

Effects of Heuristic and Jigsaw Strategies on ... Bara'u R. & Mustapha, A. (2025)

Effects of Heuristic and Jigsaw Strategies on Performance and Retention in Islamic Studies Concept among Secondary School Students in Kaduna State, Nigeria

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Abstract

This study is titled "Effect of Heuristic and Jigsaw Strategy on Academic Performance and Retention of Students in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria." The study used six (6) specific objectives that include, determining the post-test performance scores of students taught the Islamic economic system using the Heuristic strategy and those taught using the conventional method; comparing the post-test performance score of students taught the Islamic Economic System using the Jigsaw strategy, among others. All research questions and hypotheses were in harmony with the objectives. The study was delimited to SS II Islamic Studies students. Only the Islamic Economic System was covered with Heuristic, Jigsaw, performance, and retention ability as variables. The study adopted a Quasi-experimental design with a population of 29 senior secondary schools and 2, 138 students. A 195 sample size was drawn from the population and used from 3 intact classes using the purposive sampling. Islamic Studies Performance and Retention Ability Test (ISPRAT) was used as an instrument for data collection. The instrument was pilot tested and the result obtained for reliability coefficient was 0.83 index level. Data were collected by self and analyzed using Mean and standard deviation, and t-test. Hypotheses 1&2 were rejected, 3-6 retained at 0.05 significant level. Findings made revealed that jigsaw and heuristic strategies boost students' performance more than conventional strategy. Jigsaw and heuristic strategies were found to retain knowledge better than the conventional strategy. It was recommended that schools and teachers should embrace the use of these collaborative strategies

Keywords: Heuristic Strategy, Jig Saw Strategy, Performance, Retention and Islamic Studies

Introduction

Teaching involves the interaction between educators and learners to impart knowledge to students. It is a complex and multifaceted profession, requiring instructors to adeptly manage various activities and objectives simultaneously. Effective teaching necessitates the implementation of rules or regulations that underscore the value of intentional instruction. Teaching, fundamentally, is the act of making someone knowledgeable about a particular subject. It constitutes a teacher's job, career, or professional pursuit, encompassing the concepts or principles authorities convey in a discipline. This pertains to almost every subject students should learn from their teachers, who employ various instructional strategies and resources to facilitate comprehensive learning. Teaching encompasses a variety of tasks undertaken by educators to guide learners toward anticipated learning outcomes. It involves conveying knowledge, instructing individuals on performing tasks and facilitating learning or understanding through example or experience. The art and science of teaching revolve around assisting others in expanding their knowledge, sharing experiences, and learning from one another. Teaching entails creating an environment and interacting with others to facilitate specific learning objectives. Essential elements such as focus, knowledge, and ability are crucial in engaging individuals in learning (Smith, 2018). These definitions highlight that teaching is an interactive process involving the teacher, learners, and the learning environment. Clarity and precision regarding the meaning and responsibilities of teaching are essential for educators, as their understanding profoundly influences their actions in the classroom. A strong grasp of the subject matter, access to quality resources, and the ability to engage students effectively contribute to successful teaching outcomes.

It is sad to say that students at Senior Schools today are not performing well in Islamic studies, and their concentration, attention, interest, remembering, and retention are so low that it is shown or seen in the outcome of their results. This problem could be attributed to Islamic studies teachers' poor knowledge of new or recent/modern teaching strategies. It could also be attributed to teachers' unskilful and unprofessional selection and utilization of such new or modern teaching



