The Effect of Self-Regulated Learning Strategies on Developing Working Memory and Achievement Goal Orientation among High School Students[1].

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Abstract

This study aims to investigate the effect of a self-regulated learning strategies on developing working memory and achievement goal orientation among high school students. The sample was selected from high school students. The participants in this study were 76 students. Experimental group (EG) consisted of 38 students while the control group (CG) consisted of 38 students. An experimental pretest and posttest control-group design was used in this study. The self-regulated learning strategies was conducted to the whole class by their actual teacher during the actual lesson period for 12 weeks with 50 minute sessions conducted three times a week. The program was designed based on the three basic fundamentals of self-regulated learning strategies, namely 'cognitive, metacognitive and resource management strategies'. The results of this study indicated great gains for students in the experimental group in among working memory and achievement goal orientation. The study shows that students in the experimental group, compared to those in the control group, develop robust among working memory and achievement goal orientation. Recommendation: As self-regulated learning strategies exhibit a substantial effect on students' among working memory and achievement goal orientation, it is recommended that teachers should learn how to implement these strategies in their lessons to increase their students' performance.

Introduction

Self-regulated learning plays a role in goal orientation. In terms of self-regulated learning, goal orientation can fit into it as it is assumed that students would set goals to achieve in self-regulation adopt one of the

orientations, and the setting goals will be correlated to the use of self-regulatory strategies. Consistent results has been found that mastery goals in goal orientation are strongly positively related to the use of cognitive strategies, which implies that goal orientation is strongly related to self-regulated learning (Pintrich, 1999). It is suggested by Schunk (2005) that some research has been worked on help seeking behavior that it act as importantly on self-regulation strategies and help seeking is varied depended on students' social and motivation factors. Ryan, Pintrinch and Midgley (2001) revealed that students who are socially incompetence may avoid seeking help as fear of negative consequence. Ryan (2001) also found out social goal orientation relates to self-regulation strategies in regard to students who hold a mastery goal orientation is likely to seek help from others than person who hold performance goal. That is performance goal individuals are concerned of others' negative evaluation. In terms of goal orientation, Pintrich (2003) social variable can influence motivation and self-regulated learning.

In this study, we propose working memory (WM) as a candidate for a cognitive ability that is conceptually convergent with the meshing hypothesis. WM is assumed to be important for holding information while conducting complex tasks (e.g., learning) by interacting with other cognitive systems (Baddeley, 2010; Miyake and Shah, 1999; Andrade, 2001). Although WM is typically associated with re-entrant neural networks located in the frontal, posterior, and subcortical areas (Klingberg, 2010), the system can be engaged by providing information through both auditory and visual modalities. This allows for active maintenance and representation of various perceptual information to serve the needs of broader ongoing cognitive tasks (Vogel and Machizawa, 2004; Arnott et al, 2005) . Individual differences in the capacity for processing visual or auditory stimuli through working memory can therefore have an impact on learning outcome when instructions are explicitly tailored to specific modalities, similar to the prediction rooted in the meshing hypothesis. This convergence in concept and application raises three possibilities. First,

individual differences in WM can explain a potentially increased learning outcome when instruction is tailored to a modality-specific learning style. In other words, the preference is due to higher WM capacity for processing information presented through the specific modality. Second, auditory or visual WM capacity might function alongside modality-specific preferences and enhance learning outcomes. Under this hypothesis, individual differences in WM might explain some degree of the variance in learning outcome. The third possibility is that modality-specific learning style has broad influence on cognitive outcomes and, thus, enhances learning, as well as performance in cognitive tasks that are presented in the preferred/matched modality. Based on the presented considerations, which highlighted a continued application of modality-specific learning styles in educational practice, and a scarcity of proper empirical investigations and data targeted at the relationship between modality-specific learning styles and cognitive abilities such as working memory, we conducted a study of the meshing hypothesis as it pertains to working memory and immediate recall. (Pashler et al., 2008)

