

# GENDER AS AN INTERVENING VARIABLE IN COMPARING EFFECTIVENESS OF TEACHING METHODS ON THE INTEREST OF EARLY CHILDHOOD AGRICULTURAL SCIENCE PUPILS

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**Abstract:** The study focused on gender as an intervening variable in comparing effectiveness of teaching methods on the interest of early childhood agricultural science pupils. Two research questions guided the study. Quasi-experimental design, specifically pre-test and post-test group was adopted. The sample for the study was 58 Basic 3 pupils comprising 31 males and 27 females from intact class. The two classes were randomly assigned experimental group I and II. The experimental group one was taught with blended learning method while experimental group II were taught with roleplay method. The treatment lasted for four weeks. The instrument for data collection Agricultural Interest Inventory. The instrument used for data collection were validated by three experts all from Department of Agricultural Education. The reliability of the instrument was established using Cronbach alpha which yielded a coefficient of 0.74. Mean and standard deviation were used to analyze the data collected for the study. Findings of the study revealed that that gender plays an intervening role in the interest of pupils in agricultural science when taught with blended learning and role play method as female pupils had higher interest in comparison to their male counterparts. Hence, the study recommended amongst others that the local government should provide more funds for research so that investigations be made to enquire on the reasons why females perform better when roleplay and blended learning are utilized and possibly find other innovative methods that would be a better fit for male pupils; and ministry of Education should organize workshops, in-service training programme for teachers so that they would be conversant in the use of innovative teaching methods

**Keywords:** Early Childhood, Blended learning, Roleplay, Agricultural Science Pupils, Interest.

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## 1. INTRODUCTION

Agricultural science is the branch of science which deals with growing of crops and rearing of domestic animals for the benefit of man and raw materials for the industries (Ndem, 2013). The author further explained that agriculture deals with the production of crops and rearing of farm animals by man for the purpose of providing food, raw materials and shelter. Agricultural science education as a broad multidisciplinary field that deals with the selection, breeding and management of

crops and domestic animals for economic production (Usman, 2009 as cited in Nwakile, Nwankwo, Ekenta, Ameh & Nwokolo, 2022). Agricultural science is therefore designed for inculcation of the necessary skills for the practice of agriculture for effective citizenship and contribution to food security for national sustainability. This is why the Federal Republic of Nigeria (2013) outlines the seven major objectives of teaching and learning of agricultural science to reflect the; ability to stimulate students' interest in agriculture, ability to enable students acquire basic knowledge of agriculture, ability to develop basic agricultural skills in students, ability to enable students integrate knowledge with skills in agriculture, ability to expose students to opportunities in the field of agriculture, ability to prepare students for further studies in agriculture and ability to prepare students for occupations in agriculture. Agricultural science is taught at all levels of the educational ladder including early childhood education level.

Early childhood education is a branch of education that relates to the teaching of children at the early stage of their development. Many times, the issue of debate has been what the age range is that qualifies to be called early childhood. United Nations International Children's Emergency Fund (UNICEF) (2022) refers to early childhood education as the period spanning up to eight years of age and is critical for cognitive, social, emotional and physical development. During this period, a child's newly developing brain is highly plastic and responsible to change as billions of integrated neural circuits are established through the interaction of genetics, environment and experience (Obijiofor, Okpala, Nnani, & Nwakile, 2020). The authors further posited that optimal brain development requires a stimulating environment, adequate nutrients and social interaction with attentive caregivers which in many cases are the teachers. At this stage, they are usually enrolled in schools to aid their intellectual development and the children are called pupils. In the context of this study, early childhood pupils refer to children that are eight years or less enrolled in nursery or basic education level up to basic 3. At the basic education level, one of the subjects taught is agricultural science.

Agricultural science at the basic education level focuses majorly on increasing the interest of the pupils on crop and animal production processes rather than actually carrying out the production process. According to Ejiiofor & Nwakile (2013), agricultural science at the lower levels of the educational cadre such as the basic education level and it aims to ensure that pupils are taught about agriculture, how food they eat is produced and to ensure they are interested in studying agriculture at the higher levels so as to contribute their own quota to food security. This shows that the chances of pupils of agricultural science at the early childhood education level being involved in agriculture in the future is dependent on their interest at the basic education level.

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. Interest in the field of education determines some aspects of students' affective domain which is very important in the teaching and learning process and is characterized by increased attention and concentration in classroom and academic activities (Nwakile et al, 2022). It is a motivational variable and emotionally oriented trait which determines the vigor of the learner in tackling educational activities (Asogwa, Asogwa, Okanya & Eze, 2019). Okoro (2011) stated that interest reflects a central feature in the knowledge value system of a learner, meaning that learners' interests are influenced by the value they have for an activity or knowledge. Interest guides and encourages pupils to think critically and to keep trying until success is achieved. Okoro (2011) identified the use of traditional teaching methods such as lecture method has led to low interest in agriculture hence the need for innovative teaching methods such as roleplay and blended learning to enhance promote pupils' interest in agricultural science.

