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Research Article

THE EFFECT OF SELF-REGULATION STRATEGIES COMPONENTS SPECIFIC IN MATHEMATICS ON PERFORMANCE - APPROACH AND PERFORMANCE - AVOIDANCE IN FEMALE HIGH SCHOOL STUDENTS

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ABSTRACT
This paper evaluates the effect of self-regulation strategies components specific in mathematics on performance - approach and performance - avoidance in female high school students in Qarchak County in the academic year 2012-2013. This quasi-experimental method with pre-test - re-test control group was applied. The study population consisted of 4583 female high school students in Qarchak County of which 54 were selected by multistage random sampling. They were randomly assigned to two experimental and control groups. After the pretest goal orientation questionnaire application for both groups, the experimental group attended ten session training for self-regulation specific in mathematics; however, the control group received none. Data were analyzed using descriptive statistics (standard deviation, mean) and inferential analysis using ANOVA and Tukey's test. The results indicate that training components of self-regulation strategies affects positively on performance - approach but there was no significant relationship between training components of self-regulation strategies and performance - avoidance. The results showed that training components of self-regulation strategies and creating an incentive environment and structures can provide an important role in improving performance - approach in students leading to better performance.

Keywords: *Self-regulated Learning Strategies, Achievement Goals, Performance-approach, Performance-avoidance*

INTRODUCTION
In activities of daily life, many behaviors continue in the absence of immediate external stimulus for the long-term. The persistence of behavior is due to individual goal setting and assessing their own progress. In fact, the goal expresses individual's intent and determines the amount or value of the behavior (Locke *et al.*, 1990; quoted by Dasta, 2010). Goal orientation or achievement goals equal to ends and means that one considers for its achievement behavior (Reyan and Pintrich, 2002) has been described as a motivational variable which can explain Individual goals when faced with a learning task (Fisher and Ford, 1990; quoted from Matren, 2005). The concept of goal orientation first was raised by Dweck *et al.*, among a group of primary school children in a research during the eighties. They concluded that children dealing with activities have two main objectives; one is to develope capabilities and another is to demonst their abilities that taking each of these goals in the face of challenges has a profound effect on the behavior and performance of individuals (Vandvall, 2001). Indeed achievement goals refers to a set of behavioral intentions that determines individuals' attitude toward participation in learning activities (Dweck, 1986; quoted by Malemberg, 2008). The goal orientation assumes that individuals are different in their behavior to achieve progress in academicsituations. The differences are in emotions, encouragement, thoughts, and behavioral outcomes that accordingly, person's level of success in such situations can be predictable (Elliott, 2005). Goal orientation not only covers the individuals' goals and arguments of progress, but it also shows a sort of standard individuals judge their success or failure in achieving that goal based on (Pintrich, 2000; quoted by Matren, 2005). Elliott *et al.*, (Elliott, 1997; Elliot

and Church, 1997; Elliot and Harakioik, 1996) three-part approach is one of the approaches proposed in the recent year. They reviewed and revised function - domination objective and presented a three-part framework. In the new framework, the performance target structure is divided into two parts of performance - approach and performance - avoidance. three independent objective measure are drawn in this model.

Students in performance – approach are trying to achieve higher scores than others or to avoid lack of competence. They are trying to show off their abilities and avoid merits negative judgment about their competence. They avoid obstacles and challenges and prefer tasks with the facilitated certain success. When faced with a difficult task, they responded by avoidance to avoid risk of withdrawal, showing negative emotions, they negative attribution about their abilities with less enthusiast about their tasks (Dweck and Leggett, 1988; quoted by coutinho, 2007). Sometimes, having multiple objectives increases individual performance. While student is studying for better learning and comprehension gaining good scores increases their trial. It should be noted that those who study for learning are able to study additional subjects, but students with performance-approach cannot do anything outside the designated pilot study (Matren, 2005). They suggest that intelligence and talent are innate and inflexible. As a result they attribute their failures and mistakes to their inability to understand and when tested, they get anxious and lose their confidence and their performance is affected by their failures (Dweck and Leggett, 1991).

Also individuals with performance – approach are trying to have superior abilities and, it is important for them to be considered as those with the ability to do the tasks. They when superior to others are more satisfied. They compare their performance to that of others and when they are lower than other peers feel failure and negative feelings, they have a slight positive attitude toward the class and pursue external rewards such as high grades (Ames and Archer, 1987; quoted by Rasoli, 2010).