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strategies. In addition, poor creativity, motivation, and large class size control could be the reasons for the drop in students' performance in Islamic studies. This and many others inspired the need to conduct the current research. Evidences shown in the works of Ibrahim (2019) and Aliyu (2023). revealed such inconsistency in students' performances in Islamic Studies. Islamic studies students may present good grades in their final results. However, the level of knowledge comprehension, application and recalling or bringing back from the memory what the teacher taught in the class may need to be revised. A series of attempts were made to curtail this problem, but the story is the same today. A teaching strategy that calls for interactivity, cooperativeness, and collaboration is among the better approaches to teaching and learning Islamic studies at senior secondary levels; hence, the choice of Jigsaw and Heuristic strategy in the present study, in which Nguyen, William and Nguyen (2012) made similar assertion. The study covered all Senior Secondary Schools in Zaria Quality Assurance Authority in Kaduna State with only Students of SS II. Conceptually, the study concentrated on two main strategies as independent variables: Heuristic and Jigsaw, as well as the dependent variables of academic performance and retention ability. The content taught was delimited to the concept, items, and issues raised in Islamic studies (Islamic economic system viz-a- zakat, sadaqah and Baytul-mal).

Objectives of The Study

1. Determine the post-test performance scores of students taught Islamic Economic System using Heuristic strategy and those taught using conventional strategy in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria.
2. Compare the post-test performance scores of students taught the Islamic Economic System using the Jigsaw strategy and those taught with conventional strategy in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria.
3. Compare the post-test performance scores of students taught Islamic Economic System using the Heuristic strategy and those taught using the Jigsaw strategy in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria.
4. Ascertain the post-test performance and retention ability scores of students taught Islamic Economic System using heuristic strategy in Islamic Studies in Senior Secondary Schools Kaduna State, Nigeria.
5. Examine the post-test performance and retention ability scores of students taught the Islamic Economic System using the Jigsaw strategy in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria.
6. Compare the retention ability of students taught Islamic Economic System using Heuristic strategy and those taught using Jigsaw strategy in Islamic Studies in Senior Secondary Schools Kaduna State, Nigeria.

Research questions

1. What are the post-test performance scores of students taught Islamic Economic System using Heuristic strategy and those taught using conventional strategy in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria?
2. What is the difference in post-test performance scores of students taught the Islamic Economic System using the Jigsaw strategy and those taught using the conventional strategy in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria?
3. What is the difference in the post-test performance scores of students taught Islamic Economic System using the Heuristic strategy and those taught using Jigsaw strategy in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria?
4. What is the difference in the post-test performance scores and retention ability of students taught Islamic Economic System using the Jigsaw strategy in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria?
5. To what extent do the post-test performance scores and retention ability of students taught Islamic Economic System using Heuristics differ in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria?
6. What is the difference in the post-test retention ability of students taught Islamic Economic System using Heuristic and Jigsaw strategies in Islamic Studies in Senior Secondary Schools Kaduna State, Nigeria?

Hypotheses

- H₀₁: There is no significant difference between the post-test performance scores of students taught Islamic Economic System using Heuristic strategy and those taught using conventional strategy in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria.
- H₀₂: There is no significant difference between the post-test performance scores of students taught the Islamic Economic System using Jigsaw strategy and those taught with the conventional strategy in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria.



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- H03: No significant difference exists between the post-test performance of students taught the Islamic Economic System using the Heuristic strategy and those taught using Jigsaw strategy in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria.
- H04: There is no significant difference between the post-test performance scores and retention ability of students taught Islamic Economic System using Heuristic strategy in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria.
- H05: No significant difference exists between the post-test performance scores and retention ability of students taught Islamic Economic System using Jigsaw strategy in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria.
- H06: There is no significant difference between the retention ability of students taught Islamic Economic System using Heuristic and Jigsaw strategies in Islamic Studies in Senior Secondary Schools Kaduna State, Nigeria.

Review of related literature

Learner-Cantered Approaches

By its name, this approach allows learners to determine how the lesson will be handled. The teacher sets the pace of the teaching but allows learners to be fully engaged in a lesson with their voices heard. This approach allows the learners to drive the instruction and set the tone. The teacher provides leadership while the learners contribute to making the lesson successful (Bello (2015)). This approach makes learning interesting and democratic because all class members (teacher and learners) are involved. The learners see the lesson as their making, and the degree of freedom is further recognized. It makes the lesson passionate and meaningful. This approach is regarded as nurturing the nature strategies under this approach, including discussion, role-play, Heuristic and Jigsaw strategies, which are more relevant to the present work.

