

The Influence of Eggshell Collage Making Activities on Fine Motor Development of Early Childhood with Special Needs

Putu Novi Ariasih^{1*}, Putu Rahayu Ujjanti² 

^{1,2}Pendidikan Guru Pendidikan Anak Usia Dini, Universitas Pendidikan Ganesha, Singaraja, Indonesia

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ABSTRAK

Kegiatan yang dapat menstimulus kemampuan motorik halus anak di sekolah inklusi belum dilaksanakan secara maksimal oleh guru. Maka dari itu penelitian ini bertujuan untuk membuktikan pengaruh aktivitas membuat kolase dari cangkang telur terhadap perkembangan motorik halus anak usia dini berkebutuhan khusus. Jenis penelitian ini merupakan penelitian eksperimen, dengan metode Pre-eksperimental Design dengan menggunakan rancangan penelitian One Group Pretest-Posttest Design. Populasi penelitian yakni anak usia dini berkebutuhan khusus di kelas 1 dan kelas 2. Pengambilan sampel dilakukan dengan teknik purposive sampling. Sampel penelitian terdiri dari dua kelas dengan total sampel sebanyak 5 anak. Metode pengumpulan data yakni metode observasi dan dokumentasi. Instrumen penelitian menggunakan pedoman observasi dan lembar daftar dokumentasi. Teknik analisis data metode statistik analisis deskriptif dan statistik inferensial. Hasil pengujian hipotesis penelitian dilakukan dengan menggunakan uji Paired Sampel T-Test yang menunjukkan bahwa nilai Sig. (2-tailed) < 0,05 (0,01 < 0,05). Sehingga dapat disimpulkan bahwa ada pengaruh signifikan dari aktivitas membuat kolase dari cangkang telur terhadap perkembangan motorik halus anak usia dini berkebutuhan khusus. Implikasi penelitian ini diharapkan mampu menjadi referensi aktivitas untuk mengembangkan kemampuan motorik halus siswa.

ABSTRACT

Activities that can stimulate children's fine motor skills in inclusive schools have not been implemented optimally by teachers. Therefore, this research aims to prove the effect of the activity of making collages from egg shells on the fine motor development of young children with special needs. This type of research is experimental research, with the pre-experimental design method using a one group pretest-posttest design research design. The research population is early childhood children with special needs in class 1 and class 2. Sampling was carried out using a purposive sampling technique. The research sample consisted of two classes with a total sample of 5 children. Data collection methods are observation and documentation methods. The research instrument uses observation guidelines and documentation checklist sheets. Data analysis techniques, statistical methods, descriptive analysis and inferential statistics. The results of research hypothesis testing were carried out using the paired sample t-test which showed that the sig. (2-tailed) < 0.05 (0.01 < 0.05). So it can be concluded that there is a significant influence from the activity of making collages from egg shells on the fine motor development of young children with special needs. It is hoped that the implications of this research will be a reference for activities to develop students' fine motor skills.

1. INTRODUCTION

Motor development is a process that is in line with increasing age, gradually and continuously, where individual movements increase from a simple, unorganized and unskilled state, towards mastery of complex and well-organized motor skills (Ashari, 2021; Fakhiratunnisa et al., 2022). In some children, exercise does not always help improve their motor skills. Gross motor skills require coordination of the child's muscle groups which of course can make the child able to jump, climb, run, ride a bike (Arminawati et al., 2021; Darmiatun & Mayar, 2019). While fine motor skills require hand and eye coordination such as drawing, writing and cutting. Fine motor skills in children must be developed optimally because these fine motor skills affect other aspects of learning (Azizah et al., 2022; Siti & Mayar, 2020). Unfortunately, activities that can stimulate students' fine motor skills in inclusive schools have not been carried out optimally by

teachers. In improving children's fine motor skills, the use of learning media is very important for educators. Given that children tend to choose to play rather than study.

