Modeling and positive reinforcement techniques in improving children's fine motor skills

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Abstract
Fine motor skills are essential to support educational activities, such as writing. Therefore, children's fine motor skills need to be trained in order not to be delayed or hampered. The purpose of this study is to ascertain how well playdough modeling and positive reinforcement methods work to enhance children's fine motor abilities. This study employed a quasi-experimental using a one-group pretest-posttest research design. The participants in this research were 7 children (3 girls and 4 boys) with the following characteristics:(1)aged 4-10 years; (2) possess a low category in fine motor skills; ()willing to follow modeling techniques by playing with playdough and positive reinforcement techniques from start to finish. The data collection technique used in this study was the Frostig test during pretest and posttest. The obtained data were analyzed using the gain score and the U-Mann Whitney test. The results of data analysis obtained a significance value of 0.047 (p<0.05), indicating that playdough modeling techniques and positive reinforcement techniques affect increasing fine motor skills in children.

INTRODUCTION

Writing is a basic skill children need for school (Riskayanti & Suwardi). Writing is influenced by children's fine motor skills. To develop their ability, activities are needed that can influence each individual's fine motor skills. Saputra and Rudyanto (2005) explain that children's fine motor skills are activities that involve the ability of children's fine muscles such as writing, squeezing, grasping, drawing, and many more. Children's development will be hampered if their fine motor skills are never stimulated or trained. Therefore, parents and teachers must stimulate children to be able to write and read (Laksmi et al., 2020).

Education is not something that can be taken lightly, especially for children. Through the education process, children receive training to develop their creative talents and skills to become highly competitive in Human Resources (HR) (Mardhiyah et al., 2021). There are several factors in which a child does not receive proper education, both internal and external factors, such as intelligence, motivation, level of awareness, dislike of school, culture, economics (poverty), family, unsupportive environment, and the child himself (Lestari et al., 2020). However, many children have received proper education, after realizing the importance of education for social life by increasing understanding and awareness through the culture of reading and writing which is also important for fostering children's love for Indonesian social culture and the importance of education (Aliyyah et al., 2021).

However, in reality, not all children are lucky to be able to go to school. UNICEF's data shows that around 4.1 million children and teenagers are not in school. Children who do not go to school usually join communities to study or support education, commonly referred to as non-formal education. A study conducted by Anisaturrahmi (2021) explains the effectiveness of the learning process through the community. The results found that there are visible significant improvements in achievements and behaviour. Another research by Nursekti (2020 also found that the role of the community is important in meeting children's learning needs with an approach of seeking what learning is needed. The community exists to increase their motivation to study and obtain non-formal education, to be able to compete in the wider environment. Considering that non-formal education held by the community is very efficient in empowering the community because the aims and functions of its implementation are intended for the community (Lukman, 2021). Recently, many communities have emerged to help educate the nation's children, whose role is rarely highlighted and receives little support from the government (Zikargae, 2022). The community presents with a sustainability orientation that utilizes non-formal education and leads to increased exchange of information, environmental awareness and acquisition, and use of skills (Zikargae, 2022). As a process that provides opportunities for the younger generation to develop values, skills, and competencies, non-formal education by the community can make a big contribution to overcoming various issues, including children lacking writing skills due to poverty (Abdullahi, et al., 2022). The role of the community in society can provide an example for children with poor fine motor skills such as writing. The importance of this role is to be able to support children who are left behind, in order to be literate (Sangadji et al., 2021). Accordingly, various creative methods can be employed.

According to Bandura's theory, modeling techniques are a learning activity that can be obtained through direct and indirect experience by observing other people's behavior and its consequences (Puspitaningrum, 2018). It is a way of learning by making observations, patterns (characters) of observed behavior, and involving cognitive processes (Rismawati, 2017). Michigan State University Extension (2017) believes that when children play with playdough, the muscles in their hands and fingers will become stronger for children to use when holding pencils, cutting, et cetera. Based on research conducted by Sari and Rakimahwati (2018) regarding improving fine motor skills through playing with playdough in Kindergarten cycle II. Children who play playdough are proven to have higher creativity scores than their friends who do not play playdough (Kamala & Chandra, 2020). Therefore, researchers want to use modeling techniques by playing with playdough considering that it is effective in improving children's fine motor skills.

