The Effects of Advance Graphic Organizers Strategy Intervention on Academic Achievement, Self efficacy , and Motivation to learn Social Studies in Learning Disabled second year Prep Students

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Abstract

This study investigated the effect of using advance graphic organizers on academic achievement, self efficacy ,and motivation to learn social studies in learning disabled second year prep students . A total of 60 students identified with LD were invited to participate. The sample was randomly divided into two groups; experimental (n= 30 , 23 boys ,7 girls)and control (n= 30 , 21 boys and 9 girls). ANCOVA and Repeated Measures Analyses were employed for data analysis. Findings from this study indicated the effectiveness of the program employed in improving academic achievement, self efficacy ,and motivation to learn social studies in the target students. On the basis of the findings, the study advocated for the effectiveness of using advance graphic organizers on academic achievement, self efficacy ,and motivation to learn social studies in learning disabled second year prep students .

Key Words; advance graphic organizers, academic achievement, self efficacy , motivation, learning disabled.

Introduction

Definition of Graphic Organizers and their Benefits

A graphic organizer can be defined as a visual and graphic display that depicts the relationships between facts, terms, and ideas within a learning task. Graphic organizers are also referred to as knowledge maps, concept maps, story maps, cognitive organizers, advance organizers, or concept diagrams (Strangman, Hall, & Meyer, 2003). Graphic organizers have multiple benefits. These benefits include helping learners grasp the material by assisting in seeing the relationships between ideas, concepts, or authors. Graphic organizers also assist in memory recall. Finally, graphic organizers encourage the use of developing higher-level thinking skills by assisting students to synthesize and integrate information, ideas, and concepts. Ellis and Howard (2007) stated that graphic organizers are effective across subject areas because they provide visual cues designed to assist students in their understanding of information by organizing information. According to Yin, Vanides, Ruiz-Primo Ayala, and Shavelson (2005), graphic organizers allow students a means of creating connections by visually showing relationships among concepts.

Social Studies and Graphic Organizers

Governale (1997) found that many students find social studies boring and wasting time. Carroll and Leander (2001) found that many students are frustrated, distracted, and bored because of the lack of learning strategies and with the meaningless reading assignments often associated with social studies. Student achievement in many subject areas is closely related to reading comprehension and vocabulary skills. This finding holds especially true for social studies; hence, much information is obtained through reading and comprehension. Brookbank et al. (1999) concluded that student underachievement can often be attributed to poor reading and comprehension skills.

Many students become disheartened and frustrated because they lack the ability to comprehend social studies reading material. The use of graphic organizers as a means of increasing student comprehension, aiding in recalling previously stored information from memory, and having an overall positive effect on students' attitudes toward social studies is supported in literature. With much of the present day instruction requiring students to have at least grade level reading skills, research has shown that graphic organizers facilitate readers by enabling them in connecting main ideas and recalling important facts, thus improving reading and understanding.

Gallavan and Kotter (2007) have observed through their research, "Many teachers are concerned that social studies overwhelms their students; often, students view social studies as a complex and confusing subject unrelated to their contemporary world" (p. 117). Social studies students especially benefit from graphic organizers, according to Gallavan and Kotter, because "Graphic organizers or concept maps … help students sort, simplify, show relationships, make meaning, and manage data quickly and easily" (p. 117). Also, Gallavan and Kotter comment, "Graphic organizers can make learning social studies terminology, structures, and functions manageable and memorable" (p. 118).

Governale (1997) suggests that students will become more interested in social studies when graphic organizers are used before, during, and after the lesson. The organizer will allow the students to compare and contrast individuals, groups, and events. These comparisons will aid the children in making sense of the past and also help them in putting the pieces of the historical puzzle together (McCoy & Ketterlin-Geller, 2004). Carroll and Leander (2001) surmise that when students are able to comprehend and understand what they will be learning, their frustration levels will decrease and their motivation levels will increase.

DiCecco and Gleason (2002) examined the effect of graphic organizers on the learning of relational knowledge from social studies texts for 24 students with LD in middle school. Relational knowledge is the understanding of the relationships that link key concepts within a text (DiCecco & Gleason, 2002). The researchers used a pretest-posttest control group design for the study. Both the graphic organizer group and the control group received reading instruction as well as summary writing instruction over a one month (20 sessions) treatment period. The independent variable in the study was instruction on using graphic organizers. The findings of the study were a statistically significant advantage for the recall of relational knowledge statements in written essays by the graphic organizer intervention group in comparison to the control group after 20 sessions of instruction. An interesting finding was that on measures of factual content knowledge in multiple-choice tests and quizzes, there was no main effect for condition. This indicates that care must be taken in the assessment measures used to determine the effect of graphic organizers as their positive effects may not be visible in the recall of factual knowledge.

