

EFFECT OF PROBLEM SOLVING METHOD ON STUDENTS' ACHIEVEMENT IN ECONOMICS IN PUBLIC SENIOR SECONDARY SCHOOLS IN ANAMBRA STATE, NIGERIA

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ABSTRACT

In this study, the researchers investigated the effect of problem solving method on students' achievement in Economics in public senior secondary schools in Anambra State, Nigeria. To achieve the aims of the study, two research questions were asked and two corresponding hypotheses were formulated and tested at 0.05 level of significance. This study adopted the quasi-experimental design using pre-test and post-test with experimental and control groups. The population is 76,542 SS 1 – 3 students in all the 263 public secondary schools in Anambra State. The sample size is 85 senior secondary two (SS 2) students offering Economics using purposive and cluster sampling techniques. The instrument used for the collection of data for this study was a researcher developed achievement test titled, Economics Achievement Test (EAT) which contained 20 items of multiple choice questions. The instrument was validated by three research specialists. Reliability coefficient of 0.83 was obtained using Kuder-Richardson 20 statistic (KR-20). Research questions were answered using mean and standard deviation. Analysis of Covariance (ANCOVA) was used to test the hypotheses at a 0.05 level of significance. The result revealed that problem solving method is effective in the improvement of students' achievement in Economics more than the lecture method in senior secondary schools in Anambra State. It was also revealed that the post-test mean scores of male and female students taught Economics using problem solving method do not differ significantly in public senior secondary schools in Anambra State. Based on the findings, it was recommended among others that teachers should incorporate activities that cultivate critical and higher order thinking skills in the students through problem solving method. This will help the students break away from the direct learning approach of memorization of facts and knowledge without real life applications.

Keywords: Academic Achievement, Economics and Gender, Lecture method and Problem solving method.

INTRODUCTION

Education is acknowledged as a vital instrument for achieving national development. It is through education that ignorance is eliminated and skills for productivity acquired. Education is the act of imparting or acquiring general knowledge and developing the powers of reasoning and judgment. It is an investment that pays off anytime, anywhere. By investing in education, governments, corporations, communities and individuals can help the youth to face the challenges ahead. Federal Government of Nigeria (FRN, 2013) stated that one of the aims and objectives of education in Nigeria is to help the child acquire appropriate skills, abilities and competencies both mental and physical as equipment for the individual to live in and contribute to the development of the society. Such knowledge, skills and abilities are acquired through the training provided in the school especially the secondary school. Secondary education occupies a very unique position in Nigerian educational system, because it is that level that determines the academic and professional career of students. According to Federal Government of Nigeria (FGN, 2013), one of the broad aims of secondary education within the overall education objectives are preparing students for useful living within the society and preparing them for higher education. Thus, the achievement of these aims lies on the effective teaching of various secondary school subjects and one of which is Economics.

Economics is one of the major subjects offered at the senior secondary school level. It is a subject that contributes to the development of knowledge and help individual or groups of individual(s) to build up body of economic principles and equip them with tools of economic analysis which enables individual to understand current issues and problems confronting society. Economics occupies a pride of place in the senior secondary school's curriculum. Okafor (2018) describes Economics as a subject that helps individuals to be relevant in everyday life and could prepare students for entrepreneurial career in the future. Economics serves useful purposes in modern life. Economics is one of the subjects studied in senior secondary schools as listed in the number of approved school subjects (Federal Republic of Nigeria, 2013). According to National Educational Research Development Council (2008), the objectives of secondary school Economics curriculum include to: understand basic economics principles and concepts as well as the tools for sound economic analysis, contribute intelligently to discourse on economic reforms and development as they affect or would affect the generality of Nigeria, understand the structure and functioning of economic institutions, appreciate the role of public policies on national economy, develop the skills and also appreciate the basis for rational economic decisions amongst others. However, learners' ability to grasp the various Economics concepts is determined by their achievement in the subject.

