The effectiveness of metacognitive skills on goal orientation and academic procrastination of 9-12 years old students with specific learning disabilities

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Abstract

Introduction: Procrastination is not only observed in individuals but is one of the tendencies of the human beings influenced by culture. Academic procrastination is considered as the most common form of the condition. Among the factors affecting learning are meta-cognitive styles that include beliefs and behavioral preferences. Academic procrastination is a voluntarily postponing the completion of activities and assignments affecting aspects of personal and academic life negatively. The current inspection dealt with the effectiveness of metacognitive skills on goal orientation and academic procrastination of students within the age range of 9-12 years old with specific learning disabilities.

Materials and Methods: The statistical population of the study consisted of 150 students within the age range of 9-12 years old with specific learning disabilities in Qom city. Through random sampling, thirty students with learning disabilities were selected as the main sample of the study. Moreover, two scaling measures along with two questionnaires as the goal orientation and academic procrastination (each having particular scales) were used in order to collect the required data. Finally, multivariate analysis of covariance was applied to analyze the collected data.

Results: The findings of this quasi-experimental research revealed that metacognitive skills had a significant effect on improvement of students with disabilities in Qom ($P < 0.0001$). Furthermore, it was found that metacognitive skills also influenced the academic procrastination and goal orientation of Qom students for the experimental group with special disabilities ($P < 0.0001$).

Conclusion: Metacognitive skills, aspect of affecting academic progress, helps the students with special learning disabilities in goal orientation and academic procrastination. They influence the students' academic progress in a positive manner through controlling thoughts, feelings, and performance. Furthermore, metacognitive skills culminate in progress motivation, verbal comprehension, language learning, perception, attention, memory, problem solving, social cognition, and more.

Keywords: Metacognitive skills, Objective orientation, Academic procrastination, Specific learning difficulties

Introduction

Special learning disabilities are disorders in one or more basic psychological processes that make it difficult to understand or use spoken or written language. They may be impaired in listening, thinking, speaking, reading, writing, and spelling. Mathematical words or calculations have been operationalized too (1). The Fifth Diagnostic

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and Statistical Manual of Mental Disorders (DSM-5) has been renamed as Learning Disabilities, Reading Disorders, Writing Disorders, and Math Disorders, each of which has been recognized as a stand-alone disorder. One of the main symptoms of learning disabilities (2), a specific learning disability based on DSM-5, is a neurodevelopmental disorder of biological origin that causes cognitive abnormalities. One of the main features of special learning disability is basic issues in basic educational skills that include fluency, comprehension, written expression and mathematical reasoning that are the basis of anomalies in people with cognitive impairment at the cognitive level (3). Based on Elliott (4), Pondage, and Lordporncourt (5), goal setting is a way to judge one's worthiness. Goal setting theory examines why individuals, especially students, choose a particular goal, reach the goal, and relate and get in touch with the task ahead (6). Goal orientation not only includes the goals and reasons for the individual's progress, but reflects the type of criteria by which individuals judge their performance (7). As pointed out by some researchers, goal orientation is one of the most important components of motivational components that has been studied in relation to academic procrastination (8-10). Shi (2018) claims that the term Procrastination means the tendency to delay initiation or completion of important tasks to the point of discomfort, which is often viewed as a kind of regulation failure. In the same vein, academic procrastination is the irrational delay in executing academic assignments required for students (e.g., problem-solving practice, reading, exam revision) According to the results of previous research studies, there has been a negative relationship between procrastination and the goal-oriented approach, specifically the orientation of the learning goal, which is an adaptive self-regulatory process and includes a desire to improve competency competence. Procrastination is referred to as describing the situation of taking action to do something which has unnecessarily been delayed. Practical literature and academic researchers have associated negative student performance with Procrastination behavior. In addition, it was found that procrastination has a negative relationship with performance goal orientation (8) and learning goal orientation (8, 9). However, some studies have also shown that there is no statistically significant difference between procrastination and performance goal orientation. Therefore, the main purpose of this study was to examine in details the possible relationship between the independent variable and the dependent variables. In doing so, the current attempts described dealt with the relationship between academic procrastination and metacognitive skills. One of the issues in educating students with special learning disabilities is academic procrastination. Psychologically, procrastination means assigning something we have decided to set for later times (11). Ferrari believes that a deliberate and permanent delay in starting and completing tasks until you feel uncomfortable is called procrastination. Procrastination has various dimensions and manifestations due to the complexity and components of cognitive, emotional and behavioral components. A common type of academic procrastination in students is delaying the start of a given task and planning to start and get angry after work, as well as postponing a way to control intense thoughts, feelings, and performance. This means that people can use procrastination behavior to distance themselves from these everyday feelings and anxieties as opposed to the everyday emotions of life and action, and in fact give themselves more opportunity to manage problems, and this happens in the short time. This in fact reduces tension and stress since

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the delay occurs over time and the passage of time itself is facilitated when a kind of situational erosion occurs (9). With the examination of the relevant literacy, it was concluded that a deeper study of the relationship between academic procrastination and other relevant variables is a need.

