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Effect of Science Education Provided with Digital and in-Class Games on the Scientific Process Skills of Preschool Children

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ABSTRACT In this research the effects of educational digital games and in-class educational games on scientific process skills of 6 years old children were investigated. The research was carried out with 70 preschool children who were educated in a primary school in Turkey. In the research, quasi-experimental design was used. Within the scope of the research, there are 3 groups including 2 experimental and 1 control groups. The educational digital games with the children in the Experiment I group were performed with in-class educational games with the children in the Experiment II group. The research covered a 10-week period. In order to test the hypotheses of the research, t test for the related samples, Wilcoxon Signed Sequence test, single factor ANOVA analysis for unrelated samples, Kruskal Wallis H-Test and Man Whitney U-Test were performed. According to the analysis results of the scientific process skill test scores of the groups after the application, it was found that there was no significant difference between experiment I and experiment II.. It was determined that there was a significant difference between the experiment I and experiment II groups and the control group, and this difference was in favor of the experimental groups.

Keywords In-class Educational Games, Digital Educational Games, Scientific Process Skills

1. INTRODUCTION

The early childhood period covers the first six years of life from birth. Children want to study everything that is around them with the urge to research and wonder about innate learning in this period. Children begin to learn the concepts of science with this urge to wonder and research. Science activities are very important as they help preschool children make sense of the connections between events and objects (Demiriz. & Ulutaş, 2001). For children, the purpose of science allows them to make sense of and realize the environment in which they live (Tu & Hsiao, 2008). Science, which is part of everyday life, includes experiences by all individuals, including young children (Saçkes et al, 2011). The foundation of children's knowledge and skills is laid (Avcı & Dere, 2002), preschool age is important for children to develop scientific examination, research and observation skills to learn scientific thinking (Gürdal, et al, 1993). Science education given at an early age enables children to notice the events in their environment and nature, perceive relationships, observe, interpret information, gain problem solving and scientific process skills (Avcı & Dere, 2002; Howe, 1996; Kuru, 2015; Ravanis, 2017; Şahin, 1999). Scientific process skills into two types basic and integrated (American Association for the Advancement of Science [AAAS], 1993; Padilla, 1990). It is important to develop basic scientific process skills in early childhood. Because in order for children to master integrated scientific process skills in the future, they must first have basic skills (Turiman, et al, 2012). In the Preschool Education Program of the Ministry of National Education [MoNE] (2013), scientific process skills are also emphasizes. From this point of view, it is known that science education affects children's development in many aspects in early childhood and it is recommended that researchers start from the first years of school life (Ayvacı, 2010; Eshach & Fried, 2005; Howes, 2008; Spektor-et al, 2013; Tu & Hsiao, 2008; Watters, et al, 2001)

Children examine the environment and nature and want to learn, the game comes into play. Game, due to the nature of science are consistent with many features. It also includes opportunities that will be the basis for learning science. Osborne & Brady (2001), science identified as

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playful, multi-faceted, multi-disciplinary, experimental and developing. Children develop their skills such as reasoning with play, making choices, focusing attention, establishing a cause-effect relationship, directing themselves to a goal. The game allows them to recognize objects, to name them and to say their functions. In addition, cognitive processes such as thinking, analysis, perception, inference, evaluation, problem solving, sorting, classification are accelerated with the game. The game is also an important tool in reflecting the knowledge and experience gained through the game to the real life. Although the game is an educational activity in itself, many concepts can be gained to the child through games. The child establishes a relationship between world and the environment through play (Strengthening the Vocational Education and Training System Project, 2016). The child tries to perceive the events in his environment and reflects them to the games. they learn without being aware of the game environment (Paino, 2001). According to Çakı (2008), since games can address more than one development area, they provided multidimensional development of children. Thus, the multi-faceted development of the child can be achieved. It also provides children with skills such as questioning, problem solving, judgment, analysis, synthesis and critical thinking. In this direction, educational games prepare appropriate environments for individuals to gain cognitive skills such as being able to group, formulate hypotheses, solve problems, analyze and synthesize (Çamlıyer & Çamlıyer, 1997; Öncü & Özbay 2010). Therefore, increasing the importance of educational games.

