

The Role of Self-Regulation Training in Self-Efficacy and Academic Motivation of Male Tenth Graders in Ahvaz, Iran

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Abstract

Background: Self-efficacy enables individuals to cope with stress and depression to succeed in environmental challenges. Low self-efficacy often increases emotional and social problems that influence mental health. This study aimed to investigate the effectiveness of self-regulation training in self-efficacy and academic motivation of male tenth graders in Ahvaz, Iran.

Methods: This was a quasi-experimental study using a pretest-posttest design with the control group. The statistical population was male tenth graders of Ahvaz, Iran in the 2020-2021 school year. Two grade 10 classes (with 20 students per class) were selected using multistage cluster sampling and students were randomly assigned to intervention and control groups. The research instruments included the Academic Motivation Scale (AMS) and the Generalized Self-Efficacy Scale (GSE-10). Seven self-regulation training sessions were provided to the intervention group. The data were analyzed using the repeated-measures ANOVA.

Results: The mean±standard deviation (SD) of the post-test scores of self-efficacy and academic motivation were respectively 21.35±5.31 and 91.10±10.65 in the control group and 25.80±5.09 and 100.85±7.96 in the experimental groups. Results of the repeated-measures ANOVA indicated a significant difference between experimental and control groups in self-efficacy and academic motivation ($P<0.001$). The research hypotheses was confirmed regarding the effectiveness of self-regulation training on students' self-efficacy and academic motivation ($P<0.001$). The one-month follow-up verified the stable effectiveness of the training program.

Conclusion: Results suggested that the self-regulation training program was effective in students' self-efficacy and academic motivation.

Keywords: Self-efficacy, Motivation, Students, Self-regulation

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1. Introduction

Education system is successful when it considers learners' performance in various aspects of academic life. An appropriate approach to planning, development, and evolution of educational programs is provided by identifying factors affecting students' academic achievements, through which the best results are obtained for cultural, social, and economic development in a society. The influence of positive psychology in various fields, including education, has provided the grounds to more concentration on hope, self-efficacy, and resilience constructs (1). Today, the spirit of research has changed from solving learners' academic achievement toward optimized learning and paying attention to learners' enthusiasm and motivation (2). Instead of focusing on risk factors or predictors of low performance, it has shifted to exploring factors that affect the pleasure and interest in participating the learning process necessary for sustainable academic success (3). Recent studies have explored the beneficial effects of psychological

capital on facilitating positive academic outcomes and highlighted the role of positive psychological constructs in facilitating educational outcomes, such as academic enthusiasm and motivation (4, 5).

Self-efficacy is one of the various factors widely discussed in the social cognitive theory (SCT) given its determining role in motivating learners (6). Students react to school assignments, goals, and programs in a variety of ways. Some reactions are enthusiastic while others are reluctant and avoidant. Students with academic enthusiasm mostly concentrate on the issues and topics to be learned (7). Those with strong self-efficacy beliefs show more diligence and perseverance in completing tasks than students with poor self-efficacy and as a result, they outperform their tasks (8). Self-efficacy refers to one's ability to deal with problems to achieve one's goals and succeed and it is influenced by personality traits, such as self-belief, striving, and not surrendering (9). Bandura (10) defined self-efficacy as a construct through which human cognitive,

social, emotional, and behavioral skills are effectively organized to achieve various goals. To overcome the complexity of the multidimensional data processing and problem-solving process, individuals must possess high levels of self-efficacy to achieve predetermined results in complex decision situations and analytical thinking. The higher a person's self-efficacy beliefs, the more he/she strives for cognitive processing, work, and analytical thinking (11). Self-efficacy beliefs influence individual's choice of activities, effort, and persistence. Students with high academic self-efficacy engage in doing work instead of avoiding it, work hard on activities, and continue to work and strive longer in the face of adversity (12). Those with low self-efficacy; however, reduce their effort and use lower-level solutions in face of adversities (13). Self-efficacy enables individuals to cope with stress and depression in order to succeed in environmental challenges. Low self-efficacy often increases emotional and social problems that influence mental health (14, 15).

Motivation is a major variable in learning and academic compatibility. Psychologists and education practitioners define motivation a fundamental concept to explain various levels of performance (16). It expresses the difference in the amount of effort to carry out assignments and academic behaviors in learning (17). More precisely, academic motivation is a psychological factor contributing to academic achievement and the cognitive, emotional, and behavioral investment for academic progress (18). Psychologists highlight the need to appreciate motivation in education because of its effective connection with new learning, skills, strategies and behaviors, and academic motivation is one of the basic constructs they have proposed to explain it (19). Students' academic motivation for learning is associated with self-confidence, concentration, hard work and perseverance in difficult tasks, willingness to continue studying after class, and choosing assignments that demand more effort. Students' motivated strategies for learning are one of the main components affecting successful learning and if appreciated, learning environment becomes more attractive and lively for learners (20). Motivation is effective in learning and it directs students' activities in planning, organizing, reviewing, making decisions, problem solving, and evaluation. In planning for learning, it is essential to consider motivation as the cause of behavior and a prerequisite for educational activities (21). Research evidence suggests that inappropriate teaching methods and emphasis on result-oriented evaluation methods in schools gradually undermines learners' motivation during the school year (22). Therefore, the need is felt to

pick methods to enhance their internal motivation given the need for effective training. One of these strategies is to teach students self-regulation strategies (23).

