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**A study of The Role of Games in the Learning Improvement of
Elementary Schoolboys in Karaj, Iran**

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Abstract

The present study was aimed at investigating the role of games in the learning improvement of 56 male fourth-graders of elementary schools from the Third Board of Education in Karaj, Iran. The subjects were divided into an experimental and a control group whose measures of learning in mathematics, science, geography and spelling were evaluated by means of a 40-item achievement test. The findings showed that the incorporation of games, like Seven Stones, Tug of War, Squash, Chair Play and Puppet Play, had positive effects on students' learning improvement in the selected lessons.

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1. Introduction

In recent years, physical education sciences have achieved considerable developments as an interdisciplinary scientific field. Most of the researchers working in this field have emphasized on childhood as the best time for learning skills.

Besides, special features of games and their various advantages in an overall growth of mental, physical, personal and social ability of a child have attracted the attention of many educational managers to the role of games in the children's learning process. Games for children are like speech for adults and are tools for expressing their emotions, making relationships, describing experiences, realizing wishes and self-nourishment. Games are believed to be the road that may lead the child from the unknown to the known (learning process). The game is a tool for a child's body nurtures, mind and personality growth. Children's personality growth is achieved by evolution in the nature of their games and change in their social relationships.

Many researchers have considered motion and activity as the bases for the learning process and growth in the mental ability of children. They pay much attention to the inseparability of mental and physical abilities in performing any motional patterns at the first stages of learning (elementary) as a fundamental principle. With regard to children, everyone knows that they love moving and acting, but their activities and motions are mostly intolerable for teachers. Children with calm manners, who sit still in their seats and just pay attention to what their teacher is talking about, are more accepted by the teachers. Studies conducted during the last 40 years show that lack of energy may not lead to intelligent and appropriate learning; so, games are an inseparable part of the educational

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environment and, in fact, assure that the school environment pays attention to emotional, social and cognitive growth of children. Games also help children get along with the school environment and improve their preparation for learning behaviors and solving problems.

Since 1960, scientists from many parts of the world have done many researches on the incorporation of physical activities with learning activities and students' school achievements. Some studies are about the learning process in the class performed simultaneously with some physical activities, while others are about learning processes done after physical and linguistic activities. Some studies are also done about later memory after physical activities. Matsuda and Sugihara (1969) concluded that there were significant improvements in learning about subtraction and the related exercises after a light game with bicycle. Railo and Eggen (1967) also conducted two researches about the relationship between the measure of sufficiency and adjustment to the class with educational progress of students and came to the conclusion that making intelligent students sit still in the class for long times, which usually occurs in traditional classes, would expose lots of mental pressure on them. It was also clarified that top intelligent students would gain lower marks in either IQ tests or class exams if they were made to sit still for a long time in the class or on the exam. So, the studies confirm the fact that the learning process will improve if some games or physical activities are used in teaching children. Among other researches that confirm this hypothesis is the conclusion achieved by Kronbay (1966). He shows that the ability to learn mathematics in children has increased 45% immediately after riding a bicycle. Therefore, if training is accompanied with some games and joyful activities, it will create a basis for innovation and growth of the student, learning and studying will be joyful and interesting for him and some necessary skills for living will be reinforced in the child. Incorporation of education with playing games is a method which leads to deep understanding of lessons and every teacher can employ it at his/her discretion.

In the present study, the researcher seeks for an answer to a fundamental question: "Can one help students improve their learning abilities in some courses by incorporating games into those courses?" In this study, the general goal is to speculate the role of different primary school games in learning of some selected subjects for male fourth- grade students in the Third Board of Education in Karaj, Iran. The specific goals of the present study are as follows:

- Studying the role of 'Tug of War' as a game in elementary school fourth-graders' learning of the concept of 'division' in mathematics
- Studying the role of 'Squash' as a game in elementary school fourth-graders' learning of the concept of 'climatic regions' in geography
- Studying the role of 'Chair Play' as a game in elementary school fourth-graders' learning of the concept of 'geographical directions' in geography
- Studying the role of 'Seven Stones' as a game in elementary school fourth-graders' learning and improvement of their spelling
- Studying the role of 'Puppet Play' as a game in elementary school fourth-graders' learning of 'The Respiratory System' in science

