

## Effects of Multiple Teaching Methods on Academic Achievement and Interest of Primary School Pupils in Agricultural Science in Anambra State

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### Abstract

The study investigated the effects of multiple teaching methods on academic achievement and interest of primary school pupils in agricultural science in Anambra State. Two research questions guided the study while two hypotheses were tested. The study adopted quasi experimental design. The population for the study was all public primary school pupils in the twenty-one local government areas in the state. Due to the large size of the population, multi stage sampling technique was used to select the sample for the study. A total number of 181 pupils were involved in the study. The five groups were randomly selected from five schools as follows; Control group (lecture method) - 35 pupils; Experimental group I (discussion method) - 40 pupils; Experimental group II, (demonstration method) - 28 pupils; Experimental group III (inquiry method) - 42 pupils and Experimental group IV (role-play method) - 36 pupils. The instruments for data collection were Agricultural Science Achievement Test (ASAT) and Agricultural Science Interest Scale (ASIS) which were validated by three experts, all from the Department of Agricultural Education, University of Nigeria, Nsukka. The reliability of the instruments was established using Cronbach alpha for ASIS and Kuder-Richardson 20 for ASAT. ASIS and ASAT yielded a coefficient of 0.92 and 0.86 respectively. The research questions were answered using mean while the hypotheses were tested using ANOVA. The findings of the study revealed that demonstration method and role-play respectively ranked first for improving the academic achievement and interest of primary school pupils in agricultural science while lecture method ranked last in both regards. Based on the findings of the study, it was recommended among others that Anambra state government should organize training/retraining for agricultural science teachers in the state on the use of demonstration method of teaching so as to enhance the academic achievement of pupils in agricultural science and Head Teachers of primary schools should ensure that agricultural teachers must have acquired competency in role playing before promoting them to enable the teachers understand the need of acquiring the competency so as to improve the interest of pupils in agricultural science.

**Keywords:** Academic achievement, Interest, Agricultural Science, Teaching Methods

### Introduction

Education is very important for any country that wants to develop. To ensure that a large proportion of the populace are educated, many countries including Nigeria have insisted on free primary education for all. According to FRN (2013), primary education is the education given to children aged 6 to 12 years. The author further posited that the aims of primary education in Nigeria are to inculcate permanent, numeracy and the ability to communicate effectively, lay a sound basis for scientific, critical and reflective thinking; as well as promote patriotism, fairness, understanding and national unity. To also promote agriculture which is an important aspect of

the economy, agricultural science is taught at the primary school level

Agricultural science is the art of growing crops, rearing of animals as well of marketing of agricultural produce for man's benefit. The objectives of agricultural science in primary schools include; teaching practical skills and knowledge, making education African in nature, halting or reducing the migration of school leavers from rural to urban area and provision of income for schools (Ekenechukwu, 2011). According to Ejiiofor and Nwakile (2016), the major aim of agricultural science at the primary school is creating interest for the pupils. These aims are achieved through instruction during the teaching and learning process in schools where the teacher plays vital roles.

Teaching involves imparting knowledge as to how to do something. A person who teaches is called a teacher.

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Obidike (2017) posited that a teacher is someone who instructs others and provides guidance that facilitates learning in either formal or informal institutions. The instructional delivery strategies adopted by teacher to some extent enhance pupils' learning. Hence, methods adopted in teaching are numerous and are generally referred to as teaching methods. Teaching method refers to the style of instructional delivery adopted by a teacher. Shofoyeke (2014) opined that teaching methods can be defined as practical application of teaching principles based on the nature of the learner, the nature of the subject and their learning needs. Although teaching methods are numerous, there has been emphasis on student centered teaching methods such as discussion, demonstration, role-play and inquiry methods. There seems to be no perfect teaching method as all techniques usually have benefits and their drawbacks.

