

Effectiveness of Demonstration and Lecture Methods of Teaching Agricultural Science on Senior Secondary Students' Academic Performance in Maiduguri Metropolis, Borno State, Nigeria.

By
Mohammed Adamu
&
Muhammad Alkali Kolo
Department of Education
Borno State University, Maiduguri

Abstract

This study determined the effectiveness of Demonstration and lecture methods of teaching Agricultural Science on Senior Secondary students' academic performance in Maiduguri metropolis, Borno state, Nigeria. The study adopted the pre-test post-test quasi experimental design. To obtain the subjects of the study, three Senior Secondary Schools were stratified based on gender (male school, female school and mixed school). The study used nine intact classes using simple random sampling. Agricultural Performance Test (APT) serve as a research instrument. The research Instrument was validated to obtain reliability index of 0.78 using kuder Richardson (KR-20) formula. Data was analysed using descriptive statistics and Independent sampled t-test. The findings of the study Showed that demonstration method was effective in teaching Agricultural Science in Senior Secondary Schools in Maiduguri metropolis, Lecture method was not effective in teaching Agricultural Science in Senior Secondary Schools and there was significant difference between the academic performance of boys and girls exposed to demonstration method in teaching Agricultural Science in favour of boys. The study concluded that the use of demonstration method as a teaching method enhances learning in which Agricultural Science ideas and information are extended from the teacher to the learners without difficulties. The study therefore, recommended that government should encourage Agricultural Science teachers to abreast their knowledge on the need to strategies the use of demonstration method.

Keywords: *Demonstration, Lecture, Methods Teaching, Agricultural Science.*

Introduction

The concept of teaching method is derived from teaching approach and it is procedural. Teaching method is the series of actions or activities planned by the teacher and Systematically provided to the learner to enable him receive and process the information, retain and recall it in order to be use it to tackle emerging life tasks and problems (Bamidele, 2019). According to Ayeni (2011). Teaching is a Continuous process that involves bringing about desirable changes in learners through the use of appropriate Methods. Adunola (2011) indicated that in order to bring about desirable Changes to students, teaching method used by educators should be best for the subject matter. Furthermore, Bharadiraj and Pal (2011) sustained that teaching methods work effectively mainly If they suit learners' needs since every learner interprets and responds to questions in a unique way (Chang, 2011).

Omwirhiren and Khalil (2016) describe demonstration method as a practical method of teaching which involves showing doing and telling something. According to them, the Onus is on the teacher to display the step in the process and explain them accurately and clearly while students are expected to practice by repeating the things the teacher has done. This method has been noted for bridging the gap between theory and practice. Ameh, Daniel and Akus (2007) in their own view, described demonstration method as a type of teaching method

in which the teacher is the principal actor while the learners watch with the intention to act later. Here, the teachers do whatever the learner is expected to do at the end of the lesson by showing them how to do it and explaining the step-by-step process to them. Arubayi (2015), described demonstration teaching method as a visible presentation of Ideals, skills, attitudes process and other tangibles. Demonstration lessons include facts and principles used along with materials for sharing or teaching someone else.

Arubayi (2015) Opined that for demonstration method to be effective, the lesson should be planned ahead of time have all necessary Methods and equipment need for the demonstration lesson. Participants should be given Clear and simple Instructions. He further stated that the sitting arrangement should be organized so that participants can see and hear clearly. After the demonstration generally, the Students should be given opportunity to practice individually or in groups Okoko (2014) reported that there was no significant difference in the mean achievement scores between the males and females students taught Agricultural science using demonstration method. Omwirhiran, and Khalil (2016) stated that there is statistically significant in the learning outcomes of students taught with demonstration and lecture methods. The difference was In favour of those taught by demonstration Method. Adeyinka (2020) asserts that there is significant difference in the performance of students taught Agricultural science using demonstration method, similarly Abdulazeez (2021) reported that Students that were taught with demonstration method were found to have high Achievement scores in Agricultural Science Achievement Test (ASAT) than their Counter parts that were taught with Conventional lecture method.

