

The Effectiveness of Training Meta-Cognitive Strategies on Learning Disorders of Primary School Students with Learning Disabilities

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ABSTRACT: The subject of the present study was to study the effectiveness of training meta-cognitive strategies on learning disorders of primary school students with learning disabilities. The design of the present research was experimental from pretest-posttest of following-up and control group. The population consists of all primary school students with LD in Sari in 2015-2016 that a total of 30 people of the students who were found learning disabilities were substituted with the appointment of two groups of 15 subjects (experimental group and control group). Research tool was personal information form and questionnaire of learning disorders Colorado (CLDQ). Training meta-cognitive strategies was held for the experimental group for 5 weeks in 10 sessions of 90 minutes. Analysis of covariance was used to analyze the data ($P < 0.01$). The results of the research showed that there was a significant difference between experimental and control groups in terms of learning disorders. As a result, training meta-cognitive strategies resulted in reducing learning disorders of primary school students with learning disabilities. Therefore, it seems that training meta-cognitive strategies can be used as a useful intervention in order to reduce learning disorders of primary school students with learning disabilities.

Keywords: Cognitive Strategies, Meta-Cognitive Strategies, Learning Disorders, Primary School Students, Learning Disabilities.

INTRODUCTION

Learning disabilities are one of the largest and perhaps most controversial components of exceptional education. Learning disability in the United States is the term used to describe children who are impaired in language development and communication skills. Children who their learning problems are primarily due to visual impairment, hearing, movement or emotional problems, or mental retardation general cultural constraints are not included in this group (Fletcher et al., 2007). Generally, the emphasis on the topic of learning disabilities has recently significantly expanded and the opinion of many educators and educational experts has attracted children. Until a few years ago, exceptional education was included only children who they had some problems in learning and due to causes such as vision or hearing defects, mental retardation, speech or language disabilities, severe emotional disorders, paralysis or other problems caused by lack of physical health. Institutions of exceptional schools and special classes for the education of these children who had some clear disabilities were organized and a series of separate curricula was considered for training these different groups (Ahadi & Kakavand, 2011).

In the meantime, children who were not learning anything in school and they were also deaf, blind or some problems in minds, received no special services because no plan was developed for them. Because of this situation and urging the extreme desire of the parents, education professionals recognized that there were some significant students that they were delayed in learning to speak, the correct use of language, development of normal visual perception and hearing, reading, writing, spelling and calculation. Some of these children do not understand the language but they are not deaf and some of them cannot understand what they see but they are not blind and some others cannot learn by helping normal methods of education while they have mental lag. The problem of these children is introduced "special disability in learning" today (Ahadi & Kakavand, 2011).

However, given the importance of meta-cognitive strategies in learning and academic affairs and also the need for intervention in the treatment of learning disorder, especially for the students with learning disabilities (due to more vulnerability), the present research attempts to study the impact of cognitive and metacognitive strategies training on learning disabilities in primary schools students with learning disabilities. Human progress in all fields of science has increased the importance of the education of learning strategies. In some studies, researchers conducted on some students concluded that most of the difficulties of learning and students transfer of learning were due to lack of cognitive and metacognitive skills in them. Many learners in self-regulation, self-checkout, and identification of their problems and so on need to be trained (Gij & Burllyner, 1991, quoted by Seif, 2006).

In fact, one of the important processes that take place in memory is cognitive process. This process starts from interpreting the sense and continues until recovering data from long-term memory. Since these processes are related to knowing and understanding, they are called the cognitive processes of the memory. These processes are divided in three categories of repeating and reviewing, developing or expanding and organizing. These processes are called cognitive strategies (Seif, 2006). The purpose of metacognitive strategies is a series of the processes, planning, reviewing and modifying cognitive activities. Also, Learning strategies are to encompass the students on tough assignments and insistence (Fallah Kafshgiri & Heidari, 2015). It is also shown experimentally that meta-cognition is associated with studying, learning, critical thinking, problem solving and decision making and all of them are essential for educational success (Schleifer & Dull, 2009).

