Investigating The Effect of Multi-Sensory Games on Decrease of Male Students’ Dyslexia (Based on Goodman Theory) Specified for Elementary School Second Grade in Aligudarz City

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Abstract

This survey aims to investigate the effect of multi-sensory games on decrease of male students’ dyslexia (based on Goodman theory) specified for elementary school second grade. The survey method is semi-experimental and the population includes all elementary school male students with dyslexia in Aligudarz city in academic year of 1390-91 that this population consists of 65 persons and they were selected via available groups sampling method that they were 40. The data collecting tool is a reading and dyslexia test that its validity was accepted by experts in this field, also the reliability was gained using 87% Chronbach alpha. After synchronizing the objects based on intelligence, gender and academic grade, 20 persons were located in treating group and 20 persons were located in control group after using pretest-posttest design. Then, independent variable, i.e. multi-sensory game, was assigned to treating group for 8 sessions and control group were taught as before. The achieved data from pretest and posttest were analyzed using variance analysis as well as SPSS. Based on the results, the first hypothesis with a significance level of 0/013, the second hypothesis with a significance level of 0/037, the third hypothesis with a significance level of 0/000, the fourth hypothesis with a significance level of 0/000, and the hypothesis the fifth with a significance level of 0/028 in 05/0> P were approved.

1. Introduction

Learning is a complicated process and requires different capabilities and features as well as multiple conditions. To have deficiency in each requirement (either individual or environmental) hinder the learning process. Dyslexia, one of learning disorders, especially as interpreted by most authors as Halahan and Kaufman is synonymous with that, people with dyslexia suffer from major problems in reading, writing, spelling, number

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work, short-term memory, sequencing letters and words, auditory perception, visual perception, motor skills and spatial orientation skills (Jan Abady, 2008, p 16, as quoted by Afroz, 2005).

Dyslexia is a language learning disorder that caused some problems in reading, spelling and sometimes language writing. Students who have reading dyslexia have equal mental ability, but they show considerable difficulties in learning to read through the regular training (Oakland, 1998). Perhaps the most mastery of training skills is reading. It is said understanding of the curriculum and the learning and achievement tests, low or high, depending on the amount of reading students do. (Hoospan, 2001).

To reduce reading problems, researchers have proposed methods and procedures, one of these method is Karp’s conceptual – motor method, cognitive and meta-cognitive methods as well as multi-sensory approach that are most effective known methods (Lord, 2004 ) and their efficacy has been proven in numerous studies . (Faryar, Rakhshan, 2010).

Reading is the foundation of all learning skills. Without the ability to read, children will not be able to recognize voices. Children with reading problems based on weakness that they divulge in this skill, they cannot have progress in school's instruction programs. Historically, the first responsibility of schools is to teach reading (Dehghan Ahmadabad; 2006). Therefore the main reason to Dyslexia materials is blocking the process of learning that is because of common method of reading instruction in normal school. Common method of reading instruction at schools, emphasis visual sense a lot and other senses especially tactile sense has minor role. The goal of using multi-sensory play is to reduce reading and spelling to children with specific learning disorders. Because these children will not be able to learn letters and words from common instruction in normal schools, they need special instruction that based on it all of their attention be used.

Based on a given theory by Halahan and Kafman's (Javadian translation, 2002), multi-sensory methods guarantee correction of child's problems through combination of child's sensory systems in instruction process and in this way it is supposed that if child use more than one sense in learning experience, he/she learns more. Multi-sensory methods to reduce reading problems can be helpful, because in this method children learn phonemes and letters together. Letters name is used to apportion and their sounds are used to reading. The student learns the name of letters at first and then he/she learns their sounds. After this stage the student pronouns the sound and pursue letters and write them based on what he/she is memorized.

After learning a few consonants and vowels, children should say the sound of each letter and use sound combinations to make words. When the child is able to say the sounds and learn to write them and read some three-letter words, he/she can use learned words in the story. At first they want the child to read the story silently and then read it in a loud voice (Kork, Chalfont, translated by Rounaghi,1998). In the present study, other studies have already been conducted, including Mahtaj (1979) that in a study of using educational tools, believed to help children who are reading ahead, using educational tools helping them in a best way. Ahadian (1994) stated that with instructional games, all five senses are being used while teaching without instructional tools, Focused on auditory sense more which only 13 percent of learning is form from this sense (Akhvast, 2009). Furthermore Kolsoum Soursouri (2010) accomplished an article called (designing and producing spelling educational media based on Fernald's multi-sensory model and surveying its effect to reduce spelling problems among first -grade students in Baneh city). The results showed that spelling's instructional media based on multi-sensory model focused on reduced forms of training spelling, auditory sensitivity, visual memory awareness and visual memory weakness to distinguish first-grade students (at the level of p <\% 5).