Statement of the Problem

Educators face the problem of creating a cognitive add metacognitive classroom where all students are engaged and active. Though overwhelming amount of considerations have emerged from current cognitive add metacognitive research, not all educators all over the world in general, and in our Arab world in particular, are aware of the findings of these studies. In such a case, an unbalanced prospect for teachers to provide maximal learning opportunities for all students prevails and is created. Accordingly, there will be an urgent need to create positive emotional connections to learning so that long-term learning can be transferred easily and successfully to the real-world. If students feel unsafe, stressed, or are experiencing a low-cycle of activity learning becomes impossible and they may hate the learning process as a whole and drop out. Conventional methods might be problematic and no longer is beneficial to students. Students, as Schunk& Zimmerman (1995). claims, on average, retain only five percent of information delivered through lecture twenty-four hours later. Teachers try to do the teaching without considering whether the learners are motivated or not. Hence, employing methods that are more cognitive add metacognitive may be a way to increase the effectiveness of teaching and learning.

Further research is necessary to build on the vast amount of research into

cognitive add metacognitive based learning specially with students. This will allow researchers to determine how cognitive add metacognitive based learning can be best used as an intervention with those students as there is a dearth of research with this population. Thus the present study addresses the following questions.

1- Are there differences in post-test scores mean between control and experimental groups on working memory scale?

2- Are there differences in post-test scores mean between control and experimental groups on achievement goal orientation scale?

3- Are there differences in pre- post-test scores mean of the experimental group on working memory scale?

4-Are there differences in pre- post-test scores mean of the experimental group on achievement goal orientation scale?

Purpose of the study

This study aims to investigate the effect of a self-regulated learning strategies program on working memory and achievement goal orientation among eleventh grade students. By gaining a better understanding of this process, teachers can apply the findings to create safe, stress-free classrooms that will engage the minds of students, improving their working memory, and that will help to ameliorate their achievement goal orientation.

Literature Review

According to Zimmerman and Schunk (1997), the following characteristics should be considered so that learning can be considered as

self-regulated: The use of different learning strategies, to be self-efficient

when applying the strategies and to be committed to achieving goals. The

primary goal of a self-regulation culture is to ensure that the entity involved in it is capable of improving and seeking its inherent quality and that such culture is born from the willing of individuals who are part of it.

For that reason, self-regulated learning concept has been increasing the students actively participate in their learning process, monitoring and controlling the basic processes to achieve academic goals (Schunk, 2012).

Thus, learning is increasingly considered an activity accomplished by the

students themselves and not a reactive response to teaching, for that reason, the students self-regulating their learning are proactive in their efforts to learn, since they are aware of their strengthens and limitations.

The self-regulated learning construct is related to the ways of independent

and effective academic learning including metacognition process, intrinsic motivation and strategic performance (Perry, 2002). It is also stated that the self-regulated learning influences the motivational and emotional aspect of individuals in a direct way. If a student has the necessary tools and methods to learn and study, their academic performance will be improved and consequently, their efforts will be reflected in their grades. According to the above-mentioned points, the student will be not only more motivated but also intrinsically motivated and will have positive emotions that will help to strength motivation. Lassen, Krawchuk and Rajani (2008) found that although self-variables are related to average scores per grade, self-efficacy for self-regulation is the best predictor of procrastination tendencies. Based on the findings from the two studies, the authors suggest that self-efficacy is a stronger predictor of the tendency to procrastinate than other motivation variables, such as self-regulation, achievement goal orientation and self-esteem. The costs of academic procrastination are evident: compared to neutral procrastinators, negative procrastinators reported low GPAs per grade, they expected and received a lower class grade, spent more hours procrastinating each day, took longer to begin assignments and expressed less confidence that they were capable of regulating their own learning. Self-efficacy is proposed as the key to understanding procrastination in adult students who have knowledge of cognitive and metacognitive abilities and strategies but with low confidence to use them to organize their learning. Metacognitive strategy training will help students to know what to do and how to do it, but in order to increase self-efficacy for self-regulation, students will need repeated success experiences, encouragement and demonstrations of the benefits of using successful strategies.