Heuristic Strategy

The term heuristic pertains to problem-solving, and the heuristic teaching strategy is grounded in the psychological principles of the trial and error theory. This approach requires logical thinking and imagination as prerequisites. The heuristic teaching strategy is an efficient and rapid method that necessitates independent discovery by students (Bichi (2002)). In this method, the teacher introduces a problem to the learners and then steps aside, allowing the students to uncover the solution. The heuristic strategy cultivates habits of inquiry and investigation among students, promoting self-study and self-direction. It fosters a scientific attitude by encouraging honesty in decision-making through real experiments. This approach is psychologically beneficial, emphasizing maximum learning through hands-on experience. It instills diligence as most of the work is completed at school, eliminating the need for additional tasks at home. (Eze (2021)). The heuristic strategy facilitates individual attention, fostering a positive relationship between teachers and learners. It contributes to cognitive, emotional, and psychological development, aiding overall growth. Students are placed in a situation where they learn independently, enhancing confidence and self-control. In the heuristic strategy, learners are presented with a problem and tasked with finding solutions using various resources such as libraries, laboratories, and workshops. The teacher's role is to initiate learning, and students remain active participants throughout the learning process, employing creative thinking and imagination to derive solutions based on logic, thus learning through self-experience.

Jigsaw Strategy

The Jigsaw strategy comprises a home group and an expert group. The lesson is divided into independent sub-lessons that are conducted concurrently, (Jansoon, Samsook and Coll (2008)). Each student becomes an expert in one sub-lesson as part of a group investigation. The group selects an engaging topic for the investigation, and students generate questions, constructing their knowledge collaboratively. The Jigsaw strategy is a cooperative learning structure suitable for team assignments that require expertise in distinct areas. Students assume the role of "experts" on a concept and are accountable to other group members. The group is subdivided by topic, and members collaborate with peers from other groups who share the same topic. They then return to their original group to explain their respective topics. *Jigsaw* is a cooperative learning strategy grounded in the belief that learning is most effective when students actively share ideas and collaborate on academic tasks. Various Jigsaw approaches have been developed, involving students in teaching their peers. This method is most effective when topics are simple enough for students to teach to their peers but complex enough to warrant discussion and various instructional strategies (Atoshi (2014)). Topics such as meaning, importance, and conditions meet

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the above criteria that are hoped to make the learner actively involved in peer teaching, as some learners learn better when taught by their peers. This will surely enhance their performance and retention in such a regard.

Methodology

The research employed a Quasi-experimental design, incorporating a post-test as suggested by Sambo (2008) and a post-post test for assessing retention ability. As outlined by Nfon (2013), and Aliyu (2016), who emphasized that the quasi-experimental research design allows for the utilization of intact classes and established cause and effect relationship between dependent and independent variable. The study population comprised of all SS II Islamic Studies Students in Kaduna State, Nigeria. The population was drawn from twenty-nine (29) public senior secondary schools which operate the same academic calendar and curriculum; the population consisted of 2,138 SS II students admitted in the 2023/2024 academic session in Zaria Quality Assurance Authority, Kaduna State (Ministry of Education, 2023) Headquarters, Kaduna State. The research sample size comprised of one hundred and ninety-five (195) students, specifically drawn from SS II Islamic Studies students, through purposive sampling technique. The schools used comprised of Government Girls Secondary School Kofan Gayan (A), Government Secondary School Zaria (B), and Government Secondary School, Karau-Karau (C). The instrument used in this study was a self-structured test item. It was titled "Islamic Studies Performance and Retention Ability Test (ISPRAT)". It comprised of 40 multiple-choice items, The students were made to select correct options from four (4) alternative responses, lettered (A-D), drafted from topics on the concept and importance of zakat, baytul-mal and sadaqah in Islam. The test was administered for a specific period of forty (40) minutes. The responses and the findings from the set test were analysed. Eighteen lessons plans were given to the three classes (2 Experimental and 1 Control group). Thereafter two tests were conducted in line with the treatment given. The first test was to determine the mean performance scores, while the second test was administered to determine retention scores. The research used Mean and Standard Deviation at the descriptive level to analyze research questions 1-6. A t-test was used to analyze research hypotheses 1-6. The scores or data acquired from the Islamic Studies performance and retention test were subjected to statistical analysis using the Statistical Package for Social Science (SPSS version 23). The result is presented, thus:

