APPROACHES FOR ENHANCING TEACHING AND LEARNING OF AGRICULTURAL SCIENCE IN JUNIOR SECONDARY SCHOOLS IN NSUKKA LOCAL GOVERNMENT AREA OF ENUGU STATE

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Abstract

This study was carried out to determine approaches for enhancing teaching and learning of Agricultural Science in junior secondary schools in Nsukka Local Government Area of Enugu State. The study adopted a descriptive survey research design. Three research questions guided the study. The population for this study was 60 Agricultural science teachers from 28 public junior secondary schools in Nsukka Local Government Area of Enugu State. The entire population was studied due to its manageable size. Therefore, there was no sampling. A 31-item questionnaire was used to obtain data from the respondents. The Cronbach alpha method was used to determine the internal consistency of the items, and an overall reliability coefficient of 0.81 was obtained. Three lecturers from the Department of Agricultural Education, Faculty of Vocational and Technical Education, University of Nigeria, Nsukka, validated the questionnaire. The questionnaire was administered to the respondents through personal contact, which was retrieved after completion by the respondents. The data collected was analyzed using mean and standard deviation to answer the research questions. The findings revealed that textbooks, laboratory equipment, real-life examples, charts and posters were some of the instructional materials needed for enhancing teaching and learning of Agricultural Science. The findings also showed that hands-on practical work, lecture method, group discussion, field trips and note method were some of the delivery methods needed for enhancing teaching and learning of Agricultural Science. The findings also revealed that observation, written examinations, class presentations and continuous assessment tests were some of the evaluation methods needed for enhancing teaching and learning of Agricultural Science. Based on the findings, the study recommended that education stakeholders should provide adequate and relevant instructional materials identified through this study to support pedagogy and also Government through the Federal Ministry of Education should train teachers on utilizing learner-centered, participatory delivery methods regularly especially practical and field-based approaches which would enhance teaching and learning of Agricultural Science in our secondary schools.

Keywords: Agricultural Science, junior secondary schools, teaching and learning

Introduction

Agriculture is an important sector and a significant contributor to the Nigerian economy, accounting for approximately 22% of GDP (National Bureau of Statistics, 2021). To

keep the sector relevant and competitive, it is important to invest in the education and training of the next generation of agriculturists through teaching and learning of Agricultural Science.

Agricultural Science involves growing of crops and rearing of animals for human use. It deals with teaching on how to grow crops, rear livestock and perform other operations that ensure expansion of knowledge in the subject. Singh &Verma, (2017) defined Agricultural Science as an academic discipline that encompasses the study of agriculture, including crop production, animal husbandry, soil science, agricultural economics, and sustainable agricultural practices. According to Dawn in Agriculture (2024), Agricultural Science is the academic scientific study of agriculture that involves researching and understanding the principles behind farming practices, developing new and technologies and techniques to improve agricultural productivity, and addressing challenges such as pests, diseases, and environmental health. In the context of this study, Agricultural science can be defined as the systematic study of agriculture, covering the principles, methods, and technologies used in agricultural production.

Agricultural science is an important subject in the Nigerian school curriculum, as it provides students with knowledge and skills in agriculture and prepares them for a career in the agricultural sector (Ogunfowokan and Akpan, 2017). Agricultural Science provides facts and intensive knowledge in practical agriculture necessary for internal and external examination Therefore, Agricultural Science is important for junior secondary school students and should be taught through effective teaching and learning.

Teaching is the process of imparting knowledge, skills and values to others, thereby facilitating learning and understanding. It involves creating a positive learning environment, guiding learners and providing feedback to help them succeed. Teaching is an organized method of giving information to somebody so as to change the belief and idea about something or event. According to Global Scientific Research (2025), teaching is the concerted sharing of knowledge and experience, which is usually, organized within a discipline and more generally, the provision of stimulus to the psychological and intellectual growth of a person by another person while; learning is a process of acquiring knowledge, skills, attitudes, and values through various experiences and interactions (Ormrod, 2020). In the context of Agricultural Science, teaching involves facilitating students' understanding of agricultural concepts, techniques, and their applications while learning involves students' active engagement in acquiring agricultural knowledge and skills, both inside and outside the classroom.

