

# **TEACHERS' PERCEPTION OF THE EFFECTIVENESS OF TEACHING STRATEGIES USED IN THE TEACHING OF AGRICULTURAL SCIENCE IN SENIOR SECONDARY SCHOOLS IN ADAMAYVA STATE**

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## **Abstract**

In view of the problem of youth unemployment in Adamawa State, a study was carried out to determine the effectiveness of the use of teaching strategies and evaluation procedures in Agricultural Science in Senior Secondary Schools. The population was made up of 360 teachers and 10,000 SS III Agricultural science students in the 2007/2008 academic session in the 108 senior secondary schools in the state. Sixty teachers and 900 students were randomly sampled from 30 senior secondary schools also randomly selected. The instrument used for data collection was a questionnaire with a five point scale. The instrument was validated and pretested with a reliability coefficient of 0.93. Data were analyzed using mean and z-Test statistics. It was found that 13 strategies out of the 23 presented on the instrument were perceived not effectively used in the teaching of Agricultural science while six evaluation procedures were considered not effectively utilized for assessment out of the 12 presented on the instrument. A significant difference was observed between the mean responses of teachers and students on the use of problem solving and stimulus variation teaching strategies while none was observed on the use of evaluation procedures. It was recommended that the Agricultural science teachers should use more frequently those strategies and evaluation procedures that encourage the learning of practical work and independent living.

## **Introduction**

Adamawa State and indeed the entire country is endowed with rich agricultural resources, but with the problems of youth unemployment and shortage of food supply for her increasing population. The farmers present in the country are becoming older and some of them continue to use traditional tools and implements to till the soil (Olaitan, 1990). The youths need to be encouraged to take up jobs in agricultural occupations to encourage food production hence the Nigerian Government introduced the teaching of Agriculture into the secondary schools (West African Examinations Council - WAEC, 1963).

The use of strategies and evaluation procedures in the teaching of Agricultural Science in Senior Secondary Schools in Adamawa State has not been very effective. As a result, the vocational preparation of graduating students has not been adequate (Amechi, 2000, and Obi, 2008). In the same vein, Martin and Omer (1990), Martin and Odubiya (1991), Black and William (1988) and Bradford and Cox (1998) observed over the years cases of students who passed Agricultural Science in the School Certificate Examinations with distinctions without acquiring entry level practical skill for agricultural jobs. Farauta (2000) also observed that Agricultural science students in secondary schools in Yola did not possess the skills of identifying a crop suffering from nitrogen deficiency and that the little practical skills they possessed was as a result of their very limited exposure on the school farm. A similar observation was made by Kwabe (2000) with the Senior Secondary School students offering Agricultural science adding that the teachers did not make effective use of teaching strategies and evaluation procedures.

The effective teaching of Agricultural science requires effective utilization of teaching strategies and evaluation procedures. The Agricultural science teachers and students are the major stakeholders in agricultural education. The object of this study was to determine the perceptions of teachers and students regarding the effectiveness of the use of agricultural teaching strategies and evaluation procedures.

## **Purpose of Study**

The aim purpose of the study was to determine the effectiveness of the strategies and evaluation

procedures used in teaching Agricultural science in Senior Secondary Schools in Adamawa State. More specifically, the study was to:

- 1. determine the effectiveness of the use of agricultural science teaching strategies.
2. determine the effectiveness of the evaluation procedures used in the various schools.

### Research Questions

The following research questions were put forward:

- (i) What are the strategies effectively used in the teaching of Agricultural science? (ii) What is the evaluation procedures effectively used in the teaching of agricultural science?

### Hypotheses

The following hypotheses were tested at 0.05 level of significance:

**Ho<sub>1</sub>:** There is no significant difference between the mean responses of teachers and students on the effectiveness of the use of leaching strategies.

**Ho<sub>2</sub>:** There is no significant difference between the mean responses of teachers and students on (he effectiveness of the use of evaluation procedures.

