Effects of Gender on Teaching Methods on Academic Achievement of Primary Three Pupils in Basic Science in Aguata Local Government Area

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# ABSTRACT

The study investigated the effects of gender on teaching methods on academic achievement of primary three pupils in Basic Science in Aguata Local Government Area ( L.G.A). Two research questions and two null hypotheses guided the study. Relevant literatures were reviewed. The study was carried out in only private primary schools in Aguata (L.G.A) of Anambra State. Quasi-experimental research design was used for the study. Specifically the population of the study comprised all 1,260 primary three pupils in private primary schools in Aguata L.G.A. Through simple random sample (balloting method with replacement) a total of 99 pupils were selected-experimental group 1, had 33 pupils (17 males and 16 females); experimental group 2, had 31 pupils (15 males and 16 females) and control group, had 35 pupils (15 male and 20 females) A 20- item Basic Science Achievement Test (BSAT) was used as instrument for data collection. The instrument was validated by three experts and the internal consistency was established using Kuder-Richardson Formular 20 (KR-20) and reliability coefficient was found to be 0.89. Data collected were analyzed using mean and ANCOVA. The findings showed among others that there were no significant difference in the mean achievement scores of male and female primary three pupils taught basic science with demonstration, play way and traditional methods of instruction. Based on the findings, some implications of the study were highlighted. It was recommended that primary three teachers should adopt demonstration and play way methods in teaching and learning of basic science in primary three among male and female pupils.

Keywords: Primary Education, Teaching Methods, Academic Achievement, Basic Science and Gender.

# INTRODUCTION

Primary education is the bedrock on which other levels of education lie. It also provides the vital necessities which are fundamental in developing the primary skills. According to the Federal Republic of Nigeria (FRN, 2013) in the National Policy on Education (NPE), it is that level of education given to children aged 6-12 prior to entering secondary school. In the same vein, [1] defined primary education as education given to children aged 6-12 prior to transition into secondary school in Nigeria.

This level of education provides the child for the physical, motor, health,

nutritional. intellectual. aesthetic. emotional and social development. The primary education can either be given by private or government schools. According to [2] primary schools that are managed and established by individuals, organizations, groups and missionary bodies are called private primary schools. It has the following characteristics; the schools are supported by private organizations or individual rather than government and they retain the right to select their pupils [3]. The primary school whether private or government has a lot of functions to perform. It was in

recognition of the functions/importance of primary education that the government has continued to make serious efforts towards providing her citizens with qualitative and quantitative primary education for social, moral, emotional, economic and political development. That is the reason National Policy on Education outlined the goals of primary [4] education as, preparing the child for secondary level of education including preparing for trade and crafts, laying of a sound basis for scientific and reflective thinking and developing in the child, the ability to adapt to his changing environment. Primary education shall pursue these goals through teaching, research and staff-development programme, generation and dissemination of knowledge, maintenance of minimum education standard through appropriate agencies and good teaching methods.

Regrettably, [5] observed that, the method that is in use in our primary schools in basic science classrooms is traditional method of instruction. Supporting this, several studies; [6]; [7]; [8] [9] have shown that the method that is mostly used in teaching and learning of basic science in schools is traditional method. Traditional method of instruction is a method of teaching where the teacher teaches pupils the pupils' without making much contribution in the teaching and learning Demonstration process. method of instruction allows the child to be involved in teaching and learning.

Demonstration method, according to [10] is a method which involves the combination of oral explanation with the handling or manipulation of real objects, equipment or materials. Despite these advantages about demonstration method of teaching basic science, in primary schools, the teacher can also use childcentered method of instruction. One of the child-centered method of instruction is 'play way method`.

[11] observed that play is any activity freely chosen, intrinsically motivated, and personally directed. It stands outside "Ordinary life" and is non-serious but at the same time absorbing the player intensely. Play, when applied in the field of teaching is called "playway method". Play way method of teaching is a teaching method where by the teacher uses play in the business of teaching and learning.

In line with this, [12] opined that, play way method is a teaching strategy that concretizes instructions. Not only does it pave the way for imparting effective and enduring education; it helps in realizing the broader aims of education. These two methods - demonstration and playway method may be good in teaching and learning of basic science.