Achievement Goal Orientation

Achievement goal orientation theory was regarded as a pioneering approach to motivation. The main focus of this theory is identifying the reasons for school and in-class achievement, rather than identifying the degree of motivation to learn in numeric terms (Kaplan & Maehr, 2007; Elliot & McGregor, 2001). Achievement goal orientation can be expressed as individuals' personal beliefs established to arrange their skills or to reveal the goals set out to be successful and as personal perceptions about

the reasons for learning and focusing on goals to continue being successful (Kaplan & Maehr, 2007; Pintrich, 2000). Achievement goal orientation informs us about why and how individuals study to succeed. That is to say, achievement goal orientation is the main reason individuals are motivated to succeed.

This theory is interested in why students follow a certain path in order to succeed in tasks by focusing on goals to continue their achievement . This theory was created to reveal the reasons behind student performance while undertaking classroom activities, learning formations and academic tasks. At the same time, achievement goal orientation theory focuses on what the students think while identifying goals in the situations mentioned above. In fact, the desire to succeed and to avoid failure motivates individuals. In this context, it can be said that achievement goal orientation also has an effect on shaping students' school behaviors. Although there are different types of achievement goal orientation, they can be subsumed into two broad categories: performance goal orientation and learning goal orientation.

Performance Goal Orientation dwells on displaying skills by taking others as references and is based on proving ability or avoidance of seeming incompetent (Jagacinski& Duda, 2001). Performance goal orientation has outcomes such as unwillingness to ask for academic support, cheating (Anderman,Griesinger &Westerfield, 1998), withdrawal in the face of failure and use of artificial browsing strategies. To be judged well by others is very important for students with performance goal orientation and these students avoid being evaluated negatively. These individuals are generally extrinsically motivated.

When they make mistakes, they perceive them as failure and may easily quit what they are studying. These individuals have a hard time facing difficult situations, pay attention to look competent and try to make a good impression by putting effort into being successful or avoiding failure (Greene & Miller, 1996). Performance goal orientation points to a low degree of performance avoidance and intrinsic motivation whereas performance approach can be said to have a positive relationship with

performance. According to Pintrich (2000), while students with performance approach orientation aim to be the best in class, to be the student with the best performance and the one with the highest grades

compared to classmates and to focus on looking successful rather than learning, students with performance avoidance orientation avoid being unqualified, looking incompetent when compared with others, being the

student with the lowest performance and receiving the worst grades in the classroom. In performance-approach orientation, individuals have the effort of proving superiority to others on the academic level, whereas those who are in performance-avoidance orientation are in the situation of trying not to show herself/himself as weak on academic level

Method

Research method: Quasi-experimental research method is used, quasi-experimental research is research that resembles experimental research but is not true experimental research. Although the independent variable is manipulated, participants are not randomly assigned to conditions or orders of conditions because the independent variable is manipulated before the dependent variable is measured; quasi-experimental research eliminates the directionality problem.

Participants: The sample was selected from students in the eleventh grade in basic education. The participants in this study were 76 secondary students. Experimental group (EG) consisted of 38 students while the control group (CG) consisted of 38 students. In both groups, students' social, economic statuses, intelligence and previous scholastic achievement were nearly the same. The students' ages in both groups ranged from 16 to 17 years. The participants were selected by convenience random sampling.

 The sample was randomly divided into two groups; experimental (n= 38 boys only) and control (n= 38 boys only). The two groups were matched on age, IQ, and achievement.