Presentation of Results

Answers to Research Questions

The analysis of research questions using mean and standard deviations were presented in Tables 1 to 6.

Research Question One: What is the post-test performance scores of students taught Islamic Economic System using Heuristic strategy and those taught using conventional strategy in Islamic Studies in Senior Secondary Schools Kaduna State, Nigeria?

For this research question, an examination outcome was utilized, and the overview of the scores is outlined in Table 1.

Table 1: Mean and standard deviation on differences in the post-test performance scores of students taught Islamic Economic System using Heuristic strategy and those taught using conventional strategy in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria

Variable	N	Mean	SD	Mean Diff.
Post-test Heuristic Str.	65	24.73	2.92	7.6
Post-test Conventional	70	17.18	3.07	

The examination of the outcomes presented in Table 1 indicated the contrast in the average post-test performance scores of students instructed in the Islamic Economic System using the Heuristic teaching strategy and those taught through the conventional strategy in Senior Secondary Schools in Kaduna State, Nigeria. The findings unveiled a post-test mean performance of 24.73 for students taught the Islamic Economic System using the Heuristic teaching strategy, compared to a post-test mean performance of 17.18 for those taught with the conventional strategy, resulting in a mean difference of 7.6 in favour of the Heuristic teaching strategy. This implied, that the Heuristic teaching strategy proved more effective than the conventional strategy in instructing students in the Islamic Economic System in Senior Secondary Schools in Kaduna State, Nigeria.

Research Question Two: What is the post-test performance scores of students taught Islamic Economic System using Jigsaw strategy and those taught using conventional strategy in Islamic Studies in Senior Secondary Schools Kaduna State, Nigeria?

For this research question, an examination result was employed, and a summary of the scores is outlined in Table 2.

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Table 2: Mean and standard deviation on difference in the post-test performance scores of students taught Islamic Economic System using Jigsaw strategy and those taught using conventional strategy in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria

Variable	N	Mean	SD	Mean Diff.
Post-test Jigsaw Str.	60	24.83	2.30	8.8
Post-test Conventional	70	16.03	3.00	

The examination of the outcomes in Table 2 illustrated the distinction in the post-test mean performance scores of students instructed in the Islamic Economic System using the Jigsaw teaching strategy compared to those taught through the conventional strategy in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria. The results exhibited post-test mean performances of 24.83 for students taught the Islamic Economic System using the Jigsaw teaching strategy, in contrast to 16.03 post-test mean performances for those instructed with the conventional strategy, indicating a mean difference of 8.8. Therefore, it can be inferred that, the Jigsaw teaching strategy was more effective than the conventional strategy in imparting knowledge of the Islamic Economic System to students in Senior Secondary Schools in Kaduna State, Nigeria.

Research Question Three: What is the post-test performance scores of students taught Islamic Economic System using Heuristic strategy and those taught using Jigsaw strategy in Islamic Studies in Senior Secondary Schools Kaduna State, Nigeria?

For this research question, a test outcome was employed, and the compilation of the scores is delineated in Table 3.

