

**EFFECTIVENESS OF GRAPHICS ORGANIZERS AND DISCOVERY LEARNING
METHODS ON STUDENTS ECONOMICS LEARNING OUTCOMES
IN KADUNA STATE, NIGERIA**

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Abstract

The study examined the effectiveness of Graphic Organizer and Discovery learning methods on students Economics learning outcomes in Kaduna State, Nigeria. The study had two (2) specific objectives, two research questions and two formulated null hypotheses. Quasi-experimental research design was adopted for the study. The population of this study was 15,381 SS II students offering Economics with sample of 327 from 3 intact classes. Economics Students Graphic Organizer and Discovery Test (ECGDT) was used as instrument for data collection. The validated instrument was pilot tested and 0.87 reliability index was obtained. Mean and Standard Deviation were used to analyse the research questions while Analysis of Covariance (ANCOVA) was used to test hypotheses one and two at a 0.05 level of significance. The results revealed among others that graphic organizer method is effective in teaching Economics Studies in Senior Secondary Schools in Kaduna State, Nigeria and the difference between pre-test and post-test is statistically significant (p-value=.000). Discovery method is effective in teaching Economics Studies in Senior Secondary Schools in Kaduna State, Nigeria and the difference between pre-test and post-test is statistically significant (p-value=.000). Students taught Economics using graphic organizer strategy performed better than those taught using lecture method in Senior Secondary Schools in Kaduna State, Nigeria and the difference between post-test is statistically significant (p-value=.000). The study concluded that both the graphic organizer and discovery methods are highly effective in teaching Economics to Senior Secondary School students in Kaduna State, Nigeria. The study recommended among others that Senior Secondary Schools authorities should encourage teachers to use Graphic organizer and discovery methods to teach students Economics since it improves performance in Senior Secondary Schools in Kaduna State.

Keywords: Graphics Organizer, Discovery Method, Economics, Learning Outcomes

Introduction

Teaching is the major way of imparting values, skills, norms and knowledge to learners especially students, therefore, teachers should teach to the needs and aspirations of the students, using suitable

methods of teaching that are available. The students fail because the teacher fails to teach appropriately to their needs and understanding using appropriate teaching methodologies and strategies. Teaching and education are two sides of the same coin. The success or failure of the education system rests squarely on the shoulders of teachers who should wake to more dedicated performance of their duties through continued improvement of their competences. Indeed, students' failure show poor teaching methods used by some teachers, while the standard and quality of education reflects the stand and quality of the teaching workforce (Kabir, 2020). Abu (2023), rational subjects are subjects that require logical and critical reasoning in the teaching and learning process. Economics is a rational subject because it teaches student on how to make rational decisions in the face of scarcity of resources.

Agene (2019) defines Economics as a study which teaches how to allocate limited resources to satisfy unlimited wants. This means that Economics does not only study the aspect of resources but also human management; and knowledge of Economics education help both the individual and the nation to promote national economic growth and development (Abu, 2023). It also makes the individual to be morally upright, rational and maintain an enviable degree of integrity in areas of requirement for occupational competences and economic self-reliance. So, Economics teachers should be mindful of this fact by creating conducive learning environment by employing other motivating elements such: being friendly to the learners, encouraging them to learn on their own to mention but a few to make students happy and develop interest in order to perform well. Factors that influence the choice of teaching methods include objective of the unit of an instruction; nature of the learners—level of intelligence and rate of assimilation; present knowledge level of the learners; nature of subject-matter for teaching; the number of students present in the classroom; availability of educational resources materials and the duration or period of the teaching assignment (Adoche, 2021). It is in line with the above notion that a feasibility study was carried out by the researchers to see whether Graphic Organizers Method and Discovery Method and it was discovered that they are not used in the study area which appears to be one of the reasons for low students' academic performance and retention in Economics.

On the other hand, discovery method of teaching is an appropriate method of teaching skill subjects especially Economics. This is because discovery method generates obvious enthusiasm and excitement in most children that is not obtained through mere formal presentations (Dikko, 2023). The discovery that is useful, however, is not random discovery but the discovery within an organized and structured framework that the teacher already has in mind. Jerome Bruner was the originator of discovery learning in the 1960s; although his ideas were similar to those of John Dewey. Bruner as cited by Okeme (2020), argues that discovery learning encourages active engagement, promotes motivation, autonomy, responsibility and independence, encourages the development of creativity and problem-solving skills and provides a tailored learning experience.

Review of Related Literature

The researchers reviewed some of the studies that are related to the present study.

Igomu (2020), carried out a research on the effect of graphic organizer and demonstration methods on Geography students' academic performance in senior secondary schools in Osun State, Nigeria. The study has five research objectives which were in line with research questions and null hypotheses. Stratified random sampling technique was adopted in this study. 330 students were used as sample size out the total population of 4,357 of Geography students within the study area. The findings of the study show that students that were taught using graphic organizer and demonstration methods

performed better than those taught using conventional method. It was therefore, recommended among other things that Geography teachers should use graphic organizer and demonstration methods to teach their students since they improve their students' academic performance.

