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❖ SPORT AND HEALTH

THE EFFECT OF EDUCATIONAL GAME OVER ATTENTION IN CHILDREN

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Abstract

The aim of this study is to examine the effect of educational game applications over the attention levels of children in physical education lesson. The sample of the study is consisted of 80 students from 9 -13 age group attending Marmaris Bayır village primary school. Bourdon attention test developed by B. Bourdon (1955) was applied to both control and experimental group before and after 8-week educational game program aiming to improve attention. The SPSS statistical program (version 16.0) was used for data analysis. Independent-samples t-tests were used to determine significant differences for independent variable. For all analyses, the criterion for significance was set at an alpha level of $p<0.05$.

To conclude, it has been found that 8-week educational game program applied to 9-13 age group students participated in the research affects the attention level and there is difference between groups. Attention values of experimental group to which educational game program was applied have been found to be higher than control groups.
Key words: child, educational game, attention

Introduction

Child firstly perceives his environment, then understands and after that learns and improves. While the natural development of the child changes with game activities, also forms completeness with physical education activities. Especially, the effect of the game over physical development of the child shows parallelism with the aims of physical education. (M. Hazar, 1996). Game is the environment encouraged by discovers and inventions without preventing the results. (D.A. Daubrova, 2005). Educational game has two aims: first, the game has an aim and the player aims to win the game and prevail through the attraction and enjoyment of the game. Second, the trainer aims to get individuals gain some skills by using players' winning desire and struggle wish (H. Arici, 1998). In physical education lessons, students should be aware of what they have achieved at the end of game activity. And awareness brings attention with it. Attention is to react prefentially to the related stimulus by eliminating the stimuli (M.H. Anshel et al. 1991). Attention may change depending on motivation level that child shows to the different duties, their interests and skills (H.A. Ruff and M.K. Rothbart, 1999). It has been reported that little children are weaker in paying attention to these stimuli by neglecting visual stimuli and pay less attention in stimuli in the environment than adults (V. Nougier and B. Rossi, 1999). From the many years, attention has been concerned with the factors that affect learning a motor skill. In motor- learning as a science, attention is defined as, in the human performance, the conscious or unconscious engagement in perceptual, cognitive and motor activities before, during and after performing skills; the human information- processing systems include limitation to the number of these activities that can be performed simultaneously. Attention has the limited capacity that effects the performance when done more than one activity at the sometime (R.A. Magill, 2004). In sports, individual should evaluate external clues quickly for attention and then one that is related to the duty is chosen (S.H. Boutcher, 1992, R.M. Nideffer, 1993). In this context, the importance of game, educational game concepts strengthens more for the child development. Considering these data, the aim of this study is to examine the effect of educational games that primary-school students apply in physical education lessons to improve attention.

Method

The study universe is Marmaris and the study sample is consisted of 80 students from 9-13 age group attending Bayır village primary school. The control and experimental group including male and female students were determined at random. To the experimental group, educational games to improve attention level were given for 8 weeks, one day in a week 30 minutes in a day. In this study, the applied program was done in students' physical education lessons. Test was applied to both experimental group and control group before and after 8-week period. In the research, the attention levels of the subjects and the difference between sports branches were examined. In order to determine the attention levels of the subjects in the research, "Bourdon Attention Test" developed by Benjamin Bourdon (1955) was used. Bourdon attention test is a test measuring attention, its density, the speed of mobility, concentration (Y.Y. Brunner, 2006). In this research, the letter form of Bourdon attention test was

used. Students were asked to find "b, d, g, and p" and mark them. In evaluation of the test, true-false answers of the children were taken into consideration. Each true answer was accepted one point. The maximum score that could be taken in the test was determined as 110. The individual's score's increasing meant the increasing of the attention level. Its reliability; the reliability of the test was done by the researcher. Test-retest reliability was calculated as reliability study and correlation coefficient was examined. This coefficient was found as 78. Its validity; at the end of criteria validity study, the correlation of Bourdon attention test was found as 63.

Statistical analysis; the SPSS statistical program (version 16.0) was used for data analysis. Standard statistical methods were used for the calculation of means and SD. The Kolmogorov-Smirnov test was used to determine if dependent variables were normally distributed. The Levene's test was used to determine if there was homogeneity of variance. Paired t-tests were used to determine significant differences over time for each dependent variable. Independent-samples t-tests were used to determine significant differences for independent variable. For all analyses, the criterion for significance was set at an alpha level of $p< 0,05$.