The lecture method is characterized by classroom Interaction, presentation of Ideas and Information through verbal communication. This is a direct communication of what is to be learned. It depends on the verbal and visual aptitudes of the learners. Learners are required not only to pay attention, but also to ask or answer questions (Okoko, 2014) Obunadike and Omeye (2014) asserts There is no significant difference between lecture method and demonstration Method on the academic performance of students in agricultural science. The demonstration method being more practical than lecture Method is an ideal technique for teaching agricultural science because according to Salawu (2021) learners do best in agricultural science when exposed to practical rather than sitting, discussing and listening to classroom teachings which lecture method encourages. Adebayo (2019) reported that there was significant difference between academic performance of students taught Agricultural science using lecture method and those taught using demonstration method in favour of lecture method

Similarly, Chris (2021) asserts that there was Significant difference in the mean scores of Students taught Agricultural science using lecture method and those taught using demonstration method the high mean scores is in favour of lecture method. Labaran (2018). Reported there was no significant difference in the academic performance of Male and female Students taught Agricultural science using demonstration method Seun (2019) revealed that there was significant difference in the mean achievement scores of students when taught Agricultural science using demonstration method in favour of male Students.

Statement of the Problem

The problem that prompted the need for this study is the poor academic performance of students in agricultural science in recent years which the researchers observed from experience in their terminal examinations. While the performance of those who choose to offer it, Seems to be very lows. This situation may be attributed to how students were taught right from the beginning of studying Agricultural science as a recent of the teacher's

inappropriate use of teaching methods while teaching agricultural science. Teachers with bachelors' degree in Agricultural science, crop production, soil science and Agricultural economics and extension are not taught teaching methodology, yet they find themselves in the classroom as agricultural science teachers with only agricultural subject matter. Such teachers are inadequately prepared for the realities of teaching in the secondary schools. The way and manner students perceive the subject arises from the experience that Instructional approaches adapted by teachers both in the classroom and on the field during teaching and learning processes are not impressive, the effect of this is lack of interest and poor performance of students in the subject.

Objectives of the Study

That Objectives of the study are to determine:

1. Performance of Senior Secondary Schools Students Taught Agricultural Science using demonstration method in Maiduguri metropolis, Borno State.
2. Performance of Senior Secondary Schools Students Taught Agricultural Science using lecture method in Maiduguri metropolis, Borno State.
3. Gender difference in performance of Senior Secondary School Students Taught Agricultural Science using demonstration method in Maiduguri metropolis, Borno State.

Research Questions

The following research questions were answered

1. What is the performance of senior secondary students taught agricultural science using demonstration method in Maiduguri metropolis, Borno State?
2. What is the performance of senior secondary students taught Agricultural science using lecture method in Maiduguri metropolis, Borno State?

Hypothesis

This null hypothesis was tested:

H₀: There is no significant difference between the performance of boys and girls when taught Agricultural science by demonstration Method.

Methodology

Research Design

This study used quasi experimental design which determined the effectiveness of demonstration and lecture method of teaching Agricultural science on senior secondary students' academic performance in Maiduguri metropolis, Borno State. Umoru (2004) stated that quasi experimental design is used in Investigating the Cause and effect between independent and dependent Variables. The research design used two experimental and one control groups to measure the effect of treatment on experimental groups.

Population and Sample

The target population for this study was six thousand seven hundred and twenty (6,720) SS II Agricultural science students from (26) public Senior secondary schools in Maiduguri Metropolis Borno State for the 2021/2022 academic session. However, stratified random sampling technique was used to select a sample of three (3) public senior secondary schools in Maiduguri Metropolis Borno State. The use of stratified random Sampling method

according to Cohen, Manian and Marison (2013) stratified random sampling Involves during the population in to homogeneous groups, each group containing subjects with similar characteristics. Simple random sampling (balloting) was used to select intact classes, three intact classes from each of the three Schools were selected as samples in each of the school, two classes were assigned as experimental classes while the other class was the control class.

Research instrument

The Instrument for this study was researchers designed performance Test in Agricultural Science (PTAS) which consists of 30 items of multiple-choice type. The items were drawn carefully within the scope of Agricultural science SS II Syllabus. The Instrument was scrutinized for Content (face) Validity by experts in the subject area. A pilot testing Instrument was conducted in one School which was not used in the main study to test the Validity and reliability Index of the Instrument using test-retest technique. A reliability coefficient of 0.80 was obtained.