Many studies have divided performance target into performance avoidance and performance approach. People with high oriented objectives seek to obtain high abilities. They are trying to work their best and to achieve high score to show classmates and teachers and their parents that they are intelligent; also, people with avoidant approach seek compensation for shortcomings than others. They avoid the appearance of their inability at the presence of others (Church *et al.*, 2001; quoted by Matren, 2005). The theory of goal orientation is built upon the meaning of social- cognitive theory and goal orientation theory. Elliott (1997) goal theory while emphasizes on the active role of learner in the selection, structuring modification and interpretation of their experiences and development, while goal orientation theory describes an integrated pattern of beliefs, attributions, and emotions, which the guides the behavior and describes different ways of approaching, engaging and responding to assignments in different progressive situations. Goal theory focuses on how individuals think about their assignments and performance. Dweck and Sarich (1992) believe the goal orientation could explain the relationship between beliefs about academic achievement and student engagement and persistence in performing the task (quoted by Hejazi and Babaei, 2003)**.** Self-regulated learning strategies are of the main areas that are associated with components of achievement goals (Pintrich, 2004). Using strategies requires goal selection by learner and guiding the facilities, resources and processes by them to achieve the goals (Virget, 2008**).**

Psychologists and education specialists have paid a close attention to investigate the impact of achievement goals and motivational factors in students learning and performance in different study courses for a long time (Lin and Pintrich, 2002). In this regard Pintrich (1999) provided a comprehensive definition of self-regulated learning. He knows this learning as such an active and structured learning process in which learners set learning goals and then try to identify, motivate and regulate their own behavior. Self-regulation is comprised of four components, namely: cognitive, metacognitive, motivational, and resource management strategies.In general, self regulation is called to control a person's cognitive processes (thinking, memory, etc.). The goal is to grow or change is to get person the off the outer control to be changed from other organizing to self- organizing technique **.**The self-regulation was raised by social-cognitive psychologists and researchers, including Bandura 1960, and the common features of different points of view on this subject is the relatively high overlap with each other (Zimmerman, 1998). The term self-regulation strategies refers to a wide variety of voluntary actions

learners choose to achieve the learning objectives, the main strategies include cognitive-regulated (surface and deep), metacognitive strategies and resource management (Winston and Meyer, 1986; quoted by Wirget and Yorth, 2008). Researchers and theorists have proposed various models to clarify the relationship between self-regulation and achievement goals components. An individual in doing learning tasks is faced with emotions such as interest, boredom, joy, hope, fear and anxiety that create emotions as knowing feeling, comlexity feeling, feelings of familiarity, confident, and satisfaction. These emotions create approach or avoidance behaviors and help decision making in learning situations (Ifklis, 2009). Chatzistamatiou (2013) states that attention should be given to learning complex interaction as factors associated with self-regulated learning strategies by teachers in the areas of cognitive and learning environments. this model emphasizes on the relationship between self-regulated learning strategies and activities and cognitive factors at school, including the referrnce to mathematics at school with focus on self-efficacy, beliefs in academic values and sense of fun. Andreassen and Braten (2011) in their study express that teachers need instruction to use various self- regulation strategies to enhance the effectiveness of their teaching, achievement and to facilitate student learning.

Therefore, there have been some researches on the relationship between achievement goals components and self-regulation strategies in recent years, but most of these studies examined the correlation, the current study examined the effectiveness of self-regulated learning components on performance - approach and performance - avoidance during practice learning mathematics.

Litrature Review

Since Eighties, many researches has been made in the field of achievement goals component interaction and self-regulation.

Virget (2008) tested a model that includes achievement goals components, metacognition (metacognitive knowledge, regulation and experience), reading strategies (metacognitive strategies, deep cognitive, surface cognitive and resource management) and academic performance in their research. They concluded that in effective self-regulatory students performance avoidance has a weak negative effects on metacognition. Performance – approach goals using surface cognitive strategies and resource management are directly related. Morever, the resource management strategies and meta-cognitive strategies have a positive effect on scores**.** Despite the results obtained in the literature, there was a positive relationship between performance approach goals and the use of deep cognitive and metacognitive strategies, while there was no relationship between performance avoidance and the use of surface cognitive strategies and resource management. Kotinho study (2008) showed that achievement goals are associated with academic achievement only through cognition. A student with performance approach goals have poor Meta cognition, which leads to poor academic achievement. Even when they try to perform well, it is possible to not enjoy learning. Students with poorer Meta cognition may be considered as unskilled and unqualified learners among their peers and classmates. Kotinho and Newman (2008) studied effects of Meta cognition, achievement goals, study strategies and self-efficacy in their model and concluded that Meta cognition is a poor predictor for performance avoidance but there was a positive relationship between cognition and performance approach. Estian (2007) in his study found that there was a relationship between achievement goals and deep, surface and Meta cognition self-regulation strategy. People with performance approach use surface strategies as memorization, repetition and exercises to learn. Teodosio (2006) found an insignificant relationship between performance approach and metacognitive strategies. Also found that cognitive and Meta cognitive strategies used by students are significantly associated with achievement goals. They found that people with higher performance approach more use superficial study strategies since they are trying to do their assignments more rapidly than others, and show themselves superior. Chii (2002), in their study found that individuals with a performance approach that study to get high scores do not tend to have a positive attitude to learning and show the negative correlation with the use of deep-strategies. Learners who emphasize on the superiority over others may spend less time and effort using deep strategies. To them, great efforts in the use of these strategies may indicate that they are less able. Green (1994) used path analysis of relationships between perceived ability variables, performance objectives, and deep and surface processing strategies and

