FACTORS AFFECTING EFFECTIVE DELIVERY OF AGRICULTURAL SCIENCE PRACTICAL LESSON IN SENIOR SECONDARY SCHOOLS IN EBONYI STATE OF NIGERIA

BY

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Abstract
The study focused on factors affecting effective delivery of agricultural science practical lesson in senior secondary schools in Ebonyi State. Four research questions and one null hypothesis were formulated to guide the study. Descriptive survey research design was adopted and used to elicit information from the respondents. The sample size was 216 made up of 180 students and 36 teachers. Four point Likert scale questionnaire captioned Agricultural Science Practical Questionaire (ASPQ) was used for data collection, mean and Standard Deviation were used to interpret the 4 research questions while t-test statistics was used to test the hypothesis. Based on the findings of the study, all the variables tested has impact on the performance of Senior Secondary School students in the study area. The hypothesis tested equally shows that there was no significant difference in the mean rating of the performance of students in the rural areas and urban areas. It is recommended that the government, education managers, stakeholders, teachers, students and the communities should make collaborative effort to improve on the implementation of practical lesson (work) in Senior Secondary Schools in Ebonyi State.

***Keywords**: Effective Delivery, Practical Lesson, Agricultural Science, Secondary Schools.*

Introduction

Background of the study

The growth rate in agricultural sector in Nigeria increased from an average of 3% in the 1990s to 7% in mid-2000, the food security/sufficiency status of Nigeria continued to decline (Adeoti, 2002). A look into the Nigerian economy and its development reveals that agriculture was both the main stay of the Nigerian economy and the chief foreign exchange earner. At present, agriculture accounted for only 41 percent of the economic sector while crude oil accounted for 13 percent (Ukeje, 2005). Although, agriculture no longer serves as the leading contributor to Nigeria's gross national and leading foreign exchange earner, due to phenomenal growth in the petroleum sector of the economy (Obeke, 2004). Nigeria being an agricultural country requires that the best practices in the area must be inculcated early enough in the minds of the citizens. The effectiveness and efficiency of facilitation of the teaching and learning of agriculture must be such that learners will acquire knowledge, skills and right attitudes at the secondary school level.

The conventional chalk-and-talk method of teaching agricultural science in secondary school and other tertiary institutions have not been effective in developing the needed technical knowledge and acquisition of the vocational skills necessary for agricultural development stated

in the national policy on education (Appiah, C.*et al*, 2020). The use of agricultural science teaching to increase the manpower availability, provide employment opportunities, sustain and stabilize the economy, build dynamic, strong and self-reliant nation (Iwena, 2000) could not be achieved by the ineffective traditional chalk-and-talk method of teaching agricultural science in the classroom. Agricultural science teaching curriculum comprises of both theoretical and practical lessons even though the practical aspects are ignored most time by the teachers.

Practical teaching is one of the means of making the subject real to the pupils (Mamman, 2000). Theory and practical must go hand in hand so that what is taught in the theory must be applied and demonstrated practically to enable learners acquire knowledge, skills and develop the right attitude (Appiah *et al.,* 2020). Therefore, this study is designed to determine the factors affecting the effective delivery of practical lesson in senior secondary schools in Ebonyi State.

Statement of the Problem

The poor attitude of students and teachers alike towards practical aspect of agricultural science studies in secondary schools has been growing at an alarming rate. Some school administrators no longer care to monitor and enforce the implementation of practical aspect of teaching agricultural science in schools. In some schools, the students and teachers use the time allocated for practical work as free period. This trend has helped to create lack of interest in the subject by students. The number of students who indicate interest to study agriculture related courses in higher institutions of higher learning have continued to decline. In view of the above, this study is designed to determine the factors affecting the effective delivery of agricultural science practical lessons in the secondary schools in Ebonyi State.

