



The effectiveness of self- regulatory on increasing of problem-solving and the reduction of exam anxiety among high school students

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ABSTRACT

The main purpose of the present study is to determine the effectiveness of self- regulatory on increasing of problem-solving and the reduction of educational anxiety among high school students. The research methodology is semi-experimental. The statistical community includes the whole girl high school students of Tehran. A simple accidental sampling method was used to select the related sample. The sample was 30 ones who they were established in control and experimental group equally. The research plan is based on pre and post tests. The used tools are Kesidi and Long problem solving as well as Sarason test anxiety questionnaire. The results showed that the educational anxiety is reduced in experimental group and it can be stated that the training way is effective on reducing the educational anxiety and test of students itself. Also the results indicated that with 95% confidence level, it can be stated that training self regulatory sessions can be effective on increasing students' self regulatory affairs.

Key words: self regulatory- problems solving- educational and test anxiety

INTRODUCTION

The adolescence era is one of the most challenging periods in the lifetime. The issues and problems of the same period are one of the most challenging and critical times of the adolescence times [4]. The adolescence is full of anxiety and challenges being specified by the desire of independency, seeking identity and detaching the entire imaginations and parents values in order to stabilized the personal character in this regard. Hence, putting adolescents into high pressures bring various problems at their life making anxiety among their temperament in this case [3]. The anxiety is an unfavorable feeling perceiving from the physiological-psychiatric response of a person making complex reactions in the immunological and hormonal systems and influencing on the same person's physiological and functional behavior reflections reducing personal efficacy finally [2]. Laanbelieves that the anxiety disorders are subjected to an inhibitory response from an adaptive response to a maladaptive response. Also, the studies showed that children and their environment can be effective in the formation of their beliefs and if they do not have any controls on the same environment, they will face with too much problems exposing them to the anxiety potentially[5]. Due to the carried out studies regarding to the anxiety disorders, it is considered as one of the most challenging emotional-psychiatric issues being shown as an educational-social anxiety[12]. The anxiety happening during the examination period is one of the most vital case among the adolescence time. The educational anxiety threatens the mental health of the whole students influencing on their social identity and their talents. [13]. It can be stated that the term educational anxiety is consisted of two anxiety and education. The mental and physical panic and anxiety can be constructed by the impact of intriguing scare of something making non-situational positions for the students; it never reflects any anxiety reaction itself. The education also includes the motivational and regulatory-testing methods in co-ages' behaviors depending on their function making the process of anxiety [8]. The students' educational anxiety depends on their classmates' negative competence in terms of the educational affairs. Of course, the method of teachers, examination and unfavorable complex tasks can be effective in this case. [12]. Inderbitzen (1995) has mentioned the cause of students' educational anxiety the issues of their failures and competence with their classmates as well as social relations[22], teachers and parents and lesson situation in future. The educational anxiety can cause to various consequences in the educational failure, learning interruption, mental ability failures and the lack of students' talents; as a

result, they not only get out of their educational progression, but also they will be disordered at their psychiatric growth[30]. The educational anxiety not only destroys the students' mental health but also it can cause to the healthy life of students making their personality towards the illness. Also, it can make some terrible economical disasters on family and society[25]. The related tensions can go towards the destruction of students' occupational and educational issues in future time raising their anxiety and finally the issues regarding to the depression happens for the whole students in this regard[30]. Along this, Garssia and Penitrich stated that many problems of the students have close relationship with the cognitive and hyper-cognition issues in terms of educational anxiety[10]. Students showing weak function in terms of learning issues are not aware of their mental activity and cannot find a suitable problem-solving way for recovering their performance in this case. [15,12]. The problem-solving is a basic approach in cognitive sciences being considered as the most necessary dimension of the personal life. The power of a person in problem-solving can determine the behavioral cognitive processes; it also is very effective on people's strategies for overcoming the hardest situations[10]. Hence, the problem-solving skill is one of the most essential skills being required in life potentially. The understanding of the life is combined with this skill for making people to be able to overcome their problems[7,13,31,15,18]. There have been many different factors intervening with the problem-solving issues such as Noise and Crowd [13]. , control beliefs [24].talented automatically processes, knowledge representation (Sternberg, 2007) and self regulation[1,25]. The problem-solving is one of the most crucial skills of the life[7]. Thus, training of this skill can prevent the adolescents' problems. One of the most essential reasons being focused on the problem-solving is that in the process of problem-solving many skills have been applied; through the way, these skills will be raised potentially. According to Findell and Swafford the problem-solving process can make a new situation for learning new topics. These researchers also stated thatthe problem-solving is very necessary case because it discovers the entire skill standards. Therefore, the students' opportunity will be raised for combining the related issues[5]. The problem-solving not only boosts the former skills but also it can lead to the new learning affairs. In other words, a simple way is being achieved effectively at life. Indeed, the successful problem-solving requires the self regulation navigation. [8, 26,29,10]. According to Montague (2004), the problem-solving not only requires the cognitive processes but also it needs the self regulation approaches and it has to be evaluated being aware of the problem-solving issues[25]. . In the other hand, O'Niel (1999) considers the problem-solving consisted of three elements[26]:

Contextual understanding, problem solving approaches and self regulation

A skillful problem solver has to know:

- a- The context (contextual knowledge)
- b- Having enough special mental skills
- c- Be able to apply the planned resources and knowledge during the problem-solving [26].

In other words, the same problem solver applies successful self regulation approaches actively during the struggles for solving a problem. The self regulation evaluates the bilateral relations with the bond of motivational, cognitive and behavioral elements; hence, the combined understanding of the self regulation can help researchers to apply the life skills in their paths efficiently [16]. The self regulation is called to the self struggles for changing the situation including the whole thoughts and excitements and behaviors [21]. The observations showed that the self regulation includes the conscious and unconscious processes; the biodiversity, cognitive and social systems can be devoted to the related process such as the function of adjusting body temperature, self adjusting for keeping the body balance. The emotional and excitement processes are the main core of the self regulation process. The self regulation is a multi-structural case including the motivational-cognitive processes for better organized psychological functions. [15]. The self regulation requires the personal ability in relation to the effectiveness of personal behaviors instead of mechanical reaction against the environment [11]. It also includes the active actions and physiological reaction of the human [12]. In relation to the learning the self regulation has many various models that the most important one is subjected to the balance of cognitive and hyper-cognitive interactions [20]. The recognition of the process, saving, recalling, transformation can point to those information that they can be obtained by the sensory skills. Also, the perception, judgment and understanding of excitement and memory can be evolved in this regard [7,4]. The hyper-cognition is a collection of processes and knowledge controlling and supervising the personal reactions; indeed, they point to the cognitive activity management[10]. They also relate to personal tendency to motivational approaches independently trying to admit the process of success and failure[15,10,5]. The self regulation is an efficient structure for representing many various psychological phenomena[15, 20].

The researches of Grossat and Matikshow that the self regulation is an important part of learning differences between successful and unsuccessful students; the successful students apply self regulation approaches and motivational patterns in their own struggles for reaching to the success[10]. . In contrast,

the unsuccessful students struggle low reluctantly and they never try to achieve their tasks actively; they are not able to apply the problem-solving strategies at their hard and complex situation [15]. Many students are able to apply the cognitive, motivational and behavioral aspects adjusting their educational performance. They can also get the latest strategies for reaching to the educational success particularly at their tasks and this makes them to reduce their anxiety in this pat[12,16,9]. The former researches of [21]. Chasten and Radosevich (2010) and Model (2012) indicated that if the students determine their targets, they will be able to apply the self regulation talents trying to solve their problems at this way. This also makes them to progress at their educational issues[9,11]. Hence, the recognition of the related process can optimize the self regulation affairs. In addition, the researcher is going to response the question whether the training of the self regulation is effective among the students and reduces their educational anxiety or no?

MATERIALS AND METHODS

The present study is a semi-experimental research using the pre and post tests with control group. The statistical community of the study includes the whole girl students of Tehran studying in high school grade of 2nd district of Tehran during 2012-2013. The sampling method is an accidental clustering method. Two schools of 2nd district of Tehran were selected in this study and two classes were also taken up from every school accidentally. Then the problem-solving and exam anxiety tests were achieved on students as pre test case. Among 120 selected students of these four classes, 30 students had higher anxiety scores accidentally and finally 30 mentioned students were again randomly divided into two 15 ones experimental and control groups. The experimental group received the self regulation test in 10 sessions for one hour while the control group never received any educational case; then, both groups were exposed to the post test to compare the results of both groups. Two questionnaires were applied to gather the related data.

a- Questionnaire of problem-solving methods (Cassidy and Long): this questionnaire has designed by Cassidy and long in 1996 including 20 questions. The scoring method of the related questionnaire was based on LIKERT including six basic elements of problem-solving (miserable, skilling, creation, trust in problem solving, avoidance and facing). This questionnaire has been normed by Hoomanin Iran for the first time. The related questionnaire was achieved on 900 ones (460 female and 430 male) of Tehran high school students. The test reliability coefficient using Cronbach alpha formula was obtained 0.80.

b- Questionnaire of exam anxiety: based on the exam anxiety theory of Sarason and Mandler two types of motivational moods can be seen in this regard. They happen at exam times. One of them is subjected to the learnt task and it is the motivation that provokes the responses of the correct task. Another one is related to the learnt anxiety including two suitable responses with tasks. Mandler and Sarason represented a questionnaire including 25 articles in this regard. It measures the person's readiness for responding to the tasks in this case [30,13].