Basic science is an intellectual search involving inquiry for scientific explanations which is necessary for the current technological and industrial development [13]. That was why, [14] observed that, science and its applicationtechnology is one of the most powerful instruments for enabling all members of the society to face these new challenges. Generally, early basic science teaching experiences affect later education outcomes. [15] observed that, children's informal understanding may provide a foundation on which formal basic science skills can be built. Successful early experiences in basic science have a powerful effect on the interest and pupils confidence bring to new opportunities in science learning. Improving basic science learning is of great concern for economic and developmental reasons. The problem we have in basic science teaching is from methodology. As revealed by literature, the present method of instruction used in basic science teaching is not yielding the desired result. Children if given good foundation will carry them all through education career. It becomes necessary that we start early enough to curb the problem of poor methodology.

Many strategies have been experimented on to determine the effective ways of teaching school subjects generally and basic science teaching in particular. Among these are; Practical approach [16]; mentoring [17]; Out-of class learning

environment [18] human recourse [19]; concept-mapping [20] and constructionist-based instructional model [21], yet the problem of poor academic achievement in basic science persisted. world Presently, the is going technologically higher in all aspects of life. There is need to have improvement in academic achievement in basic science otherwise our country, Nigeria, may be left out of technological world.

the words of academic In [22] achievement in children in a learning situation refers to one who attain a set standard of achievement in a given evaluation exercise, such as test. examination or series of continuous assessment. This means that a candidate who scores up to a given standard is achieving better regarded as academically. The improvement in academic achievement could be in relation to gender.

In line with this, [23] opined that, despite the fact that, school enrollment in science and engineering and technological related courses are in favour of males, females who have been, and are still the traditional social educators. environmentalist, nutritionist and health workers performed better in terms of academic achievement. This is because their traditional strengths, accumulated knowledge and wisdom acquired as educator, a modeler in their homes as informal educators helps them in classroom teaching and learning. In addition, a lot of research on gender issues and performance have been carried out. While some of these studies have found gender disparity in academic achievement in favour of males, [2], [3], some have found gender differences in favour of females, [5] [6] others have found none, [11] [12] [13]. Hence gender disparity in academic achievement is inconclusive, irrespective of the method that is in use. The inconclusiveness of differences academic gender in achievement, made the researcher to

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intend to find out whether gender has influence on this research work. Thus, the problem of this study is to find out the effect of gender on teaching methods on academic achievement among primary three pupils in basic science in Aguata Local Government Area of Anambra State, Nigeria.

## Purpose of the Study

The main purpose of this study is to find out the effects of demonstration and play way methods on achievement of primary three pupils in basic science in Aguata Local Goverment Area of Anambra State, Nigeria. In specific terms this study aims to determine:

- 1. The mean achievement scores of male and female primary three pupils taught basic science with demonstration method.
- 2. The mean achievement scores of male and female primary three pupils taught basic science with play way method.

## **Research Questions**

The following research questions guided the study:

- 1. What are mean achievement scores of male and female primary three pupils taught basic science with demonstration method of instruction.
- 2. What are the mean achievement scores of male and female primary three pupils taught basic science with play way method of instruction.

## Hypotheses

The following null hypotheses were tested at 0.05level of significance.

- 1. There is no significant difference in the mean achievement scores of male and female primary three pupils taught basic science with demonstration method.
- 2. There is no significant difference in the mean achievement scores of male and female primary three pupils taught basic science with play way method.

#### **METHODS**

A quasi-experimental design was used to determine the effect of demonstration and play way methods of instruction on academic achievement of primary three pupils' in primary schools. The study was done in Aguata Local Government Area of Anambra State Nigeria. The population comprised of one thousand two hundred and sixty (1,260) pupils in private primary schools in Aguata L. G. A. Using simple random method balloting by replacement, ninety nine (99) pupils were selected as the sample for study. The instrument titled Basic Science Achievement Test (BSAT) had twenty (20) items. Face validity of the item was determined by three experts, one from the department of early childhood and primary education, one from science education all from faculty of education Nnamdi Azikiwe University Awka and the primary three class teacher. It was administered for six weeks including one week of training. Each correct answer in BSAT was scored 5 marks (5x20=100) while zero was allocated for questions not answered

correctly. Questions not attempted at all were scored zero point. The maximum score for all the 20 questions were 100% and the minimum score was 0. The coefficient was calculated using the Kuder-Richardson Formula 20 (KR-20). The coefficient of stability was found to be The research questions were 0.89. using mean. answered Analysis of covariate (ANCOVA) was used to test the hypotheses at 0.05 level of significant. In taking decision, methods that gave a posttest mean score of 60% and above are considered effective. The method that has more mean gain when compared to the other method is considered more effective. If the probability value (P-value) is less than or equal to the significant value of 0.05, the null hypothesis is rejected, otherwise, the null hypothesis is

### **Research Question 1**

What are the Mean Academic Achievement Scores of Male and Female Primary Three Pupils Taught Basic Science with Demonstration Method of Instruction.

