
EFFECT OF AGRICULTURAL TEACHING MODELS ON SENIOR SECONDARY STUDENTS' ACHIEVEMENT IN BAUCHI METROPOLIS

BY

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ABSTRACT

The use of teaching models is not popular among agricultural science teachers in most of our secondary school. This study therefore identified the effect of using teaching models in teaching agricultural science in senior secondary schools. The study use senior secondary schools in Bauchi metropolis. Two schools were randomly selected and used as experimental and control groups. Three research question and three hypotheses were formulated which guided the study. The findings of the study revealed that, there was a great improvement in the students' performance when teaching models were use in teaching them compare to the conventional method being used in teaching the same subject or topic. In conclusion, the study recommended that teachers should use models especially when teaching Agricultural science.

INTRODUCTION

Agricultural science is a science that deals with the selection, breeding, and management of crops and domestic animals for more economical production. Agriculture can be considered as science of ecological region because it is closely linked to soil properties and climates, which are never exactly the same from one place to another, but Agriculture is the set of activities that transform the environment for the production of plants and animals for human use (Huffman, 2006).

Agricultural Education is the teaching of agriculture, natural resources, and land management through hand on experience and guidance to prepare students for entry level jobs or to further education to prepare them for advanced agricultural jobs. Classes that may be taught in an agricultural education curriculum include: horticulture, land management, Agricultural science, animal health and diseases, livestock management etc. Agricultural education is

taught at elementary level, middle school level, secondary, post-secondary and adult levels. The use of agriculture and the progressive change is a manifestation of the teachers, creativity in teaching the instructional content.

Agriculture today requires modern approach in teaching it due to lack of functional tools and equipment, therefore the use of model as visual aids may improve the students performance. (Anna & Edward 2013). Model is a visual aid or picture which highlights the main ideas and variables in a process or a system. Models give an understanding of the variables associated with school learning, especially as measured by scores on standardized test of basic skills (Brady, 2007).

Models are three dimensional objects which are representation of real things. They have front top and side elevation. Models may be smaller, larger or the same size as the real objects they represent. Models are mechanical representation of real things

molded by using clay & paper or constructed using wood or fabricated metals, plastic or sticks and they can also be bought from toy shops (Andrew, 2009).

Models are materials or device use in learning situation to supplement written or spoken words in transmission of knowledge, ideas and attitudes in Agricultural science. They are things brought into play to give clarity about the Agricultural instructions. agricultural teaching models help the learner to visualize and break down instruction discrete device use in learning situation to supplement written or spoken words in transmission of knowledge, ideas and or visualize and break down instruction discrete attitudes. They are things brought into play to give clarity about the Agricultural concept at all level (Martin, 2009).

The use of teaching models give better understanding of the subject matter, as most science subjects cannot be successfully taught based on mere theoretical explanation without proper use of teaching aids and practical skills. Therefore, to improve students achievements in agricultural science, effort should be made to construct some relevant important agricultural teaching models and other instructional materials as they provide concrete experience to the learners (Cruckshank, 2000). The use of teaching models by classroom teachers help to take over some routine task of the teachers, as they talk less, models explain better and the students or the learners gain more concrete knowledge and experience. Using models in classroom help the teachers to improve their instructional methods and also it will be useful to the students as it stimulate the spirit of inquiry, creativity and discovery as well as helping them in improving their retention ability, sustain attention and interest. The work will also support teacher-based instruction through the use of models and other instructional materials.

The major problem in our school system today is that most science subject are taught theoretically without practical or proper use of teaching model or other teaching facilities other than chalk and talk method as a result of this students find it difficult to relate the theories learnt to real life situation outside the classroom. To overcome the above mentioned problem the researcher intend to employ and determine the effect of teaching model as it deals with visualization and may improve students achievement in agriculture by making learning concrete and permanent, Interested and lively, saves time and resources and enhance creativity for both teachers and students.

PURPOSE OF THE STUDY

The main purpose of the study is to determine the effect of teaching Models on senior secondary students Achievement in Agriculture in Bauchi Metropolis. The study is specifically meant to;

1. Determine the pre-test mean score of the students in the experimental group and control group.
2. Determine the difference pretest and post-test mean achievement of the students taught using teaching models.
3. Determine the mean difference between the post-test achievement of students in experimental and control groups.

RESEARCH QUESTIONS

1. What is the pre-test mean score of the students in experimental group and control?
2. What is the difference pre-test and post-test mean score of the student taught using teaching model?
3. What is the mean difference between the post-test score of the students in experimental and control groups?

HYPOTHESES

H₀₁: There is no significant difference between the pre-test mean score of

students in experimental and control groups.

H₀₂: There is no significant difference between the pre-test and post-test mean score of students in experimental group.

H₀₃: There is no significant difference between the post-test mean score of students in experimental and control groups.

METHODOLOGY

The design for the study was Quasi-Experimental (pretest post test non Non-equivalent Control group) the pretest was administered for both groups (Experimental and Control) before administering the treatment (Agricultural teaching model) which determine that they are of equal academic ability. The post test was administered after the treatment, using the instrument Agricultural science achievement test for experimental group and control group

POPULATION OF THE STUDY

Table 1: Pre-test means score of Experimental and control groups.

Group	X	SD	N
Experimental	54.52	16.4	40
Control group	53.62	19.0	40

The table 1 above indicated that the students both in control and experimental group are of equal intellectual capability with mean of 54.52 and 53.62 this is done prior to the treatment of the experimental group. Thus,

The population of the study comprise of 15 secondary schools in Bauchi metropolis, Bauchi Local Government with 14,750 students from public schools.