Wapmn also believed that every person through his/her different sensory channels, receive the most effective information through special channel, some by listening, some through the eyes ... So he believed if training and instructional programs be arranged with children whom they have problem in learning and learning be in channel that has the most efficiency, it will be more successful (Moore, 2009). Another study by Bourn Hid called training games in elementary schools in Kansas State showed that there is meaningful relation between efficiency of game and the way to use it (Moore, 2009). Janabadi (2007)also surveyed effective methods of rehabilitation from Kpar, Fernald and SINA's instructional tool to cure peculiar incompetency of learning to read and dictate of 40 students with Dyslexia in Zahedan city , found that the use of multi-sensory approach of Fernald and training
equipment of Sina are more effective methods than Kepark to cure peculiar learning disorders (Hassanzadeh, 2010). Adams and Hasted believed that educational games can enhance student's learning and they caused active participation of students in the classroom (Akhvast, 2010). Main point related to Dyslexia's reduction is the lack of using suitable methods to reduce Dyslexia. One of these methods is the use of educational games. The implementation of new methods in teaching Persian language requires providing special condition and facilities.

Although most scholars emphasize using educational equipment and suitable games in teaching (Tabrizi, 2006) many educators and experts to repair learning's reinforcement for children with specific learning disorders, advice the use of different senses in children and stimulate them(senses). This article by giving multiple-senses game model is tried to recognize teaching method aspect based on multiple-senses game model and identify new attitudes in aid teaching based on multiple-senses approach. Therefore, educational content is designed in a way that if it performs regularly caused phonetic skills and visual memory power to be increased in students gradually and multi-sensory approach in the media designed in a way that child's sensual quality be used in reading instruction. In this method, children in order to learn words simultaneously, use several senses together, therefore reading's difficulties will be reduced and removed.

Because reading problems are main problems that children with peculiar disorders of learning face with and because of main effects of multiple-senses methods in learning, this study aim to survey effects of multiple-senses training game to reduce dyslexia in students with special learning. Research hypotheses are:

1. Using a multi-sensory learning approach reduces the problem of learning to read words.
2. To use Multi-sensory learning games reduces words chain problem
3. The use of multi-sensory learning method reduces the problem of understanding the text
4. The use of multi-sensory learning method reduces the difficulty of understanding the words.
5. The use of multi-sensory learning reduces problems of phonemes' omission

Current study is quasi-experimental research with pretest - posttest design and it is with control group. Surveyed society in this study include all the dyslexia's male students in elementary second grade in academic year 2011-12 in Aligoodarz city and it (society) includes 65 students. Sampling method was in a way that at first a list of students, who were identified to have dyslexia and referred to learning disorder center, was prepared. Then among them, 40 patients were randomly selected. Then they were randomly divided into control and experimental groups. Each group consisted of 20 persons. After matching based on intelligence, gender and educational levels, the test group faced to independent variable that was multi-sensory learning game method.

2. Research's method

This method is substantiated and practices of this media are based on one of the most famous theories of learning's psychology that means information process theory. But control group wasn't face to independence variable and they educated in a common method in schools (explanatory). Three kinds of tools is been used in this study: 1-revised scale of Houshi and Kesler to children which normal validity coefficient for minor verbal test is between 77% to 86% and to minor practical tests is fewer and it is between 77% to 84%. Test-Retest durability during a month to overall scale is 95%, to verbal scale is 93% and to practical scale, it is 90 %.(Ahadian and et al, 2002, p 76).

2- Parent's questionnaire 3- Test of reading or dyslexia, test's reliability in preface and basic performance is 86% and 87% and its durability is been confirmed by guidance instructors and counsellors (Karami Noori; Moradi, 2008). At last to measure theories, covariance analysis is been used.

Method of multi-sensory game performance in current study

In this study, M.M.S instructional design pattern was used. This model is the newest presented model in the patterns of constructivism, its name is taken from the name of its providers, M. Me Cham, Je Maily and De Smiths, presented in 2006, this pattern has seven stages that all of them are related to each other in special way. An important point in this pattern is evaluation position that is in middle place and supervises all of pattern
stages. Training plan, after appointing activities of each stage, is been practiced and it is been passed to another stage. Providers of this model put evaluation in the center in a way that after performance of each stage, it (stage) be revisited and revised. Evaluation as a rotating turntable in the center of activities remains as a pattern of M.M.S (Shah Bahrami, 2010).

