



Effectiveness of Emotional and Cognitive Processing Strategies on Academic Adjustment and Academic Engagement of High School Students of Kerman

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Abstract

The aim of this study was to evaluate the effectiveness of emotional and cognitive processing strategies on students' academic adjustment and academic engagement. This study was applied and in terms of research method was quasi-experimental with pre-test-post-test design and control group. The statistical population of this study consisted of male high school students in region 2 of Kerman. They were selected through cluster sampling method and randomly assigned to the experimental and control groups. Then the experimental group was trained and intervened for 8 sessions (90 minutes per session) and the control group did not receive any training. After the training sessions, the post-test was taken. The instruments used in this study included Sina Wesing (1993) adjustment questionnaire and Zarang academic engagement questionnaire (2012). To analyze the data, multivariate analysis of covariance (ANCOVA) and multivariate analysis of variance (MANCOVA) were performed using SPSS-22 software. The results of analysis of covariance showed that the intervention of strategies based on emotional and cognitive processing is effective in increasing academic adjustment and academic engagement of students. The results also showed that the effectiveness of emotional and cognitive processing strategies separately with academic engagement and students' academic adjustment was significantly related at the level of ($p < 0.05$). Based on the research findings, it can be concluded that teaching intervention strategies of cognitive processing and emotional processing is effective in the process of increasing academic adjustment and students' academic engagement.

Keywords: Academic engagement, academic adjustment, cognitive processing strategies, emotional processing

Introduction[#]

The more advanced communities become, scientific expertise is more important as a result of scientific progress. One of the most important trustees of this issue in all societies, Educational institutions, are always looking for the factors that affect the progress of this process and in fact ensure the educational progress of the new generation. These factors are very diverse and varied but one of them has recently attracted the

attention of researchers in this regard, the variable of educational conflict. Research has shown that students can learn more about education and homework and most of them can hope for their scientific success. On the other hand, the key to success of a teacher is to take pervasive knowledge and lead him to active learning by interfering in the learning process (Ahmadvand, 2006).

Studies have shown that if a learner can be more involved in education and learning problems, the more likely it is to hope for scientific success and reduce his educational loss. This learning activity is known by the

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researchers as the concept of educational conflict (Entwistle & McCune, 2004). Students experience different emotions in academic situations. Emotions are related to students' motivation, learning strategies, cognitive resources, learning self-management, and academic achievement, and affect their psychological and physical health as well as their academic adjustment. However, emotions have played a less prominent role in motivational or educational research (Pekrun, 2006).

In this regard, another variable that has to be considered is cognitive strategy. The cognitive strategies are the steps we will use to link and combine them with the prior information learned and storing them in long-term memory. The cognitive processing strategies are the learning process channels. Compared to them, the prescribed strategies are devisals to monitor the cognitive strategies, control and guide them. Major metacognition strategies can be represented in three categories: planning, monitoring, assessment, and regularize (Saif, 2014).

Learning cognitive processing strategies (CSI) is a training approach that emphasizes the growing learning of skills and processes of thinking and creativity in learning. This training enables all learners to act more strategic and have more confidence in the learning process. Recognition of the cognitive strategy is based on the assumption that there are visible and obvious cognitive strategies. According to weinstein and Hume (1998), cognitive strategy refers to any behavior, thought or action that learning learner uses while learning, organizing, and storing knowledge and skills as well as the ease of exploitation of them in learning. According to Seif (2001), cognitive strategies are learning tools and will help us prepare new information to blend in with the information previously learned and store them in the long-term memory. These strategies are divided into three categories of replication, practice, extension, and organization as memory processes.

Adjustment is a process that has been accompanied by human birth and is achieved in a certain way in different periods of life. During that, the individual tries to adapt to internal pressures and external requirements, and this attempt to respond to the individual's needs and demands (Salaam & Mounst, 2016). Abstract as a critical period of cognitive, psychological and emotional developments, one of the most influential factors of juvenile success is social and educational harmony. Recent research has shown the compatibility, educational and social development of juveniles. In particular, educational harmony has important implications for both teenagers' abilities to succeed in school as well as adulthood (Yoo & Miller, 2015).

