

THE EFFECTS OF PROJECT APPROACH BASED EDUCATION PROGRAM ON CREATIVE THINKING OF CHILDREN

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ABSTRACT

The aim of this study is to evaluate the effects of the Project Approach Based Education Program on the creative thinking skills of 61-66 month old children. A pretest, posttest, retention test experimental design with control group was adopted in the study. The study group comprised a total of 44 children, 22 of them assigned to experimental group and 22 to the control group. As the data collection tools, the “Personal Information Form” and “The Test for Creative Thinking-Drawing Production (TCT-DP)” was used, which was originally developed by Urban and Jellen (1996) and adapted to Turkish children by Can Yaşar and Aral (2011a) in order to evaluate the creative thinking skills of children. Project Approach Based Education Program which aimed to support children’s creative thinking skills was implemented three days a week for 10 weeks. While analyzing the data, Mann Whitney U Test for the difference between groups and Wilcoxon Signed Rank Test and Friedman’s Two-Way ANOVA tests for comparison within groups were used. At the end of the study, it was found that there was statistically significant difference between the pre-test score averages and post-test/retention test score averages concerning the Form A, Form B, and total (A+B) of TCT-DP of the children in the experimental group participating in the project-approach based education program. It was determined that there was a significant difference among the Form A, Form B, and total (A+B) post-test score averages of the children in the experimental and control groups.

Keywords: creativity, creative thinking, early childhood, preschool education, project approach

INTRODUCTION

Owing to the social, political, and technological changes in our age, creativity has taken on a different dimension, becoming important in every aspect of life. Based on the idea that the individual has a creative potential, creativity is accepted as a “universal competence” (Runco, 2003; Siraj-Blatchford, 2007). The level of creativity changes dynamically, and includes different interactions as in all other development areas (Dziedziewicz et al., 2013). Creativity, for the children involves social interactions and cognitive processes that develop through imagination and games. As per the creative thinking, it involves rotating activities that lead to new ways of thinking and ways that are effective for the child (Leggett, 2017).

Creativity levels of children develop through experiences such as painting, music, drama, dance and movement activities (Reunamo et al., 2014). Developing a willingness to research, examine children, the ability to find different solutions to problems, to discuss solutions and to make open-ended suggestions are among the ways that support creativity (Çetin, 2012). Preschool education institutions should provide children with opportunities to support creative thinking skills (Beghetto et al., 2012). In educational environments that support creativity, appropriate training programs must be used (Aktan, 2015; Ompok et al., 2020; Yıldırım, 2015). Different approaches can be used for preparing education programs that will support the creative thinking skills of children and various qualifications while expressing what they have learned in the preschool. In an education program prepared through different approaches, information, learning process and creative expression can be combined (Isbell & Raines, 2007; Ramli & Musa, 2020).

The project approach, based on the philosophy of progressive education, is defined as activities carried out on a topic related to real life situations determined in line with the interests of children under the guidance of the teacher (Helm & Katz, 2010). Its aim is that children specialize in certain areas by doing through researches and studies in those areas and is popular in preschool and primary school education (Katz & Chard, 2000a). Lilian Katz, a professor at a university in the US, has introduced a model about how the project approach can be used in preschool education (Öztürk, 2012). This approach is used in many countries of the world today thanks to its constructive, child-centered and process-oriented aspects, which help children to explore the world at an early age (Katz & Chard, 2000b). Rather than a separate topic, project activities carried out in the project approach are seen as an integral part of preschool education programs (Katz, 1998). In this research, project studies were integrated into the training program being implemented by utilizing the integrative feature of the project approach.

New trends in education focus on meeting the requirements of the age in programs and developing creativity (Cheung & Mok, 2018). It can be mentioned that numerous developmental, cultural, social, and environmental factors such as gender roles, experiences, lifestyles, home and school environments, teacher and family attitudes, educational programs are effective in the development of creativity (Artut, 2004; Chiena & Hui, 2010; Csikszentmihalyi & Robinson, 2014). It is observed that previous studies in the literature were conducted to examine the relationships between the creative thinking skills of children and different variables such as age, gender, socioeconomic level, education level of the parents, and school type (Can Yaşar & Aral, 2011a; Gizir Ergen & Köksal Akyol, 2012; Reunamo et al., 2014; Robson & Rowe, 2012). In addition, in previous studies, it was concluded that there was a significant relationship between the creativity levels of children and creative personality traits (Lee, 2005); compliance with social rules (Bayanova, 2014); language skills and social play (Holmes et al., 2015) and taking perspective (Yıldız, 2016).