Mandler and Sarason (1952) reported the validity coefficients 0.99 through two-halving method and re-testing method along with six weeks periodical interruption 0.082 in the related study. Some observations of the questionnaire showed that the subjects having higher scores get lower scores in IQ tests and vice versa[10]. Due to the research plan, covariance analysis was applied to control the error variables.

RESULTS

Table 1: descriptive indices of educational anxiety variable in under-study groups

Groups	Test	No	Descriptive indices			
			Mean	Std deviation	Minimum	Maximum
Experimental	Pre test	15	23.60	2.23	20.00	27.00
	Post test	15	19.07	1.87	15.00	23.00
Control	Pre test	15	23.07	2.22	20.00	26.00
	Post test	15	22.80	1.78	20.00	25.00

In table 1 the descriptive indices of educational anxiety variable were reported in both experimental and control groups. The lowest mean belongs to experimental group in post test (19.07) and the highest mean

is subjected to the same group in pre test. Based on the mentioned findings, the increase of total mean scores in experimental group is higher than the observation group.

Table 2: descriptive indices of problem-solving variable

Groups	Test	No	Descriptive indices			
			Mean	Std deviation	Minimum	Maximum
Experimental	Pre test	15	52.93	12.85	36.00	74.00
	Post test	15	39.40	12.23	34.00	51.00
Control	Pre test	15	41.80	12.17	28.00	53.00
	Post test	15	41.07	12.93	33.00	53.00

In table 2 the descriptive indices of problem solving variable were reported in both experimental and control groups. The lowest mean belongs to experimental group in post test (39.40) and the highest mean is subjected to the same group in pre test. Based on the mentioned findings, the increase of total mean scores in experimental group is higher than the observation group.

Table 3: Levin test to evaluate the convergence of the variances

F	DF 1	DF 2	Sig level
0.000	1	28	1.000

According to the attachments of table 3, the condition of the variances' convergence is not significant at $p > 0.05$; hence, the pre-assumption of the variances' convergence is established.

Table 4: linearity test of pre and post tests relationship

Total squares	DF	F	Mean squares	Sig level
61.33	1	42.17	61.33	0.000

According to the attachments of table 4, the obtained F and significance level smaller than 0.05, it is shown that the linearity assumption of the relationship is established.

Table 5: F test to evaluate the convergence of regression coefficients slope

Total squares	DF	F	Mean squares	Sig level
61.33	2	10.59	30.67	0.051

According to the attachments of table 5, the obtained F and significance level higher than 0.05, it is shown that the regression coefficients slope assumption of the relationship is established.

Table 6: test of educational anxiety covariance analysis in both experimental and control groups

Changes resource	Total squares	DF	Mean squares	F	Sig level
Pre test	63.241	1	63.241	8.524	0.052
Group	43.341	1	43.341	38.887	0.000
Error	30.093	27	1.115		
Total	13931.000	30			

It is shown that the educational anxiety is reduced in experimental group and hence we conclude that the training of self regulation is effective on the reduction of students' educational anxiety and examination day.

Table 7: Levin test to evaluate the convergence of the variances

Total squares	DF 1	DF2	Sig level
9.14	1	28	0.051

According to the attachments of table 7, the condition of the variances' convergence is not significant at $p > 0.05$; hence, the pre-assumption of the variances' convergence is established.

Table 8: linearity test of pre and post tests relationship

Total squares	DF	F	Mean squares	Sig level
2382.08	1	25.88	2382.08	0.001

According to the attachments of table 8, the obtained F and significance level smaller than 0.05, it is shown that the linearity assumption of the relationship is established.

Table 9: F test to evaluate the convergence of regression coefficients slope

Total squares	DF	F	Mean squares	Sig level
3669.107	2	37.22	1834.55	0.071

According to the attachments of table 9, the obtained F and significance level higher than 0.05, it is shown that the regression coefficients slope assumption of the relationship is established.

