PENA PAUD Journal
Volume 6 Issue 2 (2025) Pages 190-201
ISSN: 2775-4731 (Online) 2777-1377 (Print)
: https://doi.org/10.33369/jpp.v6i2.44420

The Effect of Plasticine Media on Alphabet Recognition in 4-5 Year Old Children in Kindergarten

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Abstract
Alphabet recognition is an essential skill in students' development; therefore, it requires greater attention from parents and teachers. This study aims to determine the effect of plasticine media on letter recognition in early childhood at Baiturrahman Sako Islamic Kindergarten, Palembang. This study uses a quantitative approach with a one-group pretest-posttest design and involves 15 children as samples selected by the purposive sampling method. The instrument used is an observation sheet that has been tested for validity and reliability with valid and reliable results. The research procedure includes administering a pretest and providing treatment through plasticine-based learning. A posttest was administered to assess treatment outcomes; the data were analysed using a t-test, which showed a significