



EFFECTIVENESS OF GRAPHIC ORGANIZERS ON MEMORY RETENTION OF SECONDARY SCHOOL STUDENTS

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ABSTRACT

The present study investigated the effectiveness of graphic organizers in enhancing the memory retention of secondary school students in comparison with traditional teaching methods. Graphic organizers such as concept maps, mind maps, flow charts, and diagrams provide visually structured representations of information and may facilitate meaningful learning, comprehension, and recall. The study adopted an experimental method to examine the effectiveness of graphic organizer-based instruction among secondary school students. A sample of 50 students studying in Standard IX was selected and divided into an experimental group of 25 students and a control group of 25 students. The experimental group was taught using lesson plans based on graphic organizers, whereas the control group was taught using traditional teaching methods. A lesson transcript and achievement test were used as the major tools and materials for the study. Pre-test results indicated that the two groups were comparable in terms of memory retention, with mean scores of 15.92 for the control group and 16.10 for the experimental group, and the obtained critical ratio was not significant. Following the instructional treatment, the experimental group achieved a higher post-test mean score of 21.54 and a mean percentage score of 86.16, compared with a mean score of 18.10 and a mean percentage score of 72.40 for the control group. The reported critical ratio indicated a significant difference between the post-test performances of the two groups. The findings demonstrate that graphic organizer-based instruction was more effective than the traditional method in improving students' memory retention and achievement. The study therefore highlights the value of visually supported, learner-centred instructional strategies and suggests that graphic organizers can be effectively integrated into secondary school classroom practices to promote meaningful learning, better understanding, and enhanced retention.

KEY WORDS: Effectiveness, Graphic Organiser, Memory Retention, Secondary School Students

INTRODUCTION

In the present educational scenario, enhancing students' learning outcomes and memory retention has become a major concern for educators, especially at the secondary school level. Traditional note-taking methods, which mainly rely on linear, text-based information, have long been used in classrooms. Although these methods help in recording information, they often fail to support meaningful learning and long-term retention, particularly when students are required to understand and remember complex concepts. With the advancement of educational psychology and instructional strategies, greater emphasis is being placed on learner-centered and visually enriched teaching approaches. One such approach is the use of Graphic Organizers, which include concept maps, mind maps, flow charts, and diagrams. These tools help learners organize information visually, establish relationships among ideas, and process content more effectively. Research suggests that visual representation of knowledge supports cognitive processing and aids memory by reducing cognitive load and improving comprehension, Mayer, R. E. (2009). Secondary school students often face challenges in retaining large volumes of formation across different subjects. At this stage, effective learning strategies are crucial, as students are transitioning from basic learning to more abstract and analytical thinking. Graphic organizers serve as an effective instructional tool by engaging students actively in learning and promoting deeper understanding, which in turn enhances memory retention. Despite the proven advantages of graphic organizers, traditional methods continue to dominate classroom practices. Many teachers are unaware of or underutilize visual learning tools due to time constraints, lack of training, or reliance on conventional methods. This creates a need to systematically examine and compare the effectiveness of graphic organizers with traditional methods in improving students' memory retention, Novak J. D & Gowin D. B. (1984). Therefore, the present study attempts to investigate the effectiveness of Graphic Organizers versus Traditional Method on memory retention among secondary school students. By adopting an experimental approach, the study aims to determine whether graphic organizers significantly enhance memory retention compared to traditional note-taking methods. The findings of this study are expected to provide valuable insights for teachers, curriculum planners, and educational practitioners in adopting effective instructional strategies to improve learning outcomes.

NEED AND SIGNIFICANCE OF THE STUDY

The present study is significant in view of the growing need to improve memory retention and meaningful learning among secondary school students who encounter increasingly complex academic content. Traditional text-based teaching may not always provide adequate opportunities for students to organize and connect information effectively. Graphic organizers such as concept maps, mind maps, flow charts, and diagrams help learners visually organize ideas and relationships, thereby supporting comprehension, cognitive processing, and retention. Mayer (2009) emphasized the role of visual representations in meaningful



learning, while Novak and Gowin (1984) highlighted the effectiveness of concept mapping in organizing knowledge. Empirical studies by Boothby and Alvermann (1984) and Dexter and Hughes (2011) also reported positive effects of graphic organizers on students' comprehension and recall. Therefore, the present experimental study is needed to examine whether graphic organizers are more effective than traditional teaching methods in enhancing memory retention among secondary school students. The findings may provide useful implications for teachers, teacher educators, and curriculum planners in adopting learner-centred and visually supported instructional strategies. The study is particularly significant because its findings show that students taught through graphic organizers achieved higher post-test performance than those taught through the traditional method, supporting the use of graphic organizers as an effective classroom strategy.

STATEMENT OF THE PROBLEM

Although previous studies have examined the usefulness of graphic organizers in improving students' comprehension, achievement, and recall, there is still a need for context-specific experimental evidence on their effectiveness in enhancing memory retention among secondary school students. Much of the existing literature has focused on reading comprehension, science learning, students with learning disabilities, or broader academic achievement, while comparatively less attention has been given to directly comparing graphic organizer-based instruction with traditional teaching methods specifically in relation to memory retention at the secondary level. The present study addresses this gap by experimentally comparing the performance of a control group taught through traditional methods with an experimental group taught using graphic organizers among Standard IX students. The pre-test results established that the two groups were comparable before treatment, while the post-test results showed a significant difference favouring the experimental group, thereby providing empirical evidence regarding the specific contribution of graphic organizers to memory retention. Therefore the present study is entitled as **"EFFECTIVENESS OF GRAPHIC ORGANIZERS ON MEMORY RETENTION OF SECONDARY SCHOOL STUDENTS."**

OBJECTIVES OF THE STUDY

- To find out the effectiveness of Graphic Organizers on memory retention of secondary school students

HYPOTHESIS OF THE STUDY

- Graphic Organizers are effective on memory retention of secondary school students.

METHOD ADOPTED FOR THE STUDY

- Experimental method is used for the present study.

EXPERIMENTAL DESIGN SELECTED

- Pre test Post test non-equivalent group design was selected for the present study.

POPULATION OF THE STUDY

- The population of the present study consists of secondary school students studying in selected secondary schools.

SAMPLE SELECTED FOR THE STUDY

- The sample consists of 50 students who are studying in standard IX (Control Group- 25 and Experimental Group 25).

TOOL AND MATERIALS USED FOR THE STUDY

1. Lesson Transcript based on Graphic Organizers and Traditional Methods on memory retention.
2. Achievement Test

ANALYSIS AND INTERPRETATION OF DATA

ANALYSIS ON THE PRE TEST SCORES OF CONTROL GROUP AND EXPERIMENTAL GROUP

Analysis refers to the process of breaking down a complex concept into smaller parts to understand it clearly. It involves examining details, identifying patterns, relationships, and drawing meaningful conclusions. In educational research, analysis helps in organizing raw data systematically so that valid interpretations can be made.

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**Table 1**

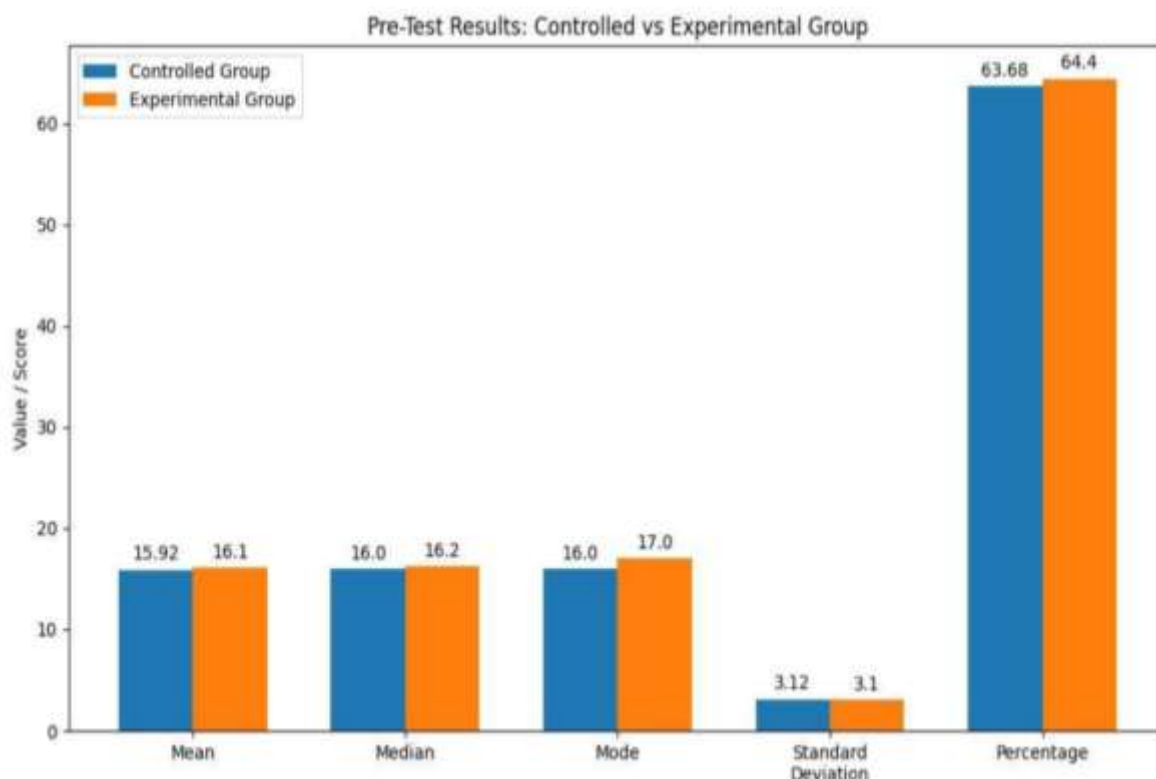
Mean, Median, Mode, Standard Deviation, Mean Percentage Scores and Critical Ratio of the Control Group and the Experimental Group in the pre-test on Memory Retention