The school environment is one of the most influential social areas in the life of a teenager. Several decades of research have shown that students' experiences and accommodations with school can have a positive and negative effect on his growth. Generally, these effects beyond normal behavior at school, for instance, academic performance and attendance and absence are at school and are extended to social or social behaviors (Umana, Taylor, Wong, & Gonzales, 2012).

Research findings of Dortaj et al., (2009) showed that aggression directly affects educational harmony positively and significantly. Also, Hosseinchary and Samani (2013) study revealed that positive cognitive regulation strategies exist for educational harmony in students and positive strategies of cognitive regulation play a mediating role among parenting styles and educational harmony. Hence, educational harmony involves the ability of the student to adapt to the conditions and requirements of education and the roles that the school puts forward as a social institution, if the student fails to do so. The lack of compliance leads to a loss of education or a drop in education, so to achieve academic progress and to prevent falls and drop out, study and focus on academic harmony is very important (Aziznajad, 2016).

Adjustment to adolescent ups and downs helps to improve educational performance in an academic school environment (Pornekdast & Partners, 2014). Students at school face many things that need harmony. On the other hand, students face changes in teachers, classrooms, rules and school methods, performance expectations, difficulty in different exercises and peers. Their success in coping with these challenges predicts the student's academic achievement (Reuland & Mikami, 2014). Students at school experience numerous issues related to adaptation.

On the other hand, the bad behaviour of students affects the entire process of education and learning and faces difficulties (Hajishamsaee, Karshki & Aminyazdi, 2013). Although studies have been conducted about harmony in the school, the concept of harmony in the school has been extended to consider the results beyond academic performance in recent years (Zee & Koomen, 2016).

Students experience many emotions in education. The thrill of his excitement, the learning strategies, the cognitive resources, the learning and academic progress of the students are related and affect their psychological and psychological health. In spite of this, there have been a significant role in motivational or educational research (Pekrun, 2006). Research has shown that if students can learn more about education and homework issues, they can be more academic than their academic success.

Students experience many emotions in education. They interact with motivation, learning strategies, cognitive resources, self-learning and academic progress and affect their psychological and psychological health as well as their academic harmony. However, there have been a significant role in the stimulation or educational research, (Pekrun, 2006). There is a structural engagement which was first introduced to understand and explain the decline and performance of education and was considered as the basis for realistic efforts in education. Cognitive theorists believe that teaching cognitive strategies helps students use appropriate strategies to solve problems and can solve their academic problems (Chapman & Tumer, 2013).

Previous research has focused on academic achievement and fields of study, and less attention has been paid to variables around and prerequisites for academic growth, such as academic adjustment and academic engagement. Therefore, the present study sought to answer the question of whether teaching cognitive and emotional processing strategies is effective on students' academic adjustment and academic engagement?

The hypotheses examined in this study were as follows:

- 1- Cognitive processing strategies are effective on academic adjustment and academic engagement of high school students in District 2 of Kerman.
- 2- Emotional processing strategies are effective on academic conflict and academic adjustment of high school students in District 2 of Kerman.

Method

The present study was a quasi-experimental research with a pretest-posttest design and a control group.

Participants

The statistical population of the present study consisted of high school students in Region 2 of Kerman in the academic year 2019-2020. Considering that the research design was quasi-experimental, the sample size was determined using Cohen's table, considering the test power (0.80), effect size (0.50) and error (0.05) for each group of 15 people. They were selected through cluster sampling method and randomly assigned to experimental and control groups.