The education program should include the knowledge and skills that will improve creative thinking skills of children and support children to come up with different solutions to problems (Abdul Rahman et al., 2021; Mayesky, 2012). It is observed that the programs aimed at improving children's creativity are comprised of language (Vass, 2007), music (Koutsoupidou & Hargreaves, 2009), movement (Cheung, 2010), drama activities (Hui & Lau, 2006; Karakelle, 2009) and picture books (Ompok et al., 2018). In the study conducted by Garaigordobil and Berruero (2011) examining the effect of the play program on the creative thinking skills of children, they determined that the program had an effect on the dimensions of creativity. In another study by Wojciehowski and Ernst (2018) the change was examined in creative thinking skills of children attending forest kindergarten at the beginning and end of

the school year. As a result of the research, it was concluded that the difference in fluency, authenticity, and imagination dimensions of creativity was significant.

The process of utilizing the knowledge and experience in the project approach is related to creative thinking skills. The project approach, in which children produce new ideas and opinions, propose hypotheses and conduct research, contributes to the development of children's creative thinking skills. In the project approach, the selection of subjects related to their culture and those that will allow them to easily connect to their daily life and history, provides content that is both interesting and easily understandable (Helm & Katz, 2010). Additionally, discovering the concepts and having the opportunity to discuss their ideas with others at the project will positively influence the creative thinking of children (Beghetto & Kaufman, 2014; Craft et al., 2014). Creative learning environments that take into account children's curiosity and interests support children's inquiries and creative discoveries (Öztürk Aynal, 2012). Considering the positive effects of changes in the classroom environment within the scope of specific themes or subjects on children's imaginations, it can be mentioned that the arrangements made in the learning environment during projects contribute to creative thinking skills (Çelebi Öncü, 2012). In addition, creating a social environment that enables children to interact with their peers and adults in the project approach is one of the key points that enhance creative thinking (Mayesky, 2012).

It is seen that the content of the project approach is similar to the child-centered basic principles of Ministry of National Education Pre-School Education Program (2013) [MoNE] such as supporting all developmental areas of children, teaching subjects as means rather than end and using daily life experiences and opportunities of the immediate environment for educational purposes. Based on these considerations, in this study, it was aimed to examine the effect of the project-based education program were integrated into the MoNE (2013) on the creative thinking skills of 61-66 month old children.

METHODOLOGY

Research Design

In order to evaluate the effect of the project-based education program on children's creative thinking skills a pretest, posttest, retention test experimental design with control group was used in this study. In the study, 2x3 mixed design was used consisting of experimental and control groups, pre-test, post-test, and retention test. In the mixed design, which is also called as split-plot factorial design, at least two variables influencing the dependent variables are examined (Büyüköztürk, 2010).

Study Group

The population constitutes the children aged 61-66 month old who were attending to kindergartens affiliated to in a province in the inner Aegean region of Turkey, provincial directorate of National Education during 2017-2018 academic years. The study group comprised a total of 44 children from two kindergartens, 22 of them assigned to experimental group and 22 to the control group aged between five and six years, who were randomly sampled among volunteer normal developmental children among the population. Additionally, to

prevent children from influencing each other, different kindergartens were selected for experimental and control group.

When the demographic characteristics of the children in the study group were examined, 54.17% of the children in the experimental group were girls, 45.83% were boys, 42.31% of the children in the control group were girls and 57.69% were boys; 50% of the children in the experimental group were the first child in the family, 29.17% were the second child, 16.67% were the third child, and 4.17% were the fifth child; 53.85% of the children in the control group were the first child in the family, 30.77% were the second child, and 15.38% were the third child. It was also determined that the parents of all children in the experimental and control groups were living together, 25% of the mothers in the experimental group were 29 years of age and below, those of 62.5% were between the ages of 30 and 39, the mothers of 12.5% were between 40 and 49 years of age; the mothers of 3.85% of the children in the control group were 29 years of age and below, those of 84.62% were between 30 and 39 years of age, and those of 11.54% were 40-49 years old; 12.5% of the fathers of the children in the experimental group were 29 years of age and below, those of 50% were between 30 and 39 years of age, and those of 33.33% were between 40 and 49 years of age, and those of 4.17% were between 50 and 59 years of age, while 73.08% of the fathers of the children in the control group were between 30 and 39 years of age, and those of 26.92% were between 40-49 years of age. In addition, it was detected that 70.83% of the children in the experimental group and 88.46% of the children in the control group previously attended to a kindergarten.