Table 1. means, standard deviations, T- value , and significance level for experimental and control groups on age (by month) , IQ , achievement

Variable	Group	N	M	SD	T	Sig.
Age	Experimental	38	181.53	3.85	0.452	0.517
	Control	38	180.71	3.81		
IQ	Experimental	38	128.18	6.23	0.596	0.483
	Control	38	128.59	6.43		
Achievement	Experimental	38	42.17	2.97	0.643	0.393
	Control	38	42.59	2.51		

Data Collection Tools

1- *The Raven's Colored Progressive Matrices Test*. The Raven's CPM is internationally recognized as a culture -fair or culture reduced test of non-verbal intelligence. This easily administered, multiple - choice pencil and

paper test has no time limit, and comprises three sets of twelve matrix designs arranged to "assess mental development up to a stage when a person is sufficiently able to reason by analogy to adopt this way of thinking as a consistent method of inference" (Raven et al., 1993). The tested is shown a series of patterns with parts missing. The parts removed are of simple shape and have been placed below the matrix. he tested can either point to the pattern piece s/he has selected or write its corresponding number on the record form (Lezak, 1995). The total score is the total number of matrices completed correctly, and the test is thus scored out of 36. The retest reliability of the Raven's CPM was revealed to be .90. The degree of correlation between the Raven's CPM and the WISC revealed correlations of 0.91.

2- *Working Memory scale: (A) Tests of Auditory Working Memory Digit Span (DS).* On the DS subtest from the Wechsler Memory Scale-Third Edition (Wechsler, 1997), participants hear increasingly longer sequences of single digit numbers. For the fi rst portion of this test, participants repeat the sequence out loud in order of presentation (forward span). For the second portion, they recite the sequence in reverse order (backward span). Correct sequences across the two portions of the test are totaled to determine the Digit Span raw score**. (B) Tests of Visuospatial Working Memory Spatial Span (SS).** Also from the Wechsler Memory Scale-Third Edition (Wechsler, 1997) and a visual analog of the DS test, during the SS subtest participants watch the examiner tap increasingly longer sequences of raised, blue blocks positioned arbitrarily on a white board. Participants tap the blocks in the same order they witnessed (forward span) or in the reverse order (backward span). Correct responses across forward span and backwards span trials are totaled to determine the Spatial Span raw score.

3- *Achievement Goal Orientation Scale:* This scale was developed by Researchers with four factors and 26 items. The factors are: performance-approach, performance-avoidance, learning approach and learning avoidance. Factor analysis points to factor loads in scale items to be between 0.41 and 0.98. Cronbach Alpha values of the factors related to reliability of the scale change between 0.92. and 0.98.

Experimental Design

An experimental Pretest-Posttest Control-Group design was used in this study. In this design, two groups are formed by assigning (38) of the students to the experimental group and (38) to the control group. Students

in the experimental and control groups were pretested and post tested in the same manner and at the same time in the study. The bivalent independent variable was the self-regulated learning strategies program and it assumed two values: presence of the self-regulated learning strategies program (for the experimental group) versus absence of the self-regulated learning strategies program (for the control group). The dependent variables were the gains in scores on working memory and achievement goal orientation scales from the pretest and posttest.

Procedures

Pre-intervention testing: All the 76 students in grade ten completed. The Raven's Colored Progressive Matrices Test, which assesses students' intelligence ; working memory scale, which assesses students' working memory , achievement goal orientation, which assesses achievement goal orientation. 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: The self-regulated learning strategies program was conducted to the whole class by their actual teacher during the actual lesson period   for 12 weeks with 50 minute sessions conducted three times a week.   The program was designed based on the three basic fundamentals of self-regulated learning, namely dimensions (motivation regulation, effort regulation, planning, attention focusing, using additional resources, summarizing strategy, emphasis strategy, and self-direction. In the 'orchestrated immersion' phase, the students, with the help of their teacher, used various pictures, power- point presentations, cartoons and comic strips. These helped them the concepts presented and the subject matter as a whole as well. As for 'relaxed alertness,' phase, cooperative learning was present. Students collaborated with one another. Students were asked to write down, share and discuss with their classmates. The aim was to eliminates fear in the learners while maintaining highly challenging environments. During the 'active processing' phase, the learner was allowed to consolidate and internalize information by actively processing it. simulations, group discussions, role plays and dramatization techniques were used in order to ensure the retaining of the obtained knowledge and to ease the structuring of this knowledge as well as

applying it into new situations.