The level of achievement of fine motor development in children aged 5-6 years includes drawing according to their ideas, imitating shapes, exploring with various media and activities, using writing tools and eating utensils correctly, cutting according to patterns, sticking pictures correctly, expressing themselves through detailed drawing movements (Fitriyah & Rochanah, 2019; Insana et al., 2022). Conducting exploration with various media and activities in learning for children with special needs can be done through collage activities. Collage is a two-dimensional work of art that uses various materials as long as the basic materials can be combined with other basic materials which in the end can be united into a complete work and can represent the expression of the aesthetic feelings of the person who made it (Amri, 2022; Kasta, 2019). Collage is a work of art or design made from an arrangement of pieces, stones, colored glass, porcelain, in the development of a mosaic, it has increased the diversity of works of fine art such as wall paintings (fresco), calligraphy works of art, handicrafts, decorations, architectural art and others (Primayana, 2020; Rahmawati et al., 2021). In improving fine motor skills in children with special needs, the use of learning media is a highlight that must be considered by educators.

Seeing this, the existence of collage as one of the media that can be used to improve the development of fine motor skills of early childhood with special needs, various educational institutions have used this media for learning activities. One of the institutions that uses collage media in learning activities is the Cahaya Impian Masa Depan Foundation. The Cahaya Impian Masa Depan Foundation is the only inclusive school in Buleleng Regency. Based on initial observations or observations carried out at the foundation, collage activities themselves have been carried out at the Cahaya Impian Masa Depan Foundation, collage media has been introduced to children in activities using used goods into crafts, such as examples of introducing leaf collages, and paper collages and grain collages.

Based on observations of learning carried out at the Cahaya Impian Masa Depan Foundation, children's fine motor skills have developed but are not yet optimal, so teachers need to develop children's fine motor skills at the Cahaya Impian Masa Depan Foundation. This can be seen when children are given activities related to fine motor skills such as cutting activities, children still experience difficulties so they still need help from teachers to complete their assignments, this problem can be seen when learning to create works of art. Teachers often develop children's fine motor skills through activities such as coloring, writing, folding and cutting. However, teachers rarely use fine motor activities such as collage activities in learning. So, the media used still tends to be lacking and still monotonous, which makes children feel bored. Therefore, researchers will make an agreement with class teachers to improve children's fine motor skills through eggshell collage activities.

Media that can be used to develop children's fine motor skills can use used goods, consisting of egg shells, used cloth, coconut pulp and dry leaves that can be used to produce creations that use one technique, namely the collage technique. The connection between collage and egg shells is that it can stimulate the development of children's fine motor skills, namely when children move their fingers and coordinate eye and hand movements well (Muarifah & Nurkhasanah, 2019; Mulandini et al., 2019). Collage is a technique commonly used is sticking, gluing and making a work with collage, through this activity the child will continue to move his fingers which are used to stick the egg shell to the picture. From the activity of sticking the child will be trained to take, put and others in order to develop fine motor skills, concentration and creativity of the child (Fitriyah & Rochanah, 2019; Kurniawati, 2021). In addition, children will also focus and concentrate on decorating the picture using eggshells so that the resulting picture becomes a beautiful work of art. This eggshell collage activity is designed with the aim of being able to develop aspects of motor development in children with special needs, especially in the aspect of fine motor development in children (Kurniawati, 2021; Mustiani et al., 2023).

The innovation of this research lies in the location and subjects studied, where the location of this research is in an inclusive school where most of the children have special needs. This research will be conducted for 3 weeks with the number of implementations in one week as many as 2 meetings, if totaled then there will be 6x collage making meetings. The activities that are usually carried out by children in the foundation are such as tearing paper, cutting and sticking, pinning pompoms, playing puzzles, playing lego, removing and attaching shirt buttons, cutting using a knife, pinning photos or works of art, drying clothes using clothespins, opening and closing zippers. The problems experienced by teachers and students require solutions. The alternative solutions provided are that learning is needed that facilitates children in their growth and development according to the age, needs and interests of the child. This study aims to prove the effect of making collages from eggshells on the development of fine motor skills of early childhood children with special needs. With this research, it is hoped that it can be one of the studies related to the use of collage activities in stimulating the development of fine motor skills of students in inclusive schools.

2. METHOD

This research is an experimental research type using the Pre-Experimental Design research design with the One Group Pretest-Posttest Design type. This research design only observes one experimental group to be given treatment because in this study there is no control group to be compared with the experimental group (Riyanto & Atmawan, 2020). This study will conduct a pretest (before being given treatment) and a posttest (after being given treatment) to determine whether there is a difference in the results of children's fine motor skills during the pretest and posttest. The population of this study was children from the Cahaya Impian Masa Depan Foundation (CIMD) totaling 275 children. In this study, the sample selection technique was Purposive Sampling. The sample of this study consisted of two classes with a total sample of 5 children. The data collection method used was the observation and documentation method, while the research instrument used observation guidelines and documentation list sheets. The instrument grid in this study can be seen in Table 1, Table 2, and Table 3.