Educational game program applied in the research (Akandere, 2006)

name of the game	**level of the game**	**goal of the game**	**explanation of the game**
hand-crash game	8-14 age and over	to be able to improve attention and deciding	Teacher has a ball in his hand. When teacher drops the ball onto the floor he wants students crash hands together. When he drops, the student not crashing hand or doing it late is eliminated. Game continues till the last student.
snow-rain game	10-12 age and over	to be able to improve attention and deciding	A leader is chosen. *he* stands on a place where he can see everybody. As for the beginning, when "storm" is said ,the whole class beats their knees, when "snow" is said they claps hands in the air. The leader repeats that for many times. Then to make students confused he says these names in complicated way. The ones who confuse are eliminated, the last student is applauded. The leader should repeat the game and see everyone. This is a game improving attention.
grabbing handkerchief	10-12 age and over	to be able to improve attention, deciding and agility	Children are divided into two groups. They stand behind the line drawn 6-8 meters away from the game area. Each child has a number and they count from left and right beginnings. The child standing in the middle of two lines has a handkerchief and he tells a number .The ones having this number run and grab handkerchief take their places without being caught by the other one. The group of the child doing it successfully takes one point. if he is caught, other group takes the point. The game continues so.
jumping over turning rope	10-12 age and over	improving attention and following features	Players are placed side to side regularly in the circle. The player in the middle has a radius-long rope in his hand. A light weight is bound to the point of the rope such as rubber shoes, sand bag. The player in the middle turns around himself and tries to touch the feet of other players with the rope. The rope is 20-30 cm high above the floor. Other players jump and make the rope pass under their feet. The one whose foot the rope touches takes place of the player in the middle.
game of seasons	10-12 age and over	to be able to improve agility and deciding of players.	Players are divided into four equal groups by taking "spring, summer, winter, autumn" seasons. Each group goes to the corner which is for them and chooses a player and sends him to the middle. The duty of these chosen ones is to hit players from other groups during the change of groups and make them join their own groups. If teacher says "spring-winter", these two groups try to change place without being hit. While changing group, the players being hit take (-).The groups taking the least (-) are ordered as 1,2,3,4 or the players being hit go to the group of the player who hits them, and the group which takes the most players wins the game. Teacher can make two groups move at the same time by saying" winter-autumn, summer-spring".
to the beach-to the pool	10-14 age	to improve attention	A big circle is drawn in play area. Children stand out of the line with wide distances. When teacher says" to the pool" all children jump into the circle with double –foot .When he says " to the beach", they jump out of the pool. To make children confused, teacher says "to the pool, to the beach" words by changing, the one not paying attention is

			eliminated.
game of colorful rings	8-12 age	to improve attention	Children stand behind the line in a messy way.3 big circles are drawn in play area. The circles are called as "red, blue, and white."When teacher says "red" all children jump into the red circle. When he says "blue" they run into blue circle on one foot. When he says "white" they run into white circle on two feet. To make students confused teacher can say a different color. The child being out of the circle loses the game.
Hitting the rolling ball.	8-12 age	to improve attention	Class is divided into two equal groups and groups stand side to side with 8-10 meter long distance, and they have a handball in their hands. The children standing in the middle line mutually have a soccer ball. With the order "start" of teacher, the child having the soccer ball rolls it quickly to his opposite friend; meanwhile the children in two groups having a hand ball try to hit the soccer ball with the hand ball. The group which hits the soccer ball takes one point.
game of hot potato	8-12 age and over	to improve attention and coordination in players	Children make a wide circle. A player is chosen as it. A child ties a big knot to the handkerchief. This becomes the hot potato. Children throw the handkerchief to each other, but the chosen player tries to catch it. If he catches the handkerchief the child throwing the handkerchief becomes it.

Results

As seen in Table1,when pre-test and post-test values of the students participated in the research were examined, a significant difference has been found between experimental and control groups($p>0.05$). Attention values of the group playing educational games to improve attention have been found to be higher than control groups. As seen in Table 2,when attention levels of the students participated in the research were examined in terms of gender variable, a significant difference has been found between groups in female and male students' post-test true-wrong values($p>0.05$)Experimental group female students have been found to have higher attention average than males. As seen in Table 3,significant difference has been found in experimental group female and male students' pre-test and post-test values ($p>0.05$). It has been determined that educational games applied to the experimental group tp improve attention increase attention levels of female students more than males'.

As seen in Table 4, no significant difference has been found in control group male students in the research.($p<0.05$) When attention test true values of control group females students were examined, a significant difference has been found between pre-test and post-test values ($p>0.05$).