Ayres et al. (2005) piloted a study that implemented a one-group, nonrandomized, pre-posttest design. One group of students was observed to evaluate the effectiveness of technology-based instruction using a cognitive organizer designed using the Inspiration 8 (2008) software. A pretest/posttest treatment control group methodology was used to examine the impact of cognitive organizers, with the integration of technology (i.e., Inspiration 6 software) content-area learning in high school inclusive social studies classes. Twenty-nine, tenth-grade students in general education and 20 students with mild disabilities were randomly assigned to receive instruction using a graphic organizer generated by the Inspiration software.

The graphic organizer was printed out and handed to the students to use as a note-taking device during the lectures. Dependent measures included a 35-item, open-ended pre/posttest of declarative social studies knowledge to assess the effectiveness of the intervention. This resulted in a mean pretest score during the graphic organizer condition of 0.4 (*SD* = .9661, range 0-3); while the posttest score was 20.11 (*SD* = 5.46, range 11-28); and the delayed posttest score was 19.10 (*SD* = 6.60,range 12-30). These results indicated students who utilized a graphic organizer as the intervention significantly outperformed students as opposed to using traditional textbook instruction.

Another study that focused on social studies and graphic organizers was conducted by (Boon et al., 2007). This study used a pre-and post-group design with 10 participants all with a mild learning disability. This study was designed as an extension of the Ayres et al. (2005) and investigated the use of Inspiration (2008) and social studies lessons. In Ayres et al., a hard copy

of the graphic organizer was printed from the software and the participants filled in the information with pencil during the teacher presented lesson. In Boon et al., however, the researchers had the participants fill out the Inspiration graphic organizer on a computer instead of on paper. The results of Boon et al. demonstrated an increase of the recall of content-area learning tasks for students with mild disabilities with the use of graphic organizers. Students who used the Inspiration software condition had a mean pretest of 11.60 [*SD* = 12.708), whereas the mean pretest score for the students in the control condition was 13.08 [*SD* = 9.604). However, after the introduction of the Inspiration software, the mean posttest score of students who used the software was 52.54 [*SD* = 13.305), the mean posttest score for students in the control condition was 26.84 [*SD* = 14.860). Data from an informal survey indicated that the participants were motivated in social studies class and liked to use the Inspiration 6 software to record, organize, edit, and summarize the most important information from the chapter.

Another study that focused on social studies and graphic organizers was conducted by(Adel Abdulla, 2010). This study aimed at improving social problem solving ability in primary five students with learning disabilities. Participants were (30) students with learning disabilities in Zagazig Educational Edara .The study used a remedial teaching program . Results showed the effectiveness of the program which was built on advance graphic organizers in improving social problem solving ability of the target students .

Further research is necessary to build on the vast amount of research into graphic organizers with learning disabled students. This will allow researchers to determine how graphic organizers can be best used as an intervention with learning disabled students as there is a dearth of research with this population. In order to address this issue with the lack of research on graphic organizers with learning disabled students . Thus the present study seeks to give answers to the following questions.

1- Are there differences in post-test scores mean between control and experimental groups on Academic Achievement test ?

2- Are there differences in post-test scores mean between control and experimental groups on Self Efficacy test ?

3- Are there differences in post-test scores mean between control and experimental groups on Academic Motivation test ?

4- If the program is effective in academic achievement of experimental group, is this effect still evident a month later?

5- If the program is effective in self efficacy of experimental group, is this effect still evident a month later?

6- If the program is effective in academic motivation of experimental group, is this effect still evident a month later?

Methods

Participants

60 students participated in the present study. Each student participant met the following established criteria to be included in the study: (a) a diagnosis of LD by teacher's references, and learning disabilities screening test (Kamel,1990) (b) an IQ score on the Mental Abilities Test (Mosa, 1989) between 90 and 118 (c) absence of any other disabling condition. The sample was randomly divided into two groups; experimental (n= 30 , 23 boys , 7 girls) and control (n= 30 , 21 boys and 9 girls).

The two groups were matched on age, IQ, academic achievement in social studies , self efficacy , and academic motivation . Table 1.shows means, standard deviations, t- value, and significance level for experimental and control groups on age (by month) ,IQ , academic achievement in social studies , self efficacy , and academic motivation (pre-test).

