



# Kinetic Sand and the Coordination of Eye and Hand for Children in Gorontalo

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**Abstract.** This study aims to determine the data of playing kinetic media on the coordination ability of children's eye and hand movements. This research is quantitative research with experimental methods. It uses a research design of one group pretest-posttest that is giving a test before and after being given treatment with the research subjects are 22 children of 5–6 years old. The results showed a significant difference in the average value of the child's eye and hand coordination abilities before and after the treatment, as evidenced by the values obtained in the pretest and post-test data were 40.9% and 68.1%, respectively. While the calculation of the T-test obtained a significant value  $< 0.05$  that is 0.00 then  $H_0$  is rejected. These results prove that there is a significant effect before and after the treatment.

**Keywords:** Early Childhood Education · Kinetic Sand · The coordination of eye and hand

## 1 Introduction

Early childhood education [1] is a level of education which is the foundation of human long-life education which is a coaching effort that is shown to children from birth to eight years old and is carried out through the provision of educational stimulation to help physical and spiritual growth and development so that children have readiness in entering further education held on formal, non-formal and informal channels. Early childhood has great potential to optimize all aspects of development including the development of eye and hand coordination abilities.

According to Sujiono (2010: 75) eye and hand, coordination is the perceptual ability of movement patterns related to the ability to choose an object. Objects are seen from the movements that are arranged. Meanwhile, according to Tanila (2012) eye and hand coordination is a person's ability to assemble several elements of motion into a movement that is in harmony with its purpose or the ability to perform a movement task with flexibility and accuracy which often involves feelings and a series of muscle coordination that affects movement.

The benefits of developing eye-hand coordination are things that have a use value that can provide results and benefits. In Tanila (2012) with this activity children can express themselves through various kinds of hand movements, can flex the child's fingers,

coordinate muscles and eyes, practice skills in combining colours and prove feelings for hand movements.

The children's world is playing. There is a need for games that can help in the process of Children's growth and development. Kinetic sand is a suitable game that can be used as a learning medium. According to Virgiwati (2015), kinetic sand is a cleaner and safer sand for children, whose use is accompanied by the use of symbols such as miniature animals, fruit and other small toys. Meanwhile, another opinion in Dayanti (2019) Kinetic sand is often also called magic sand, which is a mixture of sand with synthetic materials that produces sand with a softer texture than beach sand, not messy, it just sticks to the kinetic sand itself. Maybe with the presence of kinetic sand children can make artificial sculptures that can improve brain development, thinking skills, imagination and fine motor skills.

According to Nurlaili (2019), the benefits of playing with kinetic sand include stimulating children's fine motor nerves because children can feel the sand flowing through their fingers like a fluid that moves gently but remains dry and doesn't leave dirt on their hands. Meanwhile, according to Jatmika (Dayanti 2019:26) kinetic sand is very useful for training and building children's fine motor skills, building emotional social during the process of playing together, easy to shape, and providing fun, and relaxation for children and parents through various desired imaginations.. With this game there is no separation between playing with the child. This means that children have direct contact with kinetic sand games which provide a different experience. Playing kinetic sand can also develop smooth muscles in children including developing the muscles of the fingers through squeezing, grasping, clenching, squeezing, and pressing to create a shape. At the same time can develop the ability of eye and hand coordination.

## 2 Research Method

Penelitian ini dilaksanakan pada anak kelompok B di TK Nusa Indah kecamatan Telaga Jaya, Kabupaten Gorontalo adapun penelitiann ini merupakan penelitiann kuantitatif dengan menggunakan metode eksperimen. Penelitian ini menggunakan desain penelitian one-grub pretest-postest yang memberikan tes sebelum dan sesudah diberikan perlakuan. Subjek dalam penelitian ini berjumlah 22 orang anak. Diantaranya laki-laki berjumlah 12 anak dan perempuan berjumlah 10 anak.. Sebelum melakukan penelitian terlebih dahulu melakukan uji validitas terhadap instrumen yang digunakan selanjutnya melakukan normalitas dan uji hipotesis.

