Self-Regulation Skills and Test Anxiety of Senior High School Students [1]

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Abstract

The purpose of the study was to investigate the self-regulation skills of high school students and to reveal the relationship between self-regulation skills and test anxiety. In this study, a survey method was used. The "Motivated Strategies for Learning Questionnaire" and "Test Anxiety Inventory" were used as the data collection tools. The findings of the study indicated that the self-regulation skills of students differed significantly according to the gender, the frequency of reading books, watching TV and using social media. While the test anxiety scores of the participants did not differ significantly according to frequency of watching TV and using social media but in terms of the gender and the frequency of reading books. Furthermore, current study concluded that there was a low and negative relationship between self-regulation skills and test anxiety.

Keywords : Sel-regulation, self-regulation skills, test anxiety, high school students.

Introduction

The concept of self-regulation, according to the social cognitive theory of Bandura, focuses on the deliberation of an individual about his or her behaviors and skills as well as what he or she can achieve. It is based on the self-control ability of individuals in cognitive, affective and behavioral aspects in various situations and the selection and implementation of appropriate strategies (Bandura, 1982; Zimmerman & Moylan, 2009). The information-processing theory emphasizes the metacognitive characteristics of self-regulation (Winne & Hadwin, 1998). When both are considered together, the focus is on the metacognitive regulation skills and motivational variables (Francesca, Nietfeld & Cao, 2016).

Self-regulation refers to feelings, thoughts and behaviors that an individual develops on his or her own so as to achieve the objective set by himself or herself. It is not a mental or academic skill; instead, it is a process managed by the individual in transforming his or her mental abilities into academic skills (Zimmerman, 2000). According to Pajares (2008), self-regulation is a metacognitive process where students understand and evaluate how they behave as well as plan alternative routes to success; and, according to Schunk and Ertmer (2000), self-regulation is to produce thoughts and emotions which are necessary for learning and motivation of an individual, to plan his or her behaviors based on these thoughts and emotions and to achieve them gradually.

It can be stated that the individuals with self-regulation skills are aware of their responsibilities, active and constructive in the learning process and can regulate their objectives, easily get their act together, rivet their attention and maintain their attention span. Given the impact of the factors such as the lack of organization, focus and the inefficient use of mental skills on the formation of test anxiety, it is possible to associate self-regulation skills with test anxiety (Msayar, Akhmal & Mardhiana, 2016). A high level of test anxiety has an adverse impact of the perception of self-efficacy. And, the negative perception of self-efficacy may decrease the performance of an individual in forming an active metacognitive structure, in creating planning and organizational skills (Msayar, Akhmal, Mardhiana, 2016; Zimmerman and Martinez-Pons, 1988).

The studies on the academic achievement of students indicate that self-regulation skills, defined as the use of appropriate metacognitive, motivational and behavioral processes in the process of learning, enhance achievement (Zimmerman, 2002). Although the methods of measuring the academic achievement of students vary, test method is the most common method in Turkey. The determination of the level of knowledge of students, the transfer to some levels of education, the achievement of the desired certificate or diploma depends on the

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success on exams. This situation may create a negative impact on students and cause anxiety among them.

Test anxiety is defined as the situational, psychological, behavioral anxiety reactions against a potential failure in relation to tests or examinations (Cizek and Burg, 2006). Test anxiety has an affective aspect as well such as the symptoms that occur in body due to mental and emotional tension, which originates from thoughts not relevant to test anxiety. The mental and affective aspects of test anxiety decrease student performance.

The last year in high school is the period when students prepare most for the undergraduate exam in Turkey and thus, when they have the highest level of anxiety. Many parents receive support from professionals and there are various efforts for students to cope with such anxiety. A high level of test anxiety has an adverse impact on the perception of self-efficacy (Zimmerman and Martinez-Pons, 1988), and, a negative perception of self-efficacy may decrease the performance of an individual in forming an active metacognitive structure, in creating planning and organizational skills (Msayar, Akhmal, Mardhiana, 2016).

