JLSB
Journal of Life Science and Biomedicine

J. Life Sci. Biomed. 2(3): 83-87, 2012

ISSN 2251-9939

Original Article

Compare the Effectiveness of Task-Process Training and Effectiveness of Task-Process Training Coupled with Reinforcement of Motor Skills in the Academic Performance of Spelling in Students with Learning Disabilities in Bandar Abbas

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ABSTRACT

Purpose of the present study is to compare the effectiveness of task-process training and effectiveness of task-process training coupled with reinforcement of motor skills in the academic performance of spelling in students with learning disabilities in Bandar Abbas city. This study (quasi-experimental) is important because today children with learning disorders are considered as the biggest group of exceptional children. The study population includes all students admitted in learning disability centers of Bandar Abbas and total number of available samples in this study is 60 (30 in the control group and 30 in the experimental group). One of these centers is considered randomly as the control group and the other one is experimental group. Both experimental and control groups were matched in terms of spelling pre-test using the IQ test, Wechsler motor skill tests of Oseretsky for testing intelligence and motor skills and also by using t-test for independent groups. In addition, t-test of other independent samples was performed on the pre-test and post-test results of two groups (separately) in order to determine the effect of their trainings on academic performance. Moreover, t-test of other independent samples was performed on post-test of each group. Results showed that both training methods have had an impact on academic performance of spelling, but task-process trainings coupled with reinforcement of motor skills have had more impact on academic performance.

Key words: task-process, learning disabilities, motor skills and academic performance

INTRODUCTION

According to scientists [1] view on balanced development of motor abilities as basis of the next learning and considering a number of children with learning disorders who have much slower motor development than normal children, despite their normal intelligence, it seems that these people have a weak cognitive component to receive motor skills. Because motor skills especially fine motor skills, require a cognitive level of activity. Therefore, some people learn and develop motor activities very slowly. Many scientists believe that some mild brain disorders are the main cause of such problems. Whatever the cause, it is essential to correct their motion problems before they start training of other skills. In this study by considering the effect of reinforced motor skills on the memory, it is attempted to reinforce motor skills in order to examine its effect on memory and academic performance of spelling.

According to various theories in the field of training and remedial methods for treatment of these children, Kirk [2] provided the training-remedial programs of these students by the three following methods: 1) task training 2) process training 3) task-process training.

1–Task training meted: the emphasis is on making a chain and simplifying the task that must be learned.

2- Process training method: focuses on training and remanding of specific disability such as perception, memory and attention. This emphasis is on remedial efforts for correction of specific disability hindering the child progress.

3–Task-process method: This method includes main concepts of both previous methods in which psychological processes are not considered as the mental abilities that can be taught separately, rather processes are considered as a set of learned mental functions, conditional behaviors or responses to specific tasks.

To cite this paper: Bidaki, A, Zainalipour H, Zarei, E and Moridi, F. 2012. Compare the Effectiveness of Task-Process Training and Effectiveness of Task-Process Training Coupled with Reinforcement of Motor Skills in the Academic Performance of Spelling in Students with Learning Disabilities in Bandar Abbas. *J. Life Sci. Biomed.* 2(3): 83-87.
Journal homepage: http://jlsb.science-line.com/

Kajyaf, Darkhani, Moulavi and Amiri [3], in an article titled "effectiveness of process training and task-process methods on dictation performance of elementary school children found that there is a difference between average of post-test scores of the first experimental group (process method) and that of the second experimental group (task-process method) (P=0.01). Also findings showed that there is a significant difference between post-test scores of the first experimental group (process method) and the second experimental group (task-process method) in terms spelling improvement (P < 0.0 1).

The research result shows that the process training and task-process training for students with disabilities in spelling is effective in improvement of spelling and writing (P = 0.01). Moreover, LSD post hoc test results show that among two methods of training, the task-process training method is more effective (P < 0.01).

Results of a research conducted by Babapoore [4] entitled "Comparison of motor skills of dyslexia and normal students" showed that there is a significant difference between normal and dyslexic students in terms of general and fine motor skills and also delay in motor behaviors (P < 0.01). However, there was no significant difference between these two groups in terms of their gross motor skills and IQ. Also it was indicated that there is a significant difference in the mean scores of gross and fine motor skills in the dyslexic group (P <0.01).

Honjany [5], in his study investigated the effect of accuracy training on spelling ability to help students with learning disabilities in the exam. Results indicated that training-remedial considerations could significantly increase the average of test scores in the dictation (P ≤ 0.01). There was also a significant difference between average scores of spelling test of boys and girls (p ≤ 0.05). The estimated average spelling scores for the girls was 15.14 and for boys was 11.35 and this showed that girls had better spelling ability in writing than boys.