Student's achievement basically is the competence a learner has in an area of content. This competence is as a result of many intellectual and non-intellectual variables. A good academic achievement record of students is an index of an effective educational system. It is the tangible result of the quantity and quality of knowledge attained. It is the ripe fruit of slow and steady cultivation of knowledge and skills. Chukwu (2017) explains that academic achievement of student is the ability of the student to study and remember facts and being able to communicate his knowledge orally or in written form even in an examination condition. Students' academic achievement in Economics in secondary schools seems to have been consistently poor in both internal and external examinations. This ugly situation has been confirmed by the Chief Examiners' Report of West African Examinations Council (WAEC) (2024) which attributed poor students' achievement in Economics to lack of qualified teachers to handle the subject, poor teacher's method of presenting the content of the curriculum to students. Many researchers have also identified several other factors that are responsible for this ugly situation, and some of these factors on a broad-scale include government-related, society-related, school-related, teacher-related and even student-related factors. Nnamani and Oyibe (2016) observe that there has been decline in the performance of secondary students in Economics especially in their external examination. Continuing, Nnamani et al. (2016) further states that the major factor contributing to students' failure in Economics is the predominant usage of conventional teaching approach (lecture method)

Lecture method is a teaching method where an instructor is the central focus of information transfer. Typically, an instructor will stand before the class and present information for the students to learn. According to Uwameiye and Ojikutu (2018), in lecture method, the teacher talks to the students and write on chalkboard. The students only listen and are given minimal opportunity to contribute their ideas. Okoro (2019) opines that lecture method of teaching is teacher centred and students are passive in the teaching and learning process. Adesoji (2016) assert that the lecture teaching method involves a formal discourse or exposition on a subject matter to attain a stated instructional objective, the teacher does the talking while the learners listen and occasionally take notes. Studies (Adesoji, 2016 & Okoro, 2019) revealed that Nigerian teachers persistently use lecture teaching method or lecture method which do not promote or foster critical thinking, students' participation and 21st century competencies. It is believed that in lecture method, theory is taught as an absolute knowledge; hence pupil-centered activities for developing scientific reasoning skills and processes are lacking. The lecture method cannot be used alone in teaching and learning of Economics in secondary schools if improved students' achievement must be made. However, owing to the above assertions, it is obvious that the lecture method is been faulted due to some of its shortcoming and the need for a paradigm shift becomes indispensable as a result of the fact that the world is becoming a global village and the students are expected to be able to compete with their

fellow counterparts. This paradigm shift requires that the teachers start utilizing other teaching approaches that encourage students' active participation during class activities like the problem solving method.

Problem solving teaching strategy consists of using generic or adhoc methods in an orderly manner for finding solutions to problems. It is the key to success and has been regarded as the most significant aspect of human behaviour. Problem - solving is the process of investigation where the solution is not obvious to the investigator at the initial stage. As a teaching strategy, problem-solving entails training the students on how to solve problems by proceeding in a logical step by step manner from a problem state to its solution. No wonder, Alabi and Lasisi (2015) believe that problem solving could be any action involving channeling the cavity between the anticipated solution and the problem itself. According to Mayer and Wittrock (2016) problem solving is related to thinking reasoning decision making, critical thinking and creative thinking. Thinking refers to a problem solver's cognitive processing, but it includes both directed thinking. Reasoning refers to problem-solving with a specific task in which the goal is to draw a conclusion from the premises using logical rules base on deduction or induction. Creative thinking and critical thinking refers to specific aspects of problem-solving. Mayer and Wittrock (2016) distinguished among four cognitive processes in problem solving representing in which the problem solver constructs a cognitive representation of the problem planning, in which the problem solver devises a plan for solving the problem, executing in which the problem solver carries out the plan and self-regulating, in which the problem solving evaluates the effectiveness of cognitive processing during calculation and balancing of Economics equations in various schools.