Purpose of the Study

The main purpose of the study is to investigate the factors affecting effective delivery of practical agricultural science lessons in senior secondary schools in Ebonyi State. Specifically, the study seeks to find:

1. Factors affecting effective teaching of practical agricultural science lessons in the study area.
2. Types of practical lessons performed by students
3. The impact of practical lessons to students' learning
4. Ways to improve practical lessons

Significance of the Study

The increasing apathy shown by students in the study of agricultural science in secondary schools, especially the practical aspect should be investigated so as to find remedy for it. The result of the study will be of help to the government, teachers, school administrators, students and indeed other stakeholder in education.

Research Questions

1. What are the factors affecting effective teaching of practical agricultural science lessons in senior secondary schools in Ebonyi State?
2. What are the types of practical lessons performed by students?
3. What are the impacts of practical lessons to students learning?
4. What are the ways to improve practical lessons?

Hypothesis

The hypothesis was tested at 0.05 level of significance.

HO: there is no significant difference in the mean rating of the school location and the identified factors affecting effective practical agricultural science lessons.

Methodology

This chapter shall deal with: research design, population of the study, sample and sampling techniques, instruments for data collection, validity of instruments, reliability of instrument, method of data collection and method of data analysis.

Research Design

Descriptive survey design is used for the study. A descriptive design in a survey attempts to describe, explain and interpret conditions of the present.

Area of Study

The area of study is senior secondary schools in Ebonyi State.

Population of Study

The population of the study is made up of 36 teachers and 180 students giving a total of 216 respondents. The official record from the planning, research and statistics of the Secondary Education Board of Ebonyi State (2015) indicates that there are 87 agricultural science teachers in the urban areas and 209 of them in the rural areas.

From the 3 educational zones of the state, random sampling was used to select 18 schools, six from each zone. Out of the 18 schools, 10 students and 2 teachers were randomly selected from the 18 schools making a total of 180 students and 36 teachers.

Instrument for Data Collection

The instrument for data collection is a structured questionnaire designed by the researcher and titled: Agricultural Science Practical Questionnaire (ASPQ). The questions (items) are arranged and assigned scale format of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD), with corresponding rating scale of 4, 3, 2 and 1 respectively. Any item that has a score of 2.5 and above shall be agreed while any item of score below 2.5 shall be disagreed. The 2.5 was gotten by adding $4+3+2+1= 10 \div 4 = 2.5$

Validity of Instrument

The instrument was validated by three experts, two from the Department of Animal Science and one from the Science Education Department, all from Ebonyi State University.

Reliability of Instrument

The reliability of the instrument was determined by a pilot test with 17 teachers and 60 students from senior secondary schools in neighboring Enugu state of Nigeria.

The instruments was administered at two intervals and was subjected to internal consistency using Cronbach Alpha method.

Method of Data Collection

The questionnaire was administered to the respondents by the researcher and assisted by three research assistants.

Method of Data Analysis

Data collected was analyzed using weighted mean and standard deviation to answer the five questions. The hypothesis shall be tested at 0.05 level of significance.

Result Presentation and Analysis

Research Question One: What are the factors affecting effective teaching of practical agricultural science lessons in senior secondary schools in Ebonyi State?

Table 1: Factors affecting effective teaching of practical lessons in Agricultural Science

S/N	ITEMS	MEAN X	SD	DEC.
1.	Teachers knowledge of practical	3.22	0.76	Agreed
2.	Unavailability of school farm/garden	2.55	0.71	Agreed
3.	Nonchalant attitude of the subject teacher	3.20	0.81	Agreed
4.	Lack of supervision by the principal	3.48	0.73	Agreed
5.	Lack of tools and implement	3.32	0.75	Agreed
6.	Inadequate instructional materials	3.55	0.64	Agreed
7.	Poorly equipped laboratory for experiments	3.64	0.63	Agreed
8.	Lack of fund for purchase of equipment	3.34	0.74	Agreed
9.	Short time allotted for practical lessons	3.50	0.66	Agreed
10.	Teachers use of school farm as personal farm	3.26	0.70	Agreed
	Grand Mean (X) and SD	3.40	0.74	Agreed

The result in Table 1 above, shows that the respondents agreed that all the items were factors affecting effective teaching of practical agricultural science in the study area. The mean value of all the factors ranged between 2.55 to 3.64 which clearly indicates that each of the mean value was above the 2.50 cut-off point.