The importance of teaching and learning of Agricultural Science cannot be overemphasized. Teachers as major players in any sound Agricultural Science learning and are concerned with planning and assessing students' needs, selecting content, creating positive atmosphere for learning as well as provision and utilization of appropriate resources for teaching. Teaching and learning of Agricultural Science according to (Okoro & Eze, 2023) involves the use of effective pedagogical strategies to engage learners in active exploration, critical thinking, and practical experiences that enhance their understanding of agricultural concepts and prepare them for careers in the agricultural industry. In the context of this study, teaching and learning in Agricultural Science simply means the application of educational principles and methodologies to impart knowledge and develop skills related to agricultural practices, techniques, and scientific principles in the field of agriculture in junior secondary schools.

Teaching and learning of Agricultural Science in junior secondary schools plays important role in equipping students with the necessary knowledge and skills for sustainable agricultural practices, food production, and rural development. To ensure effective delivery of Agricultural Science, it is important to identify and employ approaches that enhance teaching and learning in Agricultural Science. In Nsukka, Enugu State, where agriculture is a significant part of the local economy, it is important to explore and implement effective approaches for teaching and learning of Agricultural Science in junior secondary schools. Approaches in teaching and learning of Agricultural Science refer to strategies, methods, and instructional models employed by educators to facilitate meaningful and engaging practical learning experiences for students in the field of Agriculture (Kimenyi & Cavanaugh 2021).

Agricultural Science is one of the subjects taught in junior secondary schools. The term Junior secondary school, also known as middle school or lower secondary school, is an educational level that typically encompasses students in JSS1, JSS2 and JSS3. It serves as a transitional phase between primary education and senior secondary education, providing a broader and more specialized curriculum to cater to the unique needs and developmental characteristics of early adolescents (Agbenyega & Inman, 2020).

In Enugu State in general, Agricultural Science is a subject taught by qualified teachers. It is expected that students in Junior Secondary School should perform excellently in Agricultural Science as a subject. However, the subject is often perceived as boring and irrelevant by students, and this has led to a decline in interest and enrolment in the subject. In recent years, there has been an increasing interest in finding approaches to enhance the teaching and learning

of Agricultural Science in junior secondary schools in Nsukka. Teaching and learning of Agricultural Science in junior secondary schools in Nsukka, has been reported to be ineffective and unproductive (Eze et al., 2021). Teaching and learning of Agricultural Science in Junior Secondary Schools in Nsukka have been faced with various challenges that affect the quality of education and these challenges include inadequate qualified teachers, inadequate instructional materials, inadequate practical experience, inadequate training of teachers, lack of interest on the part of the students, and insufficient government support (Isitor & Okonkwo, 2016; Dibia, 2017). These challenges have resulted in poor academic performance of students in the subject and a general lack of interest in agriculture as a career. For instance, a study by Anugwo and Ezenwa (2018) found that only 43% of junior secondary school students in Nsukka had a positive attitude towards agriculture, while 57% had a negative attitude towards the subject. Therefore, it becomes necessary to investigate approaches for teaching and learning of agricultural science in junior secondary schools in the Nsukka Local Government Area of Enugu State.

Purpose of the Study

The general purpose of the study was to identify approaches for enhancing teaching and learning of Agricultural Science in Junior Secondary School, in Nsukka Local Government Area of Enugu State. Specifically, the study sought to identify:

1. instructional materials needed for enhancing teaching and learning of Agricultural Science in junior secondary schools in Nsukka Local Government Area of Enugu State.
2. delivery methods needed for enhancing teaching and learning of Agricultural Science in junior secondary schools in Nsukka Local Government Area of Enugu State.
3. evaluation methods needed for enhancing teaching and learning of Agricultural Science in junior secondary schools in Nsukka Local Government Area of Enugu State.

Research Questions

The study was guided by the following research questions:

1. What are the instructional materials needed for enhancing teaching and learning of Agricultural Science in junior secondary school in Nsukka Local Government Area of Enugu State?
2. What are the delivery methods needed for enhancing teaching and learning of Agricultural Science in junior secondary school in Nsukka Local Government Area of Enugu State?

3. What are the evaluation methods needed for enhancing teaching and learning of Agricultural Science in junior secondary school in Nsukka Local Government Area of Enugu State?