Table 1. *means, standard deviations , t- value , and significance level for experimental and control groups on age (by month),IQ, academic achievement in social studies , self efficacy , and academic motivation (pre-test).*

Variable	Group	N	M	SD	T	Sig.
Age	Experimental	30	169.24	1.96	-.121	Not sig.
	Control	30	1168.41	2.01		
IQ	Experimental	30	111.34	4.45	-.221	Not sig.
	Control	30	111.89	4.24		
academic achievement in social studies	Experimental	30	17.21	3.00	-.547	Not sig.
	Control	30	17.67	3.52		
self efficacy	Experimental	30	24.80	2.65	-.539	Not sig.
	Control	30	25.83	2.32		
academic motivation	Experimental	30	35.27	3.00	-.547	Not sig.
	Control	30	35.85	3.52		

Table 1. shows that al t- values did not reach significance level . This indicated that the two groups did not differ in age (by month),IQ, academic achievement in social studies , self efficacy , and academic motivation (pre-test).

Instruments

1- *Academic Achievement Test* : The end-of- year examination results of the participants in social studies standardized and marked by the teachers , and provided the summative evaluation scores for the analysis. Hence, scores in the social studies served as the measures of students' achievement.

2- Me and Social Studies : Social Studies Self-Efficacy: Me and Social Studies was developed for two purposes: one, to provide an intermediate rather than specific measure of math self-efficacy, and two, to provide a scale which might profile students' strong or weak self-efficacious characteristics. Current math self-efficacy instruments tend to be specific in specific content and questions. Factor Analysis yielded three factors: Effort, ability , and resiliency .

In completing Me and Social Studies, students were instructed to respond by thinking how they felt about themselves with reference to math using a three point Likert scale (agree=3, Uncertain= 2 , and Disagree=1). Reliability coefficients were computed for the full scale (social studies self-efficacy) and subscales (ability, effort, resiliency). These results were -91 for Social Studies self efficacy, .93 for ability, -73 for effort, and -80 For resiliency.

3- *Intrinsic and Extrinsic Motivational Orientations Scale* : The Intrinsic and Extrinsic Motivational Orientations Scale consists of six subscales; three for Intrinsic Motivation (Challenge , Curiosity, Independent Mastery) , and three for Extrinsic Motivation (Easy Work, Pleasing Teacher , and Dependence on Teacher). a three point Likert scale (agree=3, Uncertain= 2 , and Disagree=1) was used . Reliability coefficients were computed for the full scale (Intrinsic and Extrinsic Motivational Orientations Scale) and subscales. These results were -91 for Intrinsic and Extrinsic Motivational Orientations Scale, .91 for challenge , -73 for curiosity , and -80 For Independent Mastery, 0.82 for easy work , 0.76 for pleasing teacher, and 0.86 for dependence on teacher .

Procedures

Screening : Second year prep students who participated met the following established criteria to be included in the study: (a) a diagnosis of LD by teacher's references, and learning disabilities screening test (Kamel,1990) (b) an IQ score on the Mental Abilities Test (Mosa, 1989) between 90 and 118 (c) absence of any other disabling condition.

Pre-intervention testing : All the sixty students in grade two prep completed Me and Social Studies : Social Studies Self-Efficacy, which assesses students' self efficacy in social studies ; Intrinsic and Extrinsic Motivational Orientations Scale, which assesses students' intrinsic and extrinsic motivational orientations. Additionally , the end-of- year examination results of the participants in social studies standardized and marked by the teachers , and provided the summative evaluation scores for the analysis. Hence, scores in the social studies served as the measures of students' achievement. Thus data was reported for the students who completed the study .

General Instructional Procedures: Instruction was delivered to The second year social studies teacher [2]. Before the study started, instructors participated in 10 hours of training to learn how to implement the advance graphic organizers strategy . The teacher was provided with a notebook that contained detailed directions for implementing all activities and lessons. The teacher; Mrs Saada , received training and role-played implementing the strategy until she was able to do so to criterion. To help ensure complete implementation, she was provided with a checklist for each lesson. As she taught a lesson, each step was checked as it was completed.

The teacher , however, had the flexibility to respond to individual student needs, backing up and repeating a step, if necessary, or reordering steps. Students received 3 training sessions a week, lasting between 40 and 45 min . Instruction took place in the regular classroom in order to naturalize the situation.

Fidelity of Treatment Implementation: To ensure that strategy instruction was delivered as intended, the following four safeguards were implemented. One, the teacher received training to criterion in how to apply the instructional procedures. Two, teacher met with the author weekly and communicated daily with the author (as needed) to discuss any noteworthy occurrences that took place when implementing instructional procedures. Reported difficulties occurred rarely and usually involved the need to individualize further for a particular student to deal with a behavioral issue. Responses to issues such as these were discussed and implemented.