Table 3: Mean and standard deviation on post-test performance scores of students taught Islamic Economic System using Heuristic strategy and those taught using Jigsaw strategy in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria

Variable	N	Mean	SD	Mean Diff.
Post-test Heuristic Str.	65	24.73	2.91	0.10
Post-test Jigsaw Str.	60	24.83	2.30	

The analysis of results in Table 3 illustrated the distinction in post-test mean performance scores among students instructed in the Islamic Economic System using Heuristic and Jigsaw strategies in Senior Secondary Schools in Kaduna State, Nigeria. The results disclosed a post-test mean performance of 24.73 for students taught the Islamic Economic System using a heuristic teaching strategy and 24.83 for those taught with a Jigsaw teaching strategy, indicating a mean difference of 0.1. This suggested that Heuristic and Jigsaw teaching strategies are efficacious in instructing students on the Islamic Economic System in Senior Secondary Schools in Kaduna State, Nigeria.

Research Question Four: What is the retention ability of students taught Islamic Economic System using Heuristic strategy in Islamic Studies in Senior Secondary Schools Kaduna State, Nigeria?

For this research question, a concise overview of the scores is provided in Table 4.

Table 4: Mean and standard deviation on retention ability of Students taught Islamic Economic System using Heuristic strategy in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria

Variable	N	Mean	SD	Mean Diff.
Post-test Heuristic Str.	65	24.73	2.92	0.24
Post-post-test Heuristic Str.	65	24.97	3.06	

The investigation results in Table 4 demonstrated how differently students taught the Islamic Economic System in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria, could retain the material. The findings showed that, students' post-test mean scores were 24.73 and 24.97, respectively, with a 0.24 difference. This indicated that in Senior Secondary Schools in Kaduna State, Nigeria. The heuristic teaching strategy preserved students' learning experiences in Islamic Studies.

Research Question Five: What is the retention ability of Student taught Islamic Economic System using Jigsaw strategy in Islamic Studies in Senior Secondary Schools Kaduna State, Nigeria?

A test result was utilised to address this study question and Table 5 presents a summary of the results.

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Table 5: Mean and standard deviation on retention ability of students taught Islamic Economic System using Jigsaw strategy in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria

Variable	N	Mean	SD	Mean Diff.
Post-test Jigsaw Str.	60	24.83	2.30	0.14
Post-post-test Jigsaw Str.	60	24.97	3.06	

Table 5 is an analysis of the memory ability of students taught the Economic System in Senior Secondary Schools in Kaduna State, Nigeria, using a heuristic teaching style. The findings showed that, students' post-test mean scores were 24.83 and 24.97, respectively, with a 0.14 difference in between the two. This indicated that at senior secondary schools in Kaduna State, Nigeria, the Jigsaw teaching strategy preserves students' learning experiences more in Islamic Studies.

Research Question Six: What is the retention ability of students taught Islamic Economic System using Heuristic and Jigsaw strategies in Islamic Studies in Senior Secondary Schools Kaduna State, Nigeria?

A test result was utilised to address this research topic, and Table 6 presents a summary of the results.

Table 6: Mean and standard deviation on retention ability of pupils taught Economic System using Heuristic and Jigsaw strategies in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria

Variable	N	Mean	SD	Mean Diff.
Post-post-test Heuristic Str.	65	24.66	2.30	0.09
Post-post-test Jigsaw Str.	60	24.75	0.81	

Table 6 analysed retention scores for students taught the Islamic Economic System in Senior Secondary Schools in Kaduna State, Nigeria, utilising Heuristic and Jigsaw teaching strategies. The findings showed that, with a mean difference of 0.09, the post-test mean scores of students taught the Islamic Economic System using a heuristic strategy was 24.66. In contrast, those taught with Jigsaw strategy had post-test mean scores of 24.75. This indicated that, at senior secondary schools in Kaduna State, Nigeria, heuristic and jigsaw teaching strategies helped students retain their knowledge of Islamic economic system and beyond.