With the technological developments in recent years, it is seen that the games have been transferred to the technological platform and the understanding of entertainment has changed significantly. Children started to play digital games with computers, tablets and mobile phones instead of classic games Therefore, the concept of digital educational game comes across in education and science education. Educational digital games can be defined as games that are prepared with the help of technological tools and that provide learning for certain goals with cognitive social, behavioral or emotional aspects (Aksoy, 2014;Samur, 2016). Almost all of the educational digital games force the learner to perform mental processing because of time constraints or racing over time. Therefore, it can contribute to the cognitive development of learners.

Briefly games and science is a part of children's daily life. Therefore, it is important to investigate their effects. In the literature, there are studies that examine the effects of different methods of pre-school children science process skills (Ayvacı, 2010; Büyüktaşkapu, 2010; Büyüktaşkapu et al, 2012; Can et al, 2017; Dilek, et al, 2020; Elkeey 2017; Şahin, et al, 2011; Tekerci & Kandir, 2017; Van Schijndel, Singer, & Raijmakers, 2008). However, there weren't studies examining the effect of science-based digital and in-class games on scientific process skills. This research aimed to examine the effect of science education performed with digital and in-class educational games on the scientific process skills of preschool children. For this purpose, the following hypotheses have been tested:

$H_0$1. The scientific process skills of preschool children do not differ significantly according to the method used (educational digital games-in-class educational games-traditional teaching method).

$H_0$2. Preschool children scientific process skills test sub-dimension pretest and posttest scores do not show significant difference according to the method used (educational digital games-in-class educational games-traditional teaching method).

2. METHOD

2.1. General Background

The research was used quasi-experimental design. Real experimental designs are studies in while individuals are randomly placed in groups according to the levels of the independent variable (Büyüköztürk, at al,2017). The difference between the real experimental design and the quasi-experimental design is that participants cannot be randomly assigned to groups (Creswell & Plano Clark, 2011). In this case, it is decided randomly to be the experimental and control groups among the previously formed groups. The research was carried out with three groups (two experimental and one control group) as seen in Table 1. In this research, a quasi-experimental design was used because three of the ready groups were determined as experimental and control groups.

2.2 Sample

The research group of the research was in a primary school located in Elazığ, Turkey. The research used purposeful sampling procedures. A purposeful sampling technique was used to determine the school where the participants were located. Use of this sampling technique is

Table 1 Experimental Design Showed Used in Research

Groups	Pre-tests	Intervention	Post-test
E_1	O_1	X	O_4
E_2	O_2	X	O_5
C	O_3		O_6

E_1; Experiment Group where Digital Educational Games and Science Teaching Practices are applied
E_2; Experiment Group where in class Educational Games and Science Teaching Practices are applied
C; Control Group,
O_1-O_4; Pre-test and post-test measurements of Experiment I group,
O_2-O_5; Pre-test and post-test measurements of Experiment II group
O_3-O_6; Pre-test and post-test measurements of Control group
X: It shows the independent variables (Experimental variables) applied to the subjects in the experimental group.

Table 2 Frequency and Percentage Distributions of the Experimental and Control Group Children by Gender

Groups	Girl		Boy		Total	
	f	%	f	%	f	%
Experiment Group I	13	38.2	10	27.8	23	32.8
Experiment Group II	9	26.5	14	38.9	23	32.8
Control	12	35.3	12	33.3	24	34.4
Total	34	100	36	100	70	100

preferred in exceptional cases that have specific criteria and characteristics (Büyüköztürk, et al, 2017). Two experiment and one control groups were included in the research. Science Education was conducted with educational digital games for the children in experiment I Group. Science Education was conducted with in-class Educational Games for the children in Experiment II group. In the selection of the experimental groups, children scientific process skills test was applied to the groups. There was no statistically significant difference between preschool children scientific process skills pre-test results and the pre-test results of three groups (Experiment I, Experiment II and Control), F=0.53; p>.05. This finding showed that the experimental and control groups were equivalent. For this reason, the experimental and control groups were randomly determined. The study group consisted of 70 children aged 60-72 months. Information on the study group is presented in Table 2.