Instruments

“Personal Information Form” developed by the researchers was used in order to collect the demographical data of the children and “The Test for Creative Thinking-Drawing Production TCT-DP” was used, which was originally developed by Urban and Jellen (1996) and whose reliability and validity tests were conducted by Can Yaşar and Aral (2011b), in order to evaluate the creative thinking skills of children.

Personal Information Form

In the form developed by the researchers; there were items related to the gender of the child, the order of birth, the number of siblings, duration of preschool education, the age of the parents, the level of parental education.

The Test for Creative Thinking–Drawing Production TCT-DP

The Test for Creative Thinking-Drawing Production (TCT-DP) developed by Urban and Jellen (1996), is an examination tool that allows for the assessment of the creative potentials of individuals in a general, simple, and economical manner. The test, which can be applied to all individuals or groups over the age of five (5-95 years of age), consists of two forms given in a row, form A and B. The application takes approximately 15 minutes for each form. The test paper contains six pieces: a semicircle, a dot, a large right angle, a curved line, a dashed line, and a small open square outside a large square frame. “Large Square Frame” is not considered a formal part. Each form is evaluated immediately after the test is implemented, taking into account the evaluation criteria (Urban & Jellen, 1996). There are 14 evaluation criteria that

make up the structure of The Test for Creative Thinking-Drawing Production, and these criteria all together and interactively reflect the holistic concept of creative thinking (Can Yaşar and Aral 2011b). During the adaptation of The Test for Creative Thinking-Drawing Production (TCT-DP) for the six-year-old Turkish children, it was determined that the reliability coefficients for internal consistency varied between .74 and .77, and the reliability coefficient was determined for the entire test as Cronbach alpha (α)=.77 (Can Yaşar 2009, 95-99).

Project Approach-Based Education Program

Project Approach-Based Education Program was prepared by the researchers considering the achievements and indicators in the Ministry of National Education Preschool Education Program (2013). In this project, “Fabric”, “Flower” and “Delight” projects were prepared and in each project, the planning, implementing the project, finalizing the project and evaluating stages of the project approach were included. After preparing program, this program was presented to expert view and recommendations of experts on education program were considered.

Data Collection

After pre-tests were applied by the researchers, “Project-Approach Based Education Program” was administered to the children forming the experimental group. The children in the experimental group were given the project-based education program by the researchers three days a week for 10 weeks. Children in the control group continued their education in the framework of the Preschool Education Program of the MoNE (2013). The project-approach based education program was implemented in the classroom, in the school yard, and during the tours outside the school. Before starting each project, a concept map related to the project was established with the children and necessary updates were made in this network during the projects. Exhibitions were organized during the finalization phases of the projects, shared with the families of the children and evaluations were made over the project. After the implementation of the education program was completed, post-tests were applied to children in the experimental and control groups. Four weeks after the post-tests, retention tests were applied to children in the experimental group to test the permanence of education.

Data Analysis

In this study, descriptive statistics such as frequency and percentage were used to evaluate the demographic characteristics of children. As a result of the normality test (Shapiro-Wilk Test) of the scores obtained from The Test for Creative Thinking-Drawing Production, results showing non-distribution were obtained. The Mann Whitney U Test was used in paired groups for examining the differences among the groups, and the Wilcoxon Signed Ranks Test and Friedman’s Two-Way ANOVA tests were used in intragroup comparisons. The level of significance was accepted as 0.05 when interpreting results; $p < 0.05$ indicated a significant difference while $p > 0.05$ indicating the absence of a significant difference (Büyüköztürk et. al., 2012).

RESULTS

The findings of this research are given below.

Considering the Table 1; it was determined that there was statistically no significant difference among the pre-test score averages of the children for the Form A ($z=-0.397$, $p>.05$), among their pre-test score averages for the Form B ($z=-0.373$, $p>.05$), and their total (A+B) pre-test score averages ($z=-0.45$, $p>.05$) within TCT-DP.

