

## **The Effect of Modelling Instruction on the Interest and Achievement of Lower Basic 5 Special Needs Pupils in Special Needs Schools in Abia State, Nigeria**

### **Abstract**

The study investigated the effect of modelling instruction on the interest and achievement of lower basic 5 special needs pupils in special needs schools in Abia state, Nigeria. The study employed a quasi-experimental design with pretest, posttest non randomised control group using 2x2 factorial matrix, and gender as moderating variable. Two intact class of lower basic 5 special needs pupils were used for the study and were assigned as experimental and control groups. The experimental group consisted of 12 pupils' and control group 15 pupils. Data were collected using a 34-item multiple choice Home Economics Achievement Test (HEAT). The questionnaire contained 10 Likert-type questions on interest scale. The instrument was subjected to face and content validation. Face and content validation were carried out by three experts. The internal consistency aspect of the reliability of the instrument was determined using Kuder Richardson (K-R<sub>20</sub>) formula which yielded an index of 0.81 indicating that the instrument was highly reliable. The experiment which lasted for six weeks was carried out with the assistance of the regular Home Economics teachers in the sampled schools. The HEAT was used to collect data for the Pre-Test, and Post-test and the retention tests. The data collected from the pupils were analyzed using mean and standard deviation to answer the three research questions that guided the study, while the Analysis of Covariance (ANCOVA) was used to test the three null-hypotheses at 0.05 level of significance. The results among others showed that pupils' Modelling teaching strategy has had an increasing and significant mean score difference on interest scores and achievement scores of primary five special needs pupils' when taught Home Economics using Modelling teaching strategy and those taught using lecture method. Furthermore, gender has no significant effect on primary five special needs pupils' taught Home Economics using modelling teaching strategy and those taught using lecture method. It is recommended that Government and relevant professional bodies should pay more attention to special needs schools by providing the needed instructional materials for better instructional delivery.

**Keywords:** Modelling, Home Economics, interest, Achievement

### **Introduction**

Home Economics is not only an important academic discipline, but also an essential pathway to improving health and well-being in society, especially for marginalized and vulnerable populations (Baker et al., 2022). Home Economics education includes preparing individuals for the many transitions they will face in their lives, including family, work, and community settings (Boswell et al., 2021). It implies that the study deals with individual physical, social, emotional and intellectual environment. It is a tool that can be used in our daily life to overcome the difficulties faced some families because it incorporates the study of all the elements of family

living, individual development and interpersonal relationships. Due to this, Home Economics has been considered as a subject that concerns human development, personal and family finances, consumer issues, housing and interior design, nutrition and food preparation, as well as textiles and apparel (Obunadike, 2023). Pupils opting for any of these related Home Economics career opportunities, need good knowledge and about current trends in Home Economics (Elikis&Hofstein, 2013). Still, these knowledge could only be made possible and easier if those who offer the Home Economics Education develop interest in the subject.

“Interest towards Home Economics plays a crucial role in the teaching and learning processes of Home Economics. It affects pupils’ achievement in Home Economics. The teaching method and the mode of assessment affect the interest towards Home Economics. Usually, the way that Home Economics is represented in the classroom and perceived by pupils, even when teachers believe they are presenting it in authentic and context-dependent way stands to alienate many pupils from Home Economics” (Elikis&Hofstein, 2013). Thomas (2013) affirmed that “special needs interest is motivated with teachers’ use of some innovative teaching like that of modelling especially when the lesson is dull and boredom”. Ekpenyong, Edem and Martin (2015) postulated that “lack of special needs pupils interest in Home Economics in Abia State metropolis had led to special needs pupils poor academic achievement. This authors attributed inadequate utilization of instructional strategies as one of the causes of special needs pupils’ lack of interest in Home Economics. The lessons in Home Economics must be such that will kindle pupils’ interest in the subject, this will invariably lead to better achievement, otherwise the teacher may have to keep re-teaching one content overtime”. In a study conducted by Kpolovie, Joe and Okoto (2014) overwhelming “preponderance of data-based evidence in the findings showed that pupils’ interest and retention in learning and attitude towards school jointly and separately predict academic achievements in schools. This implied that the teacher has to present learning concepts to pupils in a way that will catch their attention and aid retention”.