All of these may considerably hamper the achievement of curriculum in practice. Given that the intrinsic properties rather than external factors are effective in the process of learning and considering that the self-regulation skills of students may help to reduce their feelings of stress, this study aims to analyze the self-regulation skills and test anxiety levels of senior high school students in terms of various variables, which are considered to have an effect on them and to reveal the relationship between self-regulation skills and test anxiety. It is contemplated that the findings of the study would provide data for the studies on the improvement of the self-regulation skills of students and curriculum development to enable students to cope with test anxiety. The current study aims to provide answer to the following questions:

1- Do the self-regulation skills of the participants differ significantly in terms of gender, the frequency of reading books, watching TV and using social media?
2- Do the test anxiety of the participants differs significantly in terms of gender, the frequency of reading books, watching TV and using social media?
3- Is there a relationship between the self-regulation skills of participants and their test anxiety?

Methods

Model

In this study survey method was used.

Participants

The participants of the research were composed of 611 senior high school students in 9 schools among a total of 18 high schools in a province in the western part of Turkey. There were 364 female students and 247 male students.

Data collection/analysis

The study utilized "*The Motivated Strategies for Learning Questionnaire*" developed by Pintrich and De Groot (1990) and adapted into Turkish by Üredi (2005) so as to analyze the self-regulation skills of participants. Instead of employing the "Scale of Self-regulation" and "Scale of Cognitive Strategy Use" independently of each other in the study, a single scale of "Self-regulatory Learning Strategies" was used. The Cronbach alpha reliability value was .82. In order to determine the levels of test anxiety of the participants, "Test Anxiety

Inventory" developed by Spielberger (1980) and adapted into Turkish by Albayrak and Öner (1997) was administered. The Cronbach alpha reliability value was .93.

Data analysis

The data were analyzed through SPSS 20.0 software, t-test and one-way analysis of variance; Tukey and Dunnett C tests were performed and the effect size was calculated so as to explain the variation between groups. The correlation was calculated in order to examine the relationship between the scores obtained from the scales.

Results

The current study first examined whether the scores on the self-regulation skills of the participants differ according to gender through t-test for independent groups, and the result is presented in Table 1.

Table 1. *t-test result of self-regulation skills of female and male participants*

Groups	N	$\bar{X}$	S	df	t	p
Female	364	4,61	0,72	609	5,454	0,00
Male	247	4,27	0,79			

p<0,05

As seen in Table 1, the scores on the self-regulation skills of the participants differ significantly in terms of gender. Accordingly, the mean of the scores the self-regulation skills of the female students ($\bar{X}$ = 4,61) is significantly higher than that of the male students ($\bar{X}$= 4,27) [$t_{(609)}$= 5,454, p<0,05].

The study also compared the level of self-regulation skills of the participants in terms of frequency of reading books, watching TV and using social media through one way analysis of variance (ANOVA), and the findings are provided in a single table, namely, in Table 2.

Table 2. ANOVA test results related to differentiation of participants' self-regulation skills in terms of the frequency of reading books, watching TV and using social media

In terms of the frequency of reading books						
Source of Variance	**Sum of Squares**	**df**	**Mean Square**	**F**	**p**	**Significant Difference**
Between Groups	5,299	3	1,766	2,933	0,03*	Those not reading / Those reading 2 books
Within Groups	368,617	612	0,602			
Total	373,917	615				
In terms of the frequency of watching TV						
Source of Variance	**Sum of Squares**	**df**	**Mean Square**	**F**	**p**	**Significant Difference**
Between Groups	5,477	3	1,826	3,028	0,02*	3 hours and more-/2 hours
Within Groups	369,020	612	0,603			
Total	374,498	615				
In terms of the frequency of using social media						
Source of Variance	Sum of Squares	df	Mean Square	F	p	Significant Difference
Between Groups	8,144	3	2,715	4,542	0,00*	3 hours and more/ I do not use / 1 hour
Within Groups	366,372	613	0,598			
Total	374,516	616				

p<0,05

Table 2 shows that self-regulation skills of the participants differ significantly in terms of the frequency of reading books, watching TV and using social media. The scores of self-regulation skills of those who do not read books and those who read one, two, three or more books in a month are found to be $\bar{X}= 4,38$, $\bar{X}= 4,52$, $\bar{X}= 4,65$, $\bar{X}= 4,44$ respectively. The Tukey's multiple comparison test performed in the study revealed that there is a significant difference between those who read two books in a month and those who do not read at all [$F_{(3-612)}= 4,48$, $p<0,033$]. The calculated effect size ($n^2=0,01$) indicated that the difference is significant at a very low level.