Research Question Two: What are the types of practical lessons performed by students?

Table 2: The types of practical lessons performed by students

S/N	ITEMS	MEAN X	SD	DEC.
1.	Clearing of school farm	2.55	0.76	Agreed

2.	Making of ridges and mounds	2.96	0.54	Agreed
3.	Planting of crops	3.60	0.43	Agreed
4.	Weeding of farms	3.64	0.41	Agreed
5.	Application of fertilizer	3.02	0.97	Agreed
6.	Harvesting of crops	3.61	0.46	Agreed
7.	Identification of farm equipment	2.78	0.61	Agreed
8.	Establishing of nursery crops	2.10	1.20	Disagreed
9.	Record keeping	2.92	0.58	Agreed
10.	Identification of breeds of animals	2.85	0.68	Agreed
11.	Identification of pest and diseases	2.21	0.98	Disagreed
12.	Identification of types of soil	2.62	0.91	Agreed
13.	Identification of types of rock	2.53	0.89	Agreed
14.	Pruning of crops	2.12	1.06	Disagreed
15.	Visit to crop and animal farms	3.35	0.53	Agreed
	Grand Mean (X) and SD	2.85	0.73	Agreed

In Table 2, items 8, 11 and 14 has mean value less than the cut-off point of 2.50 which implies that the majority of the respondents do not agree that the items are type of practical work performed by the students. The respondents are however, in agreement that the remaining 12 factors are types of practical work done by students in the study area.

Research Question Three: What are the impacts of practical lesson to students learning?

Table 3: The impact of practical lessons to students' learning

S/N	ITEMS	MEAN X	SD	DEC.
1.	Development of interest in agriculture as vocation	3.30	0.55	Agreed
2.	Development of process skills	2.90	0.60	Agreed
3.	Better understanding of taught theory	3.01	0.98	Agreed
4.	Development of sense of initiative	3.66	0.42	Agreed
5.	Development of managerial ability	3.48	0.73	Agreed
6.	Positive attitude towards agricultural science	3.56	0.53	Agreed
	Grand Mean (X) and SD	3.33	0.64	Agreed

The result as presented in table 3 indicates that the respondents agreed that all the itemized practical work impact positively on students learning in the subject area. The mean value which ranged between 2.90 to 3.66 were greater than the cut-off mean of 2.50.

Research Question 4: What are the ways to improve practical lesson?

Table 4: Ways to improve practical lesson

S/N	ITEMS	MEAN X	SD	DEC.
1.	Allocate enough time for practical	3.10	0.87	Agreed
2.	Achievable objectives should be well defined	3.65	0.51	Agreed
3.	Scientific and modern practices should form practical lessons	3.22	0.58	Agreed
4.	The laboratory part of practical lessons should not be neglected	3.64	0.54	Agreed
5.	Teachers should not convert school farms for personal farms	3.30	0.55	Agreed
6.	Enough tools and equipment should be provided for use	2.90	0.62	Agreed
7.	Students should be given part of the proceeds as incentive and motivation	3.28	0.56	Agreed
	Grand Mean (X) and SD	3.30	0.60	Agreed

The data in Table 4 revealed that the respondents agreed that items 1 to 7, with a mean range of 2.90 to 3.65, are ways to improve practical lesson in the subject area under study.

HO: There is no significant difference in the mean ratings of the school location and the identified factors affecting effective teaching of practical agricultural science lessons.