Category	Mean	Median	Mode	SD	%	CR	Level of Sig.
Control Group	15.92	16.00	16	3.12	63.68	0.73	Not Significant
Experimental Group	16.10	16.2	17	3.10	64.4		

Table 1 present the mean, median, mode, standard deviation, and percentage scores of the control group and experimental group in the pre-test on memory retention. The mean score of the control group is 15.92, while the experimental group has a slightly higher mean score of 16.10, indicating that both groups possess nearly similar average levels of achievement at the initial stage of the study. The median score of the control group is 16.00, and that of the experimental group is 16.2, which shows that the middle scores of both groups are very close to their respective mean values. This indicates a fairly balanced distribution of scores in both groups. The mode score of the control group is 16, whereas the experimental group has a mode score of 17, suggesting that these scores occurred most frequently among the students in each group. The close proximity of the mean, median, and mode values in both groups indicates that the distribution of pre-test scores tends toward normality. The critical ratio 0.73 shows that there is no significant difference between control group and experimental group. This confirms that the control group and experimental group are comparable in terms of memory retention before the instructional treatment, thereby providing a fair and reliable basis for further comparison of the effectiveness of graphic organizers and traditional teaching methods.

Figure 1

Pre test Scores Analysis on the Scores of Control Group and Experimental Group



In order to examine the effectiveness of the lesson plan using graphic organizers and traditional teaching methods, the investigator analyzed the post-test scores of both the experimental group and the control group. The collected data were organized and standard deviation. These statistical measures were employed to summarize the data and to understand the overall performance of students in both groups. The results obtained were systematically tabulated and presented to facilitate clear interpretation and comparison. The analysis of the data reveals that the experimental group taught using graphic organizers achieved higher mean scores than the control group taught through traditional methods. This indicates that graphic organizers have a positive effect on improving memory retention among secondary school students. The standard deviation values show relatively less variation in scores, suggesting consistency in students' performance. Thus, the interpretation of the data the objective of the study and confirms that graphic organizers are more effective than traditional teaching methods in enhancing students' memory retention.

**Table 4.2**

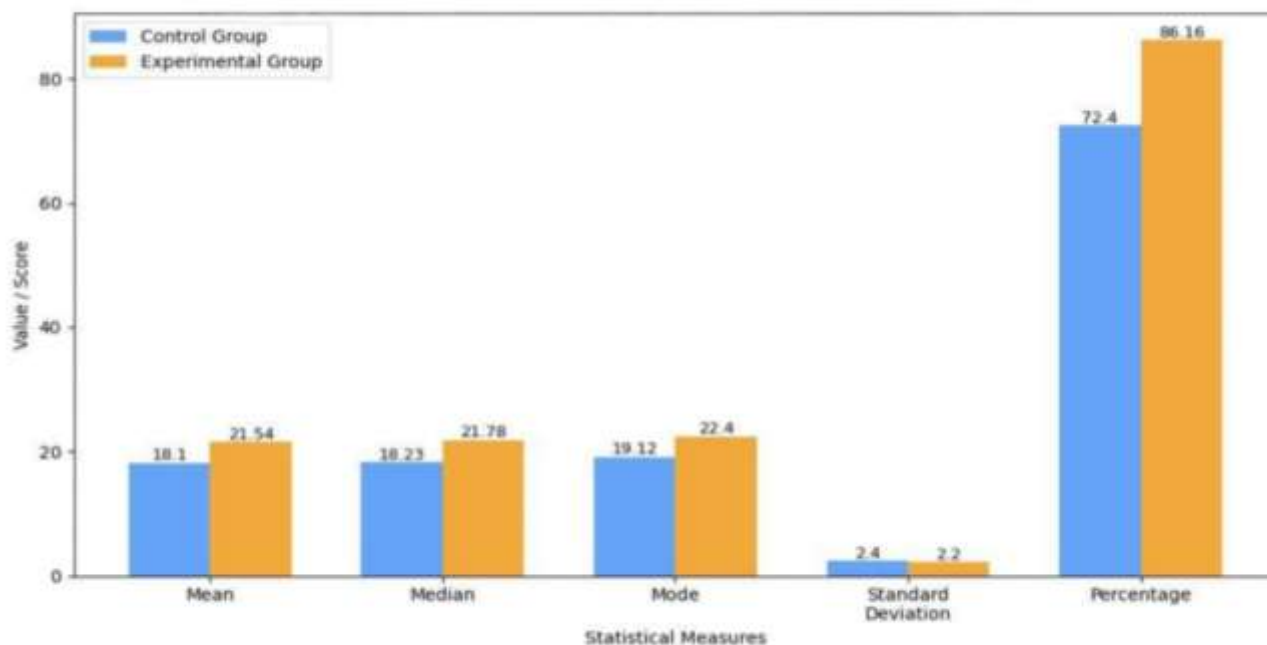
Mean, Median, Standard Deviation, Mean Percentage and Critical Ratio of Control Group and Experimental Group in the post-test on Memory Retention.