Fidelity of Treatment: To ensure that the self-regulated learning strategies program was delivered as intended by the researchers, the following four safeguards were implemented. The first safeguard was that the teacher received training to criterion in how to apply the self-regulated learning strategies program instructional procedures. The second safeguard was that teacher met with the researcher day after day and communicated daily with the researcher (as needed) to discuss any noteworthy occurrences that took place when implementing the self-regulated learning strategies program 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.

Data Analysis

A two-group pre-post design was used to compare working memory and achievement goal orientation before and after the intervention. T-test was conducted. At each time point (pre/post), the mean and standard deviation were used to summarize group responses .Probability levels of 0.05 or smaller indicated significant differences between the experimental and control groups means. The data collected through the pre-test and post-test were entered into Statistical Package for Social Sciences (SPSS) version 23.

Results

It was hypnotized that there were differences in post-test scores mean between control and experimental groups on working memory test. Table 2. shows T. Test results for the differences in post- test mean scores between experimental and control groups in working memory. According to table 2., there has been found a significant difference the differences in post- test mean scores between experimental and control groups in working memory (t=5.81, p= 0.00; p<0.01) in favor of the experimental group.

Table 2. T. test results for the differences in post- test mean scores between experimental and control groups in working memory

Variable	Experimental		**Control**		**T**	**Sig.**
	M	SD	**M**	**SD**	**5.81**[**]	**0 .01**
working memory	55.54	**2.85**	46.53	**2.27**		

Note: **P <0.01

The second hypothesis was that there were differences in post-test scores mean between control and experimental groups on achievement goal orientation Test. Table 3. shows T. Test results for the differences in post-test mean scores between experimental and control groups in achievement goal orientation. According to table 3., there has been found a significant difference the differences in post- test mean scores between experimental and control groups in achievement goal orientation (t=3.47, 4.01, 3.62, 3.83, p= 0.00; p<0.01) in favor of the experimental group for Learning approach and Performance approach, and favor of the Control group for Learning avoidance and Performance avoidance.

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

Variable	Experimental		Control		T	Sig.
	M	SD	M	SD		
Learning approach	3.98	0.80	3.23	0.76	3.47**	0 .01
Learning avoidance	3.25	0.83	3.87	0.86	4.01**	0 .01
Performance approach	3.76	0.79	3.18	0.79	3.62**	0 .01
Performance avoidance	2.81	0.73	3.35	0.77	3.83 **	0 .01

Note: **P <0.01

The third hypothesis was that there were there differences in pre- post-test scores mean of the experimental group on working memory Test. Table 4. shows T. Test results for the differences in pre- post-test scores mean of the experimental group on working memory Test. According to table 4., there has been found a significant difference the differences in pre- post-test scores mean of the experimental group on working memory (t=6.39**, p= 0.00; p<0.01) in favor of post-test scores mean.

Table 4. T. test results for the differences in pre- post-test scores mean of the experimental group on **working memory** *Test*

Variable	pre- test		post-test		T	Sig.
	M	SD	M	SD	6.39**	0 .01
working memory	47.56	2.78	55.54	2.85		

Note: **P <0.01

The fourth hypothesis was that there were there differences in pre- post-

test scores mean of the experimental group on achievement goal orientation Test. Table 5. shows T. Test results for the differences in pre-post-test scores mean of the experimental group on achievement goal orientation Test. According to table 5., there has been found a significant difference the differences in pre- post-test scores mean of the experimental group on achievement goal orientation (t=4.36, 3.46, 4.29, 3.24, p= 0.00; p<0.01) in favor of the experimental group for Learning approach and Performance approach, and favor of the Control group for Learning avoidance and Performance avoidance.