3. Findings

In this section, findings from descriptive and inferential analysis of the data are presented. In this way, at first descriptive statistics of dyslexia's test is presented in two groups of test and proof and in 5 components of words reading, words chain, text understanding, words comprehension and phonemes omission in pretest and posttests stages, then to survey study's theories, covariance analysis is been used.

<table>
<thead>
<tr>
<th>Table 1: Distribution of frequencies in studied group</th>
</tr>
</thead>
<tbody>
<tr>
<td>group</td>
</tr>
<tr>
<td>test</td>
</tr>
<tr>
<td>control</td>
</tr>
<tr>
<td>total</td>
</tr>
</tbody>
</table>

The data in Table 1 show that 20 participants (50.0% of total) are in experimental group and 20 participants (50.0% of the total number) are in control group.

First hypothesis: A multi-sensory educational game has the effect of reducing the problem of learning to read words.

<table>
<thead>
<tr>
<th>Table 2: Covariance analysis test results to total scores of words' reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable statistics</td>
</tr>
<tr>
<td>Experimental group</td>
</tr>
<tr>
<td>Control group</td>
</tr>
</tbody>
</table>

Results of Table 2 shows there are statistical differences between total scores of word's reading pre-test in the test group with adjusted average (49.43) and control group with adjusted average (38.859) with the values (36 and 1) and F equals 7.052 (level 05/0> P). It can be concluded that the experimental group had better performance, because Multi-sensory game is being used to reduce the difficulty of learning to read words. So it can be said that Multi-sense game is effective to reduce the problem of learning to read words.

Second hypothesis: Multi-sensory educational game has the effect of reducing the problem of word chain.

<table>
<thead>
<tr>
<th>Table 3: Covariance analysis test results to total scores of words' chain test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable statistics</td>
</tr>
<tr>
<td>Experimental group</td>
</tr>
<tr>
<td>Control group</td>
</tr>
</tbody>
</table>

Results of Table 3 shows there are statistical differences between total scores of word's chain pre-test in the test group with adjusted average (87.43) and control group with adjusted average (82.547) with the values (36 and 1) and F equals 7.052 (level 05/0> P). It can be concluded that the experimental group had better
performance, because Multi-sensory game is being used to reduce the difficulty of words' chain. So it can be said that Multi-sense game is effective to reduce the problem of words' chain.

Third hypothesis: Multi-sensory educational game has the effect of reducing the problem of text understanding.

Table 4: Test results of covariance analysis to total scores of text understanding test

<table>
<thead>
<tr>
<th>Variable statistics</th>
<th>Sample mass</th>
<th>Pre-test average</th>
<th>Post-test average</th>
<th>adjusted average</th>
<th>F</th>
<th>Degree of freedom</th>
<th>Significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental group</td>
<td>20</td>
<td>23.9000</td>
<td>84.0500</td>
<td>84.544</td>
<td>21.724</td>
<td>36 &amp; 1</td>
<td>.054</td>
</tr>
<tr>
<td>Control group</td>
<td>20</td>
<td>27.7000</td>
<td>64.1500</td>
<td>62.298</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results of Table 4 shows there are statistical differences between total scores of text understanding in the test group with adjusted average (84.544) and control group with adjusted average (62.298) with the values (36 and 1) and F equals 21.724(level 05/0> P). It can be concluded that the experimental group had better performance, because Multi-sensory game is being used to reduce the difficulty of text understanding, so it can be said that Multi-sense game is effective to reduce the problem of text understanding.

Fourth hypothesis: Multi-sensory educational games can impact on reducing the problem of word understanding.

Table 5: Test results of covariance analysis to total scores of words understanding test

<table>
<thead>
<tr>
<th>Variable statistics</th>
<th>Sample mass</th>
<th>Pre-test average</th>
<th>Post-test average</th>
<th>adjusted average</th>
<th>F</th>
<th>Degree of freedom</th>
<th>Significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental group</td>
<td>20</td>
<td>69.1500</td>
<td>109.0000</td>
<td>107.403</td>
<td>18.891</td>
<td>36 &amp; 1</td>
<td>.001</td>
</tr>
<tr>
<td>Control group</td>
<td>20</td>
<td>64.8000</td>
<td>88.4500</td>
<td>89.763</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results of Table 5 shows there are statistical differences between total scores of words understanding in the test group with adjusted average (107.403) and control group with adjusted average (89.763) with the values (36 and 1) and F equals 18.891(level 05/0> P). It can be concluded that the experimental group had better performance, because Multi-sensory game is being used to reduce the difficulty of words understanding, so it can be said that Multi-sense game is effective to reduce the problem of words understanding.