Discussion method of teaching is a technique in which group discussion are used to reach instructional objectives. Its advantages include increasing student interest and utilizing pupils' knowledge and experiences while its disadvantages include consuming time and limits content (Omoro & Nato, 2014). The demonstration method involves an instructor actually performing the operation before the pupils. It saves time and can be presented to groups although the demonstration method requires special classroom arrangements. Role-play is an instructional approach in which pupils are assigned characters so as to exhibit the behaviours to improve understanding of a lesson (Obijiofor & Obumneke-Okeke, 2020). Through role-play, a wide variety of experience can be brought into the classroom which could help pupils develop fluency in speaking, increase their motivation and make learning more interesting, enjoyable. However, role play is time consuming. Inquiry learning is a student-centered method of teaching whereby students interact actively, question assumptions and provide their viewpoints on any area of subject matter but it requires a lot of time and many teachers are not skilled in the method. Despite the emphasis on student centered teaching methods, numerous studies (Emaikwu, 2012; Olibie, & Ezeoba, 2013; Achuonye, 2015; Obijiofor & Obumneke-Okeke, 2020) found that many teachers still use conventional method of teaching which is teacher centered.

Conventional method of teaching is also called lecture method. Lecturing remains one of the more popular methods for transmitting information and ideas by teachers. Achuonye (2015) observed that conventional method is very prevalent in primary schools in Nigeria. The reasons for utilizing conventional teaching methods include; it saves time, permits flexibility, requires less rigid space, permits adaptability and permits versatility. Despite the reasons for utilizing the method, it has disadvantages such as; learners are more passive than active, the cooperation and interaction between the teachers and the pupils are minimal. Evidences from a number of disciplines suggest that oral presentation to a

large group of passive pupils contributes very little to real learning (Veselinovska, 2011). Similar to this, Feider and Silverman cited in Farha (2016) argued that conventional teaching method makes pupils uninterested in class, discouraged, bored and perform poorly in test. These short comings of the conventional method have consequences for the academic achievement and interest of primary school pupils.

Academic achievement is an important factor that can be influenced by teaching methods. Achievement is the accomplishment of a goal. Ouma and Munyua (2018) defined academic performance as the extent to which a pupil has achieved their educational goals, measured by examination or continuous assessment test through the grading system. It shows what a pupil has learnt and achieved. According to Obijiofor and Obumneke-Okeke (2020), academic achievement is the knowledge and skills acquired by a pupil which is usually indicated by examination scores. Achievement in primary school is usually measured with tests and exams. Contextually, achievement of pupils will be measured with a paper and pencil test. Increase in achievement of pupils can arouse their interest in learning. Interest refers to the process of giving attention to a person, activity, situation or object. It could either result or cause motivation. In the views of Agbaje, and Alake (2014) interest is a feeling of curiosity or concern about something that makes attention turn towards it. In the view of the researcher, interest is curiosity or attention developed by pupils as a result of learning experience. According to Essien, Akpan and Obot (2015), interest of student can be affected by the teaching method utilized by the teacher. Hence, the poor performance of primary school pupils in agricultural science and their perceived low interest in agricultural science in Anambra state and has led to need to investigate the issue.

A pre study visit to ten schools in Anambra revealed dwindling performances of pupils in agricultural science. Furthermore, discussions with ten randomly selected pupils in each of the schools revealed that they do not enjoy agricultural science class. This could be because of the teaching method used in teaching them among other reasons. Although authors such as Olibie, and Ezeoba (2013); Obijiofor and Obumneke-Okeke (2020) have carried out studies on effects of teaching methods on academic achievement and interest of pupils in primary schools in Anambra state, they focused on social studies and English studies respectively. Other authors such as Abdulhamid (2013); Ademama (2018) who focused on agricultural science carried out their research using secondary school students and in other states. In addition, most of the studies compared only two teaching methods while the currently study will compare five teaching methods (discussion, demonstration, role-play, inquiry and conventional methods) which are the most common teaching methods utilized in teaching agricultural science pupils in Anambra state. Hence, the study sought to fill the gap in literature by focusing on

effects of multiple teaching methods on academic achievement and interest of primary school pupils in agricultural science in Anambra State.