Table5. T. test results for the differences in pre- post-test scores mean of the experimental group on achievement goal orientation Test

Variable	pre- test		post-test		T	Sig.
	M	SD	M	SD		
Learning approach	3.31	0.66	3.98	0.80	4.36**	0 .01
Learning avoidance	3.85	0.80	3.25	0.83	3.46**	0 .01
Performance approach	3.16	0.95	3.76	0.79	4.29**	0 .01
Performance avoidance	3.39	0.80	2.81	0.73	3.24**	0 .01

Note: **P <0.01

Discussion

The Purpose of this study is to investigate the effect of a self-regulated learning strategies program on working memory and achievement goal orientation among eleventh grade students. The results of this study indicated great gains for students in the experimental group in both working memory and achievement goal orientation.

. This goes in the same line with the results of many studies. For example Ozden 's (2008)analysis of post-test and retention level tests revealed a significant difference between the groups favoring Self-Regulated Learning. Duman (2010) found that Self-Regulated Learning "…more significantly increased the students' academic achievement when compared to traditional teaching methods" (p.2095). The experimental group showed a 47.25% increase from the pre-test to post-test, whereas the control group showed an increase of 21.75% .

The performance of the experimental group in post test in working memory and academic motivation can be explained by the gain achieved by the experimental group due to the application of the Self-Regulated Learning program which was built in the light of the integrated approach. This goes in the same line with Safa El Aseer and others'(2005) claim that

"Learning can not be achieved by accident, but must be sought to by using techniques that stimulate the mind in certain ways in various fields, including art, crafts, music, body building tools, scientific stories, novels, trips, etc. , It is not too late to plant a tree for self - enrichment and mental development"(P. 204).

The mean scores of the control group scores on the working memory and academic motivation were low, while those of the experimental group were high, although there are no differences between the mean scores of the two groups in pre-test. This indicates that the program built for Self-Regulated Learning has taken into account the needs of multiple learners and their desire to learn, unlike the control group that has been learning in the traditional way in most of our schools. This is consistent with the perspective that " the traditional methods used in our schools do not guide students as individuals towards materials, tasks, and do not provide the appropriate challenge for their potential and abilities to appear, which may make students hate the school as a whole, and the materials taught to them in general" (Mourad Ali , 2006, P.38). This may be different if there is an amendment to the conditions of providing experiences based on compensatory programs that help students to live with the educational situation and benefit from it. This is consistent with what Jaber (2005) that "students who attend school and lack fertile educational experience, can compensate for the land they lost if they find fertile experience in their classrooms (P. 242).

Alivernini, Manganelli and Lucidi (2018) conducted a study on a sample of 10th-grade students and found that classroom performance-approach goal structures were related to performance avoidance personal orientations but not to performance-approach personal orientations. They also obtained the finding showing that the Personal Achievement Goal Orientation scales measure three related but separate factors: Mastery,

Performance-Approach, and Performance-Avoidance. Gunderson, Donnellan, Robins and Trzesniewski (2018), on the other hand, found that learning goals show divergent relations to child age and to parents' praise and criticism in elementary and middle school. It was also concluded in the study that making parents aware of the potentially positive effects of process praise and the potentially debilitating effects of person criticism might provide parents with more specific ideas about how to help encourage their children to adopt goals and behaviors that sustain academic motivation. Miller and Neumeister (2017) investigated relationships among gender, perceived parenting style, the personality traits of conscientiousness and neuroticism, perfectionism,

and achievement goal orientation in a high ability and high achieving young adult population and found that self-oriented and socially prescribed perfectionism had a positive relationship with performance goal orientation, Seginer and Mahajna (2018) suggesting that students with these perfectionistic tendencies are also more likely to have performance goals.