Positive reinforcement (Murpratiwi et al., 2018) given to someone in a certain situation to create a desired situation, tends to make people do the same thing to meet again in the same situation. There are many effects of giving positive reinforcement supported by several research findings which prove that there is an effect of giving positive reinforcement on children's motivation, independence, self-confidence, initial writing ability, and even the effectiveness of learning to write (Murpratiwi et al., 2018; Putri, 2019; Assyfa, 2021; Arief, 2018; Burieva, 2020). This shows that children need to be supported for every positive behavior and given positive reinforcement if they make a mistake. Therefore, children will not be afraid and bored. They

will be brave enough to say they do not want to try other things, especially for what they cannot and is something new. Previous studies only focused on using one of the modeling techniques or positive reinforcement techniques. Yet, in this study, researchers combined playdough modeling techniques and positive reinforcement techniques. Moreover, children's fine motor skills were measured during the pretest and posttest using the Frostig test (one of the measurements to see fine motor skills). This research was a community-based study where no previous research has been community-based.

Based on the explanation above, this research aims to test the effectiveness of modeling techniques using playdough and positive reinforcement techniques in improving children's fine motor skills. This research hypothesizes that modeling techniques using playdough and positive reinforcement techniques are effective in improving fine motor skills in children. This study is expected to contribute to scientific studies, professional recommendations in the field of clinical and developmental psychology, and the community as an effective application for their contributions. This research aims to find out whether modeling techniques using playdough and positive reinforcement techniques are effective in improving children's fine motor skills.

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METHOD

This research employed experimental research using a one-group pretest-posttest research design. In this research, playdough modeling techniques and positive reinforcement techniques were used as independent variables, and the level of fine motor skills as the dependent variable. At the beginning of the research, the dependent variable was measured on the subject, then after treatment was given, the dependent variable was measured again on the subject with the same measuring instrument (Azwar, 2007). Participants in this research were children from the Dadali Reading Park Community in Gresik. The population in this community is 11 children. The participant selection used a purposive sampling technique. This sampling technique does not provide the same chance to other populations of being sampled-sampling by the considerations of this study (Heryana et al, 2022). The subject criteria were as follows: (1) participants aged 4-10 years; (2) participants had a low category in fine motor skills based on the Frostig test (pretest),an initial screening; (3) participants were willing to joint modeling techniques by playing with playdough and positive reinforcement techniques from start to finish. The data collection technique in this research used the Frostig test which aims to assess the condition of the fine motor skills level of the pretest and posttest research subjects. There were three stages to be carried out at the implementation procedure as follows: (1) Carrying out a pretest with the Frostig test; (2) Treatment (given modeling techniques using playdough and positive reinforcement techniques. Design a

form of positive reinforcement in the form of food/drink/social verbal/non-verbal/activities like); (3) Carrying out a posttest with Frostig test.

Based on the score of the pretest with the Frostig test, it was found that 7 (3 girls and 4 boys) out of 11 children with low points had poor fine motor skills and met the criteria mentioned above. The analysis of the research The statistical analysis data uses the U-Mann Whitney test with a significance level of 5% (p<0.05), meaning of the hypothesis is accepted. The data obtained regarding the level of fine motor skills used in the calculations for this research is the difference in score (gain score) between the scores at the pretest and posttest. In addition, to verify the hypothesis in this research, statistical analysis uses the U-Mann Whitney test. All analysis in this research was assisted by the statistical analysis software Jeffreys's Amazing Statistics Program (JASP) for Windows.

RESULTS AND DISCUSSION

Data were collected from a total of 11 children who participated in the sampling. It was found that 7 (3 girls and 4 boys) out of 11 children met the criteria after carrying out the pretest. Participants who were in the age range of 4-10 years old previously received less stimulation due to not going to school at the age when they should have gone to school. This is due to the family's economic poverty and low motivation. The Dadali Reading Park Community is a forum for these children to receive education through activities, one of which is writing. Data were obtained from observation and treatment carried out 8 times. The collected data were then analyzed. The data obtained on the level of fine motor skills was used in calculating the gain score or the difference in scores during the pretest and posttest. To prove whether the hypothesis is rejected or accepted, this research employed the U Mann-Whitney test analysis.