### Purpose of the Study

The general purpose of the study is to determine the effects of multiple teaching methods on academic achievement and interest of primary school pupils in agricultural science in Anambra State. Specifically, the study sought to ascertain the;

- 1) Effects of discussion, demonstration, role-play, inquiry and conventional methods on academic achievement of primary school pupils in agricultural science in Anambra State
- 2) Effects of discussion, demonstration, role-play, inquiry and conventional methods on interest of primary school pupils in agricultural science in Anambra State

### Hypotheses

**Ho: 1:** There is no significant difference between the pretest achievement scores of pupils taught with the five teaching methods

**Ho 2:** There is no significant difference between the pretest interest scores of pupils taught with the five teaching methods

### Methodology

The study adopted a Quasi-experimental design and was carried out in Anambra State. The population for the study was all public primary school pupils in the twenty one local government areas in the state. Due to the large size of the population, multi stage sampling technique was used to select the sample for the study. Firstly, two local government areas (Awka south and Awka East) in the state capital were purposely selected for the study. They were selected based on the assumption that schools in the capital would have good facilities in comparison to other local government areas and are in the same area to reduce extraneous variables that could influence the result. Out of the 107 public primary schools in the area, five schools were randomly selected these schools. After selection of the five schools, all the primary five pupils in the arm with fewest pupils were selected as intact classes. This was to ensure that large class sizes did not influence the result. This yielded 28, 35, 36, 40 and 42 pupils in each of the schools. This means that a total number of 181 pupils were involved in the study. The five groups were randomly selected into five groups namely; Control group (lecture method) - 35 pupils; Experimental group I (discussion method) – 40 pupils; Experimental group II, (demonstration method) – 28 pupils; Experimental group III (inquiry method) – 42 pupils and Experimental group IV (role-play method) – 36 pupils.

The instruments for data collection were Agricultural Science Achievement Test (ASAT) and Agricultural Science Interest Scale (ASIS) which were validated by three experts, all from the Department of Agricultural Education, University of Nigeria, Nsukka. The inputs, corrections and comments by the experts guided the researcher in modifying the final copy of the instrument. The reliability of the instruments was established using Cronbach alpha for ASIS and Kuder-Richardson 20 for ASAT. ASIS and ASAT yielded a coefficient of 0.92 and 0.86 respectively.

A one week intensive training was given to the research assistants who were the regular class teachers from the sampled schools teaching Agricultural Science in primary five. The four experimental group teachers were given detailed explanations on what the teaching method they would be utilizing entailed, utilizing the teaching method in the lesson plan, how to incorporate the techniques into the lesson and the general requirements of the research. The control group teachers were briefed on the general requirements of the research since they were required to use conventional method lesson plan to teach. By the end of the training, the researcher organized a micro teaching session for the participating teachers to ensure that they had mastered the instructional technique expected of them. The study lasted for four weeks using the normal period allocated for Agricultural Science in the sampled schools to avoid altering the school timetable.

Other experimental conditions that were taken into consideration to avoid invalidity were; prior to the commencement of the experiment, the pupils in the schools chosen were assigned to experimental and control groups respectively by flip of a coin. The researcher, with the aid of five research assistants (class teachers) subjected the five randomly selected groups to a pre-test on ASAT and ASIS. Thereafter, the experimental groups were subjected to their respective treatments and control group to conventional method. The actual experiment was conducted by the trained assistants (class teachers). Experimental groups were taught using lesson plan based on the specific teaching method allocated to them. After the treatment, the post ASAT as well as ASIS were administered to both the control and experimental groups. The scripts were collected, marked and scored. Each of the 20 questions on the ASAT were scored 1 mark, giving a total of 20 marks. For the ASIS, each of the items has 4 options; positive items were scored as follows; E-4 points, S-3 points, R-2 points and N-1 point. The scores were reversed for negative items. A pupil's score was obtained by summing their score for all the items.

The data was finally analyzed based on the scores using mean to answer the research questions. If the mean of the post test is greater than the pretest, then it has a positive effect but if the mean of the post test is less than the pre-test, then it has a negative effect. Then the mean gain of the four experimental groups and the control

groups were calculated. The one with the highest mean gain was considered the best teaching method to be utilized for teaching agricultural science at the primary school level while the one with the least mean gain was considered the worst. ANOVA was used to test the hypothesis. If the p-value < 0.05, reject H<sub>0</sub> and if p-value is ≥ 0.05, accept H<sub>0</sub>.

**Results**

**Research Question 1:** What are the Effects of discussion, demonstration, role-play, inquiry and conventional methods on academic achievement of primary school pupils in agricultural science in Anambra State?