Procedure for Data collection

The researchers engaged nine (9) research assistants, three from each school and to control the effect of teacher variation all the teachers are specially agricultural science teachers with bachelor degree in Agricultural science with not less than five years of teaching experience. The research assistants were trained for three days on the need to maintain professionalism throughout the treatment phase.

Method of Data Analysis

The data collected was analyzed using descriptive statistics of mean and standard and independent sampled t-test.

Results

Research Question One; what is the performance of senior secondary students taught agricultural science using demonstration method in Maiduguri metropolis, Borno states?

The summary of the descriptive statistics of the demonstration and the control groups were presented in the table below.

Table 4.1 Descriptive statistics of the students' performance on demonstration and control groups.

Teaching Methods	PRE TEST			POST TEST		
	N	MEAN	SD	N	MEAN	SD
Demonstration method	159	53.18	12.83	159	70.56	8.44
Control	136	53.42	11.83	136	56.21	11.90
TOTAL	295					

The result from table 4.1 above revealed that on pretest result there was difference between the demonstration group and the control group. On post test result due to the effect of treatment the mean of demonstration group was 70.56 and standard deviation of 8.44 while the mean of control group was 56.21 and the standard of 11.90 which shows that there was slight significant difference on post test result and the pretest.

Research Question Two: what is the performance of senior secondary students taught agricultural science using lecture method in Maiduguri metropolis, Borno states?

The summary of the descriptive statistics of the lecture and the control groups were presented in the table below

Table 4.2 Descriptive statistics of the students' performance on lecture and control groups

Teaching Methods	PRE-TEST			POST TEST		
	N	MEAN	SD	N	MEAN	SD
Lecture method	155	59.41	10.38	155	61.38	9.26
Control	136	53.42	11.83	136	56.21	11.90
TOTAL	291	16.98				

The result from table 4.2 above revealed that there was slight difference between the lecture group and the control group on both pretest and posttest. On post test result the mean of the lecture method was 61.38 and a standard deviation of 9.26 while the mean of the control group was 56.21 and a standard deviation of 11.90. This shows there was no significant difference on post test result and the Pretest results.

Hypothesis One: there is no significant difference between the performance of Male and Female students when taught agricultural science by the demonstration method.

Summary of the independent sample t-test on students' performance when taught agricultural science using demonstration method based on gender

Table 4.3 Summary of t-test comparison of gender difference in performance using demonstration method

Gender Remark	N	MEAN	SD	df	t	P-value
Male	73	68.33	8.26	153	6.08	0.00
Female	82	57.13	10.10			S
TOTAL	155	19.84				

P<0.05

The result from table 4.3 above shows that there was significant difference between the performance of male and female students when taught agricultural science using demonstration method because the p-value (0.00) is less than the level of significance ($\alpha=0.05$), therefore, the null hypothesis is rejected. The result also showed that the performance of male students is higher than the performance of female students with mean scores of 68.33 and 57.13 respectively.

Discussion

Finding on performance of Senior Secondary students taught Agricultural Science using demonstration method in Maiduguri Metro polis, Borno states (research Question one) revealed that there was difference between the demonstration group and the control group on post test result due to the effect of treatment on their performance, in favour of demonstration method. This finding is in-line with Omwihiren and Khalil (2016) who reported that there was statistically significant in the learning outcomes of students taught with demonstration

and lecture methods the difference was in favour of those taught by demonstration method. Similarly, Abdulrazaq (2021) reported that students that were taught with demonstration method were found to have high achievement scores in Agricultural Science Achievement Test (ASAT) than their counter parts that were taught with conventional lecture method.

Finding on performance of Senior Secondary students taught Agricultural Science using lecture method in Maiduguri metropolis, Borno state (research question two) revealed that there was no significant difference between performance of lecture method group and the control group. This finding is in contrast with Adebayo (2019) who reported that there was significant difference between the academic performance of students taught agricultural science using lecture method and those taught using demonstration method in favour of lecture method.

Finding on students' performance when taught Agricultural Science using demonstration method based on gender (hypothesis one) revealed that there was significant difference between the performance of male and female students when taught agricultural science using demonstration method, because the performance of male students is higher with mean scores of 68.33 While the mean scores of female students is 57.13. This finding is in contrast with Okoko (2014) who reported that there was no significant difference in the mean achievement scores between the male and female students taught agricultural science using demonstration method. Also collaborating with thus finding Seun (2019) asserts that there was significant difference in the mean achievement scores of students when taught agricultural science using demonstration method in favour of male students.