academic achievement were. There is direct positive effect of performance targets on surface processing strategies. Moreover, the deep and surface processing strategies effect on academic achievement. Karshki study (1387), on the relationship between achievement goals components and self-regulated learning found that there was a positive relationship between performance approach self-regulated strategies and a negative relationship between performance avoidance self-regulated strategies. There was a weak correlation between avoidance goals and cognitive strategies and there is strong correlation between metacognitive strategies and resource management.

Folad (2007) showed in their study that male students tend to have a higher performance approach. Additionally, in this study, there was no significant gender differences regarding performance avoidance, and also the results showed males are more intend to seek positive judgments proven competence, compared to females. Khormaee and Kheiri (2006); Ghadam and Sarmad (2003), in separate studies evaluated the causal model of personality traits, motivational orientations and cognitive strategies. The results showed that performance approach can predict of a surface strategies in student. There have been some researches on the relationship between achievement goals components and self-regulation strategies in recent years. Researchers and theorists proposed various models

Objective: To determine the effect of self-regulation strategies components specific in mathematics on performance - approach and performance - avoidance in female high school students.

Research Hypothesis

1- Learning self-regulation strategies impacts on performance - approach in female high school students.

2- Learning self-regulation strategies impacts on performance - avoidance in female high school students.

MATERIALS AND METHODS

Research Methodology

Subjects are 54 female high school students (grade 3 studying at science field) in Qarchak County in the academic year 2012-2013. They were selected by multistage random sampling .First a list of public high school in Qarchak County has been provided. The list consisted of 14 schools. One high school with 402 students at 12 classes in four grades was randomly selected. Then a grade was randomly selected and then two classes were selected as experimental and control groups (Table 1).

Table 1: Demographic features of experimental and control groups

Group	IQ mean	IQ standard deviation	IQ mean error	size
Control	109.79	11.35	1.98	27
Experimental	110.05	10.93	1.79	27

Table 1 shows that both groups are nearly the same regarding IQ standard deviation observed and IQ mean without a significant difference between the two groups in terms of IQ.

The Study Design and Methods: This study examined self-regulated learning strategies and achievement goals using causal relations of research variables based on a model presented by Virget and York (2008). The quasi-experimental, pretest - retest experimental and control groups were used. Finally, this study was conducted in three stages. 1) The pre test, 2) The experimental group students (self-regulated learning strategies were taught in ten one-hour sessions to the experimental group), and 3) The re- test.

After pretesting both groups on achievement goals and mathematics performance, students in the experimental group attended ten one-hour sessions to be trained method of self-regulated learning strategies specific in mathematics by the research, further research to evaluate the effectiveness of the training, re test of achievement goals and mathematics performance were conducted on both experimental and control groups.

Data Collection Tool: Goal orientation questionnaire was used to measure variables.

Vande Wall Goal Orientation Questionnaire (1997): The 9-item measure has been designed and used.

Performance –approach*:* emphasis is on gaining competency among others.

Performance –avoidance: emphasis is to avoid incompetency among others.
Performance –approach four items, and performance –avoidance five items were evaluated and rated based on Likert scale ranging from completely agree (score 7) to strongly disagree (score 1). Reliability of the questionnaire in this study was 1.85 and 1.83, regarding performance –approach and performance –avoidance, respectively.

RESULTS AND DISCUSSION

Results

Kalmogorov-Smirnov-Test was used to investigate the normal distribution of the components of performance –approach and performance –avoidance assumption. Levene Statistic was used to assess the consistency of variance, and ANOVA and Tukey (HSD) tests were used to test research hypotheses and evaluate the difference between variance.