Fifth hypothesis: Multi-sensory educational games can impact on reducing the problem of phonemes omission.

Table 6: Test results of covariance analysis to total scores of phonemes omission test

<table>
<thead>
<tr>
<th>Variable statistics</th>
<th>Sample mass</th>
<th>Pre-test average</th>
<th>Post-test average</th>
<th>adjusted average</th>
<th>F</th>
<th>Degree of freedom</th>
<th>Significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental group</td>
<td>20</td>
<td>90.1000</td>
<td>120.2000</td>
<td>118.850</td>
<td>7/879</td>
<td>36 &amp; 1</td>
<td>.028</td>
</tr>
<tr>
<td>Control group</td>
<td>20</td>
<td>86.6000</td>
<td>109.6000</td>
<td>105.620</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results of Table 6 shows there are statistical differences between total scores of phonemes omission in the test group with adjusted average (118.850) and control group with adjusted average (7/879) with the values (36 and 1) and F equals 7/879(level 05/0> P).

It can be concluded that the experimental group had better performance, because Multi-sensory game is being used to reduce the difficulty of phonemes omission, so it can be said that Multi-sense game is effective to reduce the problem of phonemes omission.
4. Discussion and conclusion

In relation to the first research hypothesis, it can be said that multi-senses educational game reduces the problem of learning to read words in studied society. The results show that there are statistical differences between total scores of words' reading pre-test of the experimental group and the control group. As a result, we can conclude that multi-senses educational game can impact on reducing the problem of learning to read words. The results of this theory are consistent with Hyde Bourne's findings quoted by Moore (2009).

To justify findings of this hypothesis, we can be cited to the following conclusions that effective educational games are used in teaching and learning (Turkan, 2001).

Second hypothesis states that multi-senses educational game reduces words' chain difficulty in studied society. Results show that there is statistical difference between total scores of words' chain pre-test in test group and control group. So it can be concluded that multi-senses educational game can affect to reduce words' chain difficulty. Results of this hypothesis is consistent with Janaabadi' findings (2007). Because game is a tool to explore student's genius and abilities, it can show us that in which stage of growth the child is and to what does he/she interested in. With this recognition and by using proper tool and treatment, these geniuses and abilities can be explored better.

Educators and educational researchers have mentioned extensive advantages of the integration of educational games in learning environments. The games are fun and unique and show different ways of presenting material to students.

Many of the early studies on the games emphasized the significant increase of student's motivation, interest and participation in the game as a learning tool in the classroom.

In the third hypothesis it was shown that multi-senses educational game reduces the difficulty of understanding the text. Results show that there is statistical difference between total scores of text understanding pre-test in test group and control group. So it can be concluded that multi-senses educational game can affect to reduce text understanding difficulty. According to this hypothesis, the results are consistent with the findings of Lordy narrated by Fryer and Rakhshan (2000). A game is a voluntary activity that is dependent on the will and desire of the child, compulsory game or using multi-senses game can be beneficial. (Kirk, Chalfant, translation: Simin Ronaghi, 1994). In the fourth hypothesis it was shown that multi-senses educational game reduces the difficulty of words' understanding. Results show that there is statistical difference between total scores of words' understanding pre-test in test group and control group. So it can be concluded that multi-senses educational game can affect to reduce words' understanding difficulty. According to this hypothesis, the results are consistent with the findings of Mahtaj (1982) and Adams and Hasted, quoted by Akhvest (2010). As the child learns some good things that they were are learned through observation and reflection, experience and personal activities, in this case children's games play organized and guided games and free games play a unique role to improve and facilitate their abilities. At last based on fifth hypothesis it can be said that multi-senses educational game can reduce difficulty of phonemes' omission in studied society. Results show that there is statistical difference between total scores of phonemes' omission pre-test in test group and control group. So it can be concluded that multi-senses educational game can affect to reduce phonemes' omission difficulty. This hypothesis is consistent with Bourn Hid and Wopman, quoted by Moore (2009) as well as Ahadian (1994) and Soursouri (2010).

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