“Contemporary pupils and pupils in our schools today have different backgrounds and learning abilities which call for challenging learning experiences that will activate their potentials and increase their interest irrespective of their gender for better academic achievements in schools. This suggests a need to depart from the traditional approach of teaching Home Economics to modelling instruction. The traditional approach of Home Economics instruction consists almost entirely of teachers doing the talking while pupils listen and copy note on the chalkboard after

the lesson” (Akpoghol, Ezeudu, Adzape, &Otor, 2016). In recent years research has consistently confirmed that isolated learning is not retained (Eze, 2022). “The knowledge obtained through Home Economics programme proves valuable in the student's achievement and throughout the student's life span as it shape pupils to develop knowledge, attitudes, understanding, skills and values to achieve optimal, healthy and sustainable living for every person as an individual, and as a member of families and society” (Ndubuka, 2024). Saracogglu et al., (2020) noted that “Home Economics as a subject is a closely-knit system of ideas, principles and processes”. Connections among concepts and principles should be established so that learning the subject is less a challenge to the pupils’ memory and more a challenge to his or her intelligence (Yamamoto, et al., 2022).Lyu and Lee (2023) highlights “the importance of teaching Home Economics as a holistic and interrelated subject, where concepts and principles are not taught in isolation but in relation to one another. In other words, pupils can easily learn a procedure with combination of practical demonstration”.

By contrast, in Modelling instruction Laurillard (2015) allows “learners to visualize and experience new concepts. She also believes that technology can be used to support modeling, by providing access to a wide range of resources, such as simulations, games, and interactive learning materials. Contouring, the author noted that teachers can use these resources to create engaging and effective learning experiences, by designing and planning the learning experience with the learner's needs in mind”. Also, Verenikina (2015) stressed that “modeling can be an effective teaching strategy because it allows pupils to explore concepts in a concrete and visual way. These authors agreed that modeling can be used to make abstract concepts more accessible and easier to understand, and that it can be particularly useful for pupils who learn best through visual and hands-on experiences. This type of learning strategy helps to reduce racial conflict among school children, promotes better learning, and improves student understanding and help in a better academic achievements”.

Academic achievement is regarded as the total aggregate scores of pre-test and post- test of pupils and pupils in a school setting (Hilary, 2024). Nwadike (2018) referred it as an important educational variable that expresses the success or failure of a teaching and learning process. Ekpoudo, Kufre and Udofia (2019) refer to academic achievement as the learning outcome of the pupils which can be measured by any form of assessment technique to ascertain academic gain of the pupils. Agboh (2015) describes academic achievement as the learning outcome or the

determination of the extent to which a student has achieved educational goals. The academic achievement of pupils has been of concern to the wider society including parents', teachers and pupils. It is the learning outcome and the overall output in the teaching and learning experiences of the child.

Jacob (2020) postulated that academic achievement of special needs pupils was derived through the use of teacher made test and standardized test. "The issue of special needs pupils' poor academic achievement in Home Economics in both internal and external examination had been relatively poor. Student first school leaving certificate and common entrance Examination results between 2015 and 2021 received from Abia Education Resource derived from the Ministry of Education, showed that there was a great significance high rate decline and failure on pupils academic achievement ranging from 60% to 84.25%" (Halimat, Adeyemo & Gady, 2021). Adewale and Umoh (2016) stated that one of the issues with ineffective teaching of Home Economics was lack of utilization of effective instructional strategies. This aligned with Oghene in Emudianughe (2022) who maintained that ineffective instructional strategies was the major attributes of pupils poor academic achievement in the subject. Due to the important role achievement plays in the teaching and learning process and besides the several deficiencies in the various test formats, educators have constantly been looking out for the best ways of assessing pupils. For these reasons many the need for this study to reflect on investigating the interest and academic achievement of the special needs pupils in the Home Economics.