**Ho: 1:** There is no significant difference between the pretest achievement scores of pupils taught with the five teaching methods

**Table 1:** Mean Achievement Scores of Pupils Taught Agricultural Science with Multiple Teaching Methods

Method	N	Pre Test		Post Test		Mean gain	Rank
		$\bar{X}$	SD	$\bar{X}$	SD		
Control Group (Lecture)	35	7.20	2.40	7.50	2.61	0.30	5 <sup>th</sup>
Exp Group I (Discussion)	40	8.10	1.93	9.86	1.90	1.76	4 <sup>th</sup>
Exp Group II (Demonstration)	28	7.95	2.53	14.19	2.70	6.24	1 <sup>st</sup>
Exp Group III (Inquiry)	42	6.92	2.81	10.23	2.88	3.31	3 <sup>rd</sup>
Exp Group IV (Role-play)	36	7.42	2.43	13.24	2.54	5.82	2 <sup>nd</sup>

Key:  $\bar{X}$  = Mean; SD = Standard Deviation; N = Population = 181; Exp = Experimental

**Table 2:** ANOVA Analysis of the Pretest Achievement Scores of Pupils Taught Using Multiple Teaching Methods

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	7.228	4	1.807	1.879	.121
Within Groups	84.600	177	.961		
Total	91.828	181			

Result in Table 1 indicated that the pre-test mean achievement scores of pupils taught with multiple teaching methods ranged from 6.92 – 8.10 with standard deviation ranged from 1.93 – 2.81. This showed that the pupils were relatively at the same level before the interventions. The post test scores were 7.50 (lecture method), 9.86 (discussion method), 14.19 (demonstration method), 10.23 (inquiry method) and 13.24 (role-play method). The post test scores ranged 7.50 – 14.19 showing that the teaching methods made a difference in the achievements. The mean gains were 0.30 (lecture method), 1.76 (discussion method), 6.24 (demonstration method), 3.31 (inquiry method) and 5.82 (role-play method). Hence, the best method for teaching agricultural science to improve achievement of primary schools in Anambra is demonstration method while lecture method was ranked last.

The hypothesis of no significant difference tested in Table 2 revealed that F = 1.879 with significance of 0.121. The value was greater than 0.05 indicating that it was not significant. It means that the hypotheses was accepted showing that the academic level of all the pupils before the experiment were relatively the same.

**Research Question 2:** What are the Effects of discussion, demonstration, role-play, inquiry and conventional methods on interest of primary school pupils in agricultural science in Anambra State?

**Ho 2:** There is no significant difference between the pretest interest scores of pupils taught with the five teaching methods

Result in Table 3 indicated that the pre-test mean interest scores of pupils taught with multiple teaching methods ranged from 1.90 – 2.10 with standard deviation ranged from 0.56 – 0.99. This showed that the pupils were relatively at the same level before the interventions. The post test scores were 1.80 (lecture method), 2.40 (discussion method), 3.50 (demonstration method), 2.26 (inquiry method) and 3.80 (role-play method). The post test scores ranged 1.80 – 3.80 showing that the teaching methods made a difference in the interest of the pupils. The mean gains were – 0.10 (lecture method), 0.38 (discussion method), 1.55 (demonstration method), 0.16 (inquiry method) and 1.72 (role-play method). Hence, the best method for teaching agricultural science to improve interest of primary schools in Anambra is role-play method while lecture method was ranked last.

The hypothesis of no significance difference tested in Table 4 revealed that F = 0.605 with significance of 0.660. The value was greater than 0.05 indicating that it was not significant. It means that the hypotheses was accepted showing that the interest levels of all the pupils before the experiment were relatively the same.

**Table 3:** Mean Interest Scores of Pupils Taught Agricultural Science with Multiple Teaching Methods

Method	N	Pre Test		Post Test		Mean gain	Rank
		$\bar{X}$	SD	$\bar{X}$	SD		
Control Group (Lecture)	35	1.90	0.80	1.80	0.81	- 0.10	5 <sup>th</sup>
Exp Group I (Discussion)	40	2.02	0.93	2.40	0.92	0.38	3 <sup>rd</sup>
Exp Group II (Demonstration)	28	1.95	0.56	3.50	0.80	1.55	2 <sup>nd</sup>
Exp Group III (Inquiry)	42	2.10	0.99	2.26	0.98	0.16	4 <sup>th</sup>
Exp Group IV (Role-play)	36	2.05	0.78	3.80	0.74	1.72	1 <sup>st</sup>