In previous studies with different methods of learning and thinking and cognitive and metacognitive strategies, it shows that these strategies are trained (Saeed & Mehrabi, 2013). This means that the teachers can teach these skills to the students and even their students independently and along with other courses and then, the students and teachers can apply these strategies voluntarily and this action has a positive impact on learning and advancing the students (Seif, 2006) and in most of them, the positive impact of these strategies are confirmed on learning. The researches of Scott Paris et al (1986), Ebabaf (1996) and Ansari (2000) and also Shafaqi (2003) are among these researches which they have found the same results (quoted by Manouchehri Ardestani et al., 2011). Einstein and Hume (1998; quoted by Seif, 2006) have also mentioned some studies with these results which the teachers can help the learners succeed by training learning and study skills (cognitive and metacognitive strategies) to their students and play an important role in educational fate. Falavel (1997, quoted by Seif & Naderi, 2000) studied cognitive and meta-cognitive strategies and he has said on this that the learners apply all cognitive strategies to achieve the cognitive advancement and use the meta-cognitive strategies so that they have control on the advancement.

Following earlier studies, among psychological disorder that stems from the weakness of cognitive and metacognitive strategies of the students is learning disorders. Learning disorders are called to a group of heterogeneous disorders appeared for a serious disturbance in the acquisition and use of listening, speaking, reading, writing and calculating. Among the most important features of children with learning disorder is impairment in memory function (e.g., short-term memory and working memory defects and defects in the encoding and cognitive and metacognitive strategies) (Miri, 2012).

Children with specific learning difficulties (LD) are those that they are not able to have a full use of common education facilities by enjoying an average intelligence and higher and lack of sensory defects due to severe brain damage and social-emotional problems and they have clear and visible weakness in one or several courses. Therefore, the borderline students do not include in this group (Hallahan et al., 2011). Hallahan (quoted by Hajilou & Rezaee Sharif, 2011) has reported the prevalence of learning disabilities in different parts of the world between 3 to 12% and Marvian Hosseini (1997) has reported the incidence of learning disorders in Iran to 8% and also, Narimani and Rajabi (2005) have reported the prevalence of these disorders to 13%. In the past, many researchers emphasized the impact of cognitive and mental abilities on academic achievement. The research of Abedini et al (2010), Valle et al (2009) and Paulsen and Gentry (1995) are among the studies conducted on cognitive and metacognitive strategies and academic achievement indicating a significant relationship among these components, but less research on teaching cognitive and metacognitive strategies on student learning disorders, especially in the students with learning disabilities are discussed due to more vulnerability that they have in the periods of the school.

In fact, the contents mentioned focus on more attention by education planners, advisers and parents of students to personality traits, along with other academic abilities. Therefore, given the importance and role which meta-cognitive strategies have on behavior and academic performance of people and also being educable of these strategies and research vacuum in the field of schoolchildren are felt to learning disability, the need to more researches in confirming and rejecting the findings of the previous researches. However, the problem of the present research was that can training meta-cognitive strategies have a significant effect on learning disorders of primary school students with learning disabilities or not?

MATERIAL AND METHODS

The design of the present research was experimental from pretest-posttest of following-up and control group. The population consists of all primary school students with LD in Sari in 2015-2016 that a total of 30 people of the students who were found learning disabilities were substituted with the appointment of two groups of 15 subjects (experimental group and control group). Research tool was personal information form and questionnaire of learning disorders Colorado (CLDQ). This questionnaire is prepared by Willcutt, Boada, Riddle, Chhabildas, DeFries & Pennington (2011; quoted by Hajilou & Rezaee Sharif, 2011) and they consider learning difficulties including five elements of reading, calculate, social cognition, social anxiety and performance space resulting in the problems of learning. This questionnaire consists of 20 items completed by the parents of the students. The response to each statement in a Likert scale of 5 degrees is from never (1) to always (5). The reliability of this questionnaire and the components are studies by manufacturers of the questionnaire with internal consistency and test-retest methods and acceptable values are obtained. The separated validity and structured validity of the mentioned questionnaire have been reported desirably (Willcutt et al, 2011; quoted by Hajilou & Rezaee Sharif, 2011). Training meta-cognitive strategies was held for the experimental group for 5 weeks in 10 sessions of 90 minutes. Analysis of covariance was used to analyze the data (P<0.01).

RESULTS

In this section, description and study of the mentioned assumption and statistical analysis are discussed so that the accuracy of the assumptions can be studied. In order to investigate the significance difference among the groups in the mean variable, ANCOVA is used that this is one of the methods of inferential statistics.

Table 1. The mean and standard deviation of learning disorders before and after training, cognitive and metacognitive strategies.