It was seen that the experimental group I and the experiment group II consisted of 23 pre-school children each. It was observed that the control group consisted of 24 children It is seen that the number of boy children participating in the study is higher than the number of girl children. It was observed that the number of children in the control group was higher than the number of children in the experimental group. However, it was observed that there wasn't big difference in percentage.

2.3 Data Collection Tool

The Scientific Process Skill Test (SPST) developed by Sağırekmekçi (2016) used to measure the scientific process skills of preschool children. This test consists of a total of 20 items, with 3 items with 3 options and 17 items with 2 options. Determined as this test reliability coefficient 0.93 by Sağırekmekçi. The scientific process skill test aims to measure a total of 5 scientific process skills, including observation, classification, measurement, prediction and inference.

While applying SPST to children, a noise-free environment without interesting objects was selected and a seating arrangement was created where the researcher and the child could sit face to face, and especially the chairs where the child could sit comfortably were preferred. In the application environment, the child and the researcher alone applied test. The children were shown the items in the test and asked to make choices. The researcher made markings according to their choices.

Figure 1 In-class educational game material

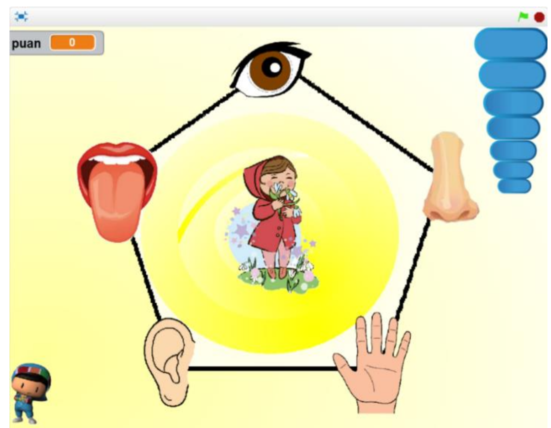

Figure 2 Digital educational game material

2.4 Preparation of Educational Games

Within the scope of the research, the researcher designed educational digital games through the Scratch program for used in the experimental group I. The researcher designed in-class educational games to be used in the Experiment II Group. Digital and in-class plays designed by the researcher; balanced nutrition, state of matter, magnet gravitational force, sensory organs, natural /unnatural substances, organs in our body, living/inanimate beings and buoyancy force of water take as basis. A total of two games, educational digital and in-class educational games, have been designed for each topic by researchers. Each game; Concepts consisted of Scientific Process Skills and Learning Process subheadings. Plays; it was presented to expert (two pre-school education and three science education) opinion for its suitability to scientific process skills, materials, suitability of concepts and target words, organization of the educational environment and examination of the learning process. Sixteen game (eight digital educational game and eight in-class educational game) designs completed by making the recommended and necessary corrections. In Figures 1 and

2, there are in-class and digital educational games designed for the sensory organs.

2.5 Process of Using Digital Educational Games and In-Class Educational Games

The researcher spent time with the children in the research group in the classrooms of the children before starting the research. Because the researcher wanted to meet and communicate with children and get to know the developmental characteristics of children before the pre-test applied. In the research, Scientific Process Skill Test applied to the experimental and control groups as pre-test and post-test. The research covered period of 10 weeks period. Two weeks of this period were reserved for pre-test and post-test applications. After the pre-test applications, educational digital games were used in the experimental group I and in-class educational games in the experiment II group. Science subjects transferred to the control group with the traditional teaching method by researcher. The implementation process carried out once a week, with 40 minutes for each session. In the experiment Group I, game activities carried out on the computer. In the Experiment II group, the researcher prepared the necessary materials in advance and children played games. In some games the class divided into two large groups, in some games the

Table 3 Descriptive statistics of pre-test and post-test scores of scientific process skills test of preschool students