## 3 Result and Discussion

### 3.1 Result

This study obtained data from observations before being treated (Pretest) kinetic sand games and observations after being treated (posttest) kinetic sand games. This study uses research instruments using 3 indicators including squeezing, shaping, and printing. The presentation of the results of the pretest-posttest of the child's ability to carry out

**Table 1.** The Distribution of Pre-test

<b>Data <i>pre-test</i></b>	<b>Frekuensi</b>	<b>Frekuensi kumulatif (fk)</b>	<b>Frekuensi relatif (fr)</b>
12–14	5	5	22,7%
15–17	9	11	40,9%
18–20	7	18	31,8%
21–23	1	22	4,5%
Jumlah	22		100%

**Table 2.** The Distribution of Post-test

<b>Data <i>post-test</i></b>	<b>Frekuensi</b>	<b>Frekuensi kumulatif (fk)</b>	<b>Frekuensi relatif (fr)</b>
21–23	2	2	9,1%
24–26	1	3	4,5%
27–29	5	8	22,7%
30–32	5	13	22,7%
33–35	5	18	22,7%
36–38	4	22	18,1%
Jumlah	22		100%

squeezing, shaping and printing activities which can be seen descriptively on the ability to coordinate eye and hand movements obtained the following results:

In the Table 1 above, the highest number of respondents is in the pretest data 15–17 with the number of respondents being 9 or 40.9% while the total score for the data is the lowest number of respondents at 21–23 as much as 1 or 4.5% while the posttest is as follows:

In Table 2 above there are 3 highest numbers of respondents who are in the post-test data 23–35 with the number of respondents being 15 or as much as 68.1% while for the total score of the data the lowest number of respondents is at 24–26 as much as 1 or 4.5%.

### 3.1.1 The Normality Test

The results of the pretest-posttest normality test in the experimental class using the Shapiro-Wilk test using SPSS can be seen in Table 3 below:

Based on the data obtained in the Table 3. The pretest-posttest for the experimental class using the Shapiro-Wilk test showed significant values in the pretest 0.606 and posttest 0.323. Thus it can be concluded that if the significant value  $> 0.05$  then  $H_0$  is accepted and  $H_1$  is rejected which states that the pretest and post-test data are normally distributed.

**Table 3.** The test of Normality

Tests of Normality							
	KELAS	Lilliefors			Shapiro-Wilk		
		Statistic	Df	Sig.	Statistic	Df	Sig.
HASIL	Pretes	.173	22	.086	.965	22	.606
	Postes	.128	22	.200*	.951	22	.323

\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

**Table 4.** The Anacova Test

		Paired Differences					T	Df	Sig. (2-tailed)
Pair	pretet – postes	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
		1		–14.54545	3.31989	.70780	–16.01741	–13.07350	–20.550

### 3.1.2 The Test of Hypothesis

After analyzing the data obtained, then testing the hypothesis using the T-test for hypothesis testing is carried out by testing the T-test using SPSS assistance, namely the ANCOVA test shown in the Table 4 as follows:

Based on the Table 4, it can be seen that there is an effect of kinetic sand learning media on the ability to coordinate eye and hand movements in children as evidenced by a significant value < 0.05, namely 0.00.

### 3.2 Discussion

Based on the results of pretest and post-test data about the effect of kinetic sand media on the ability to coordinate eye and hand movements of children in group B. From the results of experimental research conducted, shows that there are differences in the results of using games using kinetic sand media according to the stages before and after being given treatment. This is indicated by the increase in the amount of data between the pretest and posttest. The research data before being treated with kinetic sand media obtained the highest number of respondents were 15–17 with the number of respondents being 9 or as much as 40.9%, while in the post-test data there were 3 the highest number of respondents who were at 27–35 with a total of 15 respondents or as many as 68.1% and for the total data score the lowest number of respondents is at 21–23 as many as

1 respondents or 4.5%. This shows that the respondents who were the sample in this study obtained an increase in the average results from the initial test to the final test. So, it can be said that the kinetic sand game affects the ability to coordinate eye and hand movements. This is caused by the treatment of sand playing activities for 8 meetings. In each meeting the children will carry out printing, shaping, and squeezing activities according to the theme that applies in the week during which the research takes place. This is in accordance with the theory put forward by Thorndike about the law of readiness. Children who are given stimulation will train their smooth muscles and over time will mature so that they are ready for the next stage of development (Crain, 2007).

Likewise, the research conducted by Dayanti with the title *The Effect of Kinetic Sand Learning Media on Fine Motor Skills for Children aged 4–5 Years at Bina Toddler Islamic Kindergarten Way Halim Bandar Lampung*. That the results of the study with a sample of 28 children.  $T_{count} = 4.985$  and  $T_{table}$  is obtained at 2.178 using the 5% distribution table. The criteria for testing the hypothesis is if  $T_{count} < T_{table}$  then  $H_0$  is accepted and  $H_1$  is rejected. However, if it is seen based on the results of  $T_{count} > T_{table}$ , which is  $4.985 > 2.178$   $H_0$  is rejected and  $H_1$  is accepted. This means that the kinetic sand learning media has an influence on the fine motor skills of children aged 4–5 years in Bina Toddler Islamic Kindergarten Way Halim Bandar Lampung.