Table 10: covariance analysis of problem-solving in both experimental and control groups

Changes resource	Total squares	DF	Mean squares	F	Sig level
Pre test	3040.702	1	3040.702	8.81	0.060
Group	1221.949	1	1221.949	23.63	0.000
Error	1395.831	27	51.69		
Total	54776.00	30			

It is shown that the educational anxiety is reduced in experimental group and hence we conclude that the training of self regulation is effective on the reduction of students' educational anxiety and examination day.

DISCUSSION AND CONCLUSION

The findings showed that the training of self regulation can reduce the educational anxiety of the whole students. Hence, we conclude that the training of self regulation can be effective in reducing the students' educational anxiety. The study of Tellad showed that the self regulation sessions have close relationship with the increase of self esteem and control of exam anxiety. Long and Sherer quoted of Kadishan et al evaluated the training of self regulation sessions on reducing the exam anxiety [12, 30,5]. Hamburg quoted of Moote considered the self regulation sessions effective on reducing the exam anxiety of the whole students[29,5]. Copeland and Shope believed that the ability in controlling the exam anxiety can develop the whole students' self esteem in this regard. As it shown, the mentioned researches can represent the impact of self regulation in reducing the students' exam anxiety[8]. The finding of the present study also submits the above mentioned results. It is shown that after the self regulation actions, there is seen a considerable reduction in the scores of self regulation and exam anxiety in compare to control group. Due to the former results, it can be stated that the self regulation training sessions can influence on the reduction of the exam anxiety positively. In general, when we evaluate the control group with experimental group, we observe that the impact of exam anxiety reduction is highly felt in experimental group. The findings showed that the self regulation of high school students is increased potentially and hence we conclude that training of the self regulation is effective on the high school students. The findings of the present study emphasis on the training of the self regulation affairs in compare to the control group. In other words, the scores of the experimental group are highly reduced in compare to the next group considerably. Therefore, it can be stated that the training of self regulation could increase considerably the ability of the problem solving of the experimental group. The results of T test in both independent groups showed that there is a significant difference between the related groups. This represents the impact of self regulation training affairs on increasing the problem-solving ability of the entire students. The carried out studies in this relation submit the above-mentioned issues so that [9,1,8] considers the problem-solving as the basic element of the educational success; along this, [10,16,20,30] considered the self regulation as increasing factor of the self confidence. The results represent the impact of self regulation skill in reducing the lack of controlling, avoidance of adolescents and increase of their problem-facing issues. Taramian considered the self regulation skill as reducing

factor of any educational anxiety and educational failures in this case [12]. Homburg also considered the self regulation process as the most essential factor in personal planning skills reducing the exam anxiety among students, too. For the reason, the findings of the present study indicated that the training of self regulation can increase the ability of problem-solving affairs. Indeed, the similarity of the present study with other researches is that the highest degree of self regulation is subjected to the increase of self confidence. Another common aspect of the present study is related to the fact that other researchers have considered the whole students and adolescents as the sample of their studies. Hence, these similarities can help the recovery of the results of the related study. One of the differences of the present study is that the present study has been carried out in relation to evaluate and discover the self regulation impact on the reduction of anxiety and increase of problem-solving of the students [14].