Table 1. Pretest and Posttest Results from the Frostig Test

No.	Subject	Level of Fine Motor Skills		
		Pretest	Posttest	Gain Score
1	RN	60	75	15
2	IF	72	93	21
3	RS	81	87	6
4	RF	93	102	9
5	AN	84	93	9
6	FZ	84	102	18
7	DD	102	114	12
	Average	82.29	95.14	12.86

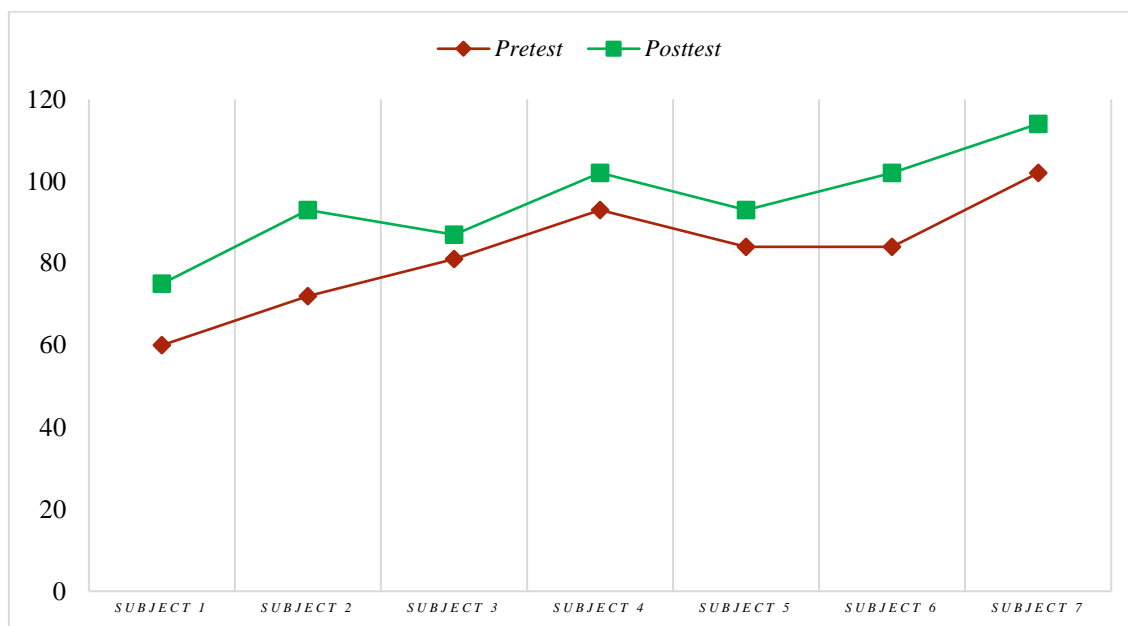The research data presented in Table 1 above can be further depicted in the diagram below:

Figure 1. Fine Motor Skill Measurement Results

Further, hypothesis testing was carried out using the non-parametric statistical test Mann Whitney-U test on the pretest and post-test scores. Two independent groups' values were compared using this test. A statistical explanation of data analysis with the Mann Whitney-U Test is provided below:

Table 2. Mann Whitney-U test results (Independent Samples T-Test)

	W	df	p
Mann Whitney-U Test on the pretest and posttest score	11.000	-	0.047

The results above describe that the hypothesis is accepted with a significance value of 0.047 ($p<0.05$), indicating that modeling techniques by playing with playdough and positive reinforcement techniques affect increasing fine motor skills in children. The pretest and post-test measurement graphs show that all subjects experienced an increase in their fine motor skills. Before treatment was carried out using playdough modeling techniques and positive reinforcement techniques, it was discovered that the subjects' average pretest result was 82.29. After treatment, the subjects' average post-test result was 95.14. This means there is an increase of 12.86. Thus, it can be assumed that these two techniques influence the improvement of fine motor skills.

The increase in fine motor skills that occurs in subjects can be caused by several things. This playdough activity is a fun activity for children to stimulate the development of fine motor skills in children. Furthermore, a statement made by Solehuddin in Sari (2013) that playing is a fun activity is supported by Marsiah (2019) that fun and process are the main things for children in playing in order to be able to create imagination and creativity in children. Sari & Rakimahwati (2018) in their research found that playdough can improve children's fine motor skills at Quraniah Air Runding West Pasaman, with the average percentage score in the very well-developed category reaching the Minimum Mastery Criteria (MMC).

Plasticine playing activities can improve the fine motor development of children aged 5-6 years, as well as increase learning completeness and children's creativity (Kamala & Chandra, 2020). Activities for playing playdough include pressing, feeling, rolling, flattening, and so on. It can also coordinate fingers, flex finger muscles, train perseverance and patience, as well as developing children's imagination and creativity (Feminin & Pusari, 2016; Mardiah et al., 2017). Sulastianto (2006) explains that forming objects with playdough can be done in various ways, including forming without rotation and using rotation, such as by massaging. The subjects of this research stated that playing with playdough by massaging and pressing is fun, especially for this elastic object. They also looked like really enjoyed playing.