Test& Sub-dimension	Group	N	x̄	Ss	Skew ness	Kurtosis	Ra nge	Min	Max	Shapiro-Wilk
	Experiment I-	23	11.82	3.09	-.143	-.912	10	6	17	.666
SPSTPRE	Experiment II	23	11.56	2.67	-.061	-.289	11	7	17	.592
	Control	24	11.62	2.76	-.221	-.643	10	6	16	.688
Observation-pre	ExperimentI-	23	4.30	1.25	-.336	-.369	4	2	6	.008
	Experiment II	23	4.0	1.12	.000	-.654	2	2	6	.090
	Control	24	4.37	1.09	-.193	-490	4	2	6	.053
Classification- pre	Experiment I	23	.91	.73	1.39	-1.00	2	2	6	.001
	Experiment II	23	.56	.58	.454	-.616	2	2	6	.000
	Control	24	.45	.58	.873	-.114	2	2	6	.000
	Experiment I-	23	1.91	.79	.162	-1.34	1	2	6	.000
Measurement- pre										
	Experiment II	23	1.91	.94	-862	.217	3	2	6	.001
	Control	24	1.79	.97	-.461	-.605	3	2	6	.005
Guesing- pre	Experiment I-	23	2.21	.95	.565	-.336	3	2	6	.003
	Experiment II	23	2.26	1.00	-.288	-.185	4	2	6	.052
	Control	24	2.25	.84	-.527	1.224	4	2	6	.004
Inference- pre	Experiment I-	23	2.56	1.16	-.173	.163	5	2	6	.164
	Experiment II	23	2.82	1.33	-.279	654	5	2	6	.195
	Control	24	2.75	1.29	-.542	-.035	5	2	6	.039
	Experiment I-	23	17.78	1.41	-.320	-.147	5	20	15	.082
SPSTPOST										
	Experiment II	23	17.91	1.31	-.223	-.128	5	20	15	.178
	Control	24	12.58	2.46	-.783	.569	10	6	16	.148
Observation-post	Experiment I-	23	5.78	.51	-2.46	5.85	2	4	6	.000
	Experiment II	23	5.86	.45	-3.71	13.69	2	4	6	.000
	Control	24	4.83	1.00	-.196	-1.170	3	3	6	.003
Classification-post	Experiment I-	23	1.60	.58	-1.21	.684	2	0	2	.000
	Experiment II	23	2.00	.00	-	-	0	2	2	.000
	Control	24	.79	.77	.395	-1.196	2	0	2	.000
	Experiment I-	23	2.52	.79	-1.89	3.47	3	0	3	.000
Measurement-post										
	Experiment II	23	2.78	.51	-2.46	5.85	2	1	3	.000
	Control	24	1.91	1.01	-.631	-.578	3	0	3	.002
Guesing-post	Experiment I-	23	3.78	.42	-1.46	.161	1	3	4	.000
	Experiment II	23	3.78	.51	-2.46	5.85	2	2	4	.000
	Control	24	2.29	.80	-.062	-.500	3	1	4	.004
Inference-post	Experiment I-	23	4.08	1.16	-1.12	.609	4	1	5	.000
	Experiment II	23	3.47	1.23	-.41	-.461	2	2	4	.017
	Control	24	2.75	.98	-.919	1.328	4	0	4	.004

Table 4 ANOVA results of preschool students' BSBT post-test scores according to the method used

Source of variance	Sum of squares	SD	Mean square	F	p	η^2
Between Groups	1106.989	5	221.398	38.722	.000	.59
Within Groups	766.154	134	5.718			
Total	1873.143	139				

Table 5 Dunnett C test results

Group(I)	Group(J)	Mean difference (I-J)
Experiment I post-SPST	Experiment II post-SPST	-.13043
	Control post-SPST	5.19928*
Experiment II post-SPST	Experiment I post-SPST	.13043
	Control post-SPST	5.32971*
Control post-SPST	Experiment I post-SPST	5.19928*
	Experiment II post-SPST	5.32971*

games divided into smaller groups and games conducted. In this process, the first games were played to explore the concepts of science, so the winning groups were not determined. In the later games, the winning groups identified and the losing group or groups encouraged to win the next games in order to ensure their motivation. The reasons for losing groups analyzed and the groups given feedback at the end of the game and provided to complete their deficiencies. In the games, children tried to focus on learning and having fun rather than winning.