Role-play is an instructional approach in which pupils are assigned characters so as to exhibit the behaviours to improve understanding of a lesson (Nwachukwu, Onah, Obijiofor, Nwankwo & Nwakile, 2020). Through role-play, a wide variety of experience in agricultural science can be brought into the classroom which could help pupils develop interest and increase their motivation in crop and animal production processes as well as make learning more interesting and enjoyable. Besides role-play, blended learning another innovative teaching method that is considered effective teaching in improving pupils' interest. In blended learning method, the teacher is often described as a partner and a facilitator in the teaching and learning process and not the possessor of knowledge hence the it is referred to as student-centred approach to learning (Horton, 2010). Furthermore, Cawston, (2011) indicated that blended learning method is an effective method for teaching agriculture because it is interactive and it increases pupils understanding of science concepts, principles and facts and enhances pupil's interest and encourages active participation of pupils in the teaching and learning process. Despite innovative teaching methods playing a role in the interest of pupils in agricultural science, Okeke (2017) posited that gender can also play a role in the interest of pupils.

Gender is identification as a male or female and its association with a social role. Gender according to Okeke (2017) is a socio-cultural construct of ascribing characters and roles to sex such as male and females. Oludipe (2012) noted that the prevalent effects of gender bias and gender stereotypes in Nigeria affects certain vocations and professions such that traditionally professions like medicine, engineering, architecture are regarded as men's while nursing, typing, catering as women. Previous studies; (Oludipe, 2012; Nwachukwu et al, 2020) referred that there exists no significant difference in the interest of boys and girls in agricultural science. On the other hand, other studies (Yong, 2009; Okoro, 2011, Nwakile et al, 2022) indicated that a significant difference exists in and interest of male and female pupils in agricultural science. However, no previous study has been carried out in Okene education zone to ascertain how gender is an intervening variable in comparing effectiveness of teaching methods on the interest of early childhood agricultural science pupils in Afikpo North Local Government Area (LGA) of Ebonyi State.

Afikpo North Local Government Area is one of the 13 LGAs in Ebonyi State. A pre study visit to ten schools in Anambra revealed dwindling interest of pupils in agricultural science evidenced by discussions with 20 randomly selected pupils in the area and 18 revealed that they do not enjoy agricultural science class. This could be because of the teaching method used in teaching them. Although authors such as Olibie, and Ezeoba (2013); Obijiofor and Obumneke-Okeke (2020); Nwakile et al (2020) found that innovative teaching methods like role play and blended learning increased interest of pupils. This calls for the need to ascertain if these methods would increase the interest of early childhood pupils in Afikpo North LGA as well as if gender is an intervening variable in comparing the effectiveness of these teaching methods in the area.

## 2. PURPOSE OF THE STUDY

The main purpose of the study was determining gender as an intervening variable in comparing effectiveness of teaching methods on the interest of early childhood agricultural science pupils. Specifically, the study sought to ascertain the;

1. differences in the mean interest scores of male and female pupils taught using blended learning
2. differences in the mean interest scores of male and female pupils taught using role play

## 3. RESEARCH QUESTIONS

1. What are the differences in the mean interest scores of male and female pupils taught using blended learning?
2. What are the differences in the mean interest scores of male and female pupils taught using role play?

## 4. METHODOLOGY

The study adopted a quasi-experimental design and was carried out in two co-educational secondary schools out of the twenty-nine secondary schools in Afikpo North LGA. The population for the study was all the pupils in basic education three in the area. Due to the large size of the population, multistage sampling technique was utilized in the study. Firstly, out of twenty-nine secondary schools in the area, twelve schools were purposely selected. The twelve schools were purposively selected on the basis of gender as these twelve schools were mixed schools where male and female pupils schooled together. Furthermore, out of the twelve schools, two were randomly selected. An intact class of 31 and 27 Agricultural science pupils were randomly selected from the two schools making a total of two intact classes of 58 Agricultural science pupils from the two schools. Agricultural Interest Inventory (AII) was used to gather data for the study which was 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 AAT which yielded a coefficient of 0.74.

A one-week intensive training was given to the research assistants who were the regular agricultural science class teachers from the sampled schools teaching agricultural science in Basic three. The research assistants 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. 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. The researcher, with the aid of two research assistants (class teachers) subjected the two randomly selected groups to a pre-test on AII. Thereafter, the two groups were subjected to their respective treatments. After the treatment, the post AII were administered to the two groups. Each of the items on

the AII had 4 options; positive items were scored as follows; SA-4 points, A-3 points, D-2 points and SD-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 two groups was calculated. The one with the higher mean gain was considered the better teaching method to be utilized for teaching agricultural science at the early childhood education level in the area and vice versa. The mean gain of the two groups based on gender was also calculated. The one with the higher mean gain was considered the better teaching method to be utilized for teaching agricultural science to either male or female pupils in the area and vice versa.