ShehnyYeilagh, Karami, Shokrkon, and Mehrabizadeh honarmand [6] in a study investigated the epidemiological spelling learning disabilities among the elementary students and multi-sensory effect of remedial methods in reducing the disability. Findings of this study suggest that the amount of epidemiology of spelling disability is 7%. Results of performing the multi-sensory remedial method showed that spelling disability reduced significantly after using this method.

Abedi and Arizi [7] attempted to investigated and compare the effectiveness of the mathematical training methods to children with learning disabilities in primary school in Isfahan. These methods included task, process and task-process training methods. Results showed that there are significant differences between the average of the scores in control and training groups. (P ≤ 0.01).It means that the mathematic performance in training group was better than the control group due to performing the training methods.

Stoeger and Ziegler [8] in a study investigated the relationship between children's fine motor skills and level of academic achievement and their concentration in two groups of clever school students with academic achievement and without academic achievement. They considered deficiencies in fine skills as an important factor in identifying clever children without academic achievement.

In a study by White, Merrill, and Wright [9] titled, Relationship between processing, motor skills and sensory profile scores, performed on 68 children with motor impairment, there was a significant relationship (P < 0.05) at the level of sensory- motor process skills and individual's daily performance levels. It was observed that children with abnormal scores on sensory profile had more function problems.

Research results of Krokman and Pesonen [10] and Rama [11] showed that problems of students with learning disabilities in the sequence of visual memory are more severe. Niemejer and Galen [12] investigated performance of 125 students in fourth and fifth grades of the schools in the Netherlands who had problems in writing and other fine motor disabilities. Results showed that 34 percent of 125 students had handwriting problems and these problems were associated with serious programming problems. Children who received physiotherapy had improved their handwriting.

Vlachos and. Karapetsas [13] showed that children with dysgraphia were acted significantly slower than normal children in reconstruction of complex shapes of Re Ostrit and memory replication. They concluded that Dysgraphia children might suffer more cognitive problems that may affect visual memory.

Isaki, Spaulding, and Plante [14] compared the performance of people with learning disability and normal people in verbal short-term memory and verbal working memory. Results showed that performance of groups with learning disabilities is more serious than control group in terms of processing and saving of information. These results support limited memory capacity of people with learning disability.

According to results of various studies, it can be concluded that students with learning disabilities have deficiencies in sequence of visual and auditory memory problems. Their problems in even more serious in the visual memory [10, 11 and 13].

MATERIALS AND METHODS

The study is a quasi-experimental study that uses the pre-test and post-test indices with control group. (Factor analysis at two levels). In this study the first group is trained with task –process training methods and the second group is trained with the task–process training coupled with the process of learning motor skills.

First a number of students with learning disabilities in the first, second and third grade of primary school (in the 2010-2011 school years) attended in a center of disorder problems were selected in the first and second region of Banda Abbas that are considered as an available random sample. Then all of them tested by Wechsler test in order to be matched in terms of intelligence in the two groups.

In the next stage, all of them tested by Oseretsky Test, that is a motor skills test and again students of two centers were matched in terms of unique motor skills and eventually all of them tested by the same spelling test (according to the related case).

When 60 students were matched in terms of intelligence and motor skills and a group of students (30) students) with educational problems were considered randomly as experimental group, student's motor skills in these students reinforced by work therapy tools and counseling with treatment centers in a three months period by using task-process training method. (Work therapy is a physical therapy method that is used to strengthen the weak muscles. Weak muscles will be strengthened by a series of active and appropriate resistance exercises. Also, effects of this treatment on stress reduction are mentioned).

Another group that is the center of learning disorders in area one is considered as a control group (30 people) trained by task-process training without reinforcement of learning motor skills. Finally, based on a post-test in both groups it will be determined whether enforced motor skills cause improved mental function and consequently academic performance or not?

RESULTS

Findings of this study are presented in two sections. In this section, descriptive indicators of the average and standard deviation and mean of standard error are given for pre-test and post-test academic achievement.

Table 1. Mean and standard deviation and mean of standard error of pre-test and post-test scores of academic achievement in control and experimental groups in all samples.

		N	mean	Std.m	Std. Error Mean
Pre-test	control	30	10.53	5.663	1.034
	Experimental group	30	12.03	4.123	0.753
Post-test	Control	30	13.33	3.325	0.607
		30	16.07	2.067	0.377

As it can be seen in Table 1, mean of the academic achievement pre- test scores in the control group is calculated as 10.53 and in the experimental group is 12.03. In addition, the mean value of academic achievement test scores in the control group is calculated as 13.33 versus 16.07 in the experimental group.