### **Statement of the Problem**

Home Economics is a subject offer by pupils in basic schools which is set to improve the services and goods used by the families, and prepare young people for living a full well-rounded life in the home, community and nation. As a field of study, it evolved out of the concern for the family and raised by the condition of a society becoming increasingly dominated by commercial and industrial interest. In spite of the importance of this subject as one that is concerned with improving family life in the society, the pupils' achievement in the subject has been relatively poor. Though, it seems that the ways of instructional delivery, do not rekindle interest among learners.

This challenge of inconsistency in progression of pupils' achievement in Home Economics, perhaps, is suspected to be related to methods employed in teaching the subject (Idoko & Anidu,

2012). Evidence from research studies, have pointed that some innovative teaching strategies such as collaborative, competitive, demonstrative and discussion methods tend to arouse interest, enhance 'achievement, promote pupils retention and also bridge the gender gap among male and females in their achievement and retention in Home Economics (Nkechukwu, 2023). Consequently, this study is set to ascertain whether or not some innovative teaching methods such as Modelling teaching can have an effect on academic achievement of lower basic 5 pupils in the subject. In the light of the above, the problem of this study put in a question form was: Can Modelling Instruction effect a change on the interest and achievement of lower basic 5 special needs pupils' in Abia State, Nigeria.

### **Purpose of the Study**

Specifically the purpose of the study sought to:

1. determine the difference in the mean interest scores of primary five special needs pupils' taught Home Economics using modelling strategy and those taught using lecture method;
2. ascertain the difference in the mean achievement scores of primary five special needs pupils' taught Home Economics using modelling teaching strategy and those taught using lecture method;
3. determine the difference in the mean achievement scores of male and female pupils taught Home Economics using modelling teaching strategy and those taught using lecture method;

### **Research Questions:**

1. What is the difference in the mean interest scores of primary five special needs pupils' taught Home Economics using modelling strategy and those taught using lecture method?
2. What is the difference in the mean achievement scores of primary five special needs pupils' taught Home Economics using modelling teaching strategy and those taught using lecture method?
3. What is the difference in the mean achievement scores of male and female pupils taught Home Economics using modelling teaching strategy and those taught using lecture method?

### **Hypotheses**

The following two hypotheses guided the study.

**H0<sub>1</sub>:** Modelling teaching strategy has no significant difference on the mean interest scores of primary five special needs pupils' taught Home Economics using scaffolding teaching strategy and those taught using lecture method

**H0<sub>2</sub>:** Modelling teaching strategy has no significant difference on the mean achievement scores of primary five special needs pupils' taught Home Economics using scaffolding teaching strategy and those taught using lecture method

**H0<sub>3</sub>:** Gender has no significant effect on primary five special needs pupils' taught Home Economics using modelling teaching strategy and those taught using lecture method

Significantly, pupils might greatly benefit from the findings because the study provides adequate information and create awareness on the need for who are the pivots of the entire process of the classroom pedagogy to receive materials that are more accessible to special needs learners, such as braille, large-print, or audio recordings.

## **Methodology**

### **Design for the study**

The study employed a quasi-experimental design with pretest, posttest non randomized control group using 2x2 factorial matrix, as gender was used as moderating variable.

### **Area of the study**

The study was carried out in two special needs schools in Abia State. Abia State was carved out of the former Imo State on 27<sup>th</sup> August, 1991. Abia is a State in the South East part of Nigeria which occupies about 5,834 square kilometres.

