IJBPAS, November, 2015, 4(11), Special Issue: 476-485

ISSN: 2277–4998

International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

EFFECTIVENESS OF TEACHING PROBLEM SOLVING LEARNING STRATEGIES ON REDUCING THE SYMPTOMS OF MATHEMATICAL LEARNING DISORDER IN ELEMENTARY SCHOOL STUDENTS OF AHVAZ

ALI MOHAMMADI[1*], LEILA SAHEBE BAZAZ[1], NAJME BARADARANZAD[2], SAFA SAFAIEMOGHADAM[1]

1. Department of Family Counseling, Shahid Chamran University, Ahvaz, Iran

2. Department of Counseling, Islamic Azad University, Ahvaz, Iran

ABSTRACT

Introduction: Considering the importance of problem solving in learning mathematics and arithmetic during primary school, the present study examines the Effectiveness of teaching problem solving Learning strategies on reducing the symptoms of mathematical learning disorder in primary school students. **Method:** In terms of purpose, the present study is functional and it is descriptive in terms of methodology and design. This quasi-experimental research is conducted in the framework with the pre-test and post-test design with control group. The population of the study included all the Sixth grade students of elementary schools in Ahvaz during 2014-2015. The sample was selected After conducting diagnostic tests, 40 students who had mathematical learning disorder were selected and randomly assigned in two groups of control and experiment. After 10 sessions, both experimental and control groups participated in post-test. The analysis of the data was done using SPSS version 16 software. **Results:** The results of this study indicated the effectiveness of problem solving learning strategies to reduce symptoms in children the symptoms of mathematical disorder in primary school children. **Conclusions:** Teaching problem solving Learning strategies enables students decide better on mathematical, social and academic issues. It also helps them to be more accurate in learning process and thinking, and to believe that they have the ability to solve problems.

Keywords: Problem Solving, Learning Strategies, Mathematical Learning Disorder, Elementary Students.

[1]. * **Corresponding** author**. Email address: mohammadi9631@gmail.com**

INTRODUCTION

Specific learning disorder means the failure of one or more of the basic psychological processes that may be shown as the disability to hear, think, speak, write, or do mathematical calculations. Specific learning disorders are composed of two main parts: developmental learning disorders, academic learning disorders. Developmental learning disorders include the problems with a group of skills required to be learned as the lesson that the child needs them such as attention, perception, thinking (Ronaghi, 2009). Academic learning disorders are diagnosed when a person's progress in standardized tests for reading and a written statement of basic mathematics is lower than (more than 2 standard deviation between academic achievement and intelligence) normal intellectual and educational level (Berahmand , 2012). Mathematical disorder is one particular form of learning disorder which affects the mathematics skills of the person. Poor education, environmental deprivation and the inability of the brain to process the concepts of number are the causes of mathematical disorder (Shalov, 2014). The students' mathematical disorder can be as follows: there are problems in determining the shape and size of the set of numbers (the number), one by one correspondence, and place value of numbers, mathematical skills, and the concept of value for money, reading time and problem solving. Currently, there is much evidence to show that mathematics disorder is a heterogeneous problem. It may include problems in arithmetic, geometry, and algebra.... On the other hand this disorder is composed of different nature and from different parts, for example, knowledge of arithmetic facts, ability to perform tasks related to the recognition and application of principles of displacement and contribute to accounts such as property, estimating application. Mathematical disorder is a scientific issue in problem solving (Dowker, 2005). In general mathematical learning disability is considered as a cognitive disorder in which the mathematical ability is affected (Ardila & Rosselli, 2008).

However, in this group of students with learning mathematics disabilities in addition to mathematical problems face with dyslexia and attention deficit disorder with hyperactivity at the same time which should be taken into account. However, the most difficult part of the work to solve the problem is to determine what an action should be taken to solve the problem .The actions required to be remembered and then comes into force for solving the problems should be considered. However, the problem can be simply defined. Whenever someone wants to do something, but fails to

reach its target, it is a problem for him. In other words, each ambiguous condition is a problem. Learning is a very complex problem. Problems and attempts taken to solve them are part of our life. The process of dealing with the problem is the same as living conditions. Two different perspectives to problem-solving in teaching mathematics are:

1. Teach mathematics to students so that they could solve problems
2. Teach mathematics based on problem solving method.

Based on the first view, mathematics education is in accordance with the content and teaching different subject matter and concepts. The students are expected to use their mathematical knowledge to solve different problems. In the second approach teaching mathematics occurs through problem solving. That is, the student does problem solving, and in the meantime it makes mathematical content and new concepts, discovers and learns. Now, the second view is more common in teaching mathematics. In this view problem solving is at the heart of the focus of teaching mathematics. One of those who investigated on problem-solving, and how to training it, is George Polia. He presented a model for thinking, problem solving and learning strategies which had two major characters:

1. The four-stage model for problem solving thinking and
2. Teaching strategies

However, the second point was more important in education (Adam, 2010).