2.6 Data Analysis

SPSS 22.0 statistical package program was used for all statistical analyzes to analyze the data obtained during the research. Prior to the analysis, the author checked whether the pre-and post-test data applied were entered correctly into the computer. Descriptive statistical analysis was conducted among variables for the experimental and control group. Arithmetic means, standard deviation, kurtosis coefficient, skewness coefficient, minimum and maximum values of the data belonging to the groups were calculated. Descriptive statistical results were used to have an opinion on the data and to check the assumptions before analysis. In the literature, the application of the Shapiro-Wilks test is recommended if the group size is less than 50 to examine the normality of the scores (Büyüköztürk, 2015; Rovai et al, 2014). In this direction, the Shapiro-Wilks test was conducted to see if the scores were normal. Data on variables in experiment I, Experiment II and control groups were analyzed using single factor ANOVA for unrelated samples, Kruskal Wallis H-Test and Man Whitney U-test for unrelated measurements.

3. RESULT AND DISCUSSION

Two titles were created to test research hypotheses; "descriptive statistics" and "inferential statistics."

3.1 Descriptive Statistics

The Scientific Process Test pre-test (SPSTPRE) scores applied to preschool children who constitute the study group of the study and the average distributions of each sub-dimension of the test were tested. The mean test scores for the group, the number of children in the groups, the standard deviation of the groups, skewness and kurtosis values, minimum and maximum values and Shapiro-Wilk values are given in Table 3.

It shows that the skewness and kurtosis values of SPSTPRE and SPSTPOST scores remain between the normal distribution limits (+ 1.5, -1.5). However, it was determined that the test sub-dimensions were not within the normal distribution limits (+1.5, -1.5). In addition, when Shapiro-Wilk values were examined, it was found that the SPSTPRE and SPSTPOST scores were normally distributed, but the sub-dimensions of the test did not show normal distribution ($p < 0.05$).

3.2 Inferential Statistics

$H_0$1. The scientific process skills of preschool children do not differ significantly according to the method used (educational digital games-in-class educational games-traditional teaching method).

One-way ANOVA was applied to the data to investigate whether children's scientific process skills differ according to the method used and the findings are given in Table 4.

It is observed that there is a statistically significant difference between the average post-SPST scores of pre-school children according to the method used (F=38.722; $p<.05$; $\eta 2$=.59). The result obtained for the post-test scores also supports the eta-square value. When the eta-square values obtained (η^2=.59) are taken into consideration, it can be said that digital games and in-class educational games have a broad effect on post-SPST scores. The Dunnett C test was applied to the data as a post hoc test in order to investigate the source of this difference between the programs as a result of the analyses. Dunnett C test results are given in Table 5.

According to the Dunnett C test result, post- SPST average scores showed no significant difference between experiment and Experiment II. It was found that there was a significant difference between experiment I and control group in favor of experiment I group, and there was a

Table 6 Results of Kruskal Wallis test of post-SPST sub-dimensions according to applied method

Sub-dimension	Group	n	Rank Average	*sd*	$\chi2$	*p*	*Significant Difference*
Observation	Experiment I	23	41.02	2	22.44	.000	.000
	Experiment II	23	43.54	2			
	Control	24	22.50	2			
Classification	Experiment I	23	38.15	2	32.41	.000	.000
	Experiment II	23	49.00	2			
	Control	24	20.02	2			
Measurement	Experiment I	23	37.80	2	13.08	.001	.001
	Experiment II	23	43.76	2			
	Control	24	25.38	2			
Guesing	Experiment I	23	45.52	2	41.95	.000	.000
	Experiment II	23	46.11	2			
	Control	24	15.73	2			
Inference	Experiment I	23	46.35	2	14.82	.001	.001
	Experiment II	23	36.33	2			
	Control	24	24.31	2			

significant difference between experiment II and control group in favor of experiment II group.