Abah (2020), conducted a research on the effects of discovery and graphic organizer methods on Islamic Studies students' academic performance in junior secondary schools in Sokoto State, Nigeria. The study has six research objectives which were in line with research questions and null hypotheses. Intact classes were used in this study. 352 students were used as sample size out the total population of 5,571 of Islamic Studies students within the study area. The findings of the study show that students that were taught using project and graphic organizer methods performed better than those taught using conventional method. It was therefore, recommended among other things that Islamic Studies teachers should use discovery and graphic organizer methods to teach their students since they improve their students' academic performance.

Research Objectives

The study was guided by the following objectives to:

1. find out the difference between pre-test and post-test performance of Islamic Studies Students taught with graphic organizer instructional strategy in Senior Secondary schools in Kaduna State, Nigeria; and
2. examine the difference between pre-test and post-test performance of Islamic Studies students taught with discovery instructional strategy in Senior Secondary Schools in Kaduna State, Nigeria.

Research Questions

The study was guided by the following questions to:

1. What are the effects of Graphic Organizers on the Academic Performance before and after treatment of Students taught Economics in Senior Secondary Schools in Kaduna State, Nigeria?
2. Does discovery method have any effect on the academic performance before and after treatment of students' taught Economics in senior Secondary School in Kaduna State, Nigeria?

Hypotheses

The following null hypotheses were tested at 0.05 levels of significance to ascertain its level of acceptance or otherwise:

H01: There is no significant difference in the pre-test and post-test performance before and after treatment of Economics Students using Graphic Organizer in Senior Secondary Schools in Kaduna State, Nigeria; and

H02: There is no significant difference between the pre-test and post-test performance before and after treatment of Students taught Economics using Discovery Method of Teaching in Senior Secondary Schools in Kaduna State, Nigeria.

Methodology

Quasi-experimental research design was adopted for this study with pre-test, post-test, post-post-test and control group (this means, intact classes were used). The population of this study was 15,381 SS II students offering Economics with sample of 327 from 3 intact classes (112 students for graphic organizers, 125 students for discovery, and 90 students for conventional method). The three groups are pre-tested to determine the equivalence ability of the students. The study has three groups. Two

experimental groups and one control group. The post -test was administered two weeks after the pre-test to test the students’ retention ability (Amedu, 2023). The researchers personally administered the questionnaire to ensure a high retrieval rate. Data were analysed using simple percentages and mean scores to answer the research questions. The null hypotheses were tested using t-test and Analysis of Variance (ANOVA) at the 0.05 level of significance.

Presentation and Analysis of Data

For the purpose of this study, data were presented and analyzed in accordance with the research questions and null hypotheses formulated. The presentation is organized as follows:

Research Question One: What is the difference between pre-test and post-test performance of Economics students taught using graphic organizers method in Senior Secondary Schools in Kaduna State, Nigeria?

To answer this research question, a test result was analysed using Mean and Standard Deviation as presented in Table 1.

Table 1: Mean and Standard Deviation on Difference between Pre-test and Post-test Performance of Economics Students taught using Graphic Organizers Method in Senior Secondary Schools

Variable	N	Mean	SD	Mean Diff
Pre-test Graphic Organizers	112	24.42	3.76	17.4
Post-test Graphic Organizers	112	59.16	4.47	

Source: Field Survey, (2026).

The analysis of result in Table 1 shows the difference between pre-test and post-test performance of Economics students taught using graphic organizers method in Senior Secondary Schools in Kaduna State, Nigeria. The result revealed 24.42 and 59.16 pre-test and post-test mean performances of Economics students taught with graphic organizers method with a mean difference of 17.4. This implied that graphic organizer method is effective in teaching students Economics in Senior Secondary Schools in Kaduna State, Nigeria.

Research Question Two: What is the difference between pre-test and post-test performance of Economics students taught using discovery method in Senior Secondary Schools in Kaduna State, Nigeria?

To answer this research question, a test result was analysed using Mean and Standard Deviation is as presented in Table 2.

Table 2: Mean and Standard Deviation on Difference between Pre-test and Post-test Performance of Economics students taught using Discovery Method in Senior Secondary Schools

Variable	N	Mean	SD	Mean Diff
Pre-test Discovery	125	27.26	2.90	9.5
Post-test Discovery	125	46.16	3.99	

Source: Field Survey (2026).

The analysis of results in Table 2 shows the difference between pre-test and post-test performance of Economics students taught with discovery method in Senior Secondary Schools in Kaduna State,

Nigeria. The result revealed 27.26 and 46.16 pre-test and post-test mean performances of Economics students taught with discovery organizers method with a mean difference of 9.5. This implied that discovery method is effective in teaching students Economics in Senior Secondary Schools in Kaduna State, Nigeria.

Hypotheses Testing

The hypotheses formulated for the study were tested using, the t-test and Analysis of Covariance (ANCOVA) at the 0.05 level of significance. A summary of the results for each hypothesis tested is presented in Tables 3, and 4.