Test of Hypotheses

Hypothesis One: There is no significant difference between the post-test performance scores of students taught Islamic Economic System using Heuristic strategy and those taught using conventional strategy in Islamic Studies in Senior Secondary Schools Kaduna State, Nigeria

Data collected to address the null hypothesis one was summarised and presented in Table 7.

Table 7: t-test analysis on the mean difference of post-test performance scores of students taught Islamic Economic System using Heuristic strategy and those taught using conventional strategy in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria

Variable	Mean	SD	Df	t-cal.	Sig.
Post-test Heuristic Str.	24.73	2.92	133	11.95	.003
Post-test Conventional	17.18	3.07			

Table 7 examined the differences in the mean performance scores on the post-test between students taught the Islamic Economic System in Senior Secondary Schools in Kaduna State, Nigeria, using a heuristic strategy and those taught with conventional strategy. Because the sig. value of .003 is considered less significant at the 0.05 level. Hence, the null hypothesis was rejected. Thus, in Islamic Studies at Senior Secondary Schools in Kaduna State, Nigeria, there is no discernible difference in the post-test performance scores of students taught Islamic Economic System using heuristic strategy and those taught it using a conventional strategy.

Hypothesis Two: There is no significant difference between the post-test performance score of students taught Islamic Economic System using Jigsaw strategy and those taught with conventional strategy in Islamic Studies in Senior Secondary Schools Kaduna, Nigeria

Data collected to address the null hypothesis two was summarised and presented in Table 8.

Table 8: t-test analysis on the mean difference between the post-test performance score of students taught Islamic Economic System using Jigsaw strategy and those taught with conventional strategy in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria

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Variable	Mean	SD	Df	t-cal.	Sig.
Post-test Jigsaw Str.	24.83	2.30	128	9.77	.002
Post-test Conventional	16.03	3.00			

Table 8 examined the differences in the post-test mean performance scores between students taught Islamic Economic System in Senior Secondary Schools in Kaduna State, Nigeria, using the Jigsaw strategy and students taught using conventional strategy. Because the sig. value of .002 is below the 0.05 level of significance; the null hypothesis was rejected. This indicated that, in Islamic economic system in Senior Secondary Schools in Kaduna Nigeria, there is no discernible difference in the post-test mean performance scores of students taught Islamic Economic System using the Jigsaw strategy and those taught with conventional strategy.

Hypothesis Three: There is no significant difference between the post-test performance scores of students taught Islamic Economic System using Heuristic strategy and those taught using Jigsaw strategy in Islamic Studies in Senior Secondary Schools Kaduna, Nigeria

Data collected to address the null hypothesis three was summarised and presented in Table 9.

Table 9: t-test analysis on the mean difference of the post-test performance scores of students taught Islamic Economic System using Heuristic strategy and those taught using Jigsaw strategy in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria

Variable	Mean	SD	Df	t-cal.	Sig.
Post-test Heuristic Str.	24.73	2.91	123	.212	.833
Post-test Jigsaw Str.	24.83	2.30			

Table 9 examined the differences in the post-test mean performance scores of students taught the Islamic Economic System in Senior Secondary Schools in Kaduna State, Nigeria, using Heuristic and Jigsaw strategies. Because the sig. value of .833 is more than 0.05 significant level, so the null hypothesis was retained. This indicated no discernible difference in the post-test mean performance scores of students taught the Islamic Economic System in Senior Secondary Schools in Kaduna, Nigeria, using Heuristic strategy and those taught with Jigsaw strategy.

Hypothesis Four: There is no significant difference between post-test mean performance scores and retention ability of students taught Islamic Economic System using Heuristic strategy in Islamic Studies in Senior Secondary Schools Kaduna State, Nigeria

Data collected to address the null hypothesis four was summarised and presented in Table 10.

