agricultural science require a lot of funds for

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repairing and replacing of faulty equipment, employing more qualified staff, buying of fertilizers etc.

Effective organization of young farmers' club (Y.F.C.) – Idahor (2012), sees the Young Farmers' club as a voluntary and democratic youth organization for boys and girls of between 10-25 years of age, and whose main objective is to develop the interest of our youths in agriculture. This programme is primarily designed to teach young people especially the students. In order to curb the problems of ignorance in agriculture, the government, community and the entire school should help to intensify this club by assisting in the supply of tractor, hiring service, imposed seeds and other inputs. More so, appoint wealthy people as patrons to monitor the cash flow of the club.

Acquisition of more land for school farms - The current emphasis on functional educational programme makes it mandatory that school and colleges should keep farms. A school farm in this context is a piece of land located within or around the school and used for cultivation of crops and rearing of animals. Essentially, school farms are geared towards helping students to acquire necessary arming skills and ensuring that classroom theories are backed up by facts and practices. To provide students with opportunity of acquiring knowledge, skills and needed competencies in agriculture, the school farms should be enlarged. The community, which the school is located could be approached to donate enough land for schools' agricultural programmes. Government schools and colleges may also acquire land through the 'land use decree'. It is advisable therefore to make schools farms as large as possible but should not be too large as to become a burden to both the agricultural science teachers, the students as well as the administration (Odoh 2021).

Dynamic methods of teaching - For agricultural science to be improved at secondary school levels, agricultural science teacher must be a professional who combines knowledge of what he teaches with appropriate methods and techniques of teaching. A teaching strategy is an integration of method and techniques, which has to reflect expected activities for both teachers and learners for teaching/learning process. Ezenwagu, Oguejiofor and Obiakor (2020), opined that any method that is adopted by the agricultural science teaches in the actual teaching exercise must lead to the development of ideas, concept understanding and attitudes by the students. Agricultural science by a practical oriented subject requires practices with diverse teaching methods like demonstration, project, field trip/excursion, laboratory work, discussion etc.

Availability of teaching materials/aid - Teaching aids or instructional materials consist of carefully planned and selected resources to facilitate teaching/learning process. According to Ughamadu (2012) instructional material refer to those materials like textbooks, chalkboard, models, charts, television, radio and other projected and non-project devices or tools, which bring about efficiency and effectiveness in the teaching/learning process and invariably promote and enhance the achievement of instructional objectives.

The researcher 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

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of agricultural science by students in senior secondary schools in Osisioma Ngwa LGA of Abia State. Okorie (2014) 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 (2020) 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 Osisioma Ngwa. Taiwo (2011) 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.

Statement of the Problem

In spite of the support system given to the education of secondary school students by the government, majority of the students either do not or partially achieve their aims of secondary school education. This can be deduced from the increasing concern of the general public, the poor standard of our educational system which regulated to the poor performance of students in various school subjects and inadequate teaching aid in the secondary school curriculum.
This poor performance could be attributed to at least in part to inadequate preparation which can be related to poor study habit and problems of teaching methodology in agricultural science. This is because it is not uncommon to see brilliant students failing their examination as a result of poor teaching and poor preparation. Many students perform poorly in their academic work not because they do not have the mental ability to do well but because their teacher's do not know or do not have or use the most effective method of studying or teaching. In order to improve student's academic performance in Agricultural science and also improve teaching of Agricultural science, deliberate efforts have to be put in place by the teachers, government and parents to drill the students in the acquisition of appropriate study habit and improvement in teaching Agricultural science subjects

The researcher wants to find out the strategies that can be used be used to improve the effective teaching and learning of agricultural science in the study area.

Research Questions

The following research questions guided the study

1. To what extent are the availability and adequacy of the resources for teaching and learning Agricultural science in senior secondary schools in the study area?
2. To what extent is the adequacy of the processes used in teaching and learning Agricultural science in senior secondary schools in the study area?

Research Methods

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The research method used for the study was presented under the following sub-headings; Design of the study, Area of the study, Population of the study, Sample and Sampling Techniques, Instrument for Data collection, validation of the instrument, Reliability of the instrument, method of data collection, method of data analysis and decision rule.

