The effectiveness of metacognition training on motivational beliefs and self-regulated learning strategies of students with learning disorders

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ARTICLE INFORMATION	ABSTRACT
	Background and Aim: Learning can be considered as the most fundamental process, as a result of which, a helpless and helpless creature, over time and in interaction and physical growth, reaches a transformed person whose cognitive abilities and power of thought knows no bounds. The aim of the current research was to investigate the effectiveness of metacognitive training on motivational beliefs and self-regulated learning strategies of students with learning disabilities. **Method:** The current research method is practical in terms of purpose and in terms of field situation and in terms of semi-experimental method with a pre-test, post-test design was with the control group and random assignment. The statistical population of this research included all elementary school students aged 10 to 13 with learning disabilities in reading, writing and math in Juybar city in the academic year of 2019-20. Purposive sampling and 30 students were selected as a sample and then randomly assigned 15 students to the experimental group (related to metacognition training) and 15 students to the control group. The experimental group underwent metacognitive training based on Koziak's (2001) model for 10 one-hour weekly sessions; while the control group did not receive any intervention. Also, Harter's motivational beliefs questionnaire (1981) and Ryan and Connell's self-regulated learning questionnaire (1989) were used in the pre-test and post-test stages. Finally, the data were analyzed using univariate and multivariate analysis of covariance and Bonferroni's post hoc test. **Results:** The results showed that metacognition training has an effect on students' motivational beliefs (F=12.31; P=0.002) and self-regulation learning strategies (F=17.35; P=0.001). **Conclusion:** It can be concluded that metacognitive training is effective on students' motivational beliefs and self-regulation learning strategies, and this training can be used to reduce students' psychological problems.

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Introduction

A learning disability is an impairment in one or more psychological processes necessary to understand and understand or use language and writing or speaking, which may manifest as an incomplete ability to listen, think, speak, read, spell, or perform mathematical calculations. Show (Turgesan, 2018). Learning disorders in students will lead to academic failure and decrease in their motivation and dropping out of school and will cause irreparable psychological and economic damage to the child and the family and the education system. One of the reasons why students have good grades during the semester but face a drop in grades at the end of the semester is their low motivation level (Moll et al., 2014). Research findings state that motivational beliefs are essential to students' academic performance (Lynch, 2010; Wybrowski, Matthews, & Kitsantaz, 2017; Rodriguez Martinez, Pinero Aguin, Gomez Taibo, Ruggiero Fernandez, Estevez Blanco, and Val Arias, 2017). Motivational beliefs are a group of personal and social criteria people refer to to do or avoid an action (Kimo, 2017). These beliefs include criteria about people's reasoning in choosing the methods of doing tasks and are affected by the consequences of the behavior of identification with others and other factors and may change in different situations (Rosario et al., 2013). Cognitive theories and studies emphasize that learners use cognitive strategies when acquiring, storing and recalling information and ignore the role of motivational variables (Yu & Fazio, 2019). Based on this, in recent decades, we have seen the formation and development of various theoretical frameworks about self-regulated learning, which agree on the existence of cognitive, metacognitive, emotional, and motivational components (Masoumi Jahandizi, Hijazi, Ahmadi, and Vakili, 2019). Self-regulation is a process that helps the learner to acquire academic skills such as setting goals, choosing, replacing strategies and effective control (Nikpey, Farahbakhsh, and Yusuf-Vand, 2017). Zimmerman (1990) considers self-regulated learning strategies as a type of learning in which students initiate and direct their own efforts instead of relying on teachers, parents or other educational agents to acquire skills and knowledge; In other words, self-regulated learning refers to the active participation of the learner in the learning process from a behavioral, motivational, cognitive and meta-cognitive

perspective (Narimani, Khoshvodeniai Chamachai, Zahid and Abolghasemi, 2016). Pentrich and DeGroot (1990) proposed a model for self-regulated learning, which includes motivational beliefs (self-efficacy, internal valuation, and test anxiety) and self-regulated learning strategies (cognitive and metacognitive strategies). Based on this model, self-efficacy is defined as the set of students' beliefs about their abilities to do things and the internal evaluation of the importance that the student gives to a particular task or lesson, as well as exam anxiety. This special emotional state is experienced in official exams or evaluation situations. They are considered as motivational beliefs and cognitive and metacognitive processes as self-regulated learning.