Table 1: Mean Achievement Scores of Male and female Primary Three Pupils TaughtBasic Science with Demonstration Method of Instruction.Source of VariationNMean PretestMean PosttestGained Mean

accepted.

	19	Mean recest	Mean i osticsi	Gamea Me
Male Female	17 16	29.24 29.25	73.06 76.19	44.81 47.93

Table 1, shows that the male pupils taught with demonstration method has gained mean of 44.81 while female pupils taught with the same method of instruction has gained mean of 47.93. This means that female pupils achieved

better than male pupils when demonstration method was in use.

# **Research Question 2**

What are the Mean Achievement Scores of Male and Female Primary Three Pupils Taught Basic Science with PlayWay Method of Instruction.

Table 2: Mean	Achievement	Scores of	of male	and	Female	Primary	Three	Pupils	Taught
Basic Science w	ith Play Way N	Method o	f Instru	ction	l.				

Source of Variation	N	Mean Pretest	Mean Posttest	Gained Mean	
Male	15	26.00	71.33	45.33	
Female	16	29.05	82.69	53.63	

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Table 2 shows that, the female pupils taught with playway method achieved better than the male pupils taught with the same method of instruction. This is because the gained mean recorded by female pupils is 53.63 is higher than that recorded by male pupils which is45.33 when taught with playway method.

# www.iaajournals.org Null Hvpothesis 1

There is no Significance Difference in the Mean Achievement Scores of Male and Female Primary Three Pupils Taught Basic Science with Demonstration Methods of Instruction.

Table 3: ANCOVA T	<b>Test of Significant</b>	Difference in	Achievement	Scores of	Male	and
Female Primary Thre	ee Pupils Taught Ba	asic Science Us	ing Demonstra	ation Meth	od.	
Source of Variation	Sum of Squares d	lf Mean Square	FCal. Pval	ue Remark	ζ	

	5 5 . 5 <b>.</b>			• • • • • • • • • • • • • • • • • • • •	
Corrected Model	2665.961a	2 1332.980			
Intercept	3947.729	1 3947.729			
Pretest	2585.279	1 2585.279			
gender	79.835	1 79.835	1.274	.268	NS
Error	1880.100	30 62.670			
Total	188077.000	33			
Corrected Total	4546.061	32			

Table 3 shows that a hypothesis test on significance difference between mean achievement scores of male and female pupils taught basic science with demonstration method was not significant (dfs=1;33; F=1.274=P-value=.268. Thus null hypothesis 1 was accepted.

#### Null Hypothesis 2

There is no Significance Difference in the Mean Achievement Scores of Male and Female Primary Three Pupils Taught Basic Science with Play way Method of Instruction.

Table 4: ANCOVA Test of Significant Difference in Achievement Scores of Male and Female Primary Three Pupils Taught Basic Science Using Play way Method of Instruction

Source of Variation	Sum of Squares	dfMean SquareF Cal. Pvalue Remark	
Corrected Model	2683.369	2 1341.685	
Intercept	4560.200	1 4560.200	
Pretest	1685.301	1 1685.301	
Gender	303.742	1 303.742 5.496 0.026 NS	
Error	1547.469	28 55.267	
Total	188955.000	31	
Corrected Total	4230.839	30	

Table 4 shows that a hypothesis test on significance difference between mean achievement scores of male and female pupils taught basic science with play way method was not significant (dfs=1;31; F=5.496=P-value=.026. Thus null hypothesis 2 was accepted. SUMMARY OF FINDINGS

From the analysis, the following findings were made:

- 1. The achievement scores of male and female pupils taught basic science with demonstration method of instruction shows that, female pupils achieved better than male pupils.
- 2. The achievement scores of male and female pupils taught basic

science with play way method of instruction shows that, female pupils achieved better than male pupils..

1. 3 There is no significant difference in the mean achievement scores of demonstration and play way methods of instruction. Thus null hypothesis 1 was accepted.