$H_0$2. Preschool children' scientific process skills test sub-dimension pre-test and posttest scores do not show significant difference according to the method used (educational digital games-in-clas s educational games-traditional teaching method).

Kruskal Wallis Test was used to examine whether the children's scientific process skills differed according to the method used and the findings are given in Table 6.

When Table 6 is examined, it is observed that the scientific process Skill Test lower dimension scores of the children participating in the practice differ significantly ($p< .05$). This finding shows that the three methods used have different effects on children's scientific process skills.

The Man Whitney U-test was performed to determine the source of the difference between the groups. The results of the Man Whitney U-test are given in Table 7.

When Table 7 is examined, post-SPST subscale mean scores showed significant difference in favor of the experimental group II in the classification sub-dimension between the experimental I and II groups (U=172.50, p<.05). However, observation (U = 242.50, p <.05), measurement (U = 494.00, p <.05), guesing (U = 255.00, p <.05), inference (U = 255.50, p <.05) does not show significant differences in the sub-dimensions. Observation (U = 127.50, p <.05), classification (U = 123.00, p <.05), measurement (U = 176.50, p <.05), guesing (U = 36.50) between experimental I and control group, p <.05), inference (U = 104.00, p <.05) sub-dimensions in favor of the experimental group I have a significant difference. There is a significant difference between experimental group I and control group in terms of observing (U=113.00, p<.05), classification (U=57.50, p<.05), measuring (U=132.50, p<.05), guesing (U=41.00, p<.05) and estima inference (U=179.50, p<.05) in favor of experimental group I.

The present study aimed to determine the effect of science teaching, which is carried out with educational digital games and in-clas educational games, on the scientific process skills of preschool children. According to the results of the research, it was seen that both types of games (educational digital games and in-class educational games) were effective in developing scientific process skills. When the differences between the groups of the scientific process skills sub-dimensions were examined, it was found that there was a significant difference between the experimental group I (educational digital games) and the experimental group II (in-class educational games) in the classification sub-dimension in favor of experiment II, while the other sub-dimensions did not show significant difference. In other words, it was seen that both types of games were effective on observation, classification, measurement, guessing, inferential skills. However, it is seen that the effect of in-class educational games on classification skill is greater. It was concluded that the scientific process skills of the children in the experimental group I and II were significantly higher than the children in the control group. It was concluded that the scientific process skill test sub-dimensions differed significantly between experimental and control groups in favor of experimental groups. This may be an indication that science education with educational digital games and in-class educational games is effective in increasing scientific process skills.

When the literature was examined, no researches examining the effects of educational digital games and in-clas educational games on scientific process skills in preschool period were found. There are many studies in the literature that examine the impact of science activities on scientific process skills (Ayvacı, 2010; Büyüktaşkapu, 2010; Büyüktaşkapu et al, 2012; Can et al, 2017; Dilek, et al, 2020;. Elkeey 2017; Kalemkuş, et al2021; Ping, et al,2019;. Solé-Llussà, et al, 2020; Şahin, Güven, & Yurdatapan, 2011; Tekerci & Kandir, 2017; Uludağ, & Erkan, 2020; Van Schijndel, Singer, & Raijmakers, 2008). In their research, Van Schijndel, Singer, & Raijmakers (2008) examined the impact of a science program on the research skills of two-