Table 1. The Guidelines for Observation Instruments for Fine Motor Skills in Early Childhood

Dimensions	Indicator	Observation Points
Small Muscle Movement	Facial Muscles	<ol style="list-style-type: none"> Children use their eyes to concentrate on assembling a collage with small pieces. Children use their eyes to concentrate on putting together a collage with large pieces.
	Hand Muscles	<ol style="list-style-type: none"> Children use their fingers to assemble a collage with small pieces. Children use their fingers to assemble a collage with large pieces.
Eye-Hand Coordination	Timing (time)	<ol style="list-style-type: none"> Children stick the collage according to the specified time. Children complete the collage on time according to the guidelines.
	Accuracy (Precision)	<ol style="list-style-type: none"> Children assemble the collage correctly. Children stick pictures or large or small pieces of egg shell according to the instructions.

Table 2. The Early Childhood Fine Motor Skills Observation Sheet

No	Observation Items	Evaluation			
		BSB	BSH	MB	BB
		4	3	2	1
1.	Children use their eyes to concentrate on assembling a collage with small pieces.				
2.	Children use their eyes to concentrate on putting together a collage with large pieces.				
3.	Children use their fingers to assemble a collage with small pieces.				
4.	Children use their fingers to assemble a collage with large pieces.				
5.	Children stick the collage according to the specified time.				
6.	Children complete the collage on time according to the guidelines.				
7.	Children assemble the collage correctly.				
8.	Children stick pictures or large or small pieces of egg shell according to the instructions.				

Table 3. The Documentation List Sheet

No	Documented aspects	Documentation results	
		Yes	No
1.	Data on the results of students' fine motor activities		
2.	Student data		

No	Documented aspects	Documentation results	
		Yes	No
3.	Teacher data		
4.	Photos of research activities		

Data analysis techniques are activities to group data based on variables and types of respondents, describe data, test analysis requirements. To describe the data of each variable, statistics are used. This quantitative research uses descriptive analysis statistical methods and inferential statistics. Normality tests are carried out to test whether the data is normally distributed or not. The data of egg shell collage making activity will be calculated using the Shapiro-Wilk test in the SPSS 16.0 for windows program which is used to determine the data status. If the significance level is 5% and the significance value is more than 0.05 then the data is considered normally distributed. Conversely, if the significance level is less than 5% and the significance value is less than 0.05 the data distribution is considered abnormal. To find out whether the homogeneity of the variance between groups is met or not, a homogeneity test will be carried out. By evaluating using the Levene's test with the SPSS 16.0 for windows statistical analysis tool and by making decisions and drawing conclusions based on hypothesis testing carried out with a significance level of 5%, a hypothesis test can be carried out regarding the homogeneity of the variance. So, it can be concluded that the variance is the same (homogeneous) if the significance is greater than 0.05, but if the variance is different (not homogeneous) if the significance is less than 0.05.

Hypothesis testing is used as the final data analysis technique in testing the effect of eggshell collage making activities on the fine motor development of early childhood with special needs. Paired Sample T-Test is used to test the difference between the average values of using eggshell collage media and those not using eggshell collage media. Hypothesis testing in this study was conducted to see if there was a significant difference between the group averages before and after treatment to see the effect of eggshell collage activities on the fine motor development of early childhood with special needs at the Cahaya Impian Masa Depan Foundation (CIMD). By comparing the average state variables of the two samples, this test is used to assess the ability to generalize (significance of research findings).

3. RESULT AND DISCUSSION

Result

The data analyzed in this study were data on the fine motor skills of early childhood with special needs at the Cahaya Impian Masa Depan Foundation (CIMD) for the 2024/2025 Academic Year. The data on the results of fine motor skills were obtained from the pre-test and post-test results. The sample used in this study was 5 children. The research design used in this study was the Pre-Experimental Design design because it did not have a control group and the experimental design used was the One Group Pretest Posttest Design. Description of the final value data for children's fine motor skills which describes the average (mean), median, mode and standard deviation. The recapitulation of the final value data can be seen in [Table 4](#).