Problem solving method plays an important role in the academic achievement of students and has received broad public interest as an important competency in modern societies. Akinwumi and Falemu (2017) assert that problem-solving is a systematic approach that reviews learning competencies, comprehending and composing, critical and creative thinking, these features are most important dimensions of thinking and learning in regardless of the acknowledgment of the importance of developing problem-solving skills. Akuma (2018) avers that p problem solving instructional strategy enables teacher and the student to bridge the gap between a problem and a solution by using information (knowledge) and reasoning. The use of problem solving method as an innovative means of teaching Economics seems to accelerate students' academic achievement. Empirically, Ayeni (2022) who investigated the effects of experiential learning and problem-solving strategies on academic performance of Biology students at senior level in some senior secondary schools located in south-west Nigeria found that after exposure of experimental group to experiential learning, problem solving strategies, their performance was high compare to their counterparts in control group. Again, Abdurahaman, Usman, Olorukooba and Bichi (2016) who investigated the impact of problem-solving and discovery strategies on attitude, retention and academic performance in genetic concepts among secondary school students in Zaria, Nigeria found that gender did not show any difference in performance in all the two teaching strategies.

Gender refers to the apparent commonality in the relationship between male and female in terms of academic achievement in a school setting. Bello (2016) contends that human is either male or female, provided with either masculine or feminine qualities. Gender is defined by Gupta, Pasrija and Kavita (2015) as a psychological term describing behaviour and attributes expected of individuals on the basis of being born either a male or a female. Changeiywo (2012) on the embrassive nature of gender observes that, it is a cultural construct writing developed by society to distinguish the roles, behaviours, mental and emotional characteristics between male and female. Dike and Abimbola (2010) assert that gender is obvious from birth and children are socialized very early into appropriate sex-typed-occupations. Gender from the above, is the societal meaning assigned to male and female with a particular role that each should play. This is verifiable because, there is a general belief among Nigerians that males are superior to females in terms of physical physique, cognition, logical reasoning and even in their learning outcomes (Anigbogu, 2012). Gender differential valuation of male and female has been viewed as an integral part of the educational process and the development of the male and female personalities. This is so because it

is the biased role expectation of culture and society ascribed based on being males or females. Filgona and Sababa (2017) in a study on gender role stereotypes and career choice of secondary school students observed that boys showed interest on brain tasking careers while girls were more interested on subjects that do not require much brain work.

The teaching of Economics in schools has not really met standard owing to the fact that teachers adopt the teacher-centered method which promotes rote memorization. Problem solving method in teaching Economics is necessary as it will equip the students with skills both now and when they further their studies. Based on the experiences gathered from scholarly works on these methods of teaching, evidences showed that the problem solving method is successful when applied in teaching of subjects like Chemistry, Accounting, Physics, Social Studies, Basic Science amongst others in secondary schools across Nigeria (Akinwumi & Falemu, 2017; Akuma, 2018; Ayeni, 2022; Abdurahaman, Usman, Olorukooba & Bichi, 2016) without any research of this magnitude carried out in Economics. Some of the results obtained are complementary to each other and sometimes contradicting each other. Considering the importance of this study, there is an apparent gap which would be bridged and this work offers itself as a link and attempt will be made in the direction of exploring the effect of problem solving method on students' achievement in Economics in public senior secondary schools in Anambra State, Nigeria.