With the help of self-regulation strategies, students review and assess their multiple failures in order to improve active learning. Thanks to self-regulation, students comprehend the effectiveness of specific strategies for problem solving and effective learning (24). Self-regulation is the process through which students actively and continuously guide their cognitions, behaviors, and efforts in a systematic way toward achieving goals (goal orientation) (25). Accordingly, this study aimed to investigate the effectiveness of self-regulation training in self-efficacy and academic motivation of male tenth graders.

2. Methods

This was a quasi-experimental study conducted using pretest-posttest design with control group. Statistical population was male tenth graders of Ahvaz, Iran in the 2020-2021 school year. We selected the students through multistage cluster sampling. Primarily, a district was randomly selected from among four education districts of Ahvaz. Afterwards, we selected two classes (intervention and control groups) randomly from two schools. In the present study, we included 20 tenth-grade male students in each group by use of G*power statistical software with a test power of 0.96 and $\alpha=0.05$. The mean and standard deviation in the experimental and control groups were 16.96 ± 0.74 and 16.18 ± 0.53 , respectively (26). Prior to the training course, the intervention and control groups were evaluated using Harter's Educational Motivation Scale and Schwarzer and Jerusalem's Generalized Self-Efficacy scale. Inclusion criteria were being a tenth grader, absence of taking psychological therapy or training simultaneous with the research project, and obtaining informed written consent from the participants. Exclusion criteria were leaving school and the inability to continue or complete the course. Seven 90-minute self-regulation group training sessions based on Zimmerman's Self-Regulation of Learning Theory (27) were provided to the intervention group once a week. The control group was on the waiting list. Following the pretest, the intervention group received self-regulation training. A summary of sessions is shown in Table 1.

2.1. Instruments

Academic Motivation Scale (AMS): The Harter's

Table 1: Step-by-step self-regulation training in seven sessions

Session	Content
1	Step 1: Goal setting 1. An overview of the self-regulated learning model was provided. 2. The participants were required to express their opinions and experiences of this model. 3. The major dimensions of goal setting were stated (goals should be real, tangible, challenging, and short-term). 4. The participants were required to write down their three major learning goals.
2	Step 2: Time management and planning 1. The participants were given the opportunity to share their experience with the first session. 2. Time management was explained as a contributing factor to achieve goals. 3. Evasion was explained. 4. The participants were asked to express their strategies in positive sentences to overcome evasion and its negative consequences.
3	1. Scheduling (daily and weekly) and its benefits were discussed. 2. The participants were asked to plan for the goals they set in the previous session. 3. The participants were asked to plan their assignments during the week until the next session.
4	Step 3: Self-motivation behavior 1. Time management strategies were reviewed. 2. Forms written by the participants during the week were used for planning and they were asked to explain what they used for planning. 3. The participants were asked to express their methods used to avoid wasting time. 4. Explanations were provided to the students about behavioral motivation and how it differs from cognitive motivation.
5	1. The participants were asked to talk about the relation between topics of two previous sessions. 2. To get started, the participants were asked to think about their motivation for studying. 3. The motivation and the difference between internal and external motivation were explained to the participants.
6	Step 4: Cognitive self-motivation 1. The participants were asked to describe situations when they were highly motivated and situations when they were not motivated at all. 2. The participants were taught to employ self-tutorials, such as stopping negative thoughts and starting to talk positively. 3. The participants were asked to make sentences that motivate them to continue learning activities. 4. The participants were taught how to recognize their negative thoughts and take measures to resolve them.
7	1. The participants received training on concentration management strategies (relaxation) 2. Muscle relaxation was taught to increase concentration and reduce anxiety. 3. The participants were asked to discuss anxiety reduction methods.