Table 1

Mann-Whitney U Test Results concerning the Test for Creative Thinking-Drawing Production (TCT-DP) Form A, Form B, and total (A+B) Pre-Test Scores of Children in the Experimental and Control Groups

YD- ROT	Group	n	\bar{X}	Med.	Min.	Max.	ss	Mean Rank	z	p
A form	Experimental	22	5,77	6	4	9	1,6	21,75	-0,397	0,692
	Control	22	6,05	6	4	10	1,89	23,25		
B form	Experimental	22	6,77	7	4	10	1,82	24,83	-0,373	0,739
	Control	22	7	7	4	11	2,2	25,67		
Total (A+B)	Experimental	22	13,05	12,5	8	19	4,02	21,23	-0,45	0,74
	Control	22	12,8	13	8	21	3,65	23,91		

Examining the Table 2, it was determined that there was a significant difference between TCT-DP Form A, Form B and total (A+B) pre-test score averages and post-test/retention test score averages of the children in the experimental group participating in the project-approach based education program ($p<.05$). In addition, it was also observed that TCT-DP Form A, Form B and total (A+B) post-test scores are not different from the retention test scores, and the score averages are very close to each other.

Table 2

Friedman's Two Way ANOVA Test Results concerning The Test for Creative Thinking-Drawing Production (TCT-DP) Form A, Form B, and Total (A+B) Pre-test, Post-test, and Retention Test Scores of the Children in the Experimental Group

YDROT	Test	n	\bar{X}	Med.	Min.	Max.	ss	Mean Rank	Chi Square	p	Multiple Comparison Test
A form	Pre-test	22	5,77	6	4	9	1,6	1,02	38,861	0,007	1-2
	Post-test	22	8,41	8	6	12	1,87	2,41			1-3
	Retention- test	22	8,64	8	6	12	1,65	2,57			
B form	Pre-test	22	6,77	7	4	10	1,82	1,07	33,627	0,001	1-2
	Post-test	22	9,36	9	6	14	2,3	2,48			1-3
	Retention- test	22	9,23	9	6	14	1,97	2,45			
Total (A+B)	Pre-test	22	12,55	12,5	8	19	3,32	1	35,877	0,001	1-2
	Post-test	22	17,91	17,5	12	26	3,95	2,48			1-3
	Retention- test	22	17,86	17	12	26	3,54	2,52			

When Table 3 was examined, considering the post-test average scores of the children in the control group concerning the TCT-DP the difference between the pre-test post-test Form A scores were found to be statistically significant ($p < .05$), while the difference between the pre-test post-test Form B and total (A+B) scores was determined to be statistically not significant ($p > .05$).

Table 3

Wilcoxon Signed Ranks Test Results concerning The Test for Creative Thinking-Drawing Production (TCT-DP) Form A, Form B, and Total (A+B) Pre-test Post-test Scores of Children in the Control Group

YD-ROT	Test	n	\bar{X}	Med.	Min.	Max.	ss	Mean	z	p
								Rank		
A form	Pre-test	22	6,05	6	4	10	1,89	23,25	-2,309	0,031
	Post-test	22	6,68	7	4	12	2,21	24,5		
B form	Pre-test	22	7	7	4	11	2,2	25,67	0,346	0,732
	Post-test	22	6,91	7	4	11	2,09	25,33		
Total (A+B)	Pre-test	22	12,8	13	8	21	4,02	23,91	-1,082	0,292
	Post-test	22	13,59	14	8	23	4,26	24,91		

Considering Table 4 it was determined that there were statistically significant differences among the total post-test score averages of the children for the Form A ($z = -4,373$, $p < .05$), among their total post-test score averages for the Form B ($z = -4,582$, $p < .05$), and their total (A+B) post-test score averages ($z = -4,849$, $p < .05$) within TCT-DP.