Methodology b

Descriptive survey research design was adopted. The population for this study was 60 Agricultural science teachers from 28 public junior secondary schools in Nsukka Local Government Area of Enugu State. Source: Post Primary Management Board (PPSMB), Nsukka zonal office. The entire population of 60 Agricultural Science teachers was studied due to the manageable size of the population. Therefore, there was no sampling.

The instrument for data collection was a 47-item questionnaire developed from the literature by the researcher titled "Approaches for Enhancing Teaching and Learning of Agricultural Science Questionnaire" (AETLASQ). Each of the 47 items survey instrument was structured on a four–point response option of Strongly Agree (SA), Agree(A), Disagree (D), and Strongly Disagree (SD), with corresponding values of 4, 3, 2 and 1, respectively.

The instrument was validated by three lecturers from the Department of Agricultural Science Education, Faculty of Vocational and Technical Education, University of Nigeria, Nsukka. The comments and corrections made by the experts were used to modify the final draft of the instrument. The reliability of the validated instrument was determined using the Cronbach's alpha method, which yielded a coefficient of 0.81. Data collected from the respondents was analyzed using mean and standard deviation to answer the research questions. For the purpose of decision making in respect of the research questions, real limit of numbers was used as follows: Strongly Agree (SA) 3.50 - 4.00, Agree (A), 2.50 - 3.49, Disagree(D) 1.50 - 2.49, Strongly Disagree (SD) 0.50 - 1.49.

In deciding on the agreed item, any item with a mean value of 2.50 and above was interpreted as agreed, while those with a mean value of 2.50 below were interpreted as disagreed.

Results

The results of the study were obtained from the data collected, analyzed and presented in Tables 1-3.

Research Question 1:

What are the instructional materials needed for enhancing teaching and learning of Agricultural Science in junior secondary school?

Table 1: Mean and Standard Deviation of the instructional materials needed for enhancing teaching and learning of Agricultural Science in junior secondary school (n=60)

S/N	Item Statement	Mean $\bar{X}$	SD	Remark
1.	Textbooks and reference book	3.65	0.54	Agreed
2.	Models and simulations	3.25	0.60	Agreed
3.	Charts and posters	3.41	0.64	Agreed
4.	Audio visual aids such as, animations	3.28	0.71	Agreed
5.	Laboratory equipment such as microscopes, test kits	3.60	0.64	Agreed
6.	online resources like websites	3.0	0.92	Agreed
7.	E-learning platforms	3.18	0.79	Agreed
8.	Real life examples such as inviting practicing farmers	3.7	0.47	Agreed
9.	Virtual laboratories	3.31	0.67	Agreed
10.	Educational platforms	3.46	0.70	Agreed
11.	Educational videos	3.56	0.53	Agreed
12.	Audio recordings	2.58	0.86	Agreed

Key: N=60, $\bar{X}$=Mean, SD= Standard Deviation.

Data presented in Table 1, revealed that all the 12 items had their mean values ranged from 2.58-3.70. Each of the mean values of the 12 items was above 2.50; indicating that the respondents agreed to all the items as instructional materials needed for enhancing teaching and learning of Agricultural Science in junior secondary schools. The Standard deviation of the 12 items ranged from 0.47-0.92. Each of these values were less than 1.96 (95% confidence level); indicating that the respondents were close to the mean and to each other in their responses. The standard deviation added value to the reliability of the mean.

Research Question 2:

What are the delivery methods needed for enhancing teaching and learning of Agricultural Science in junior secondary school?

Table 2: Mean and Standard Deviation of the delivery methods needed for enhancing teaching and learning of Agricultural Science in junior secondary school. (n=60)

s/n	Item Statement	Mean $\bar{X}$	SD	Remark
1.	Lecture method	3.30	0.86	Agreed
2.	Hands on practical work	3.83	0.37	Agreed
3.	Group discussion	3.60	0.55	Agreed
4.	Brainstorming	3.36	0.60	Agreed

5.	Project based learning method	3.38	0.80	Agreed
6.	Field trips	3.71	0.52	Agreed
7.	Experiential learning	3.61	0.55	Agreed
8.	Multimedia and technology integration e.g. use of computers e.t.c	3.35	0.70	Agreed
9.	Inquiry-based learning i.e. encouraging students to ask questions	3.65	0.51	Agreed
10.	Note method	3.67	0.66	Agreed
11.	Use of Instructional materials	3.8	0.41	Agreed

Key: N=60, $\bar{X}$=Mean, SD= Standard Deviation.