Three, the teacher had a checklist for each student that contained step-by step directions for each lesson. As the teacher completed a lesson step, she placed a check by it. For 42% of the sessions, the researcher also assessed treatment integrity by recording the presence or absence of each component. Session integrity was computed by dividing the number of lesson components

[2] The researcher wishes to than Mrs. Saada Waheeb, the school social studies teacher, and a Doctorate Candidate , for her assistance .

taught by the total number of components and multiplying the quantity by 100. Average session integrity scores were computed for each participant.

Design and Analysis

The effects of implementing the advance graphic organizers strategy on students' academic achievement, self efficacy ,and academic motivation were assessed using a repeated-measures design, pre- post- and follow-up testing.

Results

Table 2. shows data on ANCOVA analysis for the differences in post- test mean scores between experimental and control groups in academic achievement . The table shows that the (F) value was (132.872) and it was significant value at the level (0.01).

Table 2. *ANCOVA analysis for the differences in post- test mean scores between experimental and control groups in academic achievement*

Source	Type 111 Sum of squares	df	Mean square	F	Sig.
Pre	907	1	907		
Group	2029,969	1	2029.969	132.872	0.01
Error	977.771	57	15.278		
Total	3013.194	59			

Table 3. shows T. test results for the differences in post- test mean scores between experimental and control groups in academic achievement . The table shows that (t) vale was (14.462). This value is significant at the level (0.01) in the favor of experimental group. The table also shows that there are differences in post- test mean scores between experimental and control groups in academic achievement in the favor of experimental group.

Table 3. *T. test results for the differences in post- test mean scores between experimental and control groups in academic achievement*

Group	N	Mean	Std. deviation	T	Sig.
Experimental	30	33.45	3.40	14.462	0.01
Control	30	17.63	2.94		

Table 4. shows data on ANCOVA analysis for the differences in post- test mean scores between experimental and control groups in self efficacy . The table shows that the (F) value was (131.099) and it was significant value at the level (0.01).

Table 4. *ANCOVA analysis for the differences in post- test mean scores between experimental and control groups in self efficacy*

Source	Type 111 Sum of squares	df	Mean square	F	Sig.
Pre	17.004	1	17.004		
Group	30055.895	1	30055.895	131.099	0.01
Error	13067.862	57	229.261		
Total	43369.933	59			

Table 5. shows T. test results for the differences in post- test mean scores between experimental and control groups in self efficacy. The table shows that (t) vale was (11.568). This value is significant at the level (0.01) in the favor of experimental group. The table also shows that there

are differences in post- test mean scores between experimental and control groups in self efficacy in the favor of experimental group.

Table 5. *T. test results for the differences in post- test mean scores between experimental and control groups in self efficacy*

Group	N	Mean	Std. deviation	T	Sig.
Experimental	30	83.83	1.64	11.568	0.01
Control	30	38.90	3.81		

Table 6. shows data on ANCOVA analysis for the differences in post- test mean scores between experimental and control groups in academic motivation . The table shows that the (F) value was (521.447) and it was significant value at the level (0.01).

. Table 6. *ANCOVA analysis for the differences in post- test mean scores between experimental and control groups in academic motivation*

Source	Type 111 Sum of squares	df	Mean square	F	Sig.
Pre	229.992	1	229.992		
Group	24640.438	1	24640.438	521.447	0.01
Error	2693. 474	57	47.254		
Total	29974.733	59			

Table 7. shows T. test results for the differences in post- test mean scores between experimental and control groups in academic motivation. The table shows that (t) vale was (23.166). This value is significant at the level (0.01) in the favor of experimental group. The table also shows that there are differences in post- test mean scores between experimental and control groups in academic motivation in the favor of experimental group.

Table 7. *T. test results for the differences in post- test mean scores between experimental and control groups in academic motivation*

Group	N	Mean	Std. deviation	T	Sig.
Experimental	30	81.000	4.04	23.166	0.01
Control	30	38.533	5.22		

Table 8. shows data on repeated measures analysis for academic achievement. The table shows that there are statistical differences between measures (pre- post- follow up) at the level (0.01).

Table 8. *Repeated measures analysis for academic achievement*

Source	Type 111 sum of squares	df	Mean square	F	Sig.
Between groups	6323.974	1	6323.974	240. 362	0.01
Error 1	1710.165	58	26.310		
Between Measures	3743.818	2	1871.909	319.483	0.01
MeasuresxGroups	3827.121	2	1913.561	326.591	0.01
Error 2	761.695	116	5.859		

Table 9. shows data on Scheffe test for multi-comparisons in academic achievement test. The table shows that there are statistical differences between pre and post measures in favor of post test, and between pre and follow up measures in favor of follow up testing , but no statistical differences between post and follow up testing .