Thus, after obtaining permission from the university and the Department of Education to conduct research, the list of first boys' secondary schools in District 2 of Kerman was prepared. Then, from 43 schools in this area, a high school was randomly selected. Then, through observation and interview with the principal,

school teachers and students, finally the subjects were randomly assigned in two experimental and control groups. All students participating in the study were pretested. Then, the subjects of the experimental group were presented with the training package of cognitive and emotional processing strategy in 8 sessions (90-minute sessions in two consecutive months). However, the subjects of the control group were not provided with training in this field. After the end of the educational intervention sessions, post-test was taken from both groups. The obtained data were then statistically analyzed.

Inclusion criteria were: 1- Being in the age range of 14-15 years old; 2- Gender of the boy; 3- Education in the seventh or eighth grade; and 4- No mental disorders and hyperactivity.

Exclusion criteria: 1- Absence of more than two sessions in training classes. 2- Lack of active participation and cooperation in research stages.

Instruments

Academic Engagement Questionnaire: The Academic Conflict Questionnaire was introduced in 2012 by Zarang. Zarang (2012) used a researcher-made questionnaire to measure academic conflict in his research. Thus, at first, the components of academic conflict, cognitive conflict, motivational conflict, behavioral conflict and their corresponding items which were 45 items were extracted from the theoretical foundations (Lenin Brink & Pintrich's theoretical model) and reduced to 41 items after interviewing experts. Then, based on the items, phrases were arranged and in a preliminary study, a questionnaire with 38 items was administered. Cognitive conflict components were related to the questions 1-2-5-6-9-10-13-14-17-18-21-22 -25-26-29-30-33-34-37. The motivational engagement component was measured with questions 3-7-11-15-19-23-27-28-31-35 and the behavioral engagement component was measured with questions 4-8-12-16-20-24-32-36-38. The total reliability of the questionnaire was 92% in the preliminary stage with 38 questions. Internal consistency of the subscales of cognitive engagement is 84%, behavioral engagement is 76% and motivational engagement is 86%. Also, the total reliability of the questionnaire in the final stage with 38 questions was 90%. And internal consistency of cognitive conflict subscales with 83%, behavioral conflict 73% and behavioral conflict 80%.

The validity of the Academic Conflict Questionnaire was determined by three experts in educational sciences by determining the face and content validity in a specialized arbitration manner and in terms of compliance with its theoretical basis. In this way, the

components of academic conflict were extracted from theoretical foundations and phrases were set for each component.

Adjustment Questionnaire of High School Students: This questionnaire was first prepared by Sinha Wasing in 1993 and translated and written by Karami in 1998. This test seeks to distinguish high-adjusted high school students (ages 14 to 18) from poorly adapted students in three areas of adjustment (emotional, social, and educational).

Ali Mehdi et al. (2013) estimated the reliability of this questionnaire, as well as its content, face and criterion validity as appropriate and also the Cronbach's alpha coefficient calculated for this questionnaire is above 0.7 and the reliability coefficient of students' academic adjustment questionnaire was 0.94.

Procedure

Educational program of cognitive and emotional processing interventions

Session 1: Familiarity with students, introduction, and expression of research objectives and initial evaluation of the pre-test, the relationship between test conceptualization based on the tools of the adjustment questionnaire and the academic engagement questionnaire.

Session 2: Introduction to correct study methods, teaching awareness of positive emotions, happiness, interest and love, attention to positive emotions and the need to use them along with examples in the form of mental visualization, homework, writing major positive emotions and recording in Relevant form.

Session 3: Overview of the previous session; Educating and informing students about ways to control negative emotions and the optimal and effective use of positive emotions in the educational process. Teaching effective study techniques and practicing and focusing on the main and key concepts and doing practical tasks.

Session 4: Overview of the previous session, teaching summarizing in your own language, repetition and

practice, asking students about storing information in memory and asking the reasons for those who cannot memorize what they have learned and teaching concepts, and rooting out Causes of forgetting a set of data and educational concepts. Practice emotion control awareness.