Many researchers believe that metacognitive skills play a crucial role in a variety of cognitive activities, including verbal exchange of information, reading comprehension, progress motivation, verbal comprehension, writing, language learning, perception, attention, memory, problem solving, social cognition, and more. In general, teaching metacognitive strategies, as the field of scientific conflict, are the source of internal control, positive documents, motivation for further progress, creativity and constructiveness and self-responsibility in people and strengthens the sense of self-confidence in life and enable people makes them identify problems, test their activities in the plant, act freely and independently, and provide the best solutions in various matters (13).

Since metacognitive skills provide a theoretical basis for assessing students' efforts to succeed in learning environments (14) and support cognitive and metacognitive processes, they are good predictor of student success. The lack of awareness, cognitive and metacognitive strategies and cognitive styles, especially students with special learning disabilities, is undoubtedly an obstacle which affects teaching (15). Therefore, the present study seeks to test the hypothesis that teaching metacognitive skills affects the orientation of goals and academic procrastination of students with special learning disabilities.

Materials and Methods

The research method is quasi-experimental with factor analysis including pretest and posttest with experimental and control groups. The sample of the study comprised 150 male and female students within the age range of 9 to 12 years old with learning disabilities of Clinics disabilities in Qom city during the academic terms of 97 to 98, and the sample group included 30 subjects in experimental group and control group (each 15 non-randomly assigning into experimental and control group. They were treated in psychological service clinics in Qom in the 98-97 academic year. Based on the main purpose of the study, two experimental groups with different trainings and a control group took part in the study. All three groups were compared in pairs. That is, the results of the first experimental group were compared with the second experimental group and with the control group simultaneously. The sampling method of the present study was purposive non-random sampling because it is practically impossible to provide an accurate list of people with special learning disabilities and due to the fact that many people with this disorder and their families were reluctant to introduce themselves as disable learners. According to Hassanzadeh (16), in purposive non-random sampling, there is no random arrangement in sampling for equal chance of people in the community to be selected and participated in research. In fact, the participants of the study were non-randomly and purposively assigned in experimental and control groups (17). Among those with special learning disabilities who referred to the treatment centers for learning disorders related to education in Qom, 30 people were non-randomly selected as two experimental and control groups. This sample of both sexes includes 15 students in order to observe the ratio of females and males in special learning disabilities within the age range of 9 and 12 who referred to the centers in Qom, which were no-randomly put into two groups of 15 subjects.

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Before implementing the Jagger Metacognitive Skills Training Package (18), evaluations were first performed to collect data through the following tools.

Questionnaire for Goal Setting

In reality, Questionnaire statements were adapted to select the purpose of Wendy Will (19) and Elliott and McGregor (20). This questionnaire evaluates four factors: learning orientation, performance-orientation, performance-avoidance, and uncertainty in goal orientation. To determine the structural validity of this tool, factor analysis using the main components method along with varimax rotation has been used. In the analysis of the purpose orientation questionnaire data in this study, the value of KMO coefficient (sampling adequacy index=0/68.34) and Barlett's Crowe test showed sufficient evidence for the implementation of factor analysis method (20).

Student Scale Degradation Scale (PASS)

The academic procrastination scale was developed by Solomon and Ruth Bloom (21). The scale has 27 items, which include three components: "preparing for exams" (8 items), "preparing homework" (11 items), and "preparing for the end-of-term articles" (8 items). This questionnaire was translated into Persian by Jokar and Delavarpour (22) and its validity and validity were 0.61 and 0.88, respectively. Due to the fact that the components of students' feelings and emotions about procrastination and their tendency to change the procrastination habit do not determine the individual's procrastination, the validity of the questionnaire was calculated by removing these two components and 0.87 (23).

Educational intervention in this study included the Jagger (18) metacognitive and metacognitive skills training program. This program was taught to the experimental subjects in 8 sessions for 40 minutes. This program is designed to teach knowledge and skills of metacognition to elementary school students and includes two steps.

The group form was implemented by the researcher in collaboration with teachers; the summary of the educational program sessions was as follows: in the first to fifth sessions, the level of students' metacognitive knowledge is examined by asking questions. Question 1: What is the best thing to do before reading a text? Session 2: What is the best thing to do when reading text? Third session: What is the best thing to do after reading the text to find out if you understand the text well? Session 4: What is the best thing to do when you don't understand a sentence? And the fifth session: What is the best thing to do when you don't understand a part of the text? Also, in the sixth to eighth sessions, they are taught and given practices related to metacognitive skills. In this way, in the sixth session, the metacognitive skills required before reading the text are taught and practiced. In the seventh session, the metacognitive skills required while reading the taught text are practiced. Finally, in the eighth session, the metacognitive skills required after reading the text are taught and practiced.