## 4 Conclusion

Based on the hypothesis testing that has been carried out, it can be concluded that there is an effect of kinetic sand play on the eye movement coordination ability and resistance of group B children in Nusa Indah Kindergarten. The research data before being given kinetic sand media treatment in children obtained the highest number of respondents in the Pretest data 15–17 with the number of respondents being 9 or 40.9%, while in the Posttest data there was 3 highest number of respondents who were in the posttest data 27–35 with the number of respondents, namely 15 or as much as 68.1%, and for the total score of the data the lowest number of respondents is at 21–23 as many as 1 respondents or 4.5%. This is also shown based on the results of the calculation of the hypothesis test using the T-test using the SPSS program, namely the Ancova test and obtained a significant value  $< 0.05$ , i.e. 0.00, so  $H_0$  is rejected. Final test.

## References

1. A. Yus, *Model Pendidikan Anaka Usia Dini*. Jakarta: Prenada Media Grub, 2011
2. Anwar & Asrya Ahmad. *Pendidikan Anak Usia Dini (Panduan Praktis Nagi Ibu Dan Calon Ibu)*. Bandung: Alfabeta
3. Asriadi. 2011. *Kontribusi Koordinasi Mata Tangan Kekuatan Otot Lengan Dan Panjang Lengan Terhadap Kemampuan Passing Bawah Pada Permainan Bola Voly Kab. Gowa*.
4. Fitri Wulandari, Hery Yusuf Muslihin, Dkk. 2020. *Penenrapan Bermain Konstruksi Magic Sand Untuk Mengembangkan Kemampuan Motorik Halus Anak Usia Dini*. Tasik Malaya: Jurnal Ilmiah PTK PNE
5. Fitriyanti Wulandari. *Pengaruh Bermain Kinetic Sand Terhadap Kreativitas Anak Usia 5–6 Tahun*.

6. Mardiyati Sri Hartati 2020. *Pengaruh Penggunaan Pasir Kinetik Terhadap Perkembangan Motorik Halus Anak Di Taman Kanak – Kanak*. Padang
7. Nikmaturida. 2017. *Proses Penelitian, Masalah, Cariable Dan Paradigm Penelitian*. Medan.
8. Nur Aisyah. 2016. *Peningkatan Kemampuan Koordinasi Mata Dan Tangan Pada Anak Tunagrahita Kategori Sedang Melalui Metode Direct Intruccion Dalam Pembelajaran Ketempilan Menyulam Di SLB N 1 Sleman*. Yogyakarta.
9. Nurlaili, M. PD. 2019. *Perkembangan Motorik Halus Anak Usia Dini*. Medan.
10. Prof. Dr Sugiono. 2019. *Metode Penelitian Kuanitatif, Kualitatif Dan R&D*. Bandung: Alfabeta.
11. Tanila 2012. *Meningkatkan Kemampaun Kordinasi Mata Dan Tangan Pada Anak Tunagrahita Sedang*
12. Vany Mutia May Adry, Yaswinda. 2021. *Pengembangan Kordinasi Mata Dan Tangan Anak Usia Taman Kanak –Kanak Padang*
13. Vigiwati 2015. *Pengaruh Penggunaan Pasir Berwarna Sebagai Media Pembelajaran Terhadap Perkembangan Kognitif (Pengenalan Sains ) Anak Usia 3–4 Tahun Di PAUD Permata Bunda Kabupaten Sragen Semarang*
14. Winda Tuntari 2014. *Upaya Meningkatkan Kemampuan Koordinasi Gerak Mata Dan Tangan Melalui Kegiatan Menggunting Dengan Berbagai Media Pada Anak Kelompok TK A1 ABA Malang*. Yogyakarta
15. William Crain, *theories of Development: concepts and applications*, New Jersey: Prentice Hall
16. Yetty Dayanti, 2019. *Pengaruh Media Pembelajaran Kinetic Sand Terhadap Keterampilan Motorik Halus Anak Di TK Islam Bina Balita Way Halim Bandar Lampung*.

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