Educational strategies to solve the problem:

Regarding the importance of problem solving in teaching mathematics and numeracy in primary school, following some of the most common educational strategies have been mentioned in this context. It should be noted that in teaching this group of people, all the variables and cognitive, emotional and educational impact be considered. These strategies can be used in operative education program or individual education programs.

1. First, make sure that the student's disability in reading problem in (dyslexia) is the leading cause He is not to solve problems. As mentioned before (Jordan et al., 2003). Disability in reading performance of students in understanding and solving issues related to account and heavily influence problem solving. Thus, in this case, no doubt trying to improve and solve the problems that exist in the field of reading and understanding this is very important. Of course, if possible, these issues can be related to the students hearing.
2. To contribute to the perception and understanding of the issue, the student must

first read the problem slowly, to identify the computational method and express it loudly which in addition to avoid hastiness; it will also increase students' attention.

3. In the beginning, the teacher should ask questions that require no more than one step answer and make sure that the words used in the issue are short and concise. Considering the issues increase the students success due to the problems that the children have in their working memory (Mabbote & bisanz, 2008) and can also reduce anxiety in mathematics with positive feedback and increase their confidence and self-esteem.

4. Teach students that the issue of Keywords and search for clues that indicate the type of operations that would be required. For example, the words such as sum, Total, Overall, can indicate that the sum in question should be identified. These keywords help students with problem solving disability to be more successful.

5. The student must orally analyze all steps that are needed to solve the problem. This technique helps students to have a more complete understanding of the issue. in addition to reading the problem, it can verbal form review it. This technique will help the students with poor memory to solve their problems.

6. The numerical values used in the case have to be real. For example, if the problem states that the price of each pen is 18 dollars; according to the general level of prices in the current situation it seems totally unrealistic for students and it affects his understanding of the problem because it is a more abstract problem. One of the principles is to work with the students with concrete and real problems as much as possible. The student must read the problem with numbers and rewrite it by numerically mathematical symbols (the mathematical expression). It also helps to gather the information necessary to solve the problem .The summary information increase the range of the student's attention back. But what is very important in this regard is whether the student can write the numbers properly and right arithmetic symbols or not? However, these cases are considered as prerequisites for learning in this area that should be properly trained to act (Hassanpour, 2010).

7. To increase accuracy and enhance the level of participation, he encouraged students to make an issue of numbers at its disposal. Abstract mathematical concepts themselves are so dry, as far as possible to provide opportunities for students to continue learning with interest and motivation for more active participation in it. Actions of this kind can help. You can also ask students the question, and then ask the other students to solve.

8. Ask the student that what is the main question or the problem. This will continue

with additional questions. For example, the first question is related to the issue of what the problem is and how it should be answered. Note that students understand the questions and this way, no anxiety and panicky is produced. In this section, students can learn to do that every issue is divided into several sections.

9. The teacher should use the issue of the child's interest and related experience. To achieve this goal, teachers should design problems considering the space, class and students and their role with significant meaning to them. It can also be provided if the student is using real objects to solve the problem.

10. In order to understand the issue a list of words and words that usually indicate separately provide four main acts and talk about them with students. For example, for addition use the words such as a sum, altogether, both to acquire, receive, collectively, stored ... for the subtraction use the words like the difference between, more, fewer, taller, heavier, spent, lost, left and to the multiplication of words like each, how many times, how many times, again, three times and, as well as a list of each share, the average, monthly, daily, weekly, annual interest, use half ... for the division.

11. Help the student to some of the words and concepts used in the case is to convert their numerical equivalent (such as two weeks to 14 days to 365 days a year, a USD 10 dollars a meter 100 cm. the meaning of some terms used in the event of a problem such as a dozen, a pair, accomplished explain to them. these actions can be more meaningful and it is for them to understand and easier to resolve the issue.

12. First ask one of the students (as a template and sample) to solve the problem and then show him how to solve the issue. This makes the child gained self-confidence and encouraged to take action to resolve the issue. In this regard, you can also create a guide or working practices. For example, what information is provided? What question or questions have been asked and to solve what method should be used. In the final analysis the principle of small steps can increase a child's likelihood of success. On the other hand, we can provide opportunities for students in the role of teacher to teach math concepts to other classmates to learn this way. However, this method can be used as an amplifier.

13. Problem should be presented in front of the Student. For example, if the problem is not that the end of the page, and he had to answer at the beginning of the next page and write back. As far as possible, the child should be taken to avoid distraction and is designed to be sufficient to solve the problem should be considered instead.

14. When problem solving skills required making sure that students have already learned and does not need to learn this concept. There are four main concepts like the concept of number, ,counting ...