### **Population for the study**

The population of the study comprised 309 special needs pupils offering Home Economics in government owned primary schools in Abia State. This population comprised 173 male and 136 female special needs pupils in the public special needs schools in the State

### **Sample for the study**

A sample size of 27 pupils, 12 pupils (8 males & 4 females) was assigned to experimental (treatment) groups: while 15 pupils (8 males & 4 females) served as control. The sampling was drawn using purposive sampling technique.

### **Instrument for data collection**

The instrument used for this study was the Home Economics Achievement Test (HEAT) and Home Economics Interest Scale (HEIS). The instruments were subjected to face and content validation by three experts; two from Home Economics and one from Measurement and Evaluation all from Michael Okpara University of Agriculture Umudike. The reliability of HEAT was determined using Kuder-Richardson 20, which yielded a correlation coefficient of 0.81 while the Home Economics Interest Scale (HEIS) had a reliability coefficient of 0.84 which was determined using Pearson's Product Moment Correlation Coefficient (PPMCC) statistic.

### **Data collection method**

The researcher carried out this study in three phases thus; Pre-treatment phase, Treatment Phase and Post treatment/Retention phase. The researcher briefed the regular Home Economics teachers in the two schools used in the experimental study for a period of one week using the instructional guide on the appropriate way to administer the Home Economics Achievement Test (HEAT) and Home Economics Interest Scale (HEIS). During the second week the HEAT I was administered by their regular Home Economics teacher and was observed by the researcher (experimental and control groups) as pre-test. At the end of the test, the scores were recorded and kept. Thereafter, the treatment was then administered for a period of four weeks. The experimental group in each school were taught the selected topics using discussion supplemented with music while the control group were taught the same topics using discussion method. After four weeks of treatment, the HEAT II was re-arranged and administered to all the students as post-test.

### **Data analysis techniques**

The data collected through the administration of the instruments were analyzed using a combination of inferential and descriptive statistical methods such as mean and standard deviation to answer research questions and Analysis of Covariance (ANCOVA) was used to test the null hypotheses at .05 level of significance. ANCOVA is a useful tool for detecting differences between groups that might be obscured by the covariate. Also, Statistical Package for Social Sciences (SPSS) version 20 was used. Furthermore, a decision rule using the four (4) point scale (Likert-type scale) was formulated to guide the analysis as follows:

### **Results and Discussion**



The data for testing hypothesis 2 were analyzed with ANCOVA and the results presented in Table2

**Table 2: Analysis of Covariance (ANCOVA) of Effect of mean interest scores of pupils Home Economics using modelling teaching strategy**

Source	Type III Sum of Squares	df	Mean Square	F	Sig	Partial Eta Squared
Corrected Model	3.071 <sup>a</sup>	2	1.535	10.079	.001	.456
Intercept	12.048	1	12.048	79.077	.000	.767
Pretest	1.314	1	1.314	8.626	.007	.264
<b>Group</b>	<b>2.312</b>	<b>1</b>	<b>2.312</b>	<b>15.172</b>	<b>.001</b>	<b>.387</b>
Error	3.656	24	.152			
Total	274.320	27				
Corrected Total	6.727	26				

a. R Squared = .456 (Adjusted R Squared = .411)

Table 2 showed that a significant Probability (P)-value of 0.001 was obtained. Since the Probability-value of 0.001 is less than 0.05 alpha level, the null hypothesis of no significant effect was rejected. Therefore, Modelling teaching strategy has no significant difference on the mean interest scores of primary five special needs pupils' taught Home Economics and those taught using lecture method.

**Research question Two:** What are the difference in the mean achievement scores of primary five special needs pupils' taught Home Economics using modelling teaching strategy and those taught using lecture method?