Group		Pre-test of learning disorders	Post-test of learning disorders
Experimental	Mean	59.33	45.67
	Std. Deviation	6.82	6.82
Control	Mean	60.00	60.20
	Std. Deviation	6.29	5.17
Total	Mean	59.67	52.93
	Std. Deviation	6.45	9.49

The results of the above Table have shown that the average scores of learning disabilities of elementary school students with learning disorders in pre-training are almost close to each other and in post-test have the significant difference as a result of training meta-cognitive strategies.

Table 2. Levene's Test of Equality of Error Variances^a.

Dependent Variable: post-test of learning disorders			
F	df1	df2	Sig.
0.12	1	28	0.21
Tests the null hypothesis that the error variance of the dependent variable is equal across groups.			
a. Design: Intercept + PISEI + Group			

Given the significant level of Levene's test is more than 0.05, it can be said that data of these hypotheses have not questioned equality of variance error. Therefore, covariance analysis can be used.

Table 3. Tests of Between-Subjects Effects.

Dependent Variable: post-test of learning disorders						
Source	Type III Sum of Squares	df	MS	F	Sig.	Partial Eta Squared
Corrected Model	2108.051 ^a	2	1054.025	56.711	0.000	0.808
Intercept	61.882	1	61.882	3.330	0.079	0.110
Pre-test of learning disorders	523.917	1	523.917	28.189	0.000	0.511
Goroh	1485.657	1	1485.657	79.935	0.000	0.748
Error	501.816	27	18.586			
Total	86668.000	30				
Corrected Total	2609.867	29				

a. R Squared = .808 (Adjusted R Squared = .793)

Univariate analysis of covariance has shown that the impact of independent variable (Group) is significant; this means that after removing the effect of pretest, there is a significant difference between the mean of the scores of learning disorders of two groups in post-test. Therefore, the null hypothesis, non-significance of the mean difference between two groups in post-test after removing the pretest probability is rejected. Finally, there a significant difference between experimental and control groups in terms of learning disabilities ($P < 0.01$, $F = 79.93$). According to the mean of the scores, it can be concluded that training meta-cognitive strategies on reducing learning disorders of primary school students with learning disabilities has a positive effect.

DISCUSSION AND CONCLUSION

The results of covariance analysis showed that training meta-cognitive strategies on reducing learning disorders of primary school students with learning disabilities had a positive effect. Theoretical and practical study of literature study shows that the results of this study with the studies of the previous researchers of (Miri, 2012; Zaree et al., 2012; Daemi, 2012; Yaqoubi et al, 2014; Salehi et al 2013; Ashouri & Jalil Abkenar, 2013; Rezaee and Seif, 2013; Saeed & Mehrabi, 2013) are directly and indirectly consistent indicating the impact of training self-regulative strategies and in other words, meta-cognitive strategies are consistent with the kinds of learning disabilities and academic advancement of the students and the results of their findings are confirmed.

In explaining this result, it can be said that since learning strategies are educable, training these strategies through establishing self-directed learning readiness in the students help that they can assess their learning difficulties more desirably and deal with studying and learning the courses by more ability. In fact, training meta-cognitive strategies by focusing on teaching reading strategies such as techniques of repeating and reviewing, highlighting some parts of the text of the book and subscribing and copying the contents or semantic extension, increase and cause that they learn more easily and comfortably and obtain more success in academic affairs to a deeper understanding of their social environment through getting experience and they place more developed than before in social groups of friends. Therefore, learning disabilities including reading, counting, social anxiety, social cognition and performance space changes gradually in the students with the disabilities. This means that according to the views of Dambo (1994; quoted by Fallah Kafshgiri et al., 2015), when the learners realize that they do not understand some parts of the text, they review and say again and they adapt their speed of reading based on the difficult or unfamiliar contents. They review the contents they do not understand. Among the questions which seem difficult, they are rejected and they seek easy questions and then to difficult questions. In fact, they have used regulation strategies. Self-regulation strategies help the students to change their behaviors and they are also allowed to fix defects in their perceptions (Bembenutty, 2008). However, it is not unexpected that in the present study through training meta-cognitive strategies on learning disorders of primary school students with learning disabilities,

their learning disabilities are reduced. Therefore, it is recommended that training meta-cognitive strategies are used as useful interventions to reduce learning disorders of primary school children with learning disabilities.

Conflict of Interest

The authors declare no conflict of interest.

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