### Method

Opinion survey was adopted as the research design. The area of the study was Adamawa State in North Eastern Nigeria. The population of the study was all the Agricultural science teachers and Senior Secondary III (SS III) students offering Agricultural science in the 2007/2008 academic session in the 108 Senior Secondary Schools in the state. These were 360 teachers and 10,000 students (Obi, 2008). Out of the 108 Senior Secondary Schools, six were randomly selected from each of the .five Educational Zones of the State giving a total of 30 schools. Two Agricultural Science Teachers were also randomly selected from each school giving a total of 60 teachers. Thirty students were randomly selected from each school giving a total of 900 students. The total number of subjects in the sample was 960.

A structured questionnaire with a five point scale was used for data collection. The scale had options coded and rated as follows:

Scale Option	Code	Rating
Very Effective	(VE)	5 points
Effective	(E)	4 points
Barely Effective	(BE)	3 points
Seldom Effective	(SE)	2 points
Not Effective	(NE)	1 point

The instrument had three sections. Section A contained items on personal data of staff and students; Section B contained items on teaching strategies and Section C contained items on evaluation procedures.

Validation of the instrument was done by two experts in Agricultural Technology Education in the Department of Vocational Education, Federal University of Technology, Yola. The reliability of the instrument was ascertained through Cronbach Alpha.

Data for the computation of the reliability coefficients was obtained through a pre-test carried out on the questionnaire in 10 Senior Secondary Schools in Taraba State. One hundred and thirty subjects comprising 30 teachers and 100 students from the 10 schools that were randomly sampled were used for the pre-test. The results of the pre-test were as follows:

Section B: 23 items ----->0.89  
 Section C: 12 items ----->0.86  
 Sections B and C: 35 items----->0.93

Since all the sections yielded alpha values that were > 0.50 the instrument was considered reliable.

The instrument was later administered by the researcher on the sample in all the Educational Zones of Adamawa State. This afforded the researcher the opportunity to clear any issue on the instrument that may be required by the respondents.

Statistical tools for data analysis were mean and z-Test. The Statistical Analysis System (SAS) installed from SAS version 6.4 (1994) was used for this purpose. As provided by SAS, if the calculated z-ratio was  $< 0.05$  (level of probability) the null hypothesis was rejected and the variable declared significant. As for the mean, the option 'Effective' on the scale had a scale point or rating of 4 which was used to answer the research questions.

In doing so, 3.5 which was lower limit of 4 (Runyon and Haber, 1980) was the cut-off. This means that any item with mean rating of up to 3.5 and above was considered effectively used and any item with a mean rating of  $< 3.5$  was considered not effectively utilized.

## Results

### Research Question 1

What are the strategies effectively used in the teaching of Agricultural science? The data that answered this research question are presented in Table 1.

**Table 1: Mean Responses of Teachers and Students on the Effectiveness of the use Teaching Strategies in Agricultural Science.**

S/N	Strategies Teachers N = 60	X <sub>1</sub>	X <sub>2</sub> Students N = 900	Grand Mean	Remarks
1.	Discussion	3.60	3.60	3.63	Effective
2.	Brainstorming	3.55	3.58	3.56	Effective
3.	Buzz	3.60	3.67	3.63	Effective
4.	Problem solving	2.05	2.09	2.07	Not effective
5.	Lecture	3.50	3.52	3.51	Effective
6.	Demonstration	3.65	3.68	3.66	Effective
7.	Question and Answer	3.57	3.54	2.56	Effective
8.	Field trip	2.08	2.04	2.06	Not effective
9.	Dalton	2.01	2.03	2.02	Not effective
10.	Farm practice	2.08	2.05	2.04	Not effective
11.	Discovery	2.66	2.61	2.63	Not effective
12.	Project	2.04	2.06	2.05	Not effective
13.	Stimulus variation	3.70	3.75	3.72	Effective
14.	Non-verbal cues	3.84	3.86	3.85	Effective
15.	Voice Modulation	3.90	3.95	2.92	Effective
16.	Debate	2.01	2.06	2.03	Not effective
17.	Drill	2.11	2.14	2.12	Not effective
18.	Directed reading activity		3.58	3.57	Effective
19.	Resource person	2.02	2.00	2.01	Not effective
20.	Mnemonics	2.09	2.06	2.07	Not effective
21.	Computer instruction	2.02	2.05	2.03	Not effective
22.	Individualized instruction	2.00	2.03	2.01	Not effective
23.	Modular instruction	2.02	2.05	2.03	Not effective