Table 9. *Scheffe test for multi-comparisons in academic achievement test*

Measure	Pre M= 17.01	Post M= 33.45	Follow up M= 32.35
Pre	--	--	--
Post	18.95*	--	--
Follow up	17.85*	1. 10	--

Table 10. shows data on repeated measures analysis for self efficacy. The table shows that there are statistical differences between measures (pre- post- follow up) at the level (0.01).

Table 10. *Repeated measures analysis for self efficacy*

Source	Type 111 sum of squares	df	Mean square	F	Sig.
Between groups	50200.200	1	50200.200	590.551	0.01
Error 1	4930.333	58	85.006		
Between Measures	25297.033	2	12648.517	123.776	0.01
MeasuresxGroups	25515.700	2	12757.850	124.846	0.01
Error 2	11853.933	116	102.189		

Table11. shows data on Scheffe test for multi-comparisons in self efficacy test. The table shows that there are statistical differences between pre and post measures in favor of post test, and between pre and follow up measures in favor of follow up testing , but no statistical differences between post and follow up testing .

Table 11. *Scheffe test for multi-comparisons in self efficacy*

Measure	Pre M= 39.20	Post M= 83.83	Follow up M= 85.13
Pre	--	--	--
Post	44.633*	--	--
Follow up	45.933*	1. 300	--

Table 12. shows data on repeated measures analysis for academic motivation. The table shows that there are statistical differences between measures (pre- post- follow up) at the level (0.01).

Table 12. *Repeated measures analysis for academic motivation*

Source	Type 111 sum of squares	df	Mean square	F	Sig.
Between groups	35224.022	1	5224.022	590.551	0.01
Error 1	2984.556	58	51.458		
Between Measures	23157.378	2	11578.689	497.742	0.01
MeasuresxGroups	19331.511	2	9665.756	415.509	0.01
Error 2	2698.444	116	23.262		

Table13. shows data on Scheffe test for multi-comparisons in academic motivation scale. The table shows that there are statistical differences between pre and post measures in favor of post test, and between pre and follow up measures in favor of follow up testing , but no statistical differences between post and follow up testing .

Table 13. *Scheffe test for multi-comparisons in academic motivation*

Measure	Pre M= 35.73	Post M= 81.00	Follow up M= 82.50
Pre	--	--	--
Post	45.26*	--	--
Follow up	46.76*	1. 500	--

Discussion

This study sought to determine the effects of the advance graphic organizers strategy in improving academic achievement, self efficacy and academic motivation of second year prep students with learning disabilities.

The results of this study showed that the advance graphic organizers strategy was effective in improving academic achievement, self efficacy and academic motivation of students in experimental group, compared to the control group whose individuals were left to be taught in a traditional way .

Participants of this study fall into the minimum IQ of 90, nevertheless, they have learning disability. Thus IQ score cannot account for learning disabilities.The results of the present study support that conclusion with evidence that students who participated in the study do not fall into the low IQ range,however they have learning disabilities.When designing a program based on advance graphic organizers strategy, they had statistical increase in academic achievement, self efficacy and academic motivation. This goes in line with what Mourad Ali et al (2006) notes that there is one problem " students who are identified as learning disabled often cover any special abilities and talents,so their weakness becomes the focus of their teachers and peers , ignoring their abilities. Mourad Ali (2007) , however , notes that " learning disabled , as well as gifted students can master the same contents and school subjects ", but they need to do that in a way that is different from that used in our schools .

Experimental group gained better scores in academic achievement, self efficacy and academic motivation tests than did control groups in post-tests though there were no statistical differences between the two groups in pre- test. This is due to the program which met the experimental group's needs and interests. On the contrary, the control group was left to be taught traditionally. This goes in line with our adopted perspective which indicates that traditional methods used in our schools do not direct students as individual toward tasks and materials , and do not challenge their abilities. This may lead students to hate all subjects and the school in general. On the contrary, when teachers adopt a technique that suits students interests and challenges their abilities with its various modalities , those students had a lot of gains .

Implications

The results of this study have several important implications. This study adds to the literature on the effectiveness of graphic organizers with learning disabled students. Results appear to indicate that graphic organizers are an effective instructional strategy for improving academic achievement, self efficacy and academic motivation test scores of students with learning disabilities. Graphic organizers provide students with a visual representation of the content in a text and this may facilitate the learning of content knowledge.

In addition, the findings of this study align with the findings of Adel Abdulla's study(2010) in which they proposed that graphic organizers are more effective when students are involved in the construction of the graphic organizer.

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