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Effect of DEDEN-PjBL Model on Children's Creativity

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Abstract

This study aims to measure the effect of applying the Design, Explain, Develop, and Evaluation-Project Based Learning (DEDEn-PjBL) model on creativity in children. The research method is a quasi-experimental quantitative method with a non-equivalent one-group design by comparing pre-test and post-test values. Sampling used a saturated sample with a total of 15 students. Data was collected with an observation sheet in the form of a checklist. The collected data were analyzed using descriptive and inferential statistics using the paired sample t-test. The results of the data analysis showed that the mean posttest was higher than the mean pretest. The hypothesis test shows that the calculated t value is greater than the t table value with a significance value of 0.00, so it can be concluded that applying the DEDEn-PjBL model can increase children's creative abilities.

Keywords: *Creativity, DEDEn-PjBL Model, Children.*

Introduction

Creativity is an important attribute in education that can help students to develop critical, innovative, and independent thinking skills. Research shows that creativity is a complex phenomenon involving internal and external factors, such as talent, environment, and experience. Therefore, efforts are needed to identify factors that can increase creativity, such as providing challenges, freedom of thought, and constructive feedback. In addition, teachers also need to provide the necessary support and resources to assist students in fostering their creativity (Acar et al., 2017; Rupérez, 2020). Runco (2014), in his research, revealed that although creativity is often considered an important attribute in education, teachers lack the support to implement it in practice. Therefore, efforts are needed to identify a holistic framework for supporting creativity based on the available literature in the field of creativity. In addition, more explicit information is needed about practices related to creativity to assist teachers in cultivating creativity in students.

However, the current phenomenon shows that children's creativity is decreasing. According to Kim (2017), a decrease in children's creativity can be seen from the Torrance Tests of Creative Thinking (TTCT) test results, which show a decrease in scores in divergent and convergent thinking. This is caused by various factors, such as lack of time to play outdoors, lack of opportunity to explore, and lack of support from the surrounding environment. Therefore, it is necessary to make efforts to increase children's creativity. One way to do this is to provide opportunities to play and explore outdoors. According to Cheng & Lee (2018), outdoor play can increase children's creativity and problem-solving skills.

Playing outdoors by utilizing the lost part media, children can be actively involved in learning centered on exploration and interaction with natural objects. This allows them to develop the ability to observe objects' shapes, compare objects' weights, and classify objects in a fun and interactive way (Hasmawaty et al., 2023; Herlina et al., 2023).

In addition, providing challenges can also stimulate children's creativity. Chen et al. (2022) found that using the creative thinking tool SCAMPER in project learning can increase children's creativity. In addition, providing support and recognition for creative ideas produced by children can also increase children's creativity. In this article, we have discussed the importance of children's creativity, the phenomenon of creativity now, the causes of low creativity, and things that can be done to increase children's creativity. By increasing children's creativity, it is hoped that children can develop creative and innovative thinking skills that will be useful for their future. For example, thinking creatively and innovatively can help children solve problems, generate new ideas, and develop innovative products or services (Ata-Akturk & Sevimli-Celik, 2023; Ketabi et al., 2012; Musdalifah et al., 2020; Patston et al., 2021). Therefore, one of the teacher's efforts to increase children's creativity is applying the Project Based Learning (PjBL) model (Nurasih et al., 2022; Sadaruddin, Ahmad, et al., 2023).

However, applying the PjBL model cannot be applied standardly for early childhood, and it is necessary to develop it by considering the child's characteristics and developmental stages. Teachers need to choose the application of a suitable model to stimulate children's creativity. One of the models developed by Sadaruddin et al. (2023) has been tested to increase children's creativity, namely the Design, Explain, Develop, and Evaluation-Project Based Learning (DEDEn-PjBL) model. The DEDEn-PjBL model is quite effective in Stimulating the achievement of indicators of creativity, namely ability fluency, flexibility, originality, and elaboration of children (Munandar, 1997). So this research will look at the effect of the DEDEn-PjBL model on children's creativity in Kindergarten.

Method and Data

The research method chosen for this study is a quantitative experiment using a quasi-experimental design. This method was chosen due to the heterogeneous characteristics of the research sample (Amal et al., 2019; Sugiyono, 2017). The variables studied consisted of independent variables, namely the model DEDEn-PjBL, and the dependent variable is

children's creativity. This study used the saturated sample method for sampling by taking the entire population of 15 children from group B in TK.

The hypothesis in this study is to test whether the children were treated through a gardening project. Data was then collected using observation sheets, which measured children's creativity with indicators a) fluency, b) flexibility, c) originality, and d) elaboration. The collected data were analyzed using parametric inferential statistical methods, which required data normality, and test analysis was used to test the hypothesis paired *sample t-test* (Frey, 2023; Mee & Chua, 1991).

Results

Results of Needs Analysis

The application of the DEDEn-PjBL model can be felt authentically *(tangible)* and has the potential to help children increase creativity in the learning process (Kurnia & Nasrudin, 2022).

Table 1.1 Pretest and Posttest Data Normality Test

	Shapiro-Wilk		
	Statistic	df	Say.
Posttest	.918	15	.180
Pretest	.899	15	.091

Based on the table above on the normality test *Shapiro-Wilk* one pre-test with a value of 0.180 and post-test 0.091, with a 91% confidence level and value-alpha 0.05. based on the alpha value, the pretest and posttest values are more significant than 0.05, so the data is usually distributed.