The data for answering research question 2 were analyzed and results presented in the Table 3



**Table 4: Analysis of Covariance (ANCOVA) of Effect of mean achievement scores of Pupils taught Home Economics using modelling teaching strategy**

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	3.914 <sup>a</sup>	2	1.957	12.650	.000	.513
Intercept	3.121	1	3.121	20.175	.000	.457
Pretest	2.006	1	2.006	12.965	.001	.351
<b>Group</b>	<b>1.054</b>	<b>1</b>	<b>1.054</b>	<b>6.812</b>	<b>.015</b>	<b>.221</b>
Error	3.713	24	.155			
Total	249.728	27				
Corrected Total	7.627	26				

Table 4 revealed that a significant Probability (P)-value of 0.015 was obtained. Since the Probability-value of 0.015 is less than 0.05 alpha level, the null hypothesis of no significant effect was rejected. Therefore, there is no significant difference on the mean achievement scores of primary five special needs pupils' taught Home Economics using Modelling teaching strategy and those taught using lecture method

### Research Question three

What is the difference in the mean achievement scores of male and female pupils taught Home Economics using modelling teaching strategy and those taught using lecture method?

The data for answering research question 8 were analyzed and results presented in the Table 5

**Table 5: Pretest and Posttest mean achievement scores of Male and Female pupils taught Home Economics taught using scaffolding teaching strategy**

Gender	Teaching Method	Number Pupils	Tests				Achievement Mean Gain
			Pre test		Post test		
			$\bar{X}$	SD	$\bar{X}$	SD	
MTS	Male	4	2.76	.483	3.28	.409	0.52
	Female	8	2.91	.559	3.30	.351	0.39
LM	Male	6	2.40	.729	2.63	.602	0.23

Female	9	2.71	.558	2.84	.541	0.13
<b>MTS = Modelling Teaching Strategy</b>			<b>LM = Lecture Method</b>			

Data in Table 5 showed that male primary five pupils taught Home Economics using Modelling teaching strategy had Pretest mean score of 2.76 with standard deviation of 0.483 while the female had a pretest mean of 2.91 with standard deviation of 0.559. Similarly, the posttest mean score of male and female pupils were 3.28 and 3.30 with standard deviation scores of 0.409 and 0.351 respectively. For the lecture method (control group), the male and female pupils had a Pretest mean scores of 2.40 and 2.71 with the standard deviation scores of 0.729 and 0.558 respectively while they had Posttest achievement mean scores of mean scores of 2.63 and 2.84 with the standard deviation scores of 0.602 and 0.541 respectively. The table further showed that the male pupils had a mean gain of 0.52 while their female counterparts had a mean gain of 0.39. Whereas for the lecture method (control group), the male pupils had a mean gain of 0.23 while their female counterparts had a mean gain of 0.13. This indicated that Modelling teaching strategy had more increasing effect of 0.29 on the male pupils' academic achievements in Home Economics over the female pupils.

A corresponding hypothesis that addressed the above research question is:

### **Hypothesis three**

Gender has no significant effect on primary five special needs pupils' taught Home Economics using modelling teaching strategy and those taught using lecture method

The data for testing hypothesis three were analyzed with ANCOVA and the results presented in

Table 6

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	2.863 <sup>a</sup>	2	1.431	7.213	.004	.375
Intercept	2.361	1	2.361	11.839	.002	.331
Pretest	2.779	1	2.779	13.909	.001	.368
<b>Gender</b>	<b>.003</b>	<b>1</b>	<b>.003</b>	<b>.013</b>	<b>.910</b>	<b>.001</b>
Error	4.764	24	.199			
Total	249.728	27				
Corrected Total	7.627	26				

**Table 6:**  
An analysis of Covariance (ANCOVA) of mean achievement scores of Male and Female

#### **e pupils taught Home Economics using modelling teaching strategy**

The data in Table 6 revealed that a significant P-value of 0.910 was obtained which is greater than 0.05 level of significance. This however means that the null hypothesis stated was not rejected. Therefore, gender has significant effect on pupils' academic achievements in Home Economics. In other words, there is significant difference between the mean achievement scores of male and female pupils Home Economics using modelling teaching strategy.