The mean score of the self-regulation skills of the participants is $\bar{X}= 4,45$ for those who do not watch TV, $\bar{X}= 4,51$ for those who watch TV for one hour, $\bar{X}= 4,60$ for those who watch TV for two hours, $\bar{X}= 4,20$ for those who watch TV for three hours or more. According to the Tukey's multiple comparison test, there is a significant difference between those who watch TV for three hours or more and those for two hours [$F_{(3-612)}= 4,47$, $p<0,05$]; however, the difference has a low effect-size ($n^2=0,01$). The mean score of the self-regulation skills of the participants who do not use social media is $\bar{X}= 4,60$; that of those who use social media for one hour is $\bar{X}= 4,54$; that of those who use it for two hours is $\bar{X}= 4,52$ and that of those who use it for three hours or more is $\bar{X}= 4,29$. In order to find out the source of the differences among these mean scores, Dunnett's multiple comparison test was performed given that the homogeneity of variance assumption was not met. The results of the test indicated that there is a significant difference between the scores obtained by the students who use social media for three hours or more in a day, and those who do not use it and those who use it for one hour [$F_{(3-613)}= 4,47$, $p<0,05$]. Based on the effect-size calculated ($n^2=0,02$), the difference is significant at a moderate level.

The study performed t-test to determine whether the test anxiety scores of the participants vary according to gender through t-test for independent groups, and the results are presented in Table 3. To determine if there is a significant difference in the level of test anxiety of the participants in terms of gender, t-test for independent groups was used, and the results are presented in Table 3.

Table 3. *t-test result of test anxiety of female and male participants*

Groups	N	$\bar{X}$	S	df	t	p
Female	364	44,68	12,27	609	3,580	0,00*
Male	247	41,12	12,31			

*p<0,05

As seen in Table 3, the mean score of the test anxiety of the female students is $\bar{X}= 44,68$ while that of the male students is $\bar{X}= 41,12$. The t-test for independent groups indicated that the test anxiety level of the female students are significantly higher than those of the male students [$t_{(609)} = 3,580$, $p<0,05$].

The study analyzed whether the test anxiety scores of the participants differ in terms of the frequency of reading books, watching TV and using social media through ANOVA, and the findings are provided in Table 4, below.

Table 4. *ANOVA test results related to differentiation of participants' test anxiety in terms of the frequency of reading books, watching TV and using social media*

In terms of the frequency of reading books						
Source of Variance	**Sum of Squares**	**df**	**Mean Square**	**F**	**P**	**Significant Difference**
Between Groups	1646,706	3	548,902	3,739	0,01*	Those who do not read-Those who read 3 books or more
Within Groups	89835,214	612	146,790			
Total	91481,920	615				
In terms of the frequency of watching TV						
Source of Variance	**Sum of Squares**	**df**	**Mean Square**	**F**	**p**	**Significant Difference**
Between Groups	925,517	3	308,506	2,093	0,10	-----
Within Groups	90196,351	612	147,380			
Total	91121,869	615				
In terms of the frequency of using social media						
Source of Variance	**Sum of Squares**	**df**	**Mean Square**	**F**	**p**	**Significant Difference**
Between Groups	842,979	3	280,993	1,900	0,13	---
Within Groups	90649,413	613	147,878			
Total	91492,392	616				