Statement of the Problem

Students' achievement in Economics in external examinations in senior secondary school is persistently low and has been a source of worry to the students, government, teachers and the society at large. The West African Examination Council (WAEC) Chief Examiners' Report (2024) observes that a nationwide performance of Economics students for the past five years showed that: 23.28% passed in 2020, 23.12% in 2021, 18.11% passed in 2022, 13.47% in 2023 and 19.42% in 2024. Owing to the statistics shown above, it is evident that the dwindling performance is a pointer that students now compete for the last position instead of first in subjects like Economics in School Certificate Examination. The persistent increase in poor performance of senior secondary schools students in Economics if not urgently addressed could result to students' lack of motivation in the subject which leads to their inability to further study the course as a field of study in tertiary institutions. This drastic decline in students' achievement in Economics could be as a result of non-utilization of appropriate teaching approaches. Thus, one way to avert this consistent failure could be to employ an effective teaching and learning methods. Consequently, this study tries to find out whether the problem solving method could be relatively effective in the improvement of male and female students' achievement in Economics in public senior secondary schools in Anambra State? The pursuit of the answer to the above question is the problem of this study.

Scope of the Study

The geographical scope of the study covered all the public senior secondary schools students in Anambra State. Gender was considered as a moderating variable in this study, as the researcher compared the academic achievement of male and female students. That is, the researcher tried to find out the influence of gender on the achievement of students in Economics using problem solving method as treatment group while traditional strategy (lecture method) as control group. The content scope of Economics achievement for this study was restricted to: population, labour market, distributive trade, money, inflation, utility, theory of demand and supply.

Research Questions

The following research questions were raised to guide the study;

1. What are the post-test mean scores of students taught Economics using problem solving method and lecture method?

2. What are the post-test mean scores of male and female students taught Economics using problem solving method?

Hypotheses

The following hypotheses were formulated and tested at 0.05 level of significance:

H₀₁: There is no significant difference between the post-test mean scores of students taught Economics using problem solving method and lecture method.

H₀₂: The post-test mean scores of male and female students taught Economics using problem solving method do not differ significantly.

Method

This study adopted the quasi-experimental design using pre-test and post-test with experimental and control groups. The reason for adopting this design is because intact classes were employed so that school activities would not be disturbed as the exercise lasted for six weeks. With the use of this design, Ukozor, Onah, Ekwonye and Ogomaka (2021) opine that threats to internal validity due to history, maturation, testing, instrumentation and regression were eliminated. The design was considered appropriate because it establishes cause-effect relationship between the independent variables (teaching approaches) and dependent variables (academic achievement in Economics) and intact classes were used because of the randomization of the subject. The population is 76,542 SS 1 – 3 students in all the 263 public secondary schools in Anambra State. The sample size is 85 senior secondary two (SS 2) students offering Economics using purposive and cluster sampling techniques. The choice of SS 2 class was because they were matured enough after SS 3 that might be busy preparing for their final examination, while it was perceived that SS 1 are not yet fully abreast about the various concepts of Economics. Purposive sampling technique was used to sample two coeducational schools because they have similar nature of school facilities.

The researcher purposively chose SS 2 Economics class and clustered them into two groups of experimental group and control group i.e. 41 students (20 males and 21 females) in the experimental group and 44 students (22 males and 22 females) in the control group. The instrument used for the collection of data for this study was a researcher developed achievement test titled, Economics Achievement Test (EAT). The EAT was used to elicit the academic achievement of students in Economics as a subject both at pre-test and post-test which contained 20 items of multiple choice questions with four options (letters A to D) each, out of which only one option is the correct answer. Each test item is allocated one mark and this gave a total of 20 marks. The instrument was validated by three research specialists, two in Economics Education and one in Measurement and Evaluation, from Imo State University, Owerri. Reliability coefficient of 0.83 was obtained using Kuder-Richardson 20 statistic (KR-20). Four lessons note were prepared, each on teaching Economics via problem solving method and lecture method. Four regular Economics teachers from the selected schools and classes for the experimental group and control group were enlightened separately for 5 days. The enlightenment sessions drilled them on the content, methodology and the procedural design of the study. At the end of the training, the teachers were assigned to group each based on the sessions. Teaching started immediately after the pre-test in each of the classes. Two of the research assistants taught the experimental group using problem solving method while the remaining two research assistants taught the control group using lecture method.