According to Pamadhi (2008), the benefits of playing playdough are that children can recognize objects around them, develop brain function and taste, and develop technical life skills. Therefore, this game is a good step to improve children's fine motor skills. Children's fingers will get stronger if they regularly use this fun activity. Accordingly, they can develop the skills of holding a pencil, buttoning clothes, cutting, holding a brush perfectly, and much more (Pangestika & Setiyorini, 2015; Sari et al., 2015).

The treatment process of playing with playdough was carried out for eight sessions. The researchers observed the subjects during the treatment using playdough as a medium, and the subjects were able to imitate what was instructed in this treatment for each indicator that had to be done. Hidayah (2023) suggested that the modeling technique is an effective and efficient way to apply it in a treatment because of its several advantages. This is supported by a study conducted by Indri (2021) on children with Down syndrome, which found that modeling techniques by imitation are effective in improving children's fine motor skills, namely using spoons correctly in children, and can increase motivation in learning. The modeling technique enabled children to learn a lot by observing and imitating what they saw from the model that appeared in front of them. RF, IF, AN, and DD mentioned that playing playdough can be done easily because they only needed to imitate what was exemplified, and playdough is not a difficult game to play. Subjects reported feeling happy and motivated to be able to do the same thing as what was in front of them.

There are various colors in playdough. However, using too many playdough colors in treatment can break a child's focus (Fitria, 2022). Therefore, only one or two colors are given to children or subjects in this study. Therefore, they can be focused and proceed with the given instructions and will not be distracted. Apart from that, the observation found that several subjects, such as RS subjects, were initially confused by the instructions given during the playdough play treatment. Therefore, researchers gave instructions by repeatedly giving examples to the subjects by providing physical gesture directions. After that, all subjects no longer felt confused.

Positive reinforcement is a learning system that is provided when students or children display the expected behavior when carrying out their assignments. Its form can be in the form of verbal reinforcement, gestural reinforcement, social reinforcement, activity reinforcement, and sign reinforcement (Putri, 2019). Verbal reinforcements such as "Good Job!", "You can do it, you only need to press it a little more!", "You did great!" and many more, made the subjects show different behaviors, from an initially gloomy expression to

being enthusiastic again and completing the treatment session to completion. The motivation provided by the people around them greatly influences future behavior, from being less focused due to the influence of the surrounding environment and friends to being more focused and enthusiastic. Apart from verbal, and non-verbal positive reinforcement was also given to subjects to continue to be motivated to play playdough and complete all experimental indicators, such as giving them snacks they like, stationeries, books, and other supporting and useful things for them. In line with research by Rianti, Syamsuardi, and Jenny (2022), the use of positive reinforcement techniques minimizes children's doubts about being creative with playdough because they are always given motivation such as verbal reinforcement. Positive reinforcement also makes the subject more enthusiastic about pressing, squeezing, and rolling the playdough as part of the treatment process.

Based on the explanation above and previous review of literature, it can be seen that modeling techniques using playdough can be used and are effective in improving the fine motor skills of children at underdeveloped and adequate ages. Playing with playdough does not make children bored when playing with it, because of its elasticity which makes this toy easy to press, squeeze, and hold. Moreover, children can create things and be creative when playing with playdough. However, in most cases, the color given can break the child's focus during the treatment session. Yet, when children start to lose focus, giving positive reinforcement can be done to restore their focus. Positive reinforcement makes children enthusiastic about playing playdough again.

CONCLUSION

It can be concluded that providing modeling techniques by playing with playdough and positive reinforcement techniques has proven to be effective in improving children's fine motor skills in the Dadali Reading Park Community in Gresik. This can be demonstrated by the increase in pre-test and post-test scores. The results of this study show the expected potential to provide the community with the widespread knowledge that modeling techniques and positive reinforcement techniques can be applied by the community to children to help them improve. Moreover, it can also help children who cannot yet write, even at an age when they should be to be able to write by receiving the right stimulation at the right age.

Unfortunately, there are limitations in this study and areas that future research should address. One of them is a larger population and sample size to see higher effectiveness figures and produce more data results. Consider the surrounding environment when carrying out treatment to reduce distractions from focusing on the subject. Combining educational games can also be done to reduce boredom in children, and give them time to play other things to restore focus.

of this research can be useful in the future both in terms of science or knowledge in various fields as well as results and community development.

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