SAMPLING AND SAMPLING TECHNIQUES

Two senior secondary schools were randomly selected from the total number of the secondary schools (population). The two school were randomly categorized as control and experimental group and using odd and even number, odd number become the experimental and the even number as the control group.

INSTRUMENT FOR DATA COLLECTION

The researcher developed an instrument called Agricultural science achievement test of 20 items. The instrument was validated by experts and found to have reliability co-efficient of 0.76 using test retest method.

METHOD OF DATA ANALYSIS

The research question was answered using mean and standard deviation while the null hypothesis was tested using Z test at 0.05 level of significance.

RESULTS AND DISCUSSION

Research questions 1: What is the pre-test mean score students in experimental group and control

whatever change in their academic achievement is as a result of the treatment.

Research Question 2: What is the difference between the pre-test and post-test mean score of experimental.

Table 2: Difference in the Pre-test and post-test mean score of experimental group.

Experimental	X	SD	N
Pre-test	54.52	11.9	40
Post-test	75.5	14.7	40
Difference	20.98		

The table 2 above revealed that there is a difference of 20.98 between the pre test mean of 54.32 and post test mean 75.5 of the experimental group. Therefore the effect of agricultural teaching model(treatment) is positive and high.

Research question 3: What is the mean difference between the post-test of the students in the experimental and control group?

Table 3: Mean gain score of difference achievement and control group between the post-test of the students in the experimental and control group

Variables	X	SD	N
Experimental	75.5	11.9	40
Control	53.8	14.7	40
Mean difference	21.7		

The table 3 above, show that, the experimental group has mean gain score of 75.5 and while the control group has the mean gain score of 53.8 This indicated that, that

the treatment that is the use of agricultural teaching model has high and positive effect in comparison with the traditional method of teaching agricultural science.

Hypothesis 1:

Table 4: Z test analysis of difference in pre-test between control and experimental group.

Variables	N	X	SD	S.E.	Z-Cal	Z-critical	Remark
Experimental	40	54.52	16.4				
Control	40	53.62	19.0	0.725	2.41	3.56	Significant

Significance at $p > .05$

From the table 4 it was observed that the Z- cal value is 2.41 while the Z- critical is 3.56, the Z- cal < Z- critical, therefore the null hypothesis state that there is no significant difference between the mean academic achievement of the students taught agriculture using the Agricultural model and those taught using traditional method is accepted.

Hypothesis 2:

Table 5: Z-test analysis of difference of experimental group in pre-test and post-test

Variables	N	X	SD	S.E.	Z-Cal	Z-critical	Remark
Pre-test	40	54.52	8.53				
Post-test	40	75.5	6.57	0.4257	3.53	2.56	Significant

Significance at $p > .05$

From the table 5 it was observed that the Z- cal value is 5.32 while the Z- critical is 2.53, the Z- cal > Z- critical, therefore the null hypothesis which state that there is no

significant difference between the mean academic achievement of the students taught agriculture using the Agricultural model at pretest and post test is rejected.

Table 6 Z- test analysis of difference in the post-test mean score of experimental and control groups

Variables	N	X	SD	S.E.	Z-Cal	Z-critical	Remark
Experimental	40	75.5	11.9				
Control	40	53.8	14.7	0.2990	7.26	0.48	Significance

From the table 6 it is observed that the Z- cal value is 7.26 while the Z- critical is 0.48, the Z- cal > Z- critical, therefore the null hypothesis state that there is no significant difference between the mean academic achievement of the students taught agriculture using the Agricultural model and those taught using traditional method is rejected.

DISCUSSION OF FINDINGS

The result indicated that students both in control and experimental group were of equal intellectual capability. It was found that there is a significant difference between the pre-test mean of and post-test mean of the experimental group therefore the changes in academic performance is as a result of the treatment , it also reveal that experimental group has a higher mean gain score of 75.5 while the control group has the mean score of 53.8 This indicated that, that the treatment that is the use of agricultural teaching model has high and positive effect in comparison with the traditional method of teaching Agricultural science.

The null hypothesis one was accepted and indicate equivalent academic performance of both experimental and control groups. The null hypothesis two was rejected and indicate there is significance difference between pre test and post test of experimental. The null hypothesis three is also rejected and indicate the superiority of experimental group performance over control. Thus the use of agricultural instructional model is far better than traditional method of teaching Agricultural science.

The significance difference was in favour of the experimental group as shown in the mean score and Z, value (critical and calculated). The result confirmed the finding of Fagbemi & Ibidapo (2001). Who reported that, application of instructional models improve students achievement in biology. Yusuf & Nurudden (2012) concluded that integration of instructional models also improve students' academic performance in integrated science. The experimental group has mean gain score of 75.5 and while the control group has the mean gain score of 53.8 This indicated that, the treatment given

that is the use of agricultural teaching model has high and positive effect in comparison with the traditional method of teaching agricultural science

CONCLUSION

Based on the findings of this research, it can be concluded that; Using agricultural instructional models improve students' academic achievement whose comparison with traditional method of teaching agricultural science. Using agricultural instructional model make abstract and unfamiliar concepts to be more concrete and permanent which improve students' academic achievement and provide them with a very good sense of practical application of what they learnt.

RECOMMENDATIONS

Based on the findings of this study the recommendations were made:-

1. Teachers should involve themselves in construction of agricultural instructional model for improving students' achievement.
2. Teacher of agricultural science in secondary schools should be trained in the use of agricultural instructional model through seminars, workshop, conference and symposium.
3. Teacher's agricultural science should be encouraged to use instrument models in their daily teaching and learning activities.
4. Government and other educational philanthropist should provide functional agricultural instructional model.

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