

# EFFECTS OF TWO TEACHING METHODS ON SECONDARY SCHOOL STUDENTS' AGRICULTURAL SCIENCE PERFORMANCE IN BAUCHI METROPOLIS, NIGERIA

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## **ABSTRACT**

*This study determined the effect of two teaching methods on students' performance in agricultural science in secondary schools in Bauchi metropolis. The pre-test-post-test control group quasi-experimental design was employed. Three schools in the metropolis were randomly selected and one class each was selected from the three schools. All the students from three intact senior secondary II classes were used. A 20 item multiple choice achievement test was administered to the two treatment groups before and after the treatment and the scores so obtained were analyzed by mean, standard deviation and t-test. The findings revealed that though both teaching methods have significant effect on students' performance in agricultural science, the demonstration method was found to be more effective than the discussion method. Consequently, it was recommended among others that curriculum developers should incorporate teaching methods that support the teacher to know exactly where and how to begin each lesson.*

**Keywords:** *Teaching methods, student's performance, agricultural science, secondary schools*

## INTRODUCTION

What a teacher does in the classroom depends to some degree upon his approach to learning situations. Not fully appreciated by many educators is the importance of this initial step (Deems, n.d.). However, students' negative attitudes toward learning may be related to the method of instruction (Dyer, 1995). Though teachers with high morale, motivation and a mastery of knowledge, learner difficulties and capacity to facilitate learning are important (Zadra, 2000), correct use of an appropriate teaching method is critical to successful teaching and learning. Knowledge of how teaching methods affect students' learning may help educators to select methods that improve teaching quality, effectiveness, and accountability to learners and the public. It may also help them keep up with information technology, globalization and to avoid the status quo (Foster, Pinkest and Husman, 1991).

Organizing for effective teaching in vocational education is centered on certain factors such as what to teach, when to teach and how to teach. The teacher does not only teach the most relevant, meaningful and useful materials for specific students, he must also recognize and adopt a good and well-researched method of teaching that guarantees better understanding and also stimulates and motivate the students.

Several methods of instruction have been employed for students' interest depending on the situation. Varying factors ranging from socio-economic background, intelligence, attitude of students to teaching methods employed by teachers have been attributed to this poor achievement. Tawari (1986) observed that teaching methods that encourages students centered activities for developing reasoning and process slides through scientific approach are conspicuously lacking.

For effective teaching to take place, the teacher must stimulate, encourage and maintain active participation of the

students, through the selection of appropriate teaching methods. This would require a balance between what is taught and how it is taught. Thus, successful teaching in vocational education does not depend only on the teachers' mastery of the subject matter but also the teaching method employed. Hence, Ogbonna (2000) opines that one of the most influential factors in teaching is the teacher's method of teaching.

The discussion method has been widely accepted and recommended by some agricultural educators as the good method of teaching agriculture (Phipps & Osborne, 1988). The discussion method is the method of teaching where the central and essential characteristic is interaction (Binkley and Tulloch, 1981). During discussion session students participate in the learning process by contributing problems, analyzing the factors associated with the problems, developing possible solutions to the problems, placing the solution(s) into action, and evaluating the results of the solution.

Nowak, Watt and Walther (2004), articulated this position and present evidence that, demonstration method is generally effective in teaching sciences, mathematics and mechanics as well as subject areas within vocational and technical education. As stated by Gokhale (1996), the professional success of a technologist is directly related to his/her ability to transfer knowledge gained in the academic environment to real-world situations. Much student learning occurs through observing others. A demonstration provides the link between "knowing about" and "being able to do." Research reveals that demonstrations are most effective when they are accurate, when learners are able to see clearly and understand what is going on, and when brief explanations occur during the demonstration (Saskatchewan, 1988).

Since good teaching among other factors play significant role in enhancing performance, this study attempted to find out which method of instruction better facilitate the learning of

Agricultural science in secondary schools. To achieve this four research questions and related hypotheses were formulated to guide the study.