REFERENCES

1. Sternberg Robert, G. (2007). cognitive psychology. Tehran: teacher training publication
2. Ashman Adrian, F., Kanoy Robert, N.F. (2004).an introduction on cognitive education (theories and applications), translated by Dr. Kamal Kharazi, Tehran: SANA Publication
3. Jalili, B. (2008). pediatrics psychology, Nelson A (author), 1st printing, Tehran: Iranian medical sciences university publication.
4. KhajehRashidan, F.(2009).study of behavioral and emotional problems of Semnan Province students, 2nd printing, Semnan educational office. pp: 40-50
5. Dadjoo, Z. (2010). effective factors on the appearance of school anxiety and psychodrama effectiveness and its treatment, a thesis for MA, Tehran: AllamehTabatabaiee University, 2010
6. Zaarat, Z.,Ghafoorian, A.R.(2009). Effectiveness of problem solving skills on students' self imagination issues, educational approaches, 3 (1), 23-26
7. Sarason Irvin, G., Sarason Barbara, R. (1987).Illness psychology, (5th printing), translators: Bahman Najjarian, Mohammad Ali asghari Mogaddam and Mohsen Dehghani, Tehran: Roshd publication, 1st volume, 3rd printing.
8. Samadi, M. (2004).Study of self regulation approaches role in mathematic students, magazine of innovation at educational affairs, 79, 7-97
9. Fatehizadeh, M. (2006).Impact of cognitive therapy on the reduction of girl students' anxiety, a thesis for MA, AllamehTabatabaiee University, 2006
10. Kareshki, H. (2000). Impact of hyper-cognitive approaches on the function of first year boy students of 11th Tehran high school, a thesis for MA, university of Tehran
11. Kadivar, B. (2003) Educational psychology, Tehran: SAMT Publication
12. KarimiKar,K. (2010). Anxiety treatment, Butler ghilian, Hub Tony (authors), 1st printing, Tehran: Nasl-e-No Publication,
13. Ghorzin, R., Yazdi,S.M. (2008).Study of noise impact Frenquently on the performance of students' problem solving, knowledge and heralth, 3 and 4, 35-38
14. Anthony Day, E., RadosevichDavid, J.&Chasteen Christopher, S. (2003).Construct- and criterion-related validity of four commonly used goal orientation instruments, Contemporary Educational Psychology 28, 434–464
15. Burnette, M., South SusancR., Ickon. N.D. (2012). Vluster B Personality pathogy in Incarcerated Girls. Journal of personality Disorders. Newyork• Vol.21•ISS.3;pg.262•11 pgs.
16. Corapci, F. (2008). The Role of Child Temperament on Head Start preschoolers ' Social Competence in the Context of Cumulative Risk, Journal of Applied Developmental psychology,29,1-16.
17. Dignath,C., Buettner , G. &Langfeldt , H. (2008). How Can Primary School Students Learn Self-regulation Training Programmes , Educational Research Review , 3,101-129.
18. Dincer, C., Guneysu,S. (2001) . Examining the permanence of Problem- solving Training Givven for the Acquisition of interpersonal Problem- solving Skills, International Journal of Early Years Education, 9(3),207-219.
19. Duckworth, K., Akerman, R., MacGregor, A., Salter, E. &Vorhaus , J. (2009) . self-regulated Learning : A Literature Review , Published by Center for Research on the Wider Benefits of Learning Institute or Education. <http://www.learningbenefits.net/publicatiovs/ResReps/ResRep33.pdf>.
20. Fuent, J., Diaz, A. & Lozanon, A.(2010). Assessing self – regulated Learning in Early Childhood Education: Difficulties, Needs, and prospects, psicothema , 22(2), 278-283.
21. GreeneBarbara, A. (2004). Predicting high school students cognitive engagement and achievement: Contribution of classroom perceptions and motivation: Contemporary educational psychology,29,462-482.
22. Inderbitzen, H.M.(2003). Relation among adolescent reports of social anxiety and depressive syndrome. Journal of Anxiety Disorder, 2003;9(5):385-396.
23. McGregor Holly, A.& Elliot Andrew, J.(2009). Achievement Goals as Predictors of Achievement-Relevant Processes Prior to Task Engagement: Journal of Educational Psychology, Vol. 94, No. 2, 381–395.
24. Miller, S., Lisa, M.& West, R.L.(2010). The Effects of Age , Control Beliefs,and feedback on self- Regulation of Reading and problem Solving , Experimental Aging Reseach , 36 (1), 40-63.
25. Montague, M. (2004). Math problem Solving for Middle School Students with Disabilities , Published by U.S. Department Education, [http://www.k8accesscenter.org/traing_resources/documents/Math%20 problem20% solving.pdf](http://www.k8accesscenter.org/traing_resources/documents/Math%20problem20% solving.pdf).
26. O'Neil, H.F.,Chuang, S.& Chung, G.K.W.K. (2008). Issues in the Computer- based Assessment of Collaboratine problem Solving, Assessment in Education , 10,361-373.

27. Pintrich Paul, R., Conley Anne Marie, M. & Kempler Toni, M. (2003). Current issues in achievement goal theory and research, *International Journal of Educational Research* 39, 319–337
28. Pintrich Pual.R. (2000). An achievement goal theory perspective on issues in motivation terminology, theory, and research: *Contemporary educational psychology*, 24, 92-104
29. Taylor, K.L. & Dionne, J. (2000). Accessing problem - solving Strategy Knowledge. The Complementary Use of Conecurrent Verbal Protocols and Retrospective Debriefing *Journal of Educational psychology*, 92(3), 413-425.
30. Thompson, N.K., Bundy, K.A., Wolfe, W.R. (1998). Social training for young adolescent and performance. 31(3): 504-552.
31. Worey, N. K. (1997). *Mental health nursing in thrcommunity .mosby.*