Table 4. The Recapitulation of the Results of the Description of Fine Motor Skills of Early Childhood with Special Needs

Analysis Results	Pretest	Analysis Results	Posttest
Mean	17.80	Mean	27.80
Median	19.00	Median	28.00
Mode	19	Mode	23
Span	6	Span	8
Maximum	14	Maximum	23
Minimum	20	Minimum	31

Normality test is conducted on pre-test and post-test experimental score data. Normality test with Shapiro-Wilk calculation with the help of SPSS application. Recapitulation of normality results can be seen in [Table 5](#). Based on [Table 5](#), the results of data processing with the SPSS application using the Shapiro-Wilk test can be stated that both data are normally distributed because seen from the significance value of the pre-test experiment that the significance value (Sig.) Is 0.294 and the post-test experiment that the significance value (Sig.) Is 0.670 with the Shapiro Wilk calculation. So, it can be concluded that the results of the data normality test are greater than 0.05 (> 0.05) which means it is normally distributed. Homogeneity test is conducted on pretest and posttest experimental score data. Homogeneity test with

Levene statistic calculation with the help of SPSS application. To find out whether homogeneity is fulfilled or not, a homogeneity test is conducted using Levene's statistic. Recapitulation of homogeneity results can be seen in [Table 6](#).

Table 5. The Normality Test Results

		Tests of Normality					
		Kolmogorov-Smirnova			Shapiro Wilk		
	Group	Statistics	df	Sig.	Statistics	df	Sig.
Pretest	Pre-test	0.292	5	0.188	0.877	5	0.294
	Post-test	0.199	5	0.200	0.941	5	0.670

Table 6. The Homogeneity Test

		Tests of Homogeneity of Variances			
		Levene Statistics	df1	df2	Sig.
Pretest	Based on Mean	0.163	1	8	0.697
	Based on Median	0.225	1	8	0.648
	Based on Median and with adjusted df	0.225	1	7.955	0.648
	Based on trimmed mean	0.157	1	8	0.702

Based on [Table 6](#), by making decisions and drawing conclusions from the mean results, namely with a value of 0.697. Based on Levene's homogeneity test, all significance values (Sig.) Show values above 0.05 (Sig. > 0.05) and it can be concluded that the research data comes from a homogeneous population. Based on the normality test of data distribution, the results of the pretest and posttest of the experiment are normal. After obtaining the results of the normality test of data distribution, it is continued with testing the research hypothesis using the Paired Sample T-Test analysis method. Based on the data in the Paired Sample T-Test, the significance value is obtained. The results of the t-test can be seen in [Table 7](#).

Table 7. Paired Sample T-Test

		Paired Samples Test								
		Paired Differences						t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference						
				Lower	Upper					
Pair 1	Pretest - Posttest	-10.000	1.581	0.707	-11.963	-8.037	-14.142	4	<0.001	

Based on [Table 7](#), shows the results of the paired samples test, it is known that the Sig. (2-tailed) value <0.05 (0.01 <0.05), this indicates that H_0 is rejected and H_a is accepted. So, it can be concluded that there is an average difference between the pretest and posttest results, which means that there is a significant influence of the activity of making collages from eggshells on the development of fine motor skills of early childhood with special needs at the Cahaya Impian Masa Depan Foundation (CIMD).

Discussion

Collage creativity for children is the ability to process fine arts that is manifested by the skill of arranging and gluing parts of natural materials, artificial materials, and used materials or waste materials on drawing paper or the base area used, until a unique and interesting arrangement is produced. Collage is a technique of sticking various kinds of materials other than paint, such as paper, cloth, glass, metal and so on, then combined with the use of paint or other techniques ([Sidabutar & Siahaan, 2019](#); [Watini, 2019](#)). Collage works can be divided into several aspects, namely the aspects of function, dimension, pattern and material. Collage can also provide benefits in training children's fine motor skills when doing collage activities, some children may experience obstacles because they require fine movements of the fingers to take materials, glue and stick them on the image area. With direct practice, it can stimulate children's fine motor skills and their fingers will be ready to be invited to learn to write ([Sulastri & Astuti, 2021](#); [Timansah & Nurhadiyah, 2023](#)). Egg shells are one of the households wastes whose potential is rarely seen. Egg shells themselves are hard because they are coated with cuticles and have a smooth surface, and are firmly bound

to the outer membrane layer. On the egg shell there are many pores that are useful as air exchange channels to meet the embryo inside. Egg shells are the outer layer of the egg that functions as a protector of all parts of the egg from damage.