Table 5: T-test analysis of the responses of two groups of agricultural science teachers (from urban and rural areas of Ebonyi State) on the factors affecting effective teaching of practical agricultural science lessons

S/N	ITEMS	Agriculture practical (Urban Area) No:100		Agriculture practical (Rural Area) No: 100		t.cal	t.tab	DEC
		X_1	X_1	X_2	X_2			
1.	Teachers knowledge of practical lesson	3.68	1.07	3.54	0.50	-1.42	1.96	Not Sig.
2.	Unavailability of school farm/garden	3.00	0.63	3.11	1.01	-4.60	1.96	Not Sig.
3.	Nonchalant attitude of the subject teacher	2.64	0.91	2.58	0.51	0.51	1.96	Not Sig.
4.	Lack of supervision by the principal	2.70	1.09	3.12	0.76	0.40	1.96	Not Sig.
5.	Lack of tools and implements	3.56	0.43	3.74	1.04	-2.47	1.96	Not Sig.
6.	Inadequate instructional materials	3.20	1.16	3.59	0.98	-1.06	1.96	Not Sig.

7.	Poorly equipped laboratory for experiments	3.15	0.60	3.24	0.81	-1.92	1.96	Not Sig.
8.	Lack of fund for purchase of equipment	3.48	0.83	3.36	0.70	-0.33	1.96	Not Sig.
9.	Short time allotted for practical lessons	2.94	0.90	2.96	0.91	0.15	1.96	Not Sig.
10.	Teachers use of school farm as personal farm	3.27	0.98	3.35	0.24	-2.97	1.96	Not Sig.

From the analysis in Table 5, one can observe that the values of the t-calculated for all the items are less than the t-tabulated value of 1.96. The null hypothesis is therefore accepted which indicates that there is no significant difference in the mean rating of the respondents in the Urban areas and Rural areas on the factors affecting effective teaching of practical agricultural science lessons in the study area.

Discussion

The result of the study as shown in Table 1, indicated that the following factors affect the effective teaching of practical work in agricultural science: teachers' knowledge of practical, unavailability of school farm/garden, nonchalant attitude of the subject teacher, lack of supervision by the principal, lack of tools and implement, inadequate instructional materials, poorly equipped laboratory, lack of fund for purchase of equipment, short time allotted for practical lessons and teachers use of school farm as personal farm. In his work, Fapojuwo *et al* (2011) noted that most agricultural graduates in Nigeria lack the knowledge and work in rapidly changing environment. The above assertion supports the first and third item of this work, that teachers' knowledge of the practical work and nonchalant attitude of the subject teacher affects the teaching of practical lesson in the subject area. The finding in the Table 2 indicated that all the items were the types of practical work performed by students apart from establishment of nursery crops, identification of pest and diseases and pruning of crops which had mean values of 2.10, 2.21, and 2.12 respectively; less than the cut-off mean of 2.50. This finding is in agreement with the work of Olatunji and Wigwe (2011). On the impact of practical lessons to students learning, the respondents agreed that the following are some of the impacts practical work has on students learning: development of interest in agriculture as a vocation, development of process skills, better understanding of taught theory, development of sense of initiative, development of managerial ability and positive attitude towards agricultural science. This is in line with the work of Amadi and Aleru, (2016) who opined that practical work enhances the process of acquisition of basic knowledge and practical skills that prepare students for occupation in agriculture. The respondents also agreed that the following, if implemented will improve practical lesson in senior secondary schools in the study areas as presented in Table 4: allocate enough time for practical, achievable objective should be well defined, scientific and modern practices should form practical lessons, students should be given part of the proceeds from the practical farm as incentive and motivation, among others. In addition to the above result, Olatunji and Wigwe (2011) asserted that more emphasis should be placed on soil related and field-trip-related

practical work that are currently receiving the least attention while the stakeholders should ensure that the students-to-teacher ratio drastically reduced so that the teachers will have enough time to attend to practical agriculture lessons. Equally, the hypothesis tested upheld the null hypothesis in the mean ratings of the school location (urban areas and rural areas) on the identified factors affecting teaching of practical agricultural science lessons.

Therefore, the location of the school has no effect on the delivery of practical lesson in agricultural science in the study area. However, Amadi and Aleru, (2016) in their work noted a significant differences in the frequencies of practical work in favour of schools located in Rural Areas and Private-owned Senior Secondary Schools in Ikwere Local Government Area of Rivers State.