33-item Academic Motivation Scale (AMS) aims to measure students' academic motivation. It measures academic motivation using two double-ended questions, namely internal motivation and external motivation. The participants' answer to each question can only contain one external or internal reason. The questionnaire was scored on a five-point Likert scale. Herein, the total score of AMS was used to measure academic motivation (28). Harter (28) reported the reliability of the scales to be between 0.54 and 0.84 using Kuder-Richarson Formula 20. The test-retest reliability coefficients over a nine-month period were from 0.48 to 0.63 in one sample and from 0.58 to 0.76 over a five-month period in another sample. In the Farsi version of AMS, the content validity index (CVI) and content validity ratio (CVR) were reported to be 0.72 and 0.84, respectively. The face validity of the AMS was examined and confirmed by 12 professors of educational sciences (29). Bahrani (29) reported an alpha Cronbach coefficient of 0.78 for the scale. In the present study, Cronbach's alpha was 0.77.

Generalized Self-Efficacy Scale (GSE-10): In the current work, students' self-efficacy was measured using the Schwarzer and Jerusalem's Generalized Self-Efficacy scale (30). It is a 10-item scale in which each item refers to successful coping and implies an internal-stable attribution of success. Items include Very untrue=1, Somewhat true=2, Almost True=3, and Very true=4 and the scores are ranged between 10 and 40. Higher scores indicate higher self-efficacy. Farnia and colleagues (31) reported that the content validity of the Persian version of questionnaire was assessed and confirmed by eight experts. Additionally, the CVR and CVI were reported to be 0.96 and 0.94, respectively. The authors reported an alpha Cronbach coefficient of 0.89 for the scale (31). In the present study, Cronbach's alpha was 0.85.

2.2. Statistical Analyses

We utilized the repeated measures ANOVA to measure the effectiveness of self-regulation in students' academic motivation.

Table 2: Mean±SD of the studied variables in experimental and control groups

Variable	Phase	Intervention	Control	P value
		Mean±SD	Mean±SD	
Academic motivation	Pretest	91.90±7.67	90.95±11.35	0.832
	Posttest	100.85±7.96	91.10±10.65	<0.001
	Follow-up	101.30±8.64	90.65±9.81	<0.001
P value		<0.001	0.722	-
Self-efficacy	Pretest	21.00±4.95	21.05±6.51	0.998
	Posttest	25.80±5.09	21.35±5.31	<0.001
	Follow-up	24.85±6.17	20.60±5.95	<0.001
P value		<0.001	0.209	-

3. Results

The participants included 40 tenth-grade male students. According to demographic data, the mean age of students in the intervention group was 16.96 ± 0.74 years whereas the control group was aged 16.18 ± 0.53 years. Table 2 represents the mean and standard deviation (SD) of the studied variables in the intervention and control groups in the pretest, posttest, and follow-up. The mean±SD of the academic motivation in the control group in the pretest, posttest, and follow-up stages was 90.95 ± 11.35 , 91.10 ± 10.65 , and 90.65 ± 9.81 , respectively. Meanwhile, the mean±SD of the academic motivation in the intervention group in the pretest, posttest, and follow-up stages was 91.90 ± 7.67 , 100.85 ± 7.96 , and 101.30 ± 8.64 , respectively. The mean±SD of the self-efficacy in the control group in the pretest, posttest, and follow-up stages respectively was 21.05 ± 6.51 , 21.35 ± 5.31 , and 20.60 ± 5.95 . Moreover, the mean±SD of the self-efficacy in the intervention group in the pretest, posttest, and follow-up stages was 21.00 ± 4.95 , 25.80 ± 5.09 , and 24.85 ± 6.17 , respectively.

Assumptions of the repeated measures ANOVA, such as data normality, variance homogeneity, variance-covariance matrix homogeneity, and data sphericity, were checked prior to data analysis and in the absence of assumption violations, data were analyzed.

According to the results, the significance of tests in academic motivation for within-group ($F=27.84$ and $P<0.001$) and interaction effect ($F=25.57$ and $P<0.001$) along with in the self-efficacy for within-group ($F=21.87$, $P<0.001$) and interaction effect ($F=8.34$ and $P<0.001$) indicated that in addition to the difference among the groups in three measurement stages, there was also a significant difference between self-regulation training group and the control group in academic motivation and self-efficacy. The repeated measures ANOVA was applied to highlight the difference between the groups in terms of measurement stages (pretest, posttest, and follow-up).

We used the results of repeated measures ANOVA to examine the effectiveness of self-regulation training in increasing academic motivation and self-efficacy in the intervention and control groups in the pretest, posttest, and follow-up ($P<0.001$). The significance of within-group factors confirmed the significant difference between pretest, posttest, and follow-up for intervention and control groups ($P<0.001$). There was also a significant difference between self-regulation training and control groups for academic motivation and self-efficacy given the significant within-group resources. The statistical power confirmed the adequacy of the sample size and the low probability of type II error. The Bonferroni post hoc test revealed a significant difference between the mean scores of academic motivation and self-efficacy in the pretest, posttest, and follow-up. However, the difference between the mean scores of the posttest and follow-up was not of significance, confirming the stability of the results and the effect of self-regulation training in the follow-up. A repeated measurement diagram of academic motivation and self-efficacy scores in the intervention and control groups in the pretest, posttest, and follow-up are illustrated in Figure 1.