15. Before they start training next step, make sure that the students learned about the concept and has enough skills in it. Because of the speed of students in learning issues and mathematics is low, therefore, take measures to help them, especially in the examinations (Such as reducing the volume of work and the time of exam). Also in the later stages of education (when the student mastered the basic concepts) let him use a calculator to answer the question.

16. when the student just solved a problem, properly encourage him (use the encouraging words and do not forget to use words that have positive mental and emotional time,). In addition, when he shows progress in an objective manner (in figures) congratulate him. This positive verbal feedback to psychotherapy activities will increase confidence and self-concept of a child. For appealing the duties or exercise can also be used for educational programs and computer software to its willingness to continue to be motivated to work (Hassan pour, 2010).

Similar studies have been done in this area that some of them are mentioned. In a research conducted by Mirzaiee (2010), as the use of ICT for teaching math and comparison, it was showed that the traditional use of IT technology had effectiveness on teaching mathematics and intuition. Akahvast (2009) in a research on the effect of educational games to learn some math concepts studied the mentally retarded students. The results suggest that educational games can promote learning of mathematics in the students. Considering the importance of problem solving at learning mathematics and arithmetic during primary school, Accordingly the present study examines the Effectiveness of teaching problem solving Learning strategies on reducing the Symptoms of Mathematical Learning Disorder in Elementary school students of Ahvaz.

MATERIALS AND METHOD

In terms of purpose, the present study is functional and it is descriptive in terms of methodology and design. This quasi-experimental research is conducted in the framework with the pre-test and post-test design with control group. The population of the study included all the Sixth grade students of elementary schools in Ahvaz during 2014-2015. In order to select the sample, first a list of all primary schools for male and female students in Ahvaz were provided and then 2 primary schools for male students and 2 primary schools for female students were selected by polling. Then, from among them, the sample was selected using. The participants had to

participate in both pre-test and post-test in order to collect the required data for analysis. After conducting diagnostic tests (Raven Intelligence Test and Iranian Keymath test) 40 students who had mathematical learning disorder were selected and randomly assigned in two groups of control and experiment. After 10 sessions of 40 minutes during five weeks, both experimental and control groups participated in post-test. It should be mentioned that the control group was though based on conventional method of teaching mathematics. The analysis of the data was done using SPSS version 16 software.

Raven's Progressive Matrices (RPM)

This test is provided after the WWII and is a nonverbal group test typically used in educational settings. It is the most common and popular test administered to groups ranging from 5-year-olds to the elderly. It is made of 60 multiple choice questions, listed in order of difficulty which has to be answered during 45 minutes (Sharifi, 2002). Each correct answer will be given a score and the total raw scores of subjects with regard to age deviation from the norm table of intelligence, with a mean of 100 and a standard deviation of 15 turns. The reliability of the test and the correlation with Kessler test were 0.80 and 0.76 , respectively (Sharifi, 2002).

Key Math Inventory

This test is used to identify students with math problems for students. In Iran, 6.6 to 11.8 years in terms of scope and sequence Norm selection that includes three of the following:

- scope of basic concepts that will be formed of three sub-tests: counting, rational numbers and geometry
- area of operations, including addition, subtraction, multiplication, division and mental calculation
- fields of application that includes questions that measure the time and money, estimates, analysis and problem solving measure reliability of the test using Cronbach's alpha has been reported in 5grades as 0.80 to 0.84 (Mohammad Ismail, 1999).

Researcher-made math test

The math test was conducted in two forms (pre-test and post-test) for assessing the learning outcomes of the course before and after the test. The researcher-made test was developed on the issues of the book and mathematical skills in the Sixth book and designed with educational purposes. In order to get validity of the test, some professors and teachers in primary schools reviewed it and collectively declared their favor. The reliability of the test was obtained by Cronbach's alpha as 0.76. The test consisted of 15 questions, each question should be answered based on right or wrong.

RESULTS

Descriptive statistics:

From among the 40 elementary school students, 10 girls and 10 boys were placed in the experimental group and 10 girls and 10 boys were in the control group. The average age of girls and boys in the test group, respectively, the average age range of the experiment group was 10.0 and 10.2 years and the average age of girls and boys in the control group was 9.9 and 10.4 years respectively, as there was no significant difference in mean age. Inferential statistics

Data normality:

Before testing hypotheses for investigating the score obtained by experiment and control groups in posttest, normality of data should be examined to determine whether the test parameters can be used or not? Kolmogorov-Smirnov test was used to assess the normality of the variables.

Given that the level of significance for all study variables is 0.05, at 95%, assuming normal distribution of a given society cannot be denied and because the variables are normal, parametric test is used to test these variables.