Session 5: Teaching how to associate previously learned concepts with new learning concepts and correct storage of information in long-term memory; Training to accept positive emotions and accept without judging positive emotions and positive and negative consequences, do homework.

Session 6: Review the previous session, organizing learning concepts in long-term memory based on a series of suggested and practical exercises. Teaching some cases of the fifth session, but for negative emotions along with homework of the same session and practicing the structure of a positive attitude about self and memory.

Session 7: Performing a series of practical exercises to strengthen memory and increase the volume of active memory of students. Teaching some items in the fifth session, but for negative emotions along with homework.

Session 8: Reviewing the contents of the previous session, discussing information processing in memory. Using the two-way method of reading with the help of teacher and student, practicing exam preparation, discussing the content and the rate of tangible change in adaptation processes and academic engagement.

Data Analysis

To analyze the data and test the hypotheses, the multivariate analysis of variance (MANCOVA) test and analysis of covariance (ANCOVA) were used. Data were analyzed using SPSS-22 software. The data obtained from the sample were statistically analyzed using descriptive statistics and inferential statistics and was considered statistically significant at the level ($p < 0.05$).

Table 1.

Demographic Characteristics of Research Participants

Demographic variables	Gender	Age	Abundance	Frequency
Seventh grade students	male	14	28	63/23
Eighth grade students	male	15	17	37/77
Urban location	male	14-15	45	100
Total	male	14-15	45	100

Findings

In the present study, high school male students (seventh and eighth grade) in District 2 of Kerman participated. The calculated descriptive indices (mean and standard

deviation) of the scores of academic adjustment and academic engagement for the findings of the pre-test and post-test stage in the experimental and control groups are presented in Table 2:

Table 2.

Descriptive Statistics on the Effect of Cognitive Processing Strategies on Research Variables in Control and Experimental, Pre-Test and Post-Test Groups

Variable	Group time	pre-exam		Post-test	
		Average	Standard deviation	Average	Standard deviation
Academic compatibility	Control	32.50	6.28	31.35	6.24
	examination	31.68	6.65	29.77	5.98
Academic conflict	Control	65.54	7.22	66.25	7.34
	examination	65.84	7.27	69.07	8.98

The results presented in Table 2 show that there is not a significant difference between the mean scores of the experimental and control groups in the pre-test stage in the variables of academic adjustment and academic engagement. However, after presenting the intervention of cognitive processing strategies; in the post-test stage,

there was a significant difference between the mean scores of the experimental group compared to the mean scores of the control group. Based on the results of the Shapiro-Wilke test, the normality of the distribution of academic adjustment scores and students' academic involvement in the pre-test and post-test is confirmed.

Table 3.

Descriptive Statistics of the Effect of Emotional Processing Intervention on Research Variables in Control and Experimental, Pre-Test and Post-Test Groups

Variable	Group time	pre-exam		Post-test	
		Average	Standard deviation	Average	Standard deviation
Academic compatibility	Control	32.50	6.28	31.35	6.24
	examination	32.20	6.54	28.54	6.04
Academic conflict	Control	65.54	7.22	66.25	7.34
	examination	64.05	8.57	67.98	7.69

The results presented in Table 3 show that there is not a significant difference between the mean scores of the experimental and control groups in the pre-test stage in the variables of academic adjustment and academic engagement. However, after presenting the intervention of emotional processing strategies; in the post-test stage,

there was a significant difference between the mean scores of the experimental group compared to the mean scores of the control group. Based on the results of Shapiro-Wilkes test, the normality of the distribution of academic adjustment scores and students' academic involvement in the pre-test and post-test is confirmed.

Table 4.