Category	Mean	Median	Mode	SD	%	CR	Level of Sig.
Control Group	18.10	18.23	19.12	2.40	72.4	3.74	0.05
Experimental Group	21.54	21.78	22.40	2.20	86.16		

The post-test results presented in Table 4.2 show the mean, standard deviation, and percentage scores of the control group and experimental group after the instructional treatment. The control group, which was taught using the traditional method, obtained a mean score of 18.10 with a standard deviation of 2.40 and a percentage score of 72.4. In contrast, the experimental group taught using graphic organizers achieved a higher mean score of 21.54 with a standard deviation of 2.20 and a percentage score of 86.16. The higher mean and percentage scores of the experimental group indicate better performance in memory retention when compared to the control group. The critical ratio obtained was 3.70 which shows there exists a significant difference in the post test scores of control group and experimental groups in terms of achievement of secondary school students. The comparison of post-test scores clearly reveals that graphic organizer-based instruction is more effective than traditional teaching methods in improving memory retention among secondary school students. Although the standard deviation values of both groups are relatively close, the experimental group shows greater improvement in achievement, suggesting that the use of graphic organizers enhances understanding, recall, and retention of learned content. Thus, the post-test results support the hypothesis of the study and confirm the positive impact of graphic organizers on students' memory retention.

Figure 2

Post test Scores Analysis on the Scores of Control Group and Experimental Group



FINDINGS OF THE STUDY

The findings of the present study reveal that there is a noticeable improvement in the achievement of students taught using graphic organizers when compared to those taught through the traditional method. In the post-test, the experimental group obtained higher mean and percentage scores than the control group, indicating better memory retention and understanding of the subject matter. The graphical representations clearly show that the effectiveness of the instructional strategy used. Further, the close similarity of the pre-test scores of both the control and experimental groups confirms that the groups were comparable at the beginning of the study. However, the significant improvement observed in the post-test scores of the experimental group demonstrates that the prepared lesson plan using graphic organizers had a positive impact on students' learning. Thus, the findings of the study establish that the use of graphic organizers enhances students' achievement at the secondary level more effectively than the traditional method of teaching.



CONCLUSION

The present study was conducted to examine the effectiveness of graphic organizer-based instruction in improving memory retention among secondary school students. For this purpose, lesson plan based on graphic organizers and the traditional method were prepared and implemented systematically. The study aimed to compare the learning outcomes of students taught through these two instructional approaches. The analysis of the pre-test and post-test data revealed that both groups showed improvement in their achievement; however, the improvement was significantly higher in the experimental group taught using graphic organizers. The higher mean score, mean percentage, and improved performance in the post-test clearly indicate that graphic organizers helped students organize information effectively, understand concepts better, and retain information for a longer period of time. The findings of the study confirm that the use of graphic organizers enhances students' memory retention and learning outcomes more effectively than the traditional method of teaching. Thus, the hypotheses framed for the study were found to be tenable. The study highlights the importance of adopting learner-centered and visually supported instructional strategies in the classroom to promote meaningful learning. The study establishes that graphic organizers are powerful instructional tools that can be effectively integrated into classroom teaching to improve memory retention and academic achievement among secondary school students.

EDUCATIONAL IMPLICATIONS

The findings of the present study have important implications for classroom teaching and teacher education. Teachers may integrate graphic organizers such as concept maps, mind maps, flow charts, and diagrams into their lesson plans to help students organize information, understand relationships among concepts, and improve memory retention. Teacher educators can provide training on the effective preparation and classroom use of graphic organizers, while curriculum planners may encourage their inclusion in learner-centred and activity-based instructional practices. Graphic organizers can also promote active participation, meaningful learning, and better recall among secondary school students. The study therefore suggests that teachers should move beyond predominantly traditional methods and adopt appropriate visual and learner-centred strategies to enhance students' learning outcomes and retention.

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