Data presented in Table 2, revealed that all the 11 items had their mean values ranged from 3.30-3.83. Each of the mean values of the 11 items was above 2.50; indicating that the respondents agreed to all the items as delivery methods needed for enhancing teaching and learning of Agricultural Science in junior secondary schools. The Standard deviation of the 11 items ranged from 0.37-0.86. Each of these values were less than 1.96 (95% confidence level); indicating that the respondents were close to the mean and to each other in their responses. The standard deviation added value to the reliability of the mean.

Research Question 3:

What are the evaluation methods needed for enhancing the teaching and learning of Agricultural Science?

Table 3: Mean and Standard Deviation of the evaluation methods needed for enhancing the teaching and learning of Agricultural Science

(n=60)

s/n	Item Statement	Mean $\bar{X}$	SD	Remark
1.	Written examinations	3.75	0.57	Agreed
2.	Observation (Practical assessments)	3.78	0.41	Agreed
3.	Class presentations	3.70	0.46	Agreed
4.	Assignments and projects	3.63	0.48	Agreed
5.	Group assessments	3.61	0.49	Agreed
6.	Oral assessments	3.63	0.60	Agreed
7.	Continuous assessment tests	3.71	0.55	Agreed
8.	Self-assessment	2.82	1.00	Agreed

Key: N=60, $\bar{X}$=Mean, SD= Standard Deviation.

Data presented in Table 3, revealed that all the 8 items had their mean values ranged from 2.82-3.78. Each of the mean values of the 8 items was above 2.50; indicating that the respondents agreed to all the items as evaluation methods needed for enhancing teaching and learning of Agricultural Science in junior secondary schools. The Standard deviation of the 8 items ranged from 0.41-1.00. Each of these values were less than 1.96 (95% confidence level); indicating

that the respondents were close to the mean and to each other in their responses. The standard deviation added value to the reliability of the mean.

Discussion of findings

Research question 1 examined the instructional materials needed for enhancing teaching and learning of Agricultural Science in junior secondary school. The study revealed that textbooks and reference book, models and simulations, charts and posters, audio visual aids such as animations, laboratory equipment such as microscopes among others were found to be needed for enhancing teaching and learning of Agricultural Science in junior secondary school according to teachers' ratings. The findings of this study were in agreement with Ugwuanyi and Ugwuanyi (2019) who explored the use of instructional materials in enhancing teaching and learning of Agricultural Science in junior secondary school and found out that instructional materials such as chart and posters, models among others improves students understanding and retention of Agricultural Science concept.

Research question 2 examined the delivery methods needed for enhancing teaching and learning of Agricultural Science in junior secondary school. The study revealed that Lecture method, hands on practical work, group discussion, brainstorming, project-based learning method, field trips, experiential learning, among others were needed for enhancing teaching and learning of Agricultural Science in junior secondary school according to teachers' ratings. The findings of this study were in agreement with Irukwu and Okeke (2016), who noted that these methods help engage students, promotes understanding, develop practical skills, and connect theoretical knowledge to real-world applications.

Research question 3 examined evaluation methods needed for enhancing teaching and learning of Agricultural Science in junior secondary school. The study revealed that written examinations, observation (practical assessments), class presentations, assignments and projects, group assessments, oral assessments, continuous assessment tests and self-assessment were needed for enhancing teaching and learning of Agricultural Science in junior secondary school according to teacher's ratings. The findings of this study were in agreement with Onyekwere (2021), who noted that these methods measure students' progress, provide feedback and inform instructional decision-making.

Conclusion

In conclusion, this study achieved its aim of identifying the key approaches needed for enhancing teaching and learning of Agricultural Science in the study area. A multifaceted

approach incorporating various instructional materials, activity-based delivery methods and authentic evaluation methods is recommended based on the findings. Implementing the identified best practices can potentially bridge the theory-practice gap and nurture more competent and skilled agriculture professionals.

Recommendations

Based on the findings and implications of the study, the following recommendations were made:

1. Education stakeholders should provide adequate and relevant instructional materials identified through this study in order to support pedagogy.
2. Government through the Federal Ministry of Education should train teachers on utilizing learner-centered and participatory delivery methods regularly especially practical and field-based approaches.
3. Curriculum planners should develop the use of valid, reliable assessment tools evaluating higher-order skills.

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