4. Discussion

This study aimed to evaluate the role of self-regulation training in self-efficacy and academic motivation of male tenth graders in Ahvaz, Iran. It was found that self-regulation training was effective in increasing students' self-efficacy and academic motivation compared to the control group. This finding is consistent with the results of previous research (32, 33)

Self-regulation training seeks to increase students' learning, understanding, and concentration using cognitive and metacognitive strategies along with appropriate resource management strategies, therefore improving students' academic motivation. In addition, it enhances students' homework skills and enables

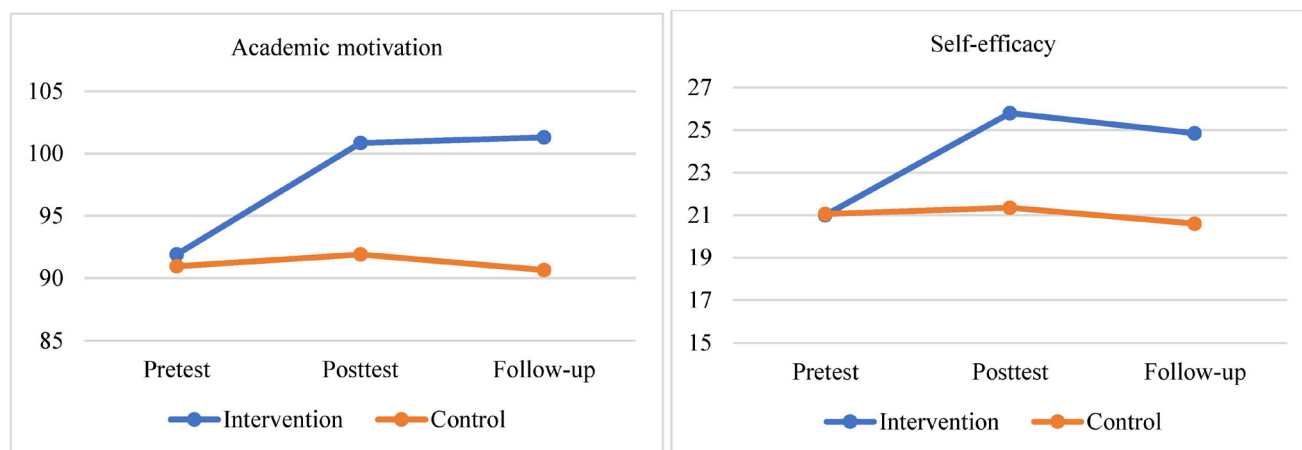


Figure 1: The figure shows the comparing the mean of academic motivation and self-efficacy scores between the groups in three evaluation phases.

them to pursue homework and related issues; hence, they succeed in solving problems, have self-confidence, and ultimately feel high self-adequacy and self-efficacy. In other words, self-regulated learners become active participants in learning. To pursue learning goals, self-regulated students follow a variety of learning strategies to constantly monitor their progress and change their strategy as needed (23).

Students who make the most of self-regulation strategies seek to generate meaningful information, control the learning process, and create a conducive learning environment to develop and enhance their academic efficiency. Ramdass and Zimmerman (34) found that self-efficacy alters in response to changes in the environment and its consequences. Given that negative and unrealistic self-assessments are the main factors influencing students to avoid challenging homework and owing to the susceptibility and variability of self-assessments to environmental factors, students' self-efficacy is expected to increase if specific strategies are adapted to reduce their unrealistic and negative assessments. This study verified the susceptibility of self-efficacy beliefs to environmental changes, especially various teaching and studying methods. This implies that by changing the teaching and learning conditions such that students play a more active role in learning process, their self-efficacy improves.

4.1. Limitations

The present paper was performed on male tenth graders in Ahvaz city; thus, caution should be observed in generalizing the results to other communities in different time and place situations due to different cultural conditions. Herein, self-report questionnaires

were used to collect data, which has its own limitations. Since we provided the questionnaires to the students to answer, the participants' communication with each other may have caused confusion in the answers.

5. Conclusions

In conclusion, in self-regulation training program, students learn skills, such as goal setting, self-monitoring, and self-assessment, and finally, they punish (self-blame) or reinforce (self-reinforcing) themselves based on their level of progress in homework. Therefore, self-regulation training program could enhance motivational variables (academic motivation and self-efficacy) in the participants.

Ethical Approval

The study was approved by the Ethical Committee of Islamic Azad University-Ahvaz Branch with the code of IR.IAU.AHVAZ.REC.1400.012. Also, written informed consent was obtained from the participants.

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