Table 2: Normally distributed variables parameters

Variable		Pre test		Re test	
		Experimental	**Control**	**Experimental**	**Control**
performance – approach	Z value	0.530	0.639	0.473	0.458
	Significance	0.941	0.809	0.979	0.985
performance – avoidance	Z value	0.616	0.669	0.556	0.551
	Significance	0.843	0.762	0.917	0.921

Table 2 shows the normal distribution of variables regarding Z values, and obtained significance level in both components of pre test and re tests in both experimental and control groups.

Table 3: Descriptive characteristics of experimental and control group students

Maximum	Minimum	SD	Mean	Group	Test	Variables
31	11	3.125	21.93	Experimental	Pre test	Performance
32	10	4.007	21.15	Control		Approach
30	11	2.556	24.7	Experimental	Re test	
33	11	4.522	20.70	Control		
31	11	4.864	21.70	Experimental	Pre test	Performance
32	10	4.957	21.52	Control		Avoidance
30	11	5.064	21.48	Experimental	Re test	
33	11	5.058	21.74	Control		

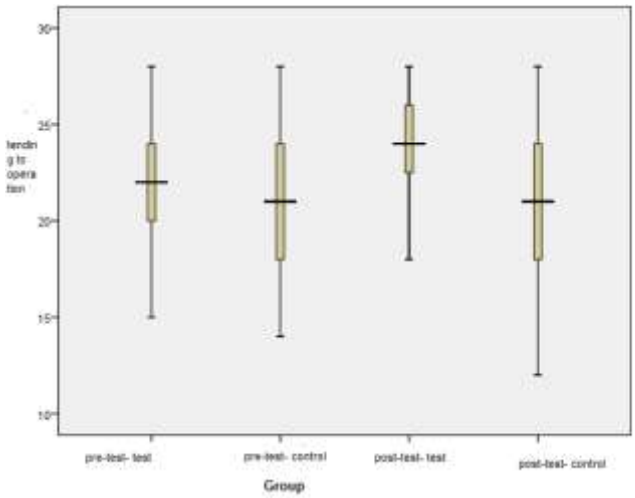
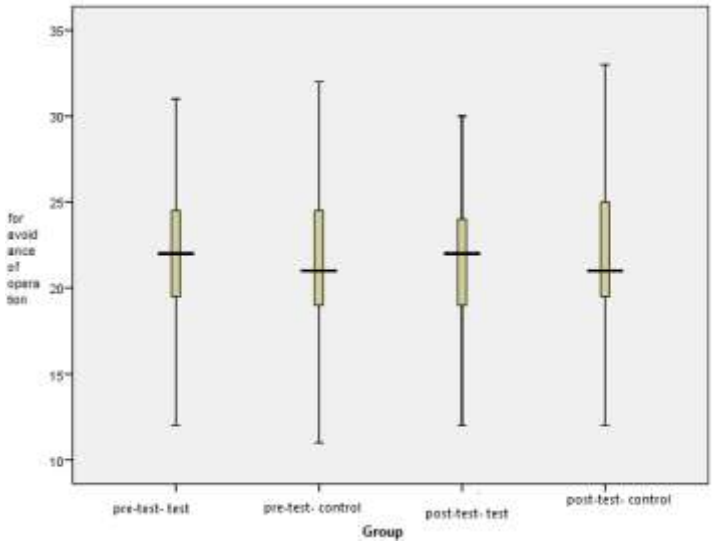


Table 3 indicate that there were significant differences between performance approach component in mean and standard deviation indicators in re-test in experimental group and in pre-test mean and standard deviation of the experimental group, pretest of control group and re- test of control group. But there were no significant differences in four tests of performance avoidance regarding mean and standard deviation indicators.

According to four graphs (1) of performance approach, experimental group bar is shorter than that of control group regarding re test that indicates the reduced variance of scores in this test. The plot shows an increase in the minimum score and middle line represents the median increase in re-test scores of the experimental group.



According to the diagram (2), in performance avoidance box plot represents the variance, minimum and maximum values and the median in all four modes with no significant difference.

1- Hypothesis 1: Learning self-regulation strategies impacts on performance - approach in female high school students

Table 4: Test of homogeneity of variance between the performance approach

Sig	F maximum	Intra group degree of freedom	Inter group degree of freedom
0.081	0.623	104	3

According to Table 4, P> 0/05, so there is no significant difference between the variances, which indicates the variance is homogeneous**.**

Table 5 : ANOVA test on performance approach

	Sum of squares	Degree of freedom	mean squares	F value	Significance level
Inter group	181.111	3	60.370	4.574	0.005
Intra group	1372.741	104			
Total	1553.852	107			

According to the results of ANOVA in Table 5, the F observed at a significance level of P <0.05 indicates that regarding performance approach there are significant differences between scores of four tests (pre-

test and re-test experimental and control).