Conclusions

This study goes some way to understanding working memory and achievement goal orientation in eleventh students. The study shows that students in the experimental group , compared to those in the control group , develop robust working memory and achievement goal orientation due to training Self-Regulated Learning Strategies. The study shows that those young students have great chance of developing their working memory and achievement goal orientation.

Future Research and Recommendations

As a result teaching with Self-Regulated Learning Strategies is effective in improving students' working memory and achievement goal orientation. In this context, it is proposed that in the classroom teaching teachers should give place to the Self-Regulated Learning Strategies. As for research that can be done in the future, the impact of the Self-Regulated Learning theory teaching on students for effect of another variables. The results of this study have supported the claim of effectiveness of the Self-Regulated Learning Strategies in enhancing working memory, and achievement goal orientation. As a result of the robust evidence provided in this study, it is hoped that the Self-Regulated Learning Strategies will be applied in improving learner outcomes in the future. The pedagogical knowledge needs to be evidence-based. The research and practice communities need to continue to work together to support learning for all students to be ready for their futures.

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تأثير استراتيجيات التنظيم الذاتي للتعلم على تنمية الذاكرة العاملة وتوجه هدف الإنجاز لدى طلاب المدارس الثانوية١

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تهدف هذه الدراسة إلى التعرف على تأثير استراتيجيات التنظيم الذاتي للتعلم على تنمية الذاكرة العاملة وتوجه هدف الإنجاز لدى طلاب المدارس الثانوية. تم اختيار العينة من طلاب المرحلة الثانوية. بلغ المشاركون في هذه الدراسة ٧٦ طالباً. موزعة على مجموعتين، تتكون المجموعة التجريبية من ٣٨ طالباً، وتتكون المجموعة الضابطة من ٣٨ طالباً. تم استخدام المنهج شبه التجريبي تصميم المجموعتين والقياس القبلي البعدي. تم إجراء استراتيجيات التنظيم الذاتي للتعلم على الفصل بأكمله من قبل معلمهم الفعلي خلال فترة الدرس الفعلية لمدة ١٢ أسبوعاً، ثلاث جلسات في الأسبوع، كل جلسة ٥٠ دقيقة. تم تصميم البرنامج بناءا على ثلاثة محاور أساسية لاستراتيجيات التنظيم الذاتي للتعلم، وهي "استراتيجيات إدارة الموارد، والاستراتيجيات المعرفية وما وراء المعرفية". كما تم استخدام مقياس ويكسلر (١٩٩٧) للذاكرة العاملة بصورتيه (أ) المدى العددي، و(ب) مدى الأشكال، وتطوير مقياس توجه هدف الانجاز يقيس أربعة أبعاد هي: توجه التعلم، تجنب التعلم، توجه الأداء، تجنب الأداء. أشارت نتائج هذه الدراسة إلى تحقيق تنمية كبيرة لطلاب المجموعة التجريبية في الذاكرة العاملة وتوجه هدف الإنجاز. حيث أنتهت الدراسة إلى وجود فروق دالة احصائيا بين المجموعتين التجريبية والضابطة في كل من الذاكرة العاملة وتوجه هدف الانجاز لصالح المجموعة التجريبية، ووجود فروق بين القياسين القبلي والبعدي للمجموعة التجريبية في كل من الذاكرة العاملة وتوجه هدف الانجاز لصالح القياس البعدي. توصي الدراسة؛ نظراً لأن استراتيجيات التنظيم الذاتي للتعلم تُظهر تأثيراً كبيراً على الطلاب في كل من الذاكرة العاملة وتوجه أهداف الإنجاز، فمن المستحسن أن يتعلم المعلمون كيفية تنفيذ هذه الاستراتيجيات في دروسهم لزيادة أداء طلابهم.

الكلمات المفتاحية: استراتيجيات التنظيم الذاتي للتعلم ، الذاكرة العاملة ، توجه هدف الإنجاز.