Results

The results of the descriptive statistic of the research variables in the pre-test, post-test and follow-up stages for the experimental and control groups are separately presented in (Table 1). This table, in fact, shows the descriptive statistics of pretest and posttest resulting from the implementation of the questionnaire and its dimensions. In the study the mean of academic procrastination in the post-test and follow-up stages decreased compared to the pre-test stage in the experimental group, while the mean of goal orientation increased (Table 1, $P < 0.0001$.

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Table 1. Pretest, posttest and follow-up data of the objectives goal orientation and academic procrastination in the experimental and control groups.

Variable	Experimental group			Control group		
	Pretest	Posttest	Follow-up	Pretest	Posttest	Follow-up
Objectives orientation	38.8±5.24	43.53±4.08	43.13±3.35	40.27±5.58	40.46±5.4	39.93±5.66
Academic procrastination	88.93±7.38	85.73±7.29	84.13±6.61	93.07±5.57	93.27±5.19	93.2±5.71

Data are shown as mean ± SD.

The results of Kolmogorov-Smirnov test to check the normality of the data showed that the hypothesis of normal distribution of scores in the variables of objectives orientation and academic procrastination in the two groups in the three stages is confirmed (P>0.05). The results of the Levin variance homogeneity test in the post-test stages in the objectives orientation (F=4.09, P=.053) and in the academic procrastination (F=0.291, P=0.594) and in the follow-up stage in the objectives orientation (F=0.093, P=0.763) and in the academic procrastination (F=0.002, P=0.965) the results show that this assumption is confirmed. Assumption of slope of regression line showed that group interaction test and pre-test in post-test stage in objectives orientation (F=5.23, P=0.055) and in the academic procrastination (F=0.004, P=0.953) and in the follow-up in the objectives orientation (F=4.68, P=.059) and in the academic procrastination (F=0.723, P=0.403). The results show that this assumption is confirmed. The results of the M box test to investigate the homogeneity of the variance-covariance matrices of the post-test stage (M box=3.46, F=1.07, P=0.362) and in the follow-up stage (M box=5.15, F=1.58, P=.191). The results of the correlation test between the control variables also showed that the correlation between these variables is less than 0.8 and acceptable (r = 0.347, P <0.05).

As demonstrated in Table 2, the relationship between pre-test and post-test of academic procrastination and objectives orientation is significant (P<0.001). By controlling this relationship, the means of academic procrastination and objectives orientation in the post-test and follow-up stages are significantly different in the experimental and control groups (P = 0.001). The results show that about 57.4% of individual differences in improving academic procrastination and objectives orientation in the post-test phase and 63.6% in the follow-up phase are related to differences between groups. In other words, metacognitive skills have an effect on academic procrastination and objectives orientation in the post-test and follow-up stages in students with specific learning disabilities. The Observed Power 100% in both post-test and follow-up stages shows that the statistical accuracy of this test is desirable. In addition, the sample size was sufficient to test this hypothesis.

Table 2. The results of multivariate analysis of covariance (MANCOVA), effect of metacognitive skills on objectives orientation and academic procrastination.

Stage	Effect	Hypothesis degree of freedom	Significance	Partial Eta Squared
Posttest	Pre academic procrastination	2	0.001	0.523
	Pre objectives orientation	2	0.001	0.813
	Group	2	0.001	0.574
Follow-up	Pre academic procrastination	2	0.001	0.618
	Pre objectives orientation	2	0.001	0.693
	Group	2	0.001	0.636

The results of analysis of covariance (ANCOVA), for comparing the two groups in post-test and follow-up are presented in Table 3. The results show the mean academic

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procrastination and objective orientation. In the experimental and control groups in the post-test and follow-up stages with pre-test control are significant (P <0.001). In other words, metacognitive skills training has been effective in improving academic procrastination and objectives orientation in two stages of post-test and follow-up. The effect of metacognitive skills on increasing the objectives orientation in the post-test is equal to 53.3% and in follow-up equal to 38.8% is obtained. Also, the effects of training in reducing academic procrastination in post-test 26.6% and in follow-up 36.7% have been.

Table 3. The results of ANCOVA for effect of metacognitive skills on objectives orientation and academic procrastination.