Table 1.2. The Calculation Results Descriptive Pretest and Posttest

Descriptive Statistics						
	N	Minimum	Maximum	Sum	Mean	Std. Deviation
Pretest	15	60	74	1023	68.20	3.468
Posttest	15	80	91	1303	86.87	3.739
Valid N (list wise)	15					

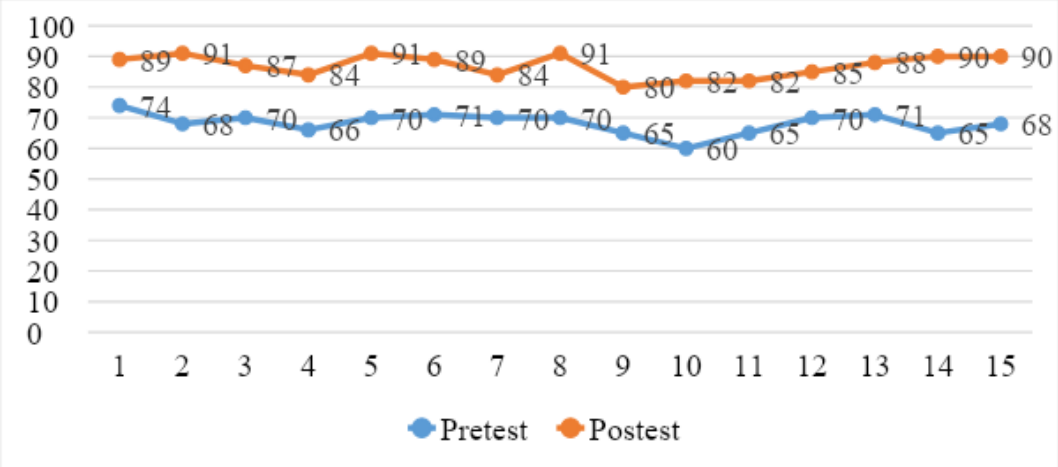
Table 1.2 shows the pretest class of 15 people with a minimum score of 60, a maximum score of 74, a total score of 1023, and a mean value of 68.20 with a standard deviation of 3.468. The value in the posttest class, the minimum score is 80, the maximum score is 91, the total score is 1303, and the average value is 86.87, with a standard deviation of 3.739. By seeing that the posttest mean value is higher than the pretest value, applying the DEDEn-PjBL model can increase children's creativity.

Table 1.3 Paired Sample T-Test Hypothesis Test

	t value count	T table value	df	Say.
Pair 1 Pretest-Posttest	21.166	1.761	14	0.00

Table 1.3 shows that the calculated t value is 21,166, and the t table value is 1,761 with a value of P=0.00. With these results, hypothesis H_0 which states there is no difference is rejected, and hypothesis H_1 stating that there is a difference, is accepted. This means that it can be concluded that the DEDEn-PjBL model can increase children's creativity in kindergarten.

Figure 1.1 Pretest and Posttest Comparison Chart



Discussion and Conclusions

The results showed that applying the DEDEn-PjBL model significantly positively affected children's creativity. Regarding creativity, playing using a project-based learning model improves children's ability to generate new and original ideas. In addition, playing projects also improve children's ability to solve problems, especially in terms of divergent and convergent thinking skills. This research addresses the importance of creativity in education and its impact on students' critical, innovative, and independent thinking development (Kim & Kim, 2017). Internal and external factors such as aptitude, environment, and experience influence creativity and support through challenge, freedom of thought, and constructive feedback are needed to enhance it (Acar et al., 2017). However, the implementation of creativity in learning is still limited. This research aims to identify a creativity support framework based on literature and concrete practices to stimulate students' creativity.

However, the current phenomenon shows a decline in children's creativity. Efforts are needed, such as providing outdoor play and exploration opportunities, which have been shown to improve children's creativity and problem-solving ability (Cheng & Lee, 2018). Challenging and supporting creative ideas also stimulates creativity (Chen et al., 2022).

The Project Based Learning (PjBL) model is an approach to improving children's creativity. The DEDEn-PjBL model stimulates children's creativity through the stages of Design, Explain, Develop, and Evaluation (Sadaruddin, Syamsuardi, et al., 2023). This study used a quantitative experiment with a quasi-experimental design, applying DEDEn-PjBL to early childhood in kindergarten. Creativity data were collected through observation sheets and analyzed with paired sample t-tests. This research is expected to provide an understanding of the effect of the DEDEn-PjBL model on children's creativity.

However, this study also found that other factors, such as the type of activity performed, could influence the DEDEn-PjBL model's positive effect on children's creativity. Therefore, further research is needed to explore these factors and how they influence project-based play's effects on children's creativity. In addition, this study also shows that the DEDEn-PjBL model can increase children's social and emotional engagement. Children who play project-based tend to be more physically active and more involved in social interactions with their peers. This can help improve children's social and emotional skills, such as communicating, cooperating, and regulating emotions. In conclusion, this study shows that the application of the DEDEn-PjBL model has a significant positive effect on creativity in children. Therefore, parents and educators should consider continuously providing opportunities for children to play project-based continuously. In addition, this study also shows that this positive effect is more significant in children who play in outdoor environments and younger age groups.

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