*p<0,05

The mean score of the test anxiety of the students who do not read is $\bar{X}$=44,79; that of the scores of those who read one book in a month is $\bar{X}$= 42,01; that of the scores of those who read two books in a month is $\bar{X}$= 44,14; and those who read three books or more in a month is $\bar{X}$= 40,10. It is obvious that the test anxiety scores of the students who do not read are higher than the scores of the others. The results of ANOVA in Table 4 indicates that the difference between the mean scores is significant [$F_{(3-612)}$= 3,74, p<0,05]. Based on the effect-size calculated in the study (n^2=0,02), the difference is significant at a moderate level. According to the Tukey's multiple comparison test, there is a significant difference between the students who do not read books and those who read three books or more in a month against those who do not read. The mean score of the test anxiety of the participants is $\bar{X}$= 42,65 for those who do not watch TV, $\bar{X}$= 43,18 for those who watch TV for one hour, $\bar{X}$= 43,24 for those who watch TV for two hours, $\bar{X}$= 43,47 for those who watch TV for three hours or more. As seen in Table 4, the study concluded that the differences between the scores are not statistically significant [$F_{(3-612)}$= 43,26, p>0,05]. The mean score of the test anxiety of the participants is $\bar{X}$= 41,04 for those who do not use social media, $\bar{X}$= 42,71 for those who use it for one hour in a day; $\bar{X}$= 44,22 for those who use it for two hours in a day; and $\bar{X}$= 44,28 for those who use it for three hours or more; and, these differences were found not to be statistically significant [$F_{(3-613)}$= 1,90, p>0,05].

The current study lastly examined the relationship between the self-regulation skills and test anxiety of the participants and the correlation results are presented in Table 5.

Table 5. *Correlation table for the scores of the Self-regulation and Test Anxiety*

	Self-regulation	Use of Cognitive Strategy	Self-regulation Overall	Delusion	Affective	Anxiety
Self-regulation	1	,579** ,000 617	,863** ,000 617	,047 ,247 617	,077 ,055 617	,067 ,094 617
Use of Cognitive Strategy		1	,912** ,000 617	-,120** ,003 617	-,033 ,411 617	-,072 ,075 617
Self-regulation Overall			1	-,051 ,205 617	,018 ,648 617	-,010 ,796 617
Delusion				1	,843** ,000 617	,944** ,000 617
Affective					1	,973** ,000 617
Anxiety						1

As seen in Table 5, there is a moderate positive correlation between the sub-scale of self-regulation and the sub-scale of the use of cognitive strategy [$r_{(617)}$ =.58, p=0,00 < .01], a high positive correlation between the sub-scale of self-regulation and the overall score obtained from the scale (self-regulation overall) [$r_{(617)}$=.86, p=0,00 < .01], a low positive correlation between the sub-scale of self-regulation and the sub-scale of delusion [$r_{(617)}$=.047, p=,247 >.01], a high positive correlation between the sub-scale of self-regulation and the dimension of affective [$r_{(617)}$=.077, p=,055 > .01] and a moderate positive correlation between sub-scale of self-regulation and the overall score obtained from the scale (anxiety) [$r_{(617)}$=.067, p=,094 > .01].

There is a high positive correlation between the sub-scale of the use of cognitive strategy and the overall scores obtained from the scale (self-regulation overall) [$r_{(617)}$=.912, p=,000 < .01], a low negative correlation between the sub-scale of the use of cognitive strategy and the sub-scale of delusion [$r_{(617)}$= -.120, p=,003 < .01] and also between the sub-scale of the use of cognitive strategy and the dimension of affectivity [$r_{(617)}$= -.033, p=,411 > .01], a negative high correlation between the sub-scale of the use of cognitive strategy and the overall score obtained from the scale (anxiety) [$r_{(617)}$= -.072, p=,075 > .01].

There is a moderate negative correlation between the overall score obtained from the scale (self-regulation overall) and the sub-scale of delusion [$r_{(617)}$= -.051, p=,205 > .01], a positive correlation between the overall score obtained from the scale (self-regulation overall) and the sub-scale of affective [$r_{(617)}$= .018, p=,648 > .01], and a low negative correlation between the overall score obtained from the scale (self-regulation overall) and the overall score obtained from the scale (anxiety) [$r_{(617)}$= -.010, p=,796 > .01]. There is a high positive correlation between the sub-scale of delusion and the sub-scale of affective [$r_{(617)}$= .843, p=,000 < .01], and between the sub-scale of delusion and the overall score obtained from the scale (anxiety) [$r_{(617)}$= .944, p=,000 < .01], and also between the sub-scale of affective and the overall score obtained from the scale (anxiety) [$r_{(617)}$= .973, p=,000 < .01].