The researcher monitored the teaching at all the stages. Teaching lasted for six weeks at the end of which post test was administered to all the groups. The EAT was administered, as the post-test. Strict

examination conditions were observed during post-testing. The EAT used for the pre-test, was administered to the subjects as the post-test. The same procedure and conditions was used while conducting the pre-test was adopted. The researcher marked and scored the scripts and the computed scores were used for data analysis. Research questions were answered using mean and standard deviation. Analysis of Covariance (ANCOVA) was used to test the hypotheses at a 0.05 level of significance. The rationale behind the choice of ANOVA was that it adjusts for covariates, providing a more nuanced understanding of variables' interactions. **Decision Rule:** When the p-value is equal to or less than the chosen alpha, reject the null hypothesis, if otherwise, accept the null hypothesis.

Result

Research Question One: What are the post-test mean scores of students taught Economics using problem solving and those taught using lecture methods?

Table 1: Mean achievement scores of students taught Economics using problem solving and those taught using lecture methods at pretest and posttest.

Test Groups	Pre-test			Post-test	
	n	$\bar{x}$	S	$\bar{x}$	S
Problem solving method	41	21.88	2.648	38.22	2.752
Lecture method	44	22.34	2.727	26.34	2.853

Data in Table 1 shows the mean achievement scores of students taught Economics using problem solving and those taught using lecture methods at pretest and posttest. From the Table, students who were taught Economics with problem solving method had post test mean score of 38.22 and the standard deviation stood at 2.752, while those taught Economics with lecture method had post test mean score of 26.34 with a standard deviation of 2.853. The disparity between the mean scores of the groups indicated that problem solving method is effective in the improvement of students' achievement in Economics more than the lecture method in senior secondary schools in Anambra State.

Hypothesis One:

H₀₁: The post-test mean scores of students taught Economics using problem solving and those taught using lecture methods are not significantly different.

Table 2: ANCOVA F-test Analysis for the Test of Hypothesis 1

Tests of Between-Subjects Effects					
Dependent Variable: Post Test					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	3.133.788 ^a	2	1566.894	250.074	.000
Intercept	566.662	1	566.662	90.438	.000
Pre_Test	139.122	1	139.122	22.204	.000
Methods	3084.707	1	3084.707	492.315	.000
Error	513.789	82	6.266		
Total	91072.000	85			
Corrected Total	3647.576	84			

a. R Squared = .859 (Adjusted R Squared = .856)

Table 2, shows the result of the analysis with respect to hypothesis 1 for the significant difference between the mean scores of students taught Economics using problem solving and those taught using lecture methods. The result indicated that the F-calculated (F-cal) value is high at 492.315. The p-value of 0.000 is less than the 0.05 level of significance. Therefore, the null hypothesis is rejected thereby accepting the alternate hypothesis which concluded that the post-test mean scores of students taught Economics using problem solving and those taught using lecture methods are significantly different in public senior secondary schools in Anambra State.

Research Question Two: What are the pretest and post-test mean scores of male and female students taught Economics using problem solving method?

Table 3: Pre-test and post-test mean scores of male and female students taught Economics using problem solving method.

Test	Pre-test			Post-test	
Problem solving method	n	$\bar{x}$	SD	$\bar{x}$	SD
Gender					
Male	20	21.30	2.408	38.40	2.583
Female	21	22.43	2.803	38.05	2.958

Table 3 shows the result of the analysis with respect to research question 4 indicating the pre-test and post-test mean scores of male and female students taught Economics using problem solving method. The result presented showed that male and female students that were taught Economics with problem solving method had post-test mean achievement scores of 38.40 with standard deviation as 2.583 and 38.48 with standard deviation as 2.958 respectively. The scores in the distribution are homogenous because there is a slight difference between the mean scores as indicated by the low standard deviation. The result from the above table showed that both male and female students achieved slightly the same scores when taught Economics using problem solving method in public senior secondary schools in Anambra State.