Research Design

A survey research design was used for the study. The study was conducted in public secondary schools in Osisioma Ngwa LGA of Abia State. The researcher choose this study area because he has prior knowledge of the study area based on their educational achievement because he was once a student there. The population of the study comprised of all the senior secondary school students in the government secondary schools in the Osisioma Ngwa LGA which is six thousand five hundred and thirty one (6531) (PPSMB 2022.). Simple random sampling was used to select thirty (30) students from each of the selected five (5) schools giving a total sample size of one hundred and fifty (150) students that was used for the study.

The instrument used for data collection was a structured questionnaire which was designed by the researcher.

The instrument was validated by two lecturers in Agric Department and one expert in Measurement and Evaluation, Enugu State University of Science and Technology (ESUT) Enugu. Their criticism and corrections were used in modifying the instrument**.** One hundred and fifty (150) copies of the questionnaire were administered by the researcher with the help of some agric teachers to the respondents. The entire questionnaire was collected from the respondent after they have been completed. Data were analyzed using mean score**.** For the sake of taking decision, any mean that is of 2.5 and above is considered agreed while any mean below 2.5 is disagreed.

Results

Research Question 1;

To what extent are the availability and adequacy of the resources for teaching and learning Agricultural science in senior secondary schools in the study area?

Table 1; Mean responses on the availability and adequacy of the resources for teaching and learning Agricultural science in senior secondary schools in the study area

SN	ITEMS	SA (4)	A (3)	D (2)	SD (1)	N	∑FX	X	Remarks
1	Agricultural science laboratories and facilities enhances the performance of teachers in teaching and learning of agric science	60	40	-	-	100	360	3.6	A

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2	It has helped students in sampling out different models, testing hypothesis on their own without the teachers guide	50	50	-	-	100	350	3.5	A
3	Adequate agric science facilities helps both the teachers and students interaction in the classroom to be effective	80	20	-	-	100	380	3.8	A
4	CD-ROMS with important contents of secondary school subjects can equally be used in teaching and learning of agric science topics	70	30	-	-	100	370	3.7	A
5	Multimedia is the embodiment of text, graphics, animation, pictures, sound and video clips and it can be easily used in teaching and learning of agric science	55	45	-	-	100	355	3.6	A

From the computed mean in table 1 above, it shows that items 1-5 have the mean score of 3.6, 3.5, 3.8, 3.7 and 3.6 respectively which indicates that the respondents agreed on the listed impact of agric science laboratories and facilities in teaching and learning of agric science.

Research Question 2;

To what extent is the adequacy of the processes used in teaching and learning Agricultural science in senior secondary schools in the study area?

Table 2; Mean responses on the adequacy of the processes used in teaching and learning Agricultural science in senior secondary schools in the study area

SN	ITEMS	SA (4)	A (3)	D (2)	SD (1)	N	∑FX	X	Remarks
6	Agricultural science laboratories and facilities enhances the performance of teachers in teaching and learning of agric science	70	30	-	-	100	370	3.7	A
7	It has helped students in sampling out different models, testing hypothesis on their own without the teachers guide	50	50	-	-	100	350	3.5	A
8	Adequate agric science facilities helps both the teachers and students interaction in the classroom to be effective	80	20	-	-	100	380	3.8	A

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9	CD-ROMS with important contents of secondary school subjects can equally be used in teaching and learning of agric science topics	55	45	-	-	100	355	3.6	A
10	Multimedia is the embodiment of text, graphics, animation, pictures, sound and video clips and it can be easily used in teaching and learning of agric science	60	40	-	-	100	360	3.6	A

From the computed mean in table 2 above, it could be seen that items 6-10 have the mean scores of 3.7, 3.5, 3.8, 3.6 and 3.6 respectively which shows that the respondents agreed on the listed adequacy of the processes used in teaching and learning Agricultural science in senior secondary schools in the study area

Discussion of Findings

Findings in table 1 showed that adequacy of facilities helps the students in understanding agricultural science concepts better and boost their performances in the subject.

Findings in table 2 also showed that students taught with adequate instructional materials in agric science perform better and are more enlightened on agric science processes.

Conclusion

Based on the findings of the study, the researcher concluded that suitable curriculum, adequate funding, establishment of school young farmers' club help in enhancing the teaching and learning of agricultural science in secondary schools

Recommendations

Based on the findings of the study, the researchers recommended that

i. Teachers and students should develop a healthy attitude towards the teaching and learning of agricultural science in secondary school.
ii. Government should endeavor to provide all the needed agric facilities in schools for the proper teaching and learning of agricultural science.
iii. They should also endeavor to employ competent teachers that will be handling these devices during teaching and learning.

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