Tablo 7 U-Test for post-SPST sub-dimensions

Group	Sub-dimensions	Group	Rank mean	Rank total	*U*	*p*	*r*
Experiment I- Experiment II	**Observation**	Experiment I Post -Test	22.54	518.50	242.50	.408	.121
		Experiment II Post-Test	22.46	562.50			
	Classification	Experiment I Post -Test	19.50	448.50	172.50	.002	.453
		Experiment II Post-Test	27.50	632.50			
	Measurement	Experiment I Post Test	21.48	494.00	494.00	.183	.196
		Experiment II Post-Test	25.52	587.00			
	Guesing	Experiment I Post -Test	23.11	531.50	255.50	.774	.042
		Experiment II Post-Test	23.89	549.50			
	Inference	Experiment I Post -Test	26.87	618.00	187.00	.74	.263
		Experiment II Post-Test	20.13	463.00			
Experiment I - Control	**Observation**	Experiment I Post-Test	30.48	701.50	127.00	.000	.518
		Control Post-Test	17.79	427.00			
	Classification	Experiment I Post -Test	30.65	705.00	123.00	.000	.509
		Control Post Test	17.63	423.00			
	Measurement	Experiment I Post-Test	28.33	651.50	176.500	.022	.335
		Control Post-Test	19.58	476.50			
	Guesing	Experiment I Post-Test	34.42	791.50	36.50	.000	.785
		Control Post-Test	14.01	336.50			
	Inference	Experiment I Post-Test	31.48	724.00	104.00	.000	.552
		Control Post-Test	16.83	404.00			
Experiment II - Control l	**Observation**	Experiment II Post -Test	31.09	715.00	113.00	.000	.582
		Control Post-Test	17.21	413.00			
	Classification	Experiment II Post -Test	33.50	770.50	57.50	.000	.772
		Control Post-Test	14.90	357.50			
	Measurement	Experiment II Post -Test	30.24	695.50	132.50	.000	.500
		Control Post-Test	18.02	432.50			
	Guesing	Experiment II Post -Test	34.22	787.00	41.00	.001	.772
		Control Post-Test	14.21	341.00			
	Inference	Experiment II Post-Test	28.20	648.50	179.50	.032	.312
		Control Post-Test	19.98	479.50			

to three-year-old preschoolers. After applied the program, it was observed that there was an increase in the development of the research skills of the children in the experimental group and the related scientific process skills. Ayvacı (2010) conducted a research that determined the impact of planning activities suitable for pre-school children on the development of children's scientific process skills. It has determined that children's ability to use scientific process skills can be improved with appropriate activities.

McFarlin (2011) conducted a qualitative study in which children attending a science-based kindergarten observed the use of scientific process skills in their daily activities in informal environments. As a result of the research, it was observed by the researcher that the children used their basic scientific process skills during play activities. Sola, & Oladayo, (2017) examined the scientific process skills that primary school children use while playing science games. As a result of the research, it was seen that primary school children used their scientific process skills while playing science-based games Thus, science-based games can be said to be effective in improving the scientific process skills. In this context, these studies are in line with the current research results.

At the high school level, limited studies have been found examining the impact of educational games and digital games on scientific process skills (Yıldırım, 2018). The effects of Physical Activity Based Games and Digital Games Method on the scientific process skills of 9th grade children were investigated. This research It has been observed that the scientific process skills of the children in the experimental groups are improved by using game-based methods, whether digital and physical activity or not. Research data parallels the results of this research.

Considering the researches in the literature, it is seen that the methods and techniques used within the framework of science education have a significant effect on children's scientific process skills. In the research conducted, it is observed that the planned and systematic execution of the stimuli that children are exposed to in the early period increases the scientific process skills of children. What, how and how much a child can discover is related to how learning environments are offered to her/him (MoNE, 2013). Among the findings obtained in the research and the research results presented above; It is seen that there is a parallelism in that science applications are effective in increasing the scientific process skills of children.

4. CONCLUSION

It is important that children who are adults of our future receive Science Education at an early age, have science literacy and scientific process skills. Thus, children will be able to be more successful and more productive individuals in solving the problems they will encounter in their future lives. They can be people who investigate, investigate and question.

This study showed that the use of in-clas and digital games in Science Education had an impact on children's scientific process skills. Considering the results of the research, educators will be in the best interest of the children to integrate the games (digital, in-class) children enjoy with science. It has been observed that there are few studies in the literature examining the science-related effects of digital and in-clas games. The effects of science-related digital and in-class games should be further investigated.

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