#### **Discussion**

The finding from research question one revealed that Modelling teaching strategy has had an increasing and significant mean score difference on interest scores of primary five special needs pupils' taught Home Economics using Modelling teaching strategy and those taught using lecture method. The result specifically showed that the differences between the mean interest scores of pupils taught using the two methods of teaching was significant. In other words, This result collaborated with similar study by Tofighi and Ashouri (2021) who found that modeling teaching strategies were more effective than lecture-based teaching in improving pupils' computer skills and retention. Also, Sun et al. (2021) found that modeling teaching strategies were more effective in improving pupils' physics knowledge and problem-solving skills than traditional lecture-based teaching methods. The authors concluded that modeling teaching strategies, can be more effective in promoting deep learning and transfer of knowledge in physics than traditional lecture-based teaching.

Furthermore, findings of the research question two showed that Modelling teaching strategy has had an increasing and significant mean score difference on achievement scores of primary five special needs pupils' taught Home Economics. This result collaborates with Hafees, Olumuyiwa and Oluwafunbi (2022) whose study revealed that there was a statistical mean effect of treatment on Basic five special needs pupils' academic achievement in Home Economics when taught using modelling instructional method as compared with conventional lecture method. In addition, Sulaiman, Mustapha and Ibrahim (2016) found out that simulation technique was much higher and better than those taught using lecture method in the cause of lesson presentation in their respective classes.

The finding from research question three revealed that gender has no significant effect on primary five special needs pupils' taught Home Economics using modelling teaching strategy

and those taught using lecture method. Specifically, male pupils taught Home Economics using modelling teaching strategy had a slight higher mean achievement than the female pupils. The result agreed with those of Isaq (2015) who carried out similar studies and found among others that male pupils taught different school subjects modelling teaching strategy were able to outperform their female counterparts. This result supported similar study by Gambari, Olumorin and Yusuf (2013) which revealed no significant difference between male and female performance in Home Economics when taught using computer supported co-operative learning instruction. Gender difference on the academic achievement of pupils in Turkish course.

### **Recommendation**

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

1. Teachers should ensure that they use the active modelling teaching strategy to teach the aspects of Home Economics where pupils regularly show gender bias in their achievement.
2. Government and relevant professional bodies should pay more attention to special needs schools by providing the needed instructional materials for better instructional delivery.
3. School administrators should organize regular seminars and workshops to teachers in order to educate and sensitize them on the effective use of modelling learning strategy in teaching Home Economics and other subjects to reduce issues of gender gap in the retention.

### **Conclusion:**

The study investigated the effect of modelling instruction on the interest and achievement of lower basic 5 special needs pupils' in special needs schools in Abia state, Nigeria. Based on the findings of the study, the following conclusions were made;

1. The result indicated that Modelling teaching strategy had significant effect on pupils' academic achievements in Home Economics. This implied that pupils are most interested in the type of learning outcomes that boosts pupils' engagement and motivation in the classroom. This calls for the principals.

2. The result has shown that Modelling teaching strategy had significant effect on pupils' academic achievements in Home Economics. This implies that the non-usage of some innovative teaching methods such as the modelling teaching strategy and the regular use of lecture teaching method by Home Economics teachers was one of the factors for the pupils' poor achievements in Home Economics
3. The result indicated that there was no difference between the mean achievement of male and female primary five special needs pupils' taught Home Economics using modelling teaching strategy and those taught using lecture method, this implied that teachers could use the teaching strategy to reduce or eliminate gender difference in the achievements of students in the subject

### **Limitations for the study**

The study was faced with the following limitations:

1. Some of the pupils' skipped classes during the experiment which might have affected their general achievement and retention in the study.
2. The pupils lack steady attention and are easily distracted
3. Six weeks used in carrying out the study might not be adequate enough for pupils' to begin to manifest huge changes in their achievements and retention in the subject as a result of their exposure to the learning strategy.

### **Disclaimer (Artificial intelligence)**

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**Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.**

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**Details of the AI usage are given below:**

- 1.
- 2.
- 3.

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