Flavell (1976) emphasizes that metacognitive education includes three general strategies: planning, control, monitoring, and discipline (Nicoquilo-Carrilho et al., 2018). Metacognitive strategies mean the set of processes of planning, revising, and modifying cognitive activities, and cognitive strategies refer to the thinking solutions that learners use to learn, memorize, and understand the content (Songor, 2007). Proper metacognitive education tries to increase students' learning, understanding and concentration; therefore, it improves students' performance. Since these students are constantly anxious and tense due to academic problems, this training reduces their stress level and increases their self-efficacy. As a result, metacognitive education improves students' homework skills and makes students follow up on homework and related issues; therefore, they can perform better in learning and trust themselves (Mosser et al., 2017). Also, the results showed that people can help their students by teaching metacognitive strategies to be more successful learners and play a more active role in their educational destiny (Mazzako & Hanich, 2010). In general, according to metacognitive skills, after training in metacognitive skills, students can reach this level of how to learn, making them more interested in studying and getting good grades. Knowing about the ways of planning, setting goals, monitoring the amount of learning, modifying learning methods, organizing and asking questions while studying all make a person have a better academic performance, and this will lead to an increase in motivation and a sense of learned helplessness and other negative

emotional concepts. It will destroy education (Amin & Sokstiarno, 2015). According to what was said, this research aims to determine the effectiveness of metacognition training on motivational beliefs and self-regulated learning strategies of students with learning disabilities. Therefore, this research seeks to answer whether metacognition training is practical for motivational beliefs and self-regulated learning strategies of students with learning disabilities.

Method

The current research method is practical in terms of purpose and in terms of field situation and in terms of quasi-experimental method with a pre-test, post-test design was with the control group and random assignment. The statistical population of this research included all elementary school students aged 10 to 13 with learning disabilities in reading, writing and math in Juybar city in the academic year of 2019-20. Purposive sampling and 30 students were selected as a sample and then randomly assigned 15 students to the experimental group (related to metacognition training) and 15 students to the control group. The experimental group underwent metacognitive training based on Koziak's (2001) model for 10 one-hour weekly sessions; while the control group did not receive any intervention. Also, Harter's motivational beliefs questionnaire (1981) and Ryan and Connell's self-regulated learning questionnaire (1989) were used in the pre-test and post-test stages. Finally, the data were analyzed using univariate and multivariate analysis of covariance and Bonferroni's post hoc test.

Tools

Harter's Motivational Beliefs Questionnaire (1981). It is a 33-question questionnaire that was designed and implemented in order to check the level of motivational beliefs of people. Harter's standard motivational beliefs questionnaire includes 33 items and its purpose is to investigate motivational beliefs among students. This tool is a modified form of Harter's scale (1980) as a tool for measuring motivational beliefs. As stated, Harter's original scale measures motivational beliefs with bipolar questions, one of which is internal motivation and the other is external motivation. The subject's answer to the subject of each question can only be one of the external reasons or take away the inside. This questionnaire is scored on a five-point Likert scale: never (1), rarely (2), sometimes (3), most

of the time (4), and almost always (5). The range of scores in this test is from 33 to 165, and the sum of all items calculates the total score of motivational beliefs.

Results

The variable scores of motivational beliefs in the experimental groups changed in the post-test compared to the pre-test, but in the control group, no significant changes were observed. The results show that the variable scores of self-regulation learning in the experimental groups have changed in the post-test compared to the pre-test, but in the control group, no significant changes are observed.

The results of the Shapiro-Wilk test showed that in the variable of motivational beliefs and its components in the pre-test, and the post-test separately between the control and experimental groups, the significance level is greater than 0.05; Therefore, the assumption of normal distribution is maintained. In the self-regulation learning variable and its components in the pre-test, and the post-test separately between the control and experimental groups, the significance level is greater than 0.05; Therefore, the assumption of normal distribution is maintained. The results showed that metacognition training affects students' motivational beliefs (F=12.31; P=0.002) and self-regulation learning strategies (F=17.35; P=0.001).

Conclusion

According to the obtained results, metacognitive training is effective in the motivational beliefs of students with learning disorders.

Learning disorder is one of the most common disorders diagnosed in childhood, which is the most important cause of poor academic performance and is associated with problems in correct and fluent word recognition and understanding. These problems lead to deficits in other cognitive abilities, including self-regulated learning (Barkeley & Larsen, 2018). Self-regulation is a type of learning in which learners initiate and direct their own efforts instead of relying on teachers, parents, or other educational administrators to acquire knowledge and skills.

Students with learning disabilities have difficulty with reading skills (reading speed and accuracy) and memorizing materials, and the awareness and application of metacognitive strategies increases the success rate of their reading skills. In fact, metacognitive education makes learning easier for learners. In general, metacognitive

education is a set of methods to help students to focus their attention on educational materials with the aim of deeply understanding its content and creating a link to new and old information and encoding them to store in memory (DeLaPaz and Wissinger, 2016).

Proper metacognitive education tries to increase students' learning, understanding and concentration; therefore, it improves students' performance. Since these students are constantly under anxiety and tension due to academic problems, this training reduces their stress level and increases their self-efficacy. As a result, metacognitive education improves students' homework skills and makes students follow up on homework and related issues; hence, they can perform better in learning and trust themselves.

Conflict of Interest

According to the authors, this article has no financial sponsor or conflict of interest.

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