Table 10: t-test analysis on the mean difference between post test performance scores and the retention ability test of students taught Islamic Economic System using Heuristic strategy in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria

Variable	Mean	SD	Df	t-cal.	Sig.
Post-test Heuristic Str.	24.73	2.92	128	.987	.185
Post-post-test Heuristic Str.	24.97	3.06			

Table 10 revealed the difference in the post-test and post-post-test mean performances of students taught the Islamic Economic System in Senior Secondary Schools in Kaduna State, Nigeria, using heuristic strategy, is displayed. Because the sig. value of .185 is more than the 0.05 significant level, so the null hypothesis was retained. This indicated no discernible difference between the performance (post-test) and retention ability scores of students taught Islamic Economic System with heuristic strategy in Senior Secondary Schools in Kaduna State, Nigeria.

Hypothesis Five: There is no significant difference between post-test mean performance scores and the retention ability of students taught Islamic Economic System using Jigsaw strategy in Islamic Studies in Senior Secondary Schools Kaduna State, Nigeria

Data collected to address the null hypothesis five was summarised and presented in Table 11.

Table 11: t-test analysis on the mean difference between post-test performance scores and the retention ability test of students taught Islamic Economic System using Jigsaw strategy in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria

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Variable	Mean	SD	Df	t-cal.	Sig.
Post-test Jigsaw Str.	24.66	2.30	118	.168	.352
Post-post-test Jigsaw Str.	24.97	3.06			

Table 11 examined the differences in the mean performances of students taught the Islamic Economic System in Senior Secondary Schools in Kaduna State, Nigeria, using the Jigsaw teaching technique. Because the sig. value of .352 is more than the 0.05 significance level; the null hypothesis is kept. Thus, using the Jigsaw technique, the post-test mean performance scores and retention ability scores of students taught Islamic Economic System in Senior Secondary Schools in Kaduna State, Nigeria, do not significantly differ.

Hypothesis Six: There is no significant difference between the retention ability of students taught Islamic Economic System using Heuristic and Jigsaw strategies in Islamic Studies in Senior Secondary Schools Kaduna State, Nigeria. Data collected to address the null hypothesis six was summarised and presented in Table 12.

Table 12: t-test analysis on the mean difference between the retention ability of students taught Islamic Economic System using Heuristic and Jigsaw strategies in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria

Variable	Mean	SD	Df	t-cal.	Sig.
Post-post-test Heuristic Str.	24.66	2.30	123	18.36	.271
Post-post-test Jigsaw Str.	24.75	0.81			

Table 12 examined the differences in the post-test mean performances of students taught the Islamic Economic System in Islamic Studies at Senior Secondary Schools in Kaduna State, Nigeria, using Heuristic and Jigsaw teaching methodologies. Because the sig. A value of .271 is more than the 0.05 significance level, so the null hypothesis is kept. Consequently, this indicated that, Jigsaw and Heuristic teaching techniques greatly preserved students' learning experiences. Therefore, in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria, there is no discernible difference in the memory capacity of students taught the Islamic Economic System using heuristic and jigsaw strategies.

Discussion of Findings

Based on the findings of the study, the following discussions were made. Students instructed in the Islamic Economic System using the Heuristic teaching strategy demonstrated significantly higher performance than those taught using the conventional method in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria ($p = .003$). This observation aligns with Eze's (2001) assertion that a systematic approach to problem-solving, such as heuristic learning, fosters positive learning habits, contributes to clarity in thinking, enhances logical reasoning, and promotes intellectual development. When these attributes are cultivated, there is a positive impact on students' performance and retention. Similarly, the performances of students instructed in the Islamic Economic System using the Jigsaw teaching strategy were significantly higher than those taught using the conventional method in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria ($p = 0.002$). This finding aligns with the report of Jansoon, Samsook and Coll (2008), who emphasized that the Jigsaw strategy involves two groups: a home group and an expert group. The lesson is divided into independent sub-lessons conducted in parallel. Each student becomes an expert in one sub-lesson as part of a group investigation. The group selects an interesting topic for research, generates questions, and constructs knowledge collaboratively. The Jigsaw strategy applies to team assignments requiring expertise in several distinct areas. Students become "experts" in a concept and are responsible for educating other group members. The hierarchical knowledge structure allows each step to be studied separately and later integrated.