ToolEntertaining learning is very necessary for early childhood because they will find it interesting and will focus on the learning media used. This is because egg shell collage can involve children in using their motor skills (Lestari et al., 2024; Primayana, 2020). Early childhood is the golden age to develop all the abilities they have, especially their fine motor skills. Fine motor skills are the ability to use hand muscles well, especially the fingers, including folding with the fingers, grasping, pinching with the fingers, and finally sticking (Susiani et al., 2018; Wandu & Mayar, 2019). The maturity of motor skills in children, children will not feel stiff in moving their hands and feet. Therefore, stimulation is needed to train the strength of children's fingers and eyes. The environment has a big influence on children's fine motor intelligence, the environment can increase or decrease the level of intelligence of children (Timansah & Nurhadiyati, 2023; Watini, 2019). Therefore, children need stimulation to maximize their mental and fine motor skills so that the more stimulation, the more things can be done and without stimulation and lack of proper stimulation, children will quickly become bored and uninterested in learning.

Before the eggshell collage activity was carried out, some children still had difficulty and were stiff when using their hand muscles in folding, pinching and sticking activities. However, after the sticking activity was carried out, the results looked good, seen from how the children folded, pinched, grasped and stuck correctly according to the eggshell and the pictures provided. Children have shown positive progress in making progress in showing adequate ability in imitating the given shape (Nofianti, 2020; Sidabutar & Siahaan, 2019). In addition, they stick with fairly good accuracy and show increasingly developed eye-hand coordination. So it can be seen that there is a difference between before and after the child does the eggshell collage. The eggshell collage activity uses eggshell media and pictures which are sticking activities with picture shapes according to those provided is one of the activities that can improve the fine motor skills of children at an early age with special needs. Through this eggshell collage activity, children can explore themselves in sticking, squeezing and pinching. In addition, it can train children's concentration when trying to hold objects that will be attached (Hasanah et al., 2023; Mardini & Aulia, 2022). The benefits of collage can help children's fine motor skills because in this activity children can do various activities that can develop children's fine motor development. The effectiveness of doing collage activities or activities can also have an effect on the fine motor skills of early childhood children with special needs (Ardina et al., 2019; Fitriah & Rohita, 2019). Collage activity is an activity that can be carried out to help the development of children's fine motor skills.

Although this study has succeeded in achieving the research objectives, there are several limitations in this study. The limitations of this study are that in this study the research conducted was limited to one place, namely the Cahaya Impian Masa Depan Foundation (CIMD) to be used as a research location. If the research was conducted in another different place, the results might be different. In this study, only the influence of eggshell collage making activities on the development of fine motor skills of early childhood with special needs at the Cahaya Impian Masa Depan Foundation (CIMD) was studied. Where the researcher focused on children who experienced obstacles in their fine motor skills. This research was conducted during the writing of the thesis. This short time is included as one of the factors that can narrow the scope of research (Mahfud & Yuliandra, 2020; Siti & Mayar, 2020). So that it can affect the results of the research that has been done. It is hoped that in further research, research can be conducted in different places, and can examine other children's motor skills and aspects.

The implications of this study are that it can be used as input for teachers to choose an appropriate and varied learning method in learning, one of which is by collage or sticking in developing children's fine motor skills. Collages that use eggshell media can improve concentration and motor development, especially in children's eyes and hands, preparing the media needed in learning activities using eggshell collage focus on children's involvement in developing their fine motor skills properly and well.

4. CONCLUSION

Based on the results of the research hypothesis testing, there is an influence of eggshell collage activities on the development of fine motor skills of early childhood with special needs at the Cahaya Impian Masa Depan Foundation (CIMD). The selection of eggshell collage can affect the fine motor skills of early childhood with special needs. This study proves that eggshell collage is applied as a development of social behavior skills of early childhood with special needs at the Cahaya Impian Masa Depan Foundation.

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