Discussion and conclusion

42 females and 38 males,80 students in all, participated in the research which was carried out with the aim of examining the effect of educational games applied in physical education lessons of primary school students over attention .When pre-test and post-test values of 8-week educational game program applied to improve attention level were examined, a significant difference has been found between experimental and control groups. Values of the group which played educational games to improve attention have been found to be higher than control group (table 1). These values show that 8-week educational program applied to improve attention increases the attention in children. At the end of 16-seance paying attention training which he applied to the nursery and primary school 1st and 2nd graders in Canada; D. Karaduman (2003) found an increase in paying attention levels of the students taking this training in comparison to the control group. These findings show similarity with the research findings and emphasize that paying attention level may be developed through a training that will be given in this field. When the attention levels of the students in the research were examined in terms of gender variable, female and males students' post-test values have been found to have significant difference according to experimental and control groups (table 2). Attention averages of female students in experimental group have been determined to be higher than males'. These values show significant difference between attention level and gender. According to the result of a research carried out about attention education in children, a development has been found in visual and audial attentions of the students in the group taking attention education (M.S. Clikeman et al. 1999). When the attention levels of the experimental group students in the research were examined, a significant difference has been found between pre-test and post-test values of female and male students and educational game practices to improve attention have been found to increase female students' average values more than males' (table 3). In a research about attention, it is reported that girls' attention skill is better than males' (J. Borchert, 1998).These research findings show similarity with the study. No significant difference has been found in control group males students' attention values in the research. A significant difference has been found between pre-test and post –test in control group females students' true values Attention test average values of control group male students have been determined to be higher than females (table 4). Some researches point out that attention skill may be

developed through education (U. Lauster 1999, B. Özdoğan, 2001).This result shows similarity with the results of the research. A positive development is thought to happen in attention skill at the end of education that will be given to the children. To conclude, it has been determined that 8-week educational game program applied to improve attention of 9-13 age group students affects students' attention level positively and improve it. It is thought that attention skill in children can be increased through educational game practices in schools.

Tables

Table 1: examining pre-test and post-test values of attention levels of students participated in the research.

variables	Group	N	avarage	Std. Dev.	t	p
Pre-test number of true ones	experimental	40	48,65	9,385	1,010	0,315
	control	40	46,65	8,285		
Pre-test number of wrong ones	experimental	40	,30	0,608	0,845	0,401
	control	40	,42	0,712		
Post-test number of true ones	experimental	40	64,70	10,493	6,853	0,000*
	control	40	49,82	8,852		
Post-test number of wrong ones	experimental	40	0,00	0,000	4,268	0,000*
	control	40	0,55	0,815		

Table 2: examining attention levels of students participated in the research in terms of gender variable.

variables		Group	N	avarage	Std. Dev.	t	P
female	Pre-test number of true ones	experimental	24	49,08	10,794	1,117	0,271
		control	18	45,67	8,296		
	Pre-test number of wrong ones	experimental	24	,33	0,637	-,242	0,810
		control	18	,39	0,850		
	Post-test number of true ones	experimental	24	68,96	7,658	7,862	0,000*
		control	18	50,33	7,515		
	Post-test number of wrong ones	experimental	24	0,00	0,000	-3,614	0,001*
		control	18	0,67	0,907		
male	Pre-test number of true ones	experimental	16	48,00	7,043	,211	0,834
		control	22	47,45	8,382		
	Pre-test number of wrong ones	experimental	16	,25	0,577	-1,058	0,297
		control	22	,45	0,596		
	Post-test number of true ones	experimental	16	58,31	11,128	2,589	0,014*
		control	22	49,41	9,970		
	Post-test number of wrong ones	experimental	16	,00	0,000	-2,453	0,019*
		control	22	,45	0,739		

Table 3: examining pre-test and post-test values of attention levels of experimental group students participated in the research.

variables			N	avarage	Std. Dev.	t	P
experimental	female	Pre-test number of true ones	24	49,08	10,794	-9,139	0,000*
		Post-test number of true ones	24	68,96	7,658		
	male	Pre-test number of true ones	16	48,00	7,043	-6,660	0,000*
		Post-test number of true ones	16	58,31	11,128		
	female	Pre-test number of wrong ones	24	0,33	0,637	2,563	0,017*
		Post-test number of wrong ones	24	0,00	0,000		
	male	Pre-test number of wrong ones	16	0,25	0,577	1,732	0,104
		Post-test number of wrong ones	16	0,00	0,000		

Table 4: examining pre-test and post-test values of attention levels of control group students participated in the research.

variables			N	avarage	Std. Dev.	t	P
control	female	Pre-test number of true ones	18	45,67	8,296	3,384	0,004*
		Post-test number of true ones	18	50,33	7,515		
	male	Pre-test number of true ones	22	47,45	8,382	1,870	0,076
		Post-test number of true ones	22	49,41	9,970		
	female	Pre-test number of wrong ones	18	,39	,850	0,960	0,350
		Post-test number of wrong ones	18	,67	,907		
	male	Pre-test number of wrong ones	22	,45	,596	0,000	1,000
		Post-test number of wrong ones	22	,45	,739		

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EFFECTS OF EXERCISE AT HIGH ALTITUDE ON MICRONUCLEUS FREQUENCY

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