Heuristic and Jigsaw strategies are notably effective in instructing students in the Islamic Economic System in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria ($p = 0.833$). This result aligned with Kapp's (2012) report that both strategies enhance thinking, excitement, competition, and cooperation, thereby enhancing students' learning experiences. Heuristic strategy significantly retains students' knowledge of the Islamic Economic System in Senior Secondary Schools in Kaduna State, Nigeria ($p = .185$). This finding resonated with Shika's (2019) assertion that, Heuristic strategy aids learners in approaching problems scientifically, broadens their minds, encourages critical thinking, logical reasoning, and active involvement in learning. It makes learning more meaningful, joyful, and permanent, fostering enthusiasm and interest in students. The jigsaw teaching strategy also significantly retains students' knowledge of the Islamic Economic System in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria ($p = .352$). This finding



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is consistent with Lilian's (2012) report on Jigsaw, highlighting its positive effects on student participation, learning content comprehension, attitude toward learning, and social relationships within groups. Each student's unique contribution is valued, and cooperation and communication become essential, making students active participants in the learning process. Heuristic and Jigsaw teaching strategies significantly enhance the retention of Islamic Economic System learning experiences in Islamic Studies in Senior Secondary Schools in Kaduna State, Nigeria ($p = .271$). This result aligned with Lilian's (2012) observation that, cooperative learning strategies such as Jigsaw, Heuristics, Individualized instruction, and Think-pair-share contribute to retaining students' knowledge and provide them with opportunities to teach themselves, promoting a depth of understanding. The strategy encourages self-teaching, a valuable skill for students to develop. Asking each group to discuss a follow-up question after an individual presentation fosters genuine and collaborative discussion.

Recommendations

Drawing from the outcomes of this study, the following recommendations are put forward:

1. School authorities should train teachers on the proper use of Heuristic strategy and encourage Islamic Studies teachers to use Heuristic strategy to teach Islamic Studies in all the topics since it enhances students' performances. Islamic Studies teachers of secondary schools should be motivated by the HOD or HOS to use Heuristic strategy. This is because it enhance good student retention of Islamic Studies content. A heuristic strategy should be used instead of the conventional teaching strategy.
2. Islamic Studies teachers in Senior Secondary Schools should use the jigsaw strategy in teaching the subject because it is better than the conventional strategy. Teachers should be discouraged from relaying solely on using traditional strategy. Teachers should update their knowledge of new ways of teaching that encourage collaboration. Islamic Studies teachers should be guided on utilizing and upgrading the use of Jigsaw strategy to make students' learning experiences more permanent and real in Islamic Studies in Senior Secondary Schools in Kaduna state.
3. Both Heuristic and Jigsaw strategies should be encouraged to be used by Islamic Studies teachers when teaching Islamic Studies in Senior Secondary Schools in Kaduna state. The school authority should ensure such compliance through the head of the departments or the head of the subject. School authorities should organize continuous professional training for Islamic Studies teachers on the process of selecting and professional use of Heuristic and Jigsaw strategies in their teaching. Both Heuristic and Jigsaw strategies should be encouraged to be used by Islamic Studies teachers when teaching Islamic Studies content to retain the learning experiences. This is because the two strategies were found to help students retain and recall previously learned content with ease and motivation more than conventional strategy. Teachers who use these strategies should be motivated by school authority through public recognition or commendation (verbal or written), as the case may be. This is in order to motivate other teachers and general competitiveness

Conclusion

The paper concluded that Heuristic and Jigsaw teaching strategies in Islamic Studies promote motivation, active participation and efficient collaboration in the instructional process. It also concluded that Students create knowledge by themselves, develop confidence and defend their findings in a small group or large class.

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