Conclusion

The study confirmed that there was significant difference between the performance of students when taught agricultural science using demonstration method, there was also significant difference between the agricultural science using demonstration method, in favour of male students because male students have higher mean scores of 68.33 while the female students have mean score of 57.13. The limitation of this study, it did not consider other science and Vocational subjects to measure students' performance.

Recommendations

The study recommends that Agricultural science teachers should maximize the use of demonstration method when teaching Agricultural science Government should encourage Agricultural Science teachers to abreast their knowledge by attending conference, seminars and workshops so as to get acquainted with different teaching strategies and lastly Government and other stakeholders should take proactive measures to improve the learning ability of the girl-child.

References

- Abdulrazak, B. (2021) Influence of Demonstration method of teaching Science on academic performance of secondary School students in Osun State. *Journal of Science Education and technology* 4(1): 62-74
- Adebayo, K (2019). Survey on the effectiveness of demonstration method of teaching on academic performance senior secondary schools students 'in Adamawa State, Nigeria *Journal of Science Education research and innovation p. 2(3): 56-67*
- Adeyinka, S. (2020) Comparative effectiveness of Demonstration and inquiry method of teaching Agricultural science on academic performance of Senior secondary schools students' in Niger state, *Nigeria Journal of Contemporary Issues and Innovation 2(3): 161-172*
- Adunola, O. (2011). The Impact of teachers' teaching Methods on the academic performance of primary school pupils in ijebu-ode local government area of Ogun state, Ego Booster Books, Ogun State, Nigeria.
- Ameh, I. Daniel, B.P & Akus, T. (2007). Research and method in the. Social Science. Antepa: Rowes press.
- Arubayi, D.O (2015). The roles of the teacher and method of teaching science Secondary school in Nigeria *AASCIT Journal of Education, 1(1):1-6,*
- Ayeni, A. J. (2011) Teachers professional development and quality assurance in Nigeria secondary schools, *World Journal of education, (2): 143- 149*
- Bamidele K. O (2019) Relationship between teaching methods and students' Academic performance in senior secondary school in Eliti state. *African Journal of Education and Arts 3(2):86-95.*
- Chang, W. (2002) "interactive teaching approach in year one conversity physics In Taiwan; Implementation and Evaluation, "Asia-pacific Forum on Science learning and Teaching 3, (2002) Available on <http://www.ied.edu.ht/apfslt/V3 Issue 1/ changwi/Index.html>.
- Chris, E.O (2021). Effects of demonstration method of teaching Agricultural science on academic performance of Senior Secondary Schools students' in Ebonyi State, Nigeria (Unpublished M.Ed. Dissertation, Ahmadu Bello University Zaria)
- Labanan, K. H. (2018) Gender difference in effectiveness of demonstration method of teaching Agricultural science on performance of Secondary Schools students' in Bauchi State, Nigeria. *International Journal of Arts and Social Sciences. 3(4): 96-104.*
- Obunadike, J. C & Omeye, C. C (2014) Comparative study of the influence of lecture and demonstration methods on the teaching of Agricultural Science in Senior Secondary Schools in Bendel Local Government Area. *International Journal of Science and Technology 3(2): 121-133.*
- Okoko, S.D. (2014): Understanding the use of Demonstration teaching strategy in science. Udoka press, Ibadan.
- Omwirhiren, E.M and Khalil, U.I (2016). The effects of the teachers' Instructional Methods on students; leaning outcomes in chemistry in selected SSS in Kaduna Metropolis, Nigeria *Journal of Education and Practice. www.ijstc.org.*
- Salawu, B. A. (2021). Comparative effectiveness of Demonstration and lecture methods of Agricultural Science on Senior Secondary School Students' Performance in Niger East Senatorial District. *Journal of contemporary Issue and Ideas 3(4): 67-75*

Seun, A. (2019). Influence of gender in effectiveness of demonstration method of teaching Agricultural science on academic performance of Senior Secondary Schools students' in Kogi central senatorial district, kogi State, Nigeria, *African Journal of Research and social sciences* 2(1): 75-86