Considering the above-mentioned specific goals of the study, the following research hypotheses are in order:

1. There is no difference between the rates of learning 'division' through games as opposed to through a regular teaching practice.
2. There is no difference between the rates of learning 'climatic regions' through games as opposed to through a regular teaching practice.
3. There is no difference between the rates of learning 'geographical directions' through games as opposed to through a regular teaching practice.
4. There is no difference between the rates of learning 'spelling of difficult words' through games as opposed to through a regular teaching practice.
5. There is no difference between the rates of learning 'the respiratory system' through games as opposed to through a regular teaching practice.

2. Method

This study is strategically based on an experimental outline including 56 male fourth-graders of elementary schools from the Third Board of Education in Karaj, Iran during the years 2009-2010 selected by means of a randomized clustered multi-stage approach.

2.1. Subjects

One elementary school in Karaj was chosen randomly and then the students were randomly divided into two classes of 28. This division was based on students' gender, IQ and their previous average point grades.

2.2. Instrument

An achievement test of 40 questions in dictation, mathematics, science and geography was employed. To obtain the appropriate content validity in each subject, first, some questions were prepared covering the whole idea of the topics included in that subject. Secondly, some interviews with experienced teachers were conducted as to the questions and their generality and then they were revised by help of supervising professors and finally 40 questions (10 for each subject) were logically chosen as the achievement test questions.

2.3. Procedure

When the subjects were randomly chosen, the achievement test was given to them once as a pretest. Then the tests were completed through a post-test for the two groups. During the experiment, 4 games were used: tug of war (for mathematics), squash (for geography), seven stones (for spelling) and puppet play (for science). Upon completion, the obtained test data were analyzed in two levels of description and inference.

3. Results

3.1. Descriptive findings

Table 1 summarizes the descriptive analysis of the results. Tug of war for mathematics (concept of dividing with remainder), puppet play for science (respiratory system), squash and chair play for better learning of geographical directions and climates and seven stones for learning the spelling of difficult words had positive effects, so the hypothesis based on the idea that the averages of the control and experimental groups were not equal after applying the test (playing games) is verified and it could be expressed that incorporating games in teaching some courses would absolutely have positive effects.

Table 1. Central tendency indexes and dispersion of marks in the four courses

Test	Groups	Stage of the Test	Average	Mean	Standard Deviation	Variance	Variation
Mathematics	Experimental	Pre-test	18.554	18.75	20	1.529	2.339
		Post-test	19.375	20	20	.9192	.8449
	Control	Pre-test	18.536	19	19	1.283	1.646
		Post-test	18.179	18.25	20	1.695	2.874
Science	Experimental	Pre-test	18.554	19	20	1.589	2.524
		Post-test	19.304	20.00	1.0214	1.043	4.0
	Control	Pre-test	18.982	19.5	20	1.190	1.416
		Post-test	18.643	19	19	1.185	1.404
Geography	Experimental	Pre-test	18.964	19.5	20	1.394	1.943
		Post-test	19.5	20	20	.8819	.7778
	Control	Pre-test	19.107	20	20	1.227	1.506
		Post-test	19.143	20	20	1.177	1.386
Spelling	Experimental	Pre-test	19.482	20	20	.8765	.7682
		Post-test	19.857	20	20	.3814	.1455
	Control	Pre-test	19.446	20	20	1.300	1.691
		Post-test	19.125	20	20	1.494	2.233

3.2. Inferential findings

Findings from hypothesis testing through analysis of covariance mention that:

1. In studying the effect of elementary school games on progress in mathematics, the results show that the effect of pre-test for both groups was meaningful ($p < 0.01$) and by controlling the effect of pre-test, the differences between the marks of post-test for the groups will also be significant ($p < 0.01$). According to the increase in the marks of the experimental group from 18.55 (in pre test) to 19.37 (in post test), one can conclude that elementary school games have had positive effects on the students' progress in mathematics.
2. In studying the effect of elementary school games on progress in science, findings claim that the effect of pre-test was meaningful for both groups ($p < 0.01$) and by controlling the effect of pre-test, one can observe a difference between the marks of the groups in both tests ($p < 0.01$). According to the increase in marks of the experimental group from 18.55 (in pre test) to 19.3 (in post test), it can be concluded that these games had positive effects on the educational progress of students in science.
3. In studying the effect of elementary school games on progress in geography, findings claim that the effect of pre-test was significant for both groups ($p < 0.01$) and by controlling the effect of pre-test, a difference between the marks of the groups in both tests ($p < 0.01$) is obvious. According to the increase in marks of the experimental group from 18.96 (in pre test) to 19.5 (in post test), it can be concluded that these games had positive effects on the educational progress of students in geography.
4. In studying the effect of elementary school games on progress in spelling, findings claim that the effect of pre-test was significant for both groups ($p < 0.01$) and by controlling the effect of pre-test, one can observe a difference between the marks of the groups in both tests ($p < 0.01$) and according to the increase in marks of the experimental group from 19.48 (in pre test) to 19.86 (in post test), it can be concluded that these games had positive effects on the educational progress of students in spelling.

4. Discussion and Conclusion

A summary of findings of the present research shows that elementary school games have positive effects on learning improvement of students in spelling, mathematics, science and geography ($p < 0.01$). These findings are in line with the existing hypotheses in this field of interest. Some of these researches are as follows: Allahyari (2002), Soltani (1994), Shafinia (1987) inside Iran and Hewes (2010), Saltz and Donnenwerth-Nolan (1981), Kronbay (1966), Levin (1976), Cratty (1972), Humphrey (1972), and Matsuda and Sugihara (1969) outside Iran. All of these studies have emphasized on the effect of games on children's educational progress.

According to Allahyari (2002), the effect of physical activity plans on the inductive- dynamic operation of both male and female elementary school students was equal and similar. Soltani (1994) showed the positive effect of sport persuasion on educational progress. Shafinia (1987) also found that there was a meaningful correlation between balance and educational progress of male and female fourth graders of elementary school.

Among the studies conducted outside of Iran, the conclusions obtained from Kronbay (1966) showed that the ability to learn mathematics with children will increase 45% immediately after riding a bicycle. Saltz and Donnenwerth-Nolan (1981) also mentioned that memorizing sentences in different topics along with sporting and doing activities will be much more effective than when children are still and have to memorize things. Levin (1976) performed a study showing that children who were allowed to use toys and who had energetic activities, learned and memorized new things much more easily. Besides, Cratty (1972) mentioned that if children could have relaxed and joyful activities during the 6 hours of school days, and even dynamic movements during recess times, they would feel free of their learning pressures and memorize articles faster. Surveys have also shown that the best way to make sure of developing skills is to teach physical activities principles to children. Humphrey (1972) represented a survey about the nature of employing toys in training process and expressed his agreement with using curricular games in the class schedule. Although the surveys conclude that increasing physical activities were so effective in training the abilities of innovative children in comparison with traditional activities limited to class time, little attention has been paid to designing plans along with physical activities. Finally, Matsuda and Sugihara (1969) show that after light

plays, especially some activities with bicycle, significant progress is displayed in learning mathematics and doing its consequent exercises.

To sum up, due to significant developments in science and information technology and also novel views and approaches posed for science and curriculum methods, it can be concluded that the specialists in teaching and training have abandoned transferring scientific facts and emphasizing on the course contents and now, they emphasize on a scientific approach in the learning- teaching process. It is obvious that learning scientific approaches and views is not possible in traditional methods and one should replace them with new ones. The existing theoretical principles about educational progress and an integrative approach show that despite the importance of these two effective relationships, not much has been done in Iran so far or if it is done, there was no scientific or academic support for it and this displays a kind of weakness. Games represented here are not only effective in education but are also good for increasing the children's abilities in decision making and concentration in sight and intellectual concepts.

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