Discussion and Suggestions

The current study concluded that the scores of self-regulation skills of the female students are significantly higher than those of the male students. The review on the studies on self-regulation skills in the literature in terms of gender showed that the findings are generally in favor of female students (Dadlı, 2015; Karahan, 2012; Pajares, 2010; Zimmerman & Martinez-Pons, 1990). This may stem from the different roles attributed to genders and cultural characteristics. Indeed, Pajares (2002) stated that female students are highly skilled in motivation and self-regulation skills and Philips and Zimmerman (1990) emphasized that the gender differences in self-regulation skills may originate from the expectations of the parents, which are different for their daughters and their sons, educational institutions and different messages on gender roles served through the mass media. The findings of the studies both in Turkey and in other countries produced the results similar to the results of this study. It is suggested that the impacts of the ways that the parents of and people around girls behave them on the self-regulation skills of female students are examined in qualitative and longitudinal studies and such studies are performed in different cultures.

It was revealed that the participants who read two or more books in a month have higher scores of self-regulation skills than others. This finding is similar to the findings obtained by (Karaaslan and Sungur, 2011; Sakız, 2013) that reading books and newspapers have a positive impact on self-efficacy and self-regulation skills. It is also consistent with the suggestions that self-regulated reading activities should be performed in order to improve self-regulation skills (Nilson, 2013). These findings emphasize the importance of the adoption of the reading habit at an early age. The study found that the participants with a longer TV viewing time have low self-regulation skills. As the individuals are cognitively in a passive situation, it can be stated that these findings yield an expected result. In this regard, students and parents can be provided with education on media literacy.

An important finding is that the scores of self-regulation skills of the participants who do not use social media are high. In the study by Türkyılmaz (2015) on the impact of the use of social media and mass media on the levels of awareness towards metacognitive reading strategies concluded that the metacognitive awareness scores of the students who do not have a profile on social networks vary significantly compared to those who have one. It may be interpreted that students allocate time for themselves and the activities which they are personally participated in rather than for social media and virtual environments and they are organized. It is reflected that the use of social media such as Facebook has a negative impact on the students' effective use of time, their performance in academic tasks and academic achievements (Karpinski &Duberstein, 2009; O'Brien, 2012; Rouis, Limayem & Salehi-Sangari, 2011). There are certain studies that demonstrate that young people tend to be addicted to Facebook, which adversely affect their self-regulation skills (Wanjohi, Mwebi & Nyang'ara, 2015). The contents on social media that students spend most of their time may be a subject of research, and more detailed research may be performed on the harms of the habit of use of social media to encourage them to spend their time on more beneficial areas and to raise awareness among students.

The study concluded that the test anxiety scores of female students are significantly higher than the scores of male students and there are studies to support this finding in the literature (Lashkaripour, 2006; Putwain &Daly, 2014; McDonald 2001; Putwain 2007; Duman, 2008). The finding of the study that the anxiety levels observed in female students are higher is consistent with the literature in general. This situation can be examined by means of qualitative studies and more detailed data can be obtained accordingly. The analysis of the test anxiety scores of the participants in terms of the frequency of reading books revealed that

the test anxiety scores of the students who do not read at all are higher than others. Given that the habit of reading enhances the comprehension skills and reading comprehension is key to exam success, it can be stated that the above-mentioned finding is reasonable. The test anxiety scores of the students who watch TV for three or more hours and those who use social media for the same period of time are higher than those of others. Though the difference is not statistically significant, it may be interpreted that the students who spend such a long time for something other than studying and learning do not study daily, which increase anxiety for exams. Indeed, the study found out that the students with a high frequency of watching TV and using social media have low self-regulation skills. In this regard, it can be stated that the findings of the study are consistent within themselves.

The analysis of the relationship between the self-regulation skills and test anxiety of the participants in the study indicated that there is a low negative relationship between self-regulation skills and test anxiety. Msayar, Akhmal and Mardhiana reflected that self-regulation skills are not decisive in test anxiety in the regression model developed in their studies. The study may conclude that the higher the self-regulation skills are, the lower the test anxiety is, although there is not very strong relationship. Indeed, Ciltaş and Bektaş (2009), Sağırlı and Azapağası (2009) expressed that test anxiety is associated with self-regulation skills.

In conclusion, it can be stated that the study revealed the importance of the need for students to acquire self-regulation skills for students in the educational systems, which are generally based on exam method. The findings of the study will hopefully contribute to the studies in the field of educational sciences and curriculum development.

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