Hypothesis Two:

H₀₂: The post-test mean scores of male and female students taught Economics using problem solving method do not differ significantly.

Table 4: ANCOVA F-test Analysis for the Test of Hypothesis 2

Tests of Between-Subjects Effects						
Dependent Variable: Post Test						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	
Corrected Model	55.289 ^a	2	27.645	4.240	.022	
Intercept	444.854	1	444.854	68.236	.000	
Pre_Test	54.017	1	54.017	8.286	.007	
Gender	7.218	1	7.218	1.107	.299	
Error	247.735	38	6.519			
Total	60193.000	41				
Corrected Total	303.024	40				

a. R Squared = .182 (Adjusted R Squared = .139)

In Table 4, the data shows the result of the analysis with respect to hypothesis 4 on the significant difference between the mean scores of male and female students taught Economics using problem solving method strategy at pretest and posttest. The result on the table indicated that the F-calculated (F-cal) value is high at 1.107. The calculated p-value of 0.299 is greater than the 0.05 level of significance. Since the calculated p-value is greater than a 0.05 level of significance, the researcher did not reject the null hypothesis thereby concluding that the post-test mean scores of male and female students taught Economics using problem solving method do not differ significantly in public senior secondary schools in Anambra State.

Discussion of Findings

The result revealed that problem solving method is effective in the improvement of students' achievement in Economics more than the lecture method in senior secondary schools in Anambra State. It was further established that the post-test mean scores of students taught Economics using problem solving and those taught using lecture methods are significantly different in public senior secondary schools in Anambra State. Supporting the result, Ayeni (2022) found that after exposure of experimental group to experiential learning, problem solving strategies, their performance was high compare to their counterparts in control group. Similarly, Abdu-Raheem (2022) found that there is a significant difference between the achievement mean scores of students in the experimental and control groups. The result was strengthened by the fact that the problem-solving method is important in improving students' achievement in Economics as it enables learners to develop critical thinking, analytical, and decision-making skills. By applying economic concepts to real-world problems, students can deepen their understanding and retain information more effectively. Unlike the lecture method, the problem-solving approach encourages active learning, creativity, and collaboration, leading to improved academic performance and practical application of economic principles. This method prepares students to tackle complex economic issues and make informed decisions in real-life situations in public senior secondary schools in Anambra State.

The result also revealed that both male and female students achieved slightly the same scores when taught Economics using problem solving method in public senior secondary schools in Anambra State. The result further established that the post-test mean scores of male and female students taught Economics using problem solving method do not differ significantly in public senior secondary schools in Anambra State. In tandem to the result, Abdurahaman, Usman, Olorukooba and Bichi (2016) found that gender did not show any difference in performance of students when taught using problem solving method. The result strengthened the fact that problem-solving method is an effective teaching approach for both male and female students in Economics, as it yields similar achievement scores for both genders. This implies that the problem-solving method can help bridge any potential gender gaps in Economics achievement. The finding highlights the importance of using interactive and engaging teaching methods that cater to diverse learning needs. The similar scores achieved by male and female students indicate that the problem-solving method is a gender-friendly approach to teaching Economics in public senior secondary schools in Anambra State.

Conclusion

In conclusion, problem solving teaching method is potent in the improvement of students' achievement in Economics. This is so because it allows the students to learn in teams while their teachers serve as guidance which enable facts findings and create the opportunity for the students to be creative and think critically towards solving economic problems in public senior secondary schools in Anambra State.

Recommendations

The researchers made the following recommendations based on the findings:

1. Teachers should incorporate activities that cultivate critical and higher order thinking skills in the students through problem solving method. This will help the students break away from the direct learning approach of memorization of facts and knowledge without real life applications.
2. Teachers should prioritize problem solving method as a gender-neutral instructional method in Economics to ensure equal opportunities for academic success and promoting inclusive learning environments in order to spur academic achievement in Economics.

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