Effects of narrative therapy on reading disorder using independent t-test To know the narrative therapy is effective in reducing the reading symptoms of the students or

not, according to the normality of data, independent t- test was used to test the scores of two groups in the pre-test and post-test. The results of these tests can be seen in the table 2 below.

Based on the results table 2 below we see that in the pre-test, level of significance between groups was 0.05 and the absolute value of the t test statistic was less than 1.96 So the difference between the control and test scores is not significant, the level of significance in the post-test between groups was less than 0.05 and the absolute value of the t test statistic was greater than 1.96. So, there was statistically significant difference in scores between the experiment and control groups, so that the mean scores of the control group and the experimental group was 6.28.In other words, the average scores of the experimental group showed that students in the treatment group after receiving the learning strategies performed better in mathematical problems and their mathematical disorders was resolved to some extent.

Table 1: Data Normality

Variable	Komologrov-Smirnov test	Sig.
Experiment group scores in pre-test	.590	.878
Control group scores in pretest	.619	.838
Experiment group scores in posttest	.729	.662
Control group scores in	.687	.733

posttest		

Table 2: te-test for experiment group in pre-test and posttest

Statistics / Groups		Levene's test	Sig.	N	Mean scores	Mean Difference	df	t statistics	Sig.
Pre-test	experiment	0.063	0.79	20	4.80	0.063	58	-0.990	0.326
	control	-	-	20	5.32	-	-	-	-
Posttest	experiment	1.059	0.310	20	10.60	0.43	58	-10.190	0.000
	control	0.063	0.79	20	4.80	-	-	-	

DISCUSSION

While many of the normal students in learning and math assignments deal with and are struggling with a anxiety and fear, there are a group of students who, despite having sufficient intelligence and a good learning environment, cannot learning these things in a serious and have serious lack in understanding of fundamental concepts. Apart numerous terms used to refer to this group of students (students with Parish account, students with account problems, students with math problems, mathematics learning disabilities and (... and in some cases, cause confusion and distress for parents and teachers as well can be used to identify it early and using appropriate teaching strategies and psychological characteristics of each child's learning style, helps taking into consideration the problems of the group of students. It should be noted that studies in this area are very limited and therefore there is less possibility for the comparisons of results. The results of the study are in line with the study of Hassanpour (2010) who concluded that using proper learning strategies and considering learning style of the students led to the reduced mathematical learning difficulties. In addition Bavi (2010) studied the impact of teaching mathematical learning strategies on students with mathematical disorder and achieved similar results and said the use of multimedia software in education, the ability of subjects in mathematics performance improved Parish account. Akhavan (2009) in a research on the effect of educational games to learn some math concepts studied the mentally retarded students. The results suggest that educational games can promote learning of mathematics in the students. This initial study examined only the Sixth grade students and it suggested that for future studies, a combination of all primary students should be considered and it is also suggested that a comparative should be conducted between the scores of both sexes. Because Teaching problem solving Learning strategies enables students decide better on mathematical, social and academic issues. It also helps them to be more accurate in learning process and thinking, and to believe that they have the ability to solve problems.

ACKNOWEDGMENTS

Of all the people who helped us in conducting this study, we Thanks.

REFERENCES

1. Adem, K. (2010). Teaching and learning using mathernotics software « the newchallenge »procedia Social and behavioral sciences, 613-619.
2. Akhavast, A. (2009). The effect of educational games on learning some math concepts inmentally retarded male students.
3. Ardila, A., Rosselli, M . (2002). Acalcuia and dyscalculia . Neuropsychology review, 12,179-231.
4. Barahmand, U., (2010), occurrence of failure in primary school students in Ardabil accounts, research in the area of Exceptional Children.
5. Dowker,A. (2005). Early identification and intervention for students with mathematics difficultie. Journal of Learning Disabilities, 38, 324 – 332.
6. Hassanpour, A., (12010), teaching strategies for students with problem solving Parish account, exceptional education.
7. Jordan,N.C.,Hanich,L.B.,& Kaplan,D.(2003). Arithmetic fact mastery in young children: A longitudinal investigation. Journal of Experimental child psychology.85, 103-119.
8. Mabbott,D.& Bisanz, J. (2008). Computational skills, working memory and conceptual knowledge in older children with mathematic disabilities. Journal of learning disabilities, 41,15-28.
9. Mirzaiee, R. (2010), using information technology and mathematics education in comparison with traditional methods. MS Thesis, University of Tehran, Faculty of Mathematics and Computer.
10. Mohammad Ismail, E., (1999) switching norm compliance and math achievement tests Ki-Matt Iran, Tehran: Center for Exceptional Children.
11. Ronaghi, S. (2009), learning disorders and academic development, Tehran: Special Education Department.
12. Shallev, R. S. (2014). Devilopmental dyscalculia. Jornal of Child Neurology.
13. Sharifi, H., (2002), the principles of psychometric and psychological testing, Tehran.