1. Is there any significant difference in the mean performance of the two groups of student before receiving the treatment in agricultural science?
2. Do demonstration methods have any significant effect on students' performance in agricultural science?
3. Does discussion methods have any significant effect on students' performance in agricultural science?
4. Is there any significant difference in students' performance in agricultural science when taught using demonstration and discussion methods?

## **HYPHOTHOSSES**

- HO<sub>1</sub>: There is no significant difference in the mean performance of the two groups of student before receiving the treatment in agricultural science.
- HO<sub>2</sub>: Demonstration methods have no significant effect on student performance in agricultural science.
- HO<sub>3</sub>: Discussion methods have no significant effect on student's performance in agricultural science.
- HO<sub>4</sub>: There is no significant difference in student's performance in agricultural science when taught using demonstration and discussion methods.

## **METHODOLOGY**

The design of the study was quasi-experimental, which employed the pretest-posttest control group. The groups were formed by random assignment using two (2) secondary schools in Bauchi metropolis. One class was randomly selected from each of the sampled schools. All the students in the two classes were used.

A pre-test was given to both groups to assess their entry behavior before the treatment. Both groups were taught the topic Maize production for three weeks, after which they were given a post-test. The group A was taught using demonstration method while group (B) was taught using discussion method. A 20 item multiple choice achievement test with 4 options each was developed and used for data collection. The statistical tools employed for data analysis obtained from pretest and posttest were mean and standard deviation and the t-test.

## RESULTS AND DISCUSSION

**Table 1:** Mean and standard deviation of pretest score of the two groups.

<b>Groups</b>	<b>N</b>	<b><math>\bar{X}</math></b>	<b>SD</b>
Demonstration (A)	35	9.43	2.26
Discussion (B)	35	8.40	2.65

*Source: Field Survey, 2008.*

The table 1 above shows that group A has higher mean score and standard deviation than group B.

**Table 2:** Mean score of the posttest and pretest of demonstration group.

<b>Groups</b>	<b>N</b>	<b><math>\bar{X}</math></b>	<b>SD</b>
Demonstration pretest	35	9.43	2.26
Demonstration posttest	35	14.63	4.65

*Source: Field Survey, 2008.*

The analysis on table 2 shows that the demonstration group, which had lower mean and standard deviation scores before the treatment increased in performance after the treatment as revealed in the post-test mean score and standard deviation.

**Table 3:** Mean score of the posttest and pretest of Discussion group

Groups	N	$\bar{X}$	SD
Discussion pretest	35	8.40	2.65
Discussion posttest	35	11.47	3.99

Source: Field Survey, 2008.

Table 3 indicates that there was improvement in students' performance after the pretest when the students were taught using the discussion method.

**Table 4:** mean score of the posttest of the two groups.

Groups	N	$\bar{X}$	SD
(A) Demonstration posttest	35	14.63	4.65
(B) Discussion pretest	35	11.47	3.99

Source: Field Survey, 2008.

Table 4 indicates that the mean and standard deviation scores of the demonstration group on the posttest was higher than the mean and standard deviation scores of the discussion group. This indicates increase in students' performance when taught using the two methods.

**Hypothesis one:** There is no significant difference in the mean performance of two groups of students of the same background before receiving treatment in Agricultural science.

Table 5: Two - tailed t-test pretest of demonstration and discussion groups of BBC students.

Group	$\bar{X}$	SD	N	DF	A-Cal	t-Crit
(A) Demonstration	9.43	2.26	35	58	1.681	1.960
(B) Discussion	8.40	2.65	35			

Source: Field Survey, 2008.

Table 5 reveals that the t-calculated is less than the t-critical therefore the null hypothesis is tenable.

**Hypothesis 2:** Demonstration methods have no significant effect on student's performance in Agricultural science.

**Table 6:** t-test posttest and pretest of students taught Agricultural science using demonstration method.

Group A	X	SD	N	DF	t-cal	t-critical	s
Posttest	14.63	4.65	35	29	5.816	2.645	
Pretest	9.43	2.26	35				

Source: Field Survey, 2008.