Data in Table 1 show that the mean of the use of all the strategies have been rated not effective by the respondents except the mean of the use often strategies. Those strategies that were not effectively utilized had to do with the acquisition of practical agricultural skills.

### Research Question 2

What is the evaluation procedures effectively used in the teaching of Agricultural science? The data that answered this research question are presented in Table 2.

Table 2: Mean Responses of Teachers and Students on the Effectiveness of the use of Evaluation Procedures in Agricultural Science

S/N	Strategies	X <sub>1</sub> Teachers	X <sub>2</sub> Students N-900	Grand Mean	Remarks
1.	Farmpracticals	2.64	2.66	2.65	Not effective
2.	Laboratory practicals	2.58	2.55	2.56	Not effective
3.	Continuous				
4.	Assessment Individual	3.60	3.62	3.61	Effective
		3.64	3.68	3.66	Effective
5.	Assignment Class	3.70	3.76	3.73	Effective
6.	Quiz Group	3.50	3.52	2.51	Effective
7.	Assignment Tutorial	3.71	3.73	3.72	Effective
.8.	Student self				
9.	Evaluation	3.73	3.76	3.74	Effective
10.	Inter- Class Competition	2.06	2.08	2.07	Not effective
	Inter-School Competition				
11.	Farm out-put Assessment	2.03	2.06	2.04	Not effective
12.	Entrepreneurial Assessment	2.23	2.25	2.24	Not effective

Data in Table 2 show that six of the evaluation procedures have been rated effectively used while the other six that encourage the acquisition of farm skills have been rated not effectively used by the respondents.

#### Hypothesis 1

There is no significant difference between the mean responses of teachers and students on the effectiveness of the use of teaching strategies.

Data for testing this hypothesis are presented in Table 3.

Table 3: z-Test of Difference between Mean Responses of Teachers and Students on the Effectiveness of the use of Teaching Strategies.

S/N	Strategies	X <sub>1</sub> Teachers N = 60	X <sub>2</sub> Students N = 900	Z-Ratio	Remarks
1.	Discussion	3.60	3.66	0.06	NS
2.	Brain storming	3.55	3.58	0.08	NS
3.	Buzz	3.60	3.67	0.09	NS
4.	Problem solving	2.05	2.09	0.04	S
5.	Lecture	3.50	3.50	0.13	NS

6.	Demonstration	3.65	3.68	0.10	NS
7.	Question and Answer	3.57	3.54	0.21	NS
8.	Field trip	2.08	2.04	0.11	NS
9.	Dalton	2.01	2.03	0.09	NS
10.	Farm practice	2.03	2.05	0.2	NS
11.	Discovery	2.66	2.61	0.4	NS
12.	Project	2.04	2.06	0.6	NS
13.	Stimulus variation	3.70	3.75	0.02	S
14.	Non-verbal cues	3.84	3.86	0.9	NS
15.	Voice Modulation	3.90	3.95	0.07	NS
16.	Debate	2.01	2.06	0.09	NS
17.	Drill	2.11	2.14	O.I	NS
18.	Directed reading activity	3.56	3.58	0.07	NS
19.	Resource person	2.02	2.00	0.3	NS
20.	Mnemonics	2.09	2.06	0.1	NS
-21.	Computer instruction	2.02	2.05	0.06	NS
22.	Individualized instruction	2.00	2.03	0.09	NS
23.	Modular instruction	2.02	2.05	0.2	NS

Note: S = Significant difference NS = Not significant difference

Data in Table 3 show that significant difference was observed between the mean ratings of teachers and students on problem solving and stimulus variation teaching strategies. This means that the two groups, of respondents had a divergent view on the effectiveness of the use of these two teaching strategies.