3. There is no significant difference in the mean achievement scores of male and female pupils taught

The result in table 1 revealed that, demonstration method of instruction improves academic achievement in classroom teaching and learning among male and female pupils. This is because. the gain in mean of both male and female pupils were high when demonstration method of instruction was in use. This showed that, demonstration method as a teaching strategy helps in academic achievement among male and female pupils. The improvement in academic achievement may be as a result of the fact that the method avails the students opportunity to be involve in teaching and learning. However, the mean difference among female pupils was higher than the mean difference among male pupils. What this shows is that the female pupils achieved higher their than male counterpart when demonstration method of instruction was in use. The finding is line with the earlier work of [6]. The researcher reported that female pupils achieved better than male pupils when demonstration method was in use. However, it disagrees with the work of [3]: [4] they observed that, male pupils achieved better than their female counterparts. Test of null hypothesis 1 in table 3 showed that, there were no significance difference in mean achievement scores of pupils taught basic science with demonstration method (dfs=1:33: F=1.274=P-value=.268. This shows that the difference was not significant. Thus null hypothesis 1 was accepted. In the same way, Brunner and Piaget emphasized on the importance of demonstration in teaching and learning of basic science in our primary schools. For these psychologists, demonstration method of instruction allows the learner to involve all the sense organs in the learning process which give room for meaningful learning. Supporting this view, [5] opined that, the use of activitydemonstration method in basic science www.iaajournals.org

basic science with demonstration method. Thus null hypothesis 2 was accepted.

## DISCUSSION OF FINDINGS

teaching, makes the child to be actively involved in the classroom and on the long-run achieves meaningful learning. Meaningful learning increases productivity. The result in table 3 showed no significant difference among male and female pupils academic achievement. The research work agrees with the findings of [2]; [3] [4], for these researchers, academic difference in achievement between male and females does not exist. However, this disagrees with the works of [11] [12] for these researchers, female pupils performed better than males in basic science classrooms irrespective of the method that is in use. In the same vein, [21] [22] reported that males performed better than females. The result in table 2 showed that play way method of instruction improves academic achievements for both male and female pupils. This is because the gains in mean of both male and female pupils were higher when play way method of instruction was used. However, the gain in mean among the female pupils was higher than the gain in mean among male pupils. Test of hypothesis 2 in table 4 showed that, there were no significance difference in mean achievement scores of male and female pupils taught basic science with play way method of instruction (dfs=1:99: F=5.496=Pvalue=.026. Thus null hypothesis 2 was accepted. In support of this findings [7]; [8]; [9] [10], have found no gender differences among male and females in some subjects. Contrary to the findings, [6] found male better than females, while [8] [9] found females achieving better

than the male counterparts. Supporting these findings, studies have shown that teaching basic science through play way method can be more effective than other methods of instructions because it encourages pupils' active participation in their exploration [20].This means children learn faster,

internalize and use ideas when they participate in basic science activities in a playful manner. This simply implies that, pupils are prone to understanding and internalizing the content better and this leads to meaningful learning. Supporting the above view, [5] opined that, play way method is a teaching strategy that concretizes instructions. In line with this finding, [7], [8] stated that, teaching pupils basic science through play way method may be more effective than teaching through other methods of instruction because it encourages children to take active role in their exploration. In support of the above view, [10] noted that play way method facilitates the transfer of knowledge across different context and provides an ideal condition in which connecting real world experience with learning concepts becomes intrinsically motivated. In this way, through play, pupils' begin to discover their world and world of science. In support of these ideas, [19] reiterated that. demonstration and play wav methods give children opportunity to transfer knowledge across different context and practice new skills which can contribute to building a foundation for

Female pupils achieved higher than their male counterparts. This showed that, demonstration and play way methods of instruction improved the academic achievement of female pupils more than that of male pupils in primary three basic science classrooms.

It was observed that, there were no significant difference among the male and female student taught with demonstration and play way and traditional methods of

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more complex cognitive processes and academic success. Stressing on the importance of demonstration and play way methods to child's learning, [23] lamented that, the use of the two methods in teaching and learning makes the basic science classroom environment to be relaxed, which makes learning to be interesting and fun. In his own words, the informal and free atmosphere gives the pupils the chance to learn basic science concepts easily in basic science classrooms. It means that through demonstration and play activities in basic science classrooms. children can demonstrate high level of creative, social and interactive activities necessary for better life in the wider society.

Emphasizing on the crucial importance of the two methods-demonstration and playway methods of instruction in basic science teaching, [17] observed that demonstration, play way and basic science learning do not have to be mutually exclusive, especially in primary three basic science classrooms. This is because, during demonstration and play, inability to resolve or solve existing problems makes them to learn more.

## CONCLUSION

instruction. Thus gender was not significant in the study. What this means is that primary three basic science teachers will not be gender sensitive in their classroom teaching and learning.

#### Recommendation

Primary three teachers can use any of the methods (Demonstration and Playway methods) in teaching and learning of primary science in Aguata L. G. A. among male and female pupils.

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