Stage	Variable	Sum of Square	df	Significance	Partial Eta Squared
Posttest	Academic procrastination	159.337	1	0.005	0.266
	Objectives orientation	121.286	1	0.001	0.533
Follow-up	Academic procrastination	226.692	1	0.001	0.367
	Objectives orientation	108.671	1	0.001	0.388

Discussion

Procrastination is a pernicious form of task avoidance associated with a variety of contexts including academic performance, work performance, health, and interpersonal relationships (30). Studies relevant to procrastination indicate that people with procrastination are easily distracted by more interesting or fun activities (31, 32 & 33). Thus, they mostly give priority to the more pleasant activities. Instead of working on the most important cases, they prefer to sleep, watch TV, or play, so that they distract or being taken away from the responsibilities. One of the reasons that students distract and replace other activities is that doing assignments and projects is annoying for them. They add that it has been found that the more people do not like a work, they procrastinate more and replace more interesting activities (12).

The main independent variable in our study, had a significant improvement in post-test in the experimental group, but this change did not seem much significant in the control group. To meet this goal, we divided the students into groups. After the metacognitive skills were implemented, learners' objectives orientation and academic procrastination gradually improved. In each meeting, the researcher and the teacher always monitored the students' progress and weaknesses by providing feedback related to how objectives orientation and academic procrastination of students with special learning disabilities develop. It was one of the researchers' strategies to facilitate the students to describe something clearly and also to encourage the students' motivation in learning and a way to help disabled learners. The educational programmers and teachers must be more careful and alert about this type of education procedure. Ignoring the latest trends and techniques and suggestions in education can have terrible outcomes on the learning and the feelings of that student. On the basis of some researchers' ideas (6, 8), teenage students with their special interest and enthusiasm and also knowledge about the such methods, will enjoy the new-method and tech-based classes. They look at everything with special care and alert. This can be used in teaching anything to them. Young students are so alert and sensitive toward any new thing, subject, method or lesson. This feature of the young students should come into use within the educational environments. And this research is not exceptional (36).

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The analysis of the data from the findings of the current inquiry reveals that the teaching metacognitive skills that are considered as conducive aspects, will be effective and will be perceived positively by the students in order to develop the language learning process.

The results of the study also revealed another fact. The fact is that psychological, the knowledge and skills for organizing, guiding, and controlling one's own thinking, actions, and learning processes. A learner with high levels of skills in organizing, guiding, and controlling one's own thinking, will learn better, will have skills in using educational tech and self-confidence, will get the best out of the teaching process and will have the most amount of attention and focus on the topic being taught. And the reverse, one who is continually has to use traditional and classic methods of written and explanatory methods, and who has to deal with boredom of education, will have conflict inside and suffering from fears, anxieties and so on, will not be able to use the class as much as needed (35).

All in all, this study arrived at results which were in keeping with Hashemi's (23) research, which examines academic procrastination through self-regulatory cognitive, motivational, and metacognitive self-regulation that self-regulatory self-regulation can predict academic procrastination. It is also consistent with the research of Jolani Ajagh (25) and Golestani Bakht va Shokri (26) and also with the researches of Saadati Shamir et al. (27) and Mirzabeigi (28).

Based on the findings of this study, the following suggestions have been offered: 1. Further research should focus on scaling materials for evaluating procrastination; 2. The patients should be further followed up patients to check for the robustness of the result; 3. Care should be taken to ensure that the researcher and the experimenter were not the same person to avoid probable prejudice in the result; and 4. Due to the lack of experimental researches concerning different intervention programs for the main variables of this study, it is recommended to conduct researches experimentally in broad areas in this field.

According to Griffiths and Parke (35) findings, due to the fact that in educational conditions in schools, a relatively high prevalence of special learning disabilities and their cognitive effects is seen and it is necessary to have workshops and trainings to identify the symptoms of this disorder in an effective way on educational matters to the teaching staff and especially in primary schools, so that educators and teachers, while identifying the obvious side effects, can prevent timely educational deficiencies caused by this disorder and treatment, and these trainings must be effectively followed by parents as well. According to Zimmerman (15), prompt and supportive action can be taken to prevent the progression of the disorder, so it is recommended that research be conducted to determine the attitudes of people with learning disabilities and those around them after obtaining improved outcomes.

Conclusion

This experimental study with pre/post-test in experimental and control groups was conducted with the purpose of investigating the effect of meta-cognitive skills training on learners' procrastination and objective orientation of learners with disabilities. Based on the research results, it can be said the training of the metacognitive learning strategies has a beneficial effect on decreasing academic procrastination and increasing self-efficacy among students having disabilities. The findings indicated that metacognitive skills lead to improving academic procrastination goal orientation and academic procrastination of male and

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female students within the age range of nine to twelve years old with special learning disabilities in Qom. The results of this research showed that metacognitive skills training is an effective training program.

Conflict of interest

The authors declare that they have no conflict of interest.

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