HO1: There is no significant difference between the pre-test and post-test performance of Economics Students taught with graphic organizers method in Senior Secondary Schools in Kaduna State, Nigeria.

Data collected to address the null hypothesis one was summarised and presented in Table 3.

Table 3: Mean and Standard Deviation on the difference between the Pre-test and Post-test performance of Economics Students taught using Graphic Organizers Method in Senior Secondary Schools in Kaduna State, Nigeria

Variable	Mean	SD	Df	t-cal	p-value
Pre-test Graphic Organizers	12.21	3.76			
			222	26.90	.000
Post-test Graphic Organizers	29.58	4.47			

Source: Field Survey, (2026).

The analysis of result in Table 3 shows the difference between the pre-test and post-test performance of Economics Students taught with graphic organizers method in Senior Secondary Schools in Kaduna State, Nigeria. The result revealed a calculated t-cal value of 26.90 with p-value of .000 which is less than 0.05 level of significance. The hypothesis was rejected which implied that significant difference exists between pre-test and post-test mean performances of students taught Economics using graphic organizers method in Senior Secondary Schools in Kaduna State, Nigeria

HO2: There is no significant difference between the pre-test and post-test performance of Economics students taught using discovery method in Senior Secondary Schools in Kaduna State, Nigeria.

Data collected to address the null hypothesis two was summarised and presented in Table 4.

Table 4: Mean and Standard Deviation on the Difference between the Pre-test and Post-test Performance of Economics students taught using Discovery Method in Senior Secondary Schools

Variable	Mean	SD	Df	t-cal	p-value
Pre-test Discovery	27.26	2.90			
			248	30.62	.000
Post-test Discovery	46.16	3.99			

Source: Field Survey (2026).

The analysis of result in Table 4 shows the difference between the pre-test and post-test performance of Economics Students taught using discovery method in Senior Secondary Schools in Kaduna State, Nigeria. The results revealed a calculated t-cal value of 30.62 with p-value of .000 which is less than 0.05 level of significance. The hypothesis was rejected which implied that significant difference

exists between pre-test and post-test mean performances of students taught Economics using discovery method in Senior Secondary Schools in Kaduna State, Nigeria.

Discussion of Findings

Based on the findings of the study the following were discussed.

Graphic organizer method improve the performance of Economics students in Senior Secondary Schools in Kaduna State, Nigeria and the difference between pre-test and post-test is statistically significant ($p\text{-value}=.000$). This finding is in line with the report of Umeh (2022) who reported that Graphic Organizer is one of the learner centered method of teaching whereby a teacher uses representation of direct reality like drawing, sketches, diagrams, charts, graphs, maps and posters. The finding is also in line with that of Ojeeh (2021) and Omale (2024), who submitted that graphic organizer is seen as a knowledge map, concept map, story map or tools designed to sustain the learning abilities of students with the view of improving students' academic performance.

On the other hand, discovery method is effective in teaching students Economics in Senior Secondary Schools in Kaduna State, Nigeria and the difference between pre-test and post-tests is statistically significant ($p\text{-value}=.000$). This finding agrees with report of Amedu (2023) who said that Discovery method of teaching is an appropriate method of teaching skill subjects especially Economics. This is because discovery method generates obvious enthusiasm and excitement in most children that is not obtained through mere formal presentations (Amedu, 2023). Jerome Bruner was the originator of discovery learning in the 1960s; although his ideas were similar to those of John Dewey. Likewise, Bruner (1949) as cited by Adoche (2021), argues that discovery learning encourages active engagement, promotes motivation, autonomy, responsibility and independence, encourages the development of creativity and problem-solving skills and provides a tailored learning experience.

Students taught Economics using graphic organizer method performed better than those taught using lecture method in Senior Secondary Schools in Kaduna State, Nigeria and the difference between post-tests is statistically significant ($p\text{-value}=.000$). This finding is in line with the report of Adoche (2021), who lamented that that most of the Nigerian Economics teachers seem not to carry out instruction using participatory methods such as graphic organizer, peer-teaching, discovery, demonstration, discussion and fieldtrip because they consume time despite its effectiveness.

Conclusion

Based on the findings, the study concluded that both the graphic organizer and discovery methods are highly effective in teaching Economics to Senior Secondary School students in Kaduna State, Nigeria. The statistically significant differences in pre-test and post-test scores indicate that both methods significantly enhance student performance compared to traditional lecture methods. Additionally, students taught using graphic organizers and discovery methods outperformed those taught using lectures, confirming the superiority of these interactive teaching approaches. While both methods improve academic performance, the results show no significant difference in effectiveness between them.

Recommendations

Based on the findings of this study, the following recommendations are made:

1. Government at all levels and Senior Secondary Schools authorities should organize workshops, conferences, symposia, and seminars to encourage teachers to use Graphic organizer strategy to teach students Economics since it improves performances in Senior Secondary Schools in Kaduna State; and

2. Government at all levels and Senior Secondary Schools authorities should sensitize and encourage teachers to use discovery strategy to teach students Economics since it improves performances in Senior Secondary Schools in Kaduna State.

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