Analysis of Covariance the Effectiveness of Teaching Cognitive and Emotional Processing Strategies on the Process of Adjustment and Academic Engagement of High School Students

Source of changes	S.S	df	MS	F	Sig.	η^2
Pre-test	352.06	1	276.03	12.20	0.003	0.705
Group	23890.17	1	23890.17	1311.39	0.001	0.865
Error	549.60	30	16.53	-	-	-

Hypothesis 1: Cognitive processing strategies have an effect on the academic adjustment and involvement

of high school students in District 2 of our partner. The analysis of covariance (ANCOVA) was used to analyze

the hypothesis. Based on the results of Table 4, after adjusting the pre-test scores, It was concluded that teaching cognitive processing strategies had a significant effect on students' adjustment process and academic

engagement ($\eta^2 = 0.705$,P ,F(1,25)=12.20) and the effect of teaching intervention strategies on the process of adjustment and academic involvement of students was 95.7%.

Table 5.

Results of MANCOVA Test to Evaluate Cognitive and Emotional Processing Strategies on the Components of Adjustment and Academic Engagement of Students

Effect	Test	value	F	df _h	df _e	P-value	η^2
Group	Pillai's Trace	0.84	154.09	3	23	0.001	0.851
	Wilks' Lambda	0.07	154.09	3	23	0.002	0.761

Hypothesis 2: Emotional processing strategies are effective on conflict and academic adjustment of high school students in District 2 of Kerman.

According to the results of Table 5, after adjusting the pre-test scores, it was shown that emotional and cognitive processing strategies had a significant relationship on the adjustment of high school students'

academic engagement ($\eta^2 = 0.851$, Lambda =0.07, P < 0.05 ,F(2 ,35)=154.09) and the effectiveness of teaching emotional processing strategies simultaneously on adjustment and academic engagement of high school students was 0.851.

Table 6.

ANOVA Test Results for Comparison of Post-Test Components of Academic Adjustment and Academic Involvement in Control and Experimental Groups

Group	Variables	S.S	df	M S	F	P-value	η^2
Group	Academic Adjustment	9.24	1	9.24	5.19	0.01	0.36
	Academic Engagement	12.03	1	12.03	6.18	0.01	0.38

After analyzing the data based on Table 6, the results obtained for the experimental and control groups in the post-test of academic adjustment were ($\eta^2 = 0.36$ P<0.01 ,F(1,39) = 5.319) and for Academic conflict were ($\eta^2 = 0.38$ P<0.01 F(1,39)=6.18). There was a significant difference that shows the significant effect of educational interventions on cognitive and emotional processing strategies on academic adjustment and academic engagement of high school students.

The results in Table 6 show the analysis of covariance in the variables of students' academic engagement (P=0.01, F=6.18) and Students academic adjustment (P=0.01, F=5.19) which is meaningful. According to the results, it can be said that in the intervention groups, there was a significant change in post-test scores in the variables of students 'academic engagement and students' academic adjustment in the post-test compared to the control group, under the influence of interventions.

Therefore, the research hypotheses regarding the effectiveness of teaching strategies based on cognitive and emotional processing on academic conflict and academic adjustment of high school male students in District 2 of Kerman are confirmed.

Discussion and Conclusion

The main objectives of the present study were to investigate the effectiveness of cognitive and emotional processing education on academic adjustment and academic engagement of high school male students in Region 2 of Kerman. The results showed that teaching cognitive and emotional processing strategies significantly increased the academic performance in the experimental group compared to the control group. Therefore, students' academic performance has improved due to the teaching of cognitive and emotional processing strategies.

Findings extracted from statistical data and according to the mentioned variables, indicate that teaching emotional and cognitive processing strategies has a significant effect on academic adjustment, academic conflict and its components in high school students in Kerman.

These results are consistent with the results of Latifi, Amiri, and Malekpour and Molavi (2009), Seif and Misrabadi (2013), Ashouri et al. (2013), Moreno and Saldana (2015) Is consistent..They believed that emotional and cognitive processing processes such as

predicting the desired level of academic performance in a particular school task, designing actions that lead to educational goals, as well as reviewing and teaching emotional and cognitive processing strategies are important processes in performing adaptive activities educational. It is academic conflict, and emotional and metacognitive processing strategies can be used to guide the student in problem solving, enhancing self-regulation and review skills, and influencing their beliefs. However, the effectiveness of this type of training requires time.