Educational Implication of the Study

The findings of the study has far reaching implications for the government, stakeholders, education managers, NGOs, students, employers of labour and indeed the citizenry. The work captured the importance of exposing the students at secondary school level to practical agriculture as it equips them to learn-by-doing as contained in the West African Examination Council (WAEC) (2016) syllabus. Some of the main objectives of introducing practical agriculture by WAEC is: dignity of labour appreciation, increasing self-sufficiency and self-reliance in food production etc.

Practical lesson (work) in agricultural science study enhances the process of acquisition of basic knowledge and practical skills that prepares students for occupation in Agriculture which invariably reduces the population of youths in the labour market and turns them into employers of labour.

Conclusion

The study focused on factors affecting effective delivery of agricultural science practical lesson in senior secondary schools in Ebonyi State of Nigeria. The results presented the factors; the types of practical lessons performed by students, the impact of practical lessons on the students learning, ways to improve on practical lessons and also noted that the location of the school does not have any impact on the effective teaching of practical lessons in senior secondary schools.

Recommendation

The following recommendations were made based on the findings of the study:

1. There should be a collaborative efforts between government, education managers, stakeholders, etc to create enough awareness of the importance of implementing practical work in the teaching and learning of agriculture in schools as the importance cannot be overemphasized.
2. The government, education managers, stakeholders and indeed all lovers of education should as a matter of urgency ensure that enough necessary machines, tools and equipment needed in schools for practical lessons are provided.
3. Supervisors, principals and all the stakeholders in education should ensure that schools have enough school farm and qualified teachers in schools for the effective delivery of practical lessons in agriculture.

References

Amadi, N.S. and Aleru, P.D. (2016). Impact of Practical Agriculture in the Development of

Agricultural Skills in Senior Secondary School Students in Ikwere Local Government Area, Rivers State. Journal of Technical and Science Education (JO TASE). Vol. 19, No.2; 140.

Appiah, C., Ogoe, P.B. & Osei-sarfo, F. (2020). Factors affecting effective Delivery of Agricultural Science in practical lessons in the Colleges of Education in the central Region of Ghana. *International Journal of Arts, Humanities and Management Studies*. 6(6): 1-25.

Gyamer, T. (1993). Alternative to Practical Work. School Science Review, 75(271): 117-123.

Harries, D.R. and Fuller, D.Q. (2014). Agriculture: Definition and overview. *In Encyclopedia of Global Archeology, (Clairsmith, Ed.).* Springer, New York: pp 104-113.

Hinneh, J.T. (2017). Attitude towards practical work and students' achievement in Biology. A case of a Private Senior Secondary School in Gaborone, Botswana. *IOSR Journal of Mathematics (IOSR-JM),* 13(4): 06-11.

Mamman, M.G. (2002). Teacher Education and Teacher effectiveness. *Journal of teachers and Teaching,* 1(2): 25-29.

Mcknight, K., Yarbro, J., Graybeal, L., and Graybeal, J. (2016). United Arab Emirates. What makes an effective teacher? (Online). Available from: https://www.pearson.com/content/corporate/global/pearson-dot-com/files/innovation/globalsurvey/reports/RINVN11137UAEreportofcrops091116.pdf

Okam, C.C. and Zakari, I.I. (2017). Impact of Laboratory-Based Teaching Strategy on Students' Attitudes and Mastery of Chemistry in Kastina Metropolis, Kastina State, Nigeria. *International Journal of Innovative Research and Development,* 6(1): 112.

Olatunji, S. O. and Wigwe, (2016). Exposure of Senior Secondary School Students to Practical Work in Agriculture in Ikwere and Obiakpo Local Government Areas of Rivers State, Nigeria. Journal of Technology and Education in Nigeria, Vol. 16 No. 1

UAE vision 2021 (n.d.). UAE vision 2021: Building Knowledge of Economy (online) Available from: https://www.vision2021.ae/en/national-agenda-2021.

Zuhrieh, S. and Enas, S.A. (2020). Science Practical Work and its Impact on students' science Achievement. *Journal of Technology and Science Education,* 10 (2): 199-215.