## 5. RESULTS

**Research Question 1:** What are the differences in the mean interest scores of male and female pupils taught using blended learning?

**Table 1: Mean and Standard Deviation of Interest Scores of Pupils Taught Using Blended Learning**

Method	Gender	N	Pre- test		Post test		Mean gain
			$\bar{X}$	SD	$\bar{X}$	SD	
Blended Learning	Male	15	2.22	0.70	3.17	0.80	0.95
	Female	12	2.42	0.84	3.85	0.92	1.43
	Mean Difference		0.20		0.68		0.48

**Key:**  $\bar{X}$  = Mean; SD = Standard Deviation; N (Population) = 27

Data in Table 1 revealed that the pre-test mean interest score of male and female pupils taught using blended learning was 2.22 and 2.42 respectively with the standard deviation of 0.70 for males and 0.84 for females. The post-test mean interest score was 3.17 for males and 3.85 for females with standard deviation of 0.80 for male and 0.92 for female. The interest gain score for males is 0.95 while for females is 1.43 showing that blended learning promotes female pupils' interest which has mean difference of 0.48 more than male pupils in agricultural Science.

**Research Question 2:** What are the differences in the mean interest scores of male and female pupils taught using role play?

**Table 2: Mean and Standard Deviation of Interest Scores of Male and Female Pupils taught using Role Play Method.**

Method	Gender	N	Pre- test		Post test		Mean gain
			$\bar{X}$	SD	$\bar{X}$	SD	
Roleplay method	Male	16	3.12	0.37	3.14	0.84	0.02
	Female	17	3.42	0.56	3.90	0.90	0.48
	Mean Difference		0.30		0.76		0.46

**Key:**  $\bar{X}$  = Mean; SD = Standard Deviation; N(Population) = 31

Table 2 shows that the pre-test interest mean scores for male and female pupils were 3.12 and 3.42 with standard deviation of 0.37 and 0.56 respectively, indicating that both male and female pupils were at the same level before treatment. On the other hand, the post-test interest mean scores for male was 3.14 and female 3.90 with standard deviation 0.84 and 0.90 respectively indicating that role play method enhances interest of female pupils more than their male counterparts.

## 6. DISCUSSION OF THE FINDINGS

The findings of the study on the differences in the mean interest scores of male and female pupils taught using blended learning revealed that the interest gain scores of the female pupils were enhanced more than those of the male pupils. This indicated that blended learning slightly enhanced interest of female than male pupils. This implies that gender plays an intervening role in the interest of pupils in agricultural science when taught with blended learning. The findings are in line with Nwakile et al. (2022) who found out that there is a slightly increase in interest of females in comparison to males when

utilizing technology in teaching which is what blended learning entails. However, the findings disagree with Obijiofor and Obumneke-Okeke (2020) who found out that innovative teaching method improves interest of male more than female pupils. The disagreement could be because the population in Obijiofor and Obumneke-Okeke were in their middle childhood while the population in the current study were in their early childhood. Hence, it is deduced that gender plays an intervening role in the interest of pupils in agricultural science when taught with blended learning as female pupils had higher interest in comparison to their male counterparts.

The findings of the study on the differences in the mean interest scores of male and female pupils taught using role play revealed that the interest gain scores of the female pupils were enhanced more than those of the male pupils. This indicates that gender plays an important role in the interest level of female more than their male counterparts when taught using the role play method. The findings are in line with Okoro (2011) who found out that gender influences the interest of pupils in English. The findings also agree with that Campbell (2016) who found out the gender play a role in academic interest of pupils when they are taught using roleplay method. Hence, it is deduced that gender plays an intervening role in the interest of pupils in agricultural science when taught with roleplay as female pupils had higher interest in comparison to their male counterparts.

## 7. CONCLUSION AND RECOMMENDATIONS

Teaching agricultural science to pupils at the early childhood education level is aimed at improving their interest so that they can pursue careers in food in agriculture in the future which would improve food security. The interest of pupils in agricultural science at the early childhood education level is dependent on the teaching method involved. Hence, innovative methods like blended learning and role play have been utilized to improve the interest of pupils in agricultural science. However, the impact of utilizing the teaching methods to improve interest in agricultural science might be influenced by gender. The study found that gender plays an intervening role in the interest of pupils in agricultural science when taught with blended learning and role play method as female pupils had higher interest in comparison to their male counterparts. Hence, these methods should be utilized in improving the interest of pupils in agricultural science. However, since females seem to benefit more from these methods the following should be done

1. The local government should provide more funds for research so that investigations be made to enquire on the reasons why females perform better when roleplay and blended learning are utilized and possibly find other innovative methods that would be a better fit for male pupils.
2. Ministry of Education should organize workshops, in-service training programme for teachers so that they would be conversant in the use of innovative teaching methods.

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