Table 6: Re hoc Tukey test on performance approach

Confidence Interval 95% Upper bound	Lower bound	Significance level	Standard error	Mean difference	Group 2	Group 1
5.53	1.21	0.001	0.827	3.371*	Pre test experimental	Re test experimental
5.51	0.34	0.020	0.989	2.926*	Pre test control	
5.95	0.79	0.005	0.989	3.370*	Re test control	

Table 6 Re hoc Tukey test results regarding performance approach variable indicate that in paired comparisons (two by two) test results, re-test experimental group is greater than other means in all cases. The significance level is P <0.05, so there is a significant difference between the experimental group retest .

2- Hypothesis 2: Learning self-regulation strategies impacts on performance - avoidance in female high school students

Table 7: test of homogeneity of variance between the performance avoidance

Sig	F maximum	Intra group degree of freedom	Inter group degree of freedom
0.139	0.936	104	3

According to Table 7, P> 0/05, so there is no significant difference between the variances, which indicates the variance is homogeneous, so the data are not questioning the assumption of equal variances **.**

Table 8: ANOVA test on performance avoidance variable

	Sum of squares	Degree of freedom	Mean squares	F value	Significance level
Inter group	1.270	3	0.457	0.019	0.996
Intra group	2512.296	104	44.157		
Total	2513.667	107			

According to Table (8), ANOVA results indicate that the observed F value is less than the critical value P> 0.05, so it is concluded that there is no significant difference between the mean scores of the four tests.

mean squares **F value** Significance level

Discussion and conclusion

According to the survey findings,in the study of hypotheses 1, the results of Tables (5 and 6), it is inferred that the effect of teaching self-regulation strategies on performance approch is positively significant for female highschool students thus the hypothesis is approved. The results of the study are consistent with that of findings Kotinho (2008), Krista (2008), Virget (2008), Kotinho and Newman (2008), Staver (2007), Chii (2002), Green (1994), Karshki (2008), Folad (2007), Khormaee and Kheiri (2006).

According to the results, this could be explained, because the people using performance approach try to have better abilities than others and others opinion on their abilities are important for them, They also have the satisfaction and success feeling when know that they are better than others can perform better, when their performance is lower compared with other peers, feel failure and negative feelings, with slight positive attitude toward the class and pursue external rewards such as high grades, they use surface strategies, this group do not think about learning, but what is important is it to store data, also because these people do not think about how to study without any attention to their interests and emotions, theyhave no sense of their duty towards it, they are merely willing to practice and gain positive judgments and avoid negative judgments of others. It is obvious that these people by learning self-regulation strategies plann to improve performance, monitoring and self-evaluation, they learn surface strategies promotion approches of memorixing, repetition and exercise better and learn how to strengthen and apply their skills, and they result in better performance, that these will reinforce objectives.

In the second hypothesis, research findings (Table 7) showed that self-regulated learning strategies on high school students' performance avoidance component was not significant and did not work. The results of the study are consistent with that of findings Kotinho (2008), Krista (2008), Virget (2008), Kotinho and Newman (2008), Staver (2007), Yorden and Midgoli (2003), Chii (2002), Green (1994), Karshki (2008), Folad (2007), Khormaee and Kheiri (2006). According to the results of first hypotheses and results of this hypotheses could be explained on the assumption that because the people who brought on the performance avoidance goals in practice more intended toward using surface strategies with more focused on not being considered as incompetent and foolish, Therefore, go into a minimum of effort on their performance avoidance strategy with less effort to deal with issues, they avoid problems and facing challenges, while, with being trained on self-regulation strategies, because they get aware of their skills they will go into more efforts to improve their academic performance and regulate their own behavior, and using performance approach attempt to gain better learning and performance than in order to deal with the challenges show less or more avoidance. Thus, each student by learning self-regulation strategies with their special properties learns what to do and how take advantages of their personal circumstances with higher productivity, also learns what to do before and during study to gain study objectives and develop incentives that encourages them .In this respect, independence in learning, teaching and behavior management of learners should be considered as the main objective and students can apply to the regulation and use of information to control learning skills. Thus, self-regulated learning organizes cognitive activities related to the of goal orientation that is conducive to stimulating students to learn better.

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