Moreover, in the inferential findings section the t-test method is used to confirm or reject study hypotheses for independent and dependent groups.

Independent variable was task-process training method coupled with enforcement of the motor skills and the dependent variable was academic achievement is (it is noteworthy that in the control group there is a daily training for learning disorder centers). Because the study design is considered as pre-test and post-test with control group, both groups are matched in terms of preliminary academic developments by using Leuven Test in order to meet the is homogeneity assumption in both groups to ensure homogeneous variance of experimental and control groups in the dictation pre- test.

Table 2. Results of study on homogeneous variance in the investigated groups

Levene's Test for Equality of Variances		**Test equality for mean**				
F	**Sig.**	**T**	**Df**	**P**	**Mean Difference**	**Std. Error Mean**
3.186	0.079	1.173 1.173	58 53.001	0.246 0.246	1.500 1.500	1.279 1.279

According to the above table, we can conclude about the homogeneous variance. If these interactions are statistically significant, the data do not support the hypothesis of homogeneous variance. However, there is no significant interaction. In fact, there is no significant difference between them. Therefore, the hypothesis is confirmed ($P \leq 0.05$).

There is a significant difference between mean value of pre-test and post-test scores of the group that is used task- process training.

The statistical t-test of dependent group is used to test this hypothesis. Results showed that the after task-process training , the difference between pre-test and post-test scores will be significant significantly. ($P<0.05$). Therefore, the study hypothesis is confirmed and the null hypothesis is rejected. Detailed results are presented in Table 3.

There is a significant difference between pre-test and post- test scores of the task-process coupled with enforcement of motor skills. The statistical t-test of dependent group is used to test this hypothesis.

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Table 3. Summary of t-test results of dependent groups in the pre-test and post-test of task- - process

	Paired Differences			T	df	P
	Mean	Std	Std Error Mean			
Pair 1 task-process training	-2.80000	2.93199	0.53531	-5.231	29	0.000

Results showed that the after task-process training coupled with enforcement of motor skills , the difference between pre-test and post-test scores will be significant significantly (P<0.05). Therefore, the study hypothesis is confirmed and the null hypothesis is rejected. Detailed results are presented in Table 4-6.

Table 4. Summary of t-test results of dependent groups in the pre-test and post-test of task- process training coupled with enforcement of motor skills.

P	Df	t	Paired Differences			
			Std. Error Mean	Std. Deviation	Mean	
0.000	29	-7.201	0.56014	3.06800	-4.03333	Pre-test

There is a significant difference between pre-test and post- test mean scores of the task-process training group and task-process training group coupled with enforcement of motor skills.

Table 5. Summary of t-test results of independent groups in the pre-test and post-test of task- process training coupled with enforcement of motor skills

	Levene's Test for Equality of Variances		t-test for Equality				
	F	Sig.	T	df	P	Mean Difference	Std. Error Mean
Equal variances assumed Equal variances not assumed	8.148	0.006	3.824	58	0.000	2.733	0.715
			3.824	48.495	0.000	2.733	0.715

The statistical t-test of independent group is used to test this hypothesis. Also Leven Test is used to test the hypothesis of the lack of homogeneity of variances of experimental and control groups in the dictation post- test.

Results showed that the after task-process training coupled with enforcement of motor skills , the difference between pre-test and post-test scores will be significant (P < 0.05). Therefore, the study hypothesis is confirmed and the null hypothesis is rejected. Detailed results are presented in Table 5.

DISCUSSION

According to findings of this study, we conclude that task- process training is effective in improving writing skills, spelling. However, the effect of task- process training method coupled with the motor skills of spelling is more impressive. Therefore, the research hypothesis was confirmed and those with reinforced motor skills had better improvements than those who have not received it. This means strengthening motor skills improves memory and enhances learning and academic achievement because scientists believe that the balanced ability of motor skills is basis of the next learning.

Therefore, it is necessary to reform movement difficulties' people. Therefore, it is concluded that teachers need to investigated both process problems of these children (perceptual skills, visual memory, auditory memory, visual perception, attention) and assess student's step by and chain training methods beside task-process training for increasing of their motor skills.

In this study some qualitative findings was also obtained one of the most important ones is that individual and remedial training can improve children's problems in terms of spelling disabilities. In the individual training plans, different training methods are used including combined sensory training, perceptual and motor skills, cognitive and Meta cognitive skills, visual memory, auditory memory and auditory perception, and rehabilitation models using multi-sensory improvement methods trained to children individually. Effectiveness of this method is confirmed by man studies.

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