## Hypothesis 2

There is no significant difference between the mean responses of teachers and students on the effectiveness of the use of evaluation procedures.

Data for testing this hypothesis are presented in Table 4.

**Table 4: z-Test of Difference Between Mean Responses of Teachers and Students on the Effectiveness of the Evaluation Procedures.**

S/N	Strategies	Xi Teachers N = 60	X <sub>2</sub> Students N = 900	Z-Ratio	Remarks
1.	Farm practical	2.64	2.66	0.06	NS
2.	Laboratory practical	2.58	2.55	0.08	NS
3-	Continuous Assessment	3.60	3.62	0.1	NS
4.	Individual Assignment	3.64	3.68	0.3	NS
5.	Class Quiz	3.70	3.76	0.09	NS
6.	Group Assignment	3.50	3.52	0.07	NS
7.	Tutorial	3.71	3.73	0.7	NS
8.	Student self Evaluation	3.73	3.76	0.4	NS

9.	Inter-Class Competition	2.06	2.08	0.06	NS
10.	Inter- School Competition	2.03	2.06	0.3	NS
11.	Farm out-put Assessment	2.02	2.04	0.1	NS
12.	Entrepreneurial Assessment	2.23	2.25	0.4	NS

Data in Table 4 show no significant difference in the teachers and students rating of evaluation procedures. This means that both groups had a similar view regarding the effectiveness of the use of evaluation procedures.

### Findings

The findings were the findings of the study:

1. Ten teaching strategies were perceived to be effectively utilized while the remaining thirteen were considered not effectively utilized.
2. Six evaluation procedures were perceived effectively utilized while the other six were considered not effectively utilized.
3. A significant difference was observed between the teachers and students rating of the effectiveness of the use of problem-solving and stimulus variation strategies in teaching Agricultural science.
4. No significant difference was observed between the teachers and students rating of the effectiveness of the use of evaluation procedures.

### Discussion

The effectiveness and ineffectiveness of the use of strategies in teaching Agricultural Science as found in the study were consistent with those of Martin and Orner (1990) and Martin and Odubiya (1991). The effectiveness and ineffectiveness of the use of evaluation procedures as revealed in the study were similar to those of Black and William (1998) and Bradford and Cox (1998). The observations made in the two hypotheses tested were as well consistent with those of previous studies.

Teaching strategies and evaluation procedures in a vocational subject such as Agricultural science in Senior Secondary Schools are expected to encourage practical work. While integrating adequate theoretical knowledge, it is supposed to expose the students to an array of opportunities inherent in agricultural production and general businesses. Agricultural education in Adamawa State is yet to live up to these expectations.

### Conclusion

Some of the strategies and evaluation procedures used to teach Agricultural Science in Senior Secondary Schools in Adamawa State were effectively used while a good number of them that encourage practical work and skill acquisition were not effectively utilized. As a result, theoretical learning of Agriculture tended to have prominence over practical farm activities. This situation had detrimental effect on the vocational life of the graduating students.

### Recommendations

The following recommendations were made:

1. Agricultural science teachers in Adamawa State should endeavour to use very effectively strategies that encourage the acquisition of practical skills in Agriculture.

2. They should as well use more effectively evaluation procedures that emphasize and reflect the level of mastery of practical agricultural work.
3. The adoption of practical agricultural work evaluation procedure should be facilitated through the provision of the modular Agricultural science curriculum for the secondary schools by the Federal Ministry of Education.

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