Table 4

Mann-Whitney U Test Results concerning The Test for Creative Thinking-Drawing Production (TCT-DP) Form A, Form B, and Total (A+B) Post-test Scores of Children in the Experimental and Control Groups

YD-ROT	Test	n	\bar{X}	Med.	Min.	Max.	ss	Mean Rank	z	p
								Rank		
A form	Experimental	22	8,41	8	6	12	1,87	30,84	-4,373	0,001
	Control	22	6,68	7	4	12	2,21	24,5		
B form	Experimental	22	9,36	9	6	14	2,3	34,33	-4,582	0,001
	Control	22	6,91	7	4	11	2,09	25,33		
Total (A+B)	Experimental	22	17,91	17,5	12	26	3,95	32,83	-4,849	0,001
	Control	22	13,59	14	8	23	4,26	24,91		

DISCUSSION AND IMPLICATIONS

Creativity forms the basis of scientific and technological improvements and social development. Creative thinking needs to be supported from an early age since there is a potential that makes it easier for children to adapt to the conditions of their age (Englebright Fox & Schirmacher, 2014). When creativity skills of children are supported from the early childhood, they will be efficient, productive, and successful individuals in adulthood. It is stated that contemporary educational programs, which will arouse curiosity in children and enable them to make observations and discoveries, are important in growing creative individuals. Educational programs should be prepared so as to include materials, activities, and

different themes that improve children's basic skills and support their creative thinking skills (Çetin, 2012).

In this study, it was determined that there was statistically significant difference ($p.05$) between the pre-test score averages and post-test/retention test score averages concerning the Form A, Form B, and total (A+B) of TCT-DP of the children in the experimental group participating in the project-approach based education program, and it was also found that the effect of project-approach based education continued in the development of creative thinking skills of children in the experimental group. During the projects, in order to support creative thinking skills of children, it is considered of vital importance to provide flexible environments, in which children can move freely and apply what they have learned, and to interpret different answers to the questions they are researching (Alkhudhair, 2015). In previous research studies the literature, it was determined that creative education programs (Alfonso-Benlliure et al., 2013), cognitive skill support programs (İnal Kızıltepe et al., 2017), the storyline method (Smogorzewska, 2012) and play activities (Canning 2013; Rizi et al., 2011) have an effect on the creative thinking skills of children.

While the difference between pre-test post-test Form A scores of children in the control group was found to be statistically significant, it was determined that the difference between the pre-test post-test Form B and total (A+B) scores was not statistically significant ($p>.05$). It is thought that this difference, which was detected only in A-Forms of children in the control group, emerges from the fact that the children are in the developmental period and the change in their creative thinking skills. It was determined that there was a significant difference among the Form A, Form B, and total (A+B) post-test score averages ($p.05$) of the children in the experimental and control groups. It is observed that children participating in the Project-Approach Based Education Program have higher creative thinking scores than children who do not participate in the program. It can be mentioned that the difference in favor of the experimental group concerning the creative thinking skills emerges from the activities involved in the project-approach based education program that enable children to research, experiment, discover, learn, and take part in the process actively, and asking them open-ended questions that support their skills such as problem solving, cause and effect relationship, and providing them with rich materials. In addition, in the study conducted by Burns and Lewis (2016), it was determined that project-approach based education improves critical thinking and problem-solving skills of pre-school children, brings children concrete experiences and improved their creativity. Similarly, Metin and Aral (2014) determined that there was a statistically significant difference among the average skill scores of children, who received project-approach based education, concerning the Predictive Drawing, Observatory Drawing, and Imaginary Drawing subtests of the Silver Drawing Test. As can be seen, the findings of the mentioned research studies are in parallel with the findings of this research.

CONCLUSION

This study, which has shown that the studies based on the project approach, which are integrated to MoNE and include various themes, different activities and materials that develop children's basic skills, improve the creative thinking skills of children aged 61-66 months, has some limitations apart from the contributions it made to the literature. Based on this research, which was applied to a small study group and yielded positive results, the scope of the studies based on the project approach could be expanded to reach more widespread results. The use of

a single measurement tool in determining the creative thinking skills of children is also one of the limitations of this study.

This study, which was conducted to determine the effect of the project-approach based educational program on children's creative thinking skills, is limited to the number of children in the research group, and to the activities included in the project-approach based education program. As the conclusion of this research study, it was determined that the Project-Approach Based Education Program was effective in supporting children's creative thinking skills. In line with the the data obtained in the study, the following suggestions are made:

Education programs can be prepared based on different approaches for improving the creative thinking skills of pre-school children and experimental studies can be planned on the effectiveness of these programs.

Experimental studies can be conducted to examine the effects of project-approach based education on creative thinking skills together with other skills in different developmental areas.

Family involvement activities in the project approach can include the creative thinking skills within a relationship with life, and the efforts to support the creative thinking skills of parents and children.

Participation of pre-school teachers in trainings, seminars, and workshops on project approaches supporting creative thinking skills may contribute to their professional development.

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