Table 6 shows that the t-calculated is greater than the t-critical implying that the demonstration method has significant effect on student's performance in Agricultural Science.

### Hypothesis 3

Discussion methods have no significant effect on student's performance in Agricultural science.

**Table 7:** tests of posttest and pretest scores of students taught Agricultural science using Discussion method.

Group B	X	SD	n	DF	t-cal	t-critical
Posttest	11.47	3.99	35	29	3.919	2.045
Pretest	8.40	2.65	35			

Source: Field Survey, 2008.

Table 7 shows that the value of t-calculated is greater than while the t-critical. Therefore the lecture method has significant effect on students' performance in Agricultural Science.

**Hypothesis 4:** There is no significant difference in student's performance in Agricultural science when taught using demonstration method of instruction.

**Table 8:** t-test of posttest of students taught Agricultural science using demonstration and Discussion method.

Group		X	SD	n	DF	t-cal	t-critical
(A) Demonstration		14.63	4.65	35	58	2.777	1.960
(B) Discussion		11.47	3.99	35			

Source: Field Survey, 2008.

Table 8 shows that the t-calculated is greater than the t-critical. Therefore, the null hypothesis is rejected. This means that there is significant difference in student's performance in Agricultural science when taught using demonstration method. Hence, demonstration proves more effective in facilitating students understanding.

Data analysis on table 1 indicated that a significant difference does not exist in the performance of the two groups of students prior to receiving treatment. This is not simplifying since the students are said to have the same background. This finding is a pointer to the effectiveness of teaching method, which Ogbonna (2000) opined is out of the factors influencing transfer of learning.

Table 2 reveals that the null hypothesis was rejected justifying the significant effect demonstration method has on students, performance in BBC. Little wonder than when Okwori (2002) content that the there is no trade in technical education that cannot be taught successfully without demonstration. The effectiveness of demonstration cannot be over stressed and teachers have always opted for its usage. Nwachukwu (2001) also pointed that demonstration method is effective in achieving objective learning in cal-life situations. It enhances the development and substance of interest among students similarly; Abimbade (1997) maintained that it has the ability to make the presentation of knowledge clear.

Table 7 shows that hypothesis 3 lecture methods have no significant effect on students performance in BBC was rejected. The effectiveness of the lecture method through excessively verbalized theoretical is made manifest in this study. This shows that although the lecture method is most often criticized, it can be effective when carefully planned and skillfully delivered.

Table 8 revealed that the fourth null hypothesis was rejected. This shows the inferiority of demonstration over lecture method, confirming that certain teaching methods are more rewarding than others lecture they allow for pupils participation (Lar, 1997). This finding justify the claims of Datol (2002) and Chudung (2002) that no effective teaching can take place without suitable method employed by the teacher and most choices of method could which lesson delivery.

## **CONCLUSION AND RECOMMENDATIONS**

The outcome of this study as far as the objective are concerned is quite revealing. The study revealed among others that the performance of students prior to treatment is the same and that the demonstration and lecture methods have significant effect on students' performance in Agricultural Science. It further shows demonstration method is superior to lecture method in achieving instructional goals in Agricultural Science. It is therefore pertinent that effective teaching of Agricultural Science in technical college requires practical approach, which must involve both the teachers and the students. Based on the results, the following are recommended.

1. Agricultural Science teacher's awareness of the methods of teaching should be bordered through workshops, seminars and conferences on teaching strategies.
2. Individual teacher should ensure adherence to the application of appropriate teaching methods based on topics

with different materials to capture and sustain student's interest.

3. Curriculum developers should incorporate suggested teaching methods that might support to teacher to exactly know where to begin each lesson.
4. Good learning environment with adequate instructional materials used to be put in place in all technical colleges to enhance performance and good success.
5. Government should improve substantially the maintaining of technical education and its implementation to ensure effective teaching and learning.

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