The results of the present study also showed that education based on cognitive processing can be effective and useful in students' educational process and lead to improving the abilities related to students' academic performance. These findings are consistent with the results of previous studies by Ashouri et al. (2013) which showed the use of cognitive processing strategies can increase students' learning and academic achievement. Therefore, it is better to start education based on cognitive and emotional processing strategies at an early age and at the primary school level, so that it can be used as a way to prevent students' learning disabilities and academic maladaptation. Overall, the findings showed that metacognitive problem-solving training improves students' cognitive processing, impulsivity, and distraction in the short term, and over time improves these abilities and extends them to other tasks.

Therefore, if teachers' training is based on this, it can lead to improving students' cognitive, emotional and academic abilities. This research findings are in line with the results of Ejei, Manzari Tavakoli, and Hosseini (2012) who concluded that there is a causal relationship between the effectiveness of emotional processing strategies on adaptation and academic conflict. Thus, teaching students emotional processing strategies reduces their negative emotions and increases a positive attitude toward their abilities, thereby improving students' level of adjustment in terms of social adjustment, emotional and academic adjustment, and academic engagement.

In general, it can be said that the training intervention program of cognitive and emotional processing strategies will improve the academic and social performance of students by providing appropriate solutions to the individual in controlling emotions and reducing maladaptive behaviors.

These findings were confirmed in the study by Ababaf (2019), Scott et al., (2015) on interventions based on cognitive empowerment on cognitive processes and their effectiveness on various variables. In this regard, cognitive theorists believe that teaching cognitive strategies helps students use appropriate strategies to solve academic problems and be able to

solve their academic problems (Chapman & Tanmer, 2004).

In explaining these findings, it can be stated that teaching students cognitive and emotional processing strategies increases the level of academic adjustment and students' academic engagement in the teaching-learning process. Based on the results of this study, it is necessary to prepare intervention programs based on teaching cognitive processing and emotional processing strategies along with the educational process of students so that they do not face difficulties in learning academic concepts and facilitate the process of teaching and learning students.

It is also concluded that by teaching strategies based on cognitive and emotional processing to students along with the learning process, it is possible to increase the level of academic adjustment and academic engagement of students in the teaching-learning processes of schools.

Research Limitations

Doing this research was faced with limitations, including the research sample, its preparation method and data collection methods to measure the effectiveness of the training program using self-report scales and control of gender variables and the number of short training sessions. This study was performed only on male students in Kerman. There has been some inability to control all environmental factors related to the situation, and implementation of interventions.

Limitations of data collection method: The tool used in this study was a questionnaire and the participants may not reflect the facts for various reasons. To address this shortcoming, it was better to use interviews and observations or other cases if possible due to limitations. Time, resources and facilities were not possible. This research has been done cross-sectionally. Because of this, it makes it difficult to generalize the conclusion to other cases.

Inability to control all environmental factors related to the location of interventions: Due to the large number of questionnaire items, a kind of reluctance was observed in the subjects.

Research Suggestions

Therefore, it is suggested that in future research, students in different educational levels and different disciplines and both sexes be researched.

It is also suggested that in future research, the effectiveness of these strategies on other variables in the field of educational psychology such as academic procrastination and academic burnout, etc. be addressed.

Based on the findings of the present study, interventions based on emotional processing are

effective in improving academic engagement and academic adjustment of students. Therefore, familiarizing teachers with such interventions can be effective in improving this ability in students.

Adaptation in the educational environment has always been one of the concerns of school officials and the education system in general. Based on the findings of the present study, the use of teaching emotional processing strategies has an important role in improving students' adaptive behaviors. Therefore, holding training courses in the field of emotional processing can be effective. It is suggested that the teaching of emotional processing strategies be implemented and practiced for students who have moral and behavioral problems.

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