**Table 4:** ANOVA Analysis of the Pretest Interest Scores of Pupils Taught Using Multiple Teaching Methods

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	2.149	4	0.537	.605	.660
Within Groups	78.109	177	.888		
Total	80.258	181			

**Discussion of the Findings**

Findings on the effects of discussion, demonstration, role-play, inquiry and conventional methods on academic achievement of primary school pupils in agricultural science in Anambra State revealed that demonstration method improved achievement the most. This was closely followed by role-play method, inquiry method and discussion method in that order. Although lecture method also improved achievement, it was very marginal. The pupils taught with demonstration method could have scored high because pupils learn faster by doing in comparison to what they hear while those taught with lecture method could have scored the least because learning through lecture method does not involve the pupils and children in primary school level like to be active. The hypothesis tested on no significant difference between the pretest achievement scores of pupils taught with the five teaching methods was accepted. This showed that before the experiment, the pupils were relatively on the same level in respect to academic achievement. The findings are in line with Obijiofor and Obumneke-Okeke (2020) who found out that role play method improves academic achievement of pupils more than lecture method. The findings are also in line with Abdulhamid (2013) who found out that demonstration improves the academic achievement of pupils more than discussion method. The findings also agree with Olibie and Ezeoba (2013) who found out that enquiry method improves teaching method more than method

The findings of the study on effects of discussion, demonstration, role-play, inquiry and conventional methods on interest of primary school pupils in agricultural science in Anambra State revealed that role play method improved interest of pupils the more in learning agricultural science. This is closely followed by demonstration method, discussion method and inquiry method. Lecture method ranked last and even reduced the interest of pupils in agricultural science. Pupils taught with role play method could have scored the highest on the interest scale because role play is like drama which is fun and children at that level enjoy whatever is fun. On

the other hand, lecture method reduced their interest in agricultural science because it is boring and not suitable for children at that age. The hypothesis tested on no significant difference between the pretest interest scores of pupils taught with the five teaching methods was accepted. This showed that before the experiment, the pupils were relatively on the same level in respect to interest in agricultural science.. The findings are in line with Obijiofor and Obumneke-Okeke (2020) who found out that role play method improves interest of of pupils more than lecture method. The findings are also in line with Emaikwu (2012) who found out that lecture method reduces the interest of pupils in learning because it is boring and monotonous.

**Conclusion**

As it is often said, no method of teaching can be considered the best as each has its draw backs. However, lecture method has been used the most for teaching pupils agricultural science at the primary level as if it suits the students so much. Unfortunately, if any method should be used, it definitely should not be lecture method. This is because its characteristics are not in any way suitable to learners at the primary school level. Many times, many researchers have recommended various methods which they usually compared to only lecture method. This study therefore compared five of the most utilized teaching methods in primary school for teaching pupils agricultural science. It was discovered that demonstration method improved the achievement of students closely followed by role play method, inquiry method and discussion method while lecture method ranked last. On the other hand, role play method improved the interest of pupils the most in agricultural science. This was closely followed by demonstration method, discussion method and inquiry method while pupils taught with lecture method ranked last on the interest scale and even reduced the interest of pupils in agricultural science. Hence, demonstration and role play should be utilized in teaching agricultural science pupils in primary schools in Anambra while lecture method should

be discouraged at all costs. This would improve academic achievement and interest of pupils in agricultural science in Anambra state.

### Recommendations

Based on the findings of the study, the following recommendations were made;

- 1) Anambra state government should organize training/retraining for agricultural science teachers in the state on the use of demonstration method of teaching so as to enhance the academic achievement of pupils in agricultural science.
- 2) Head Teachers of primary schools should ensure that agricultural teachers must have acquired competency in role playing before promoting them to enable the teachers understand the need of acquiring the competency so as to improve the interest of pupils in agricultural science.
- 3) Agricultural science teachers at the primary school level should stop the use of lecture method in teaching pupils of agricultural science which hinders their achievement and interest in the subject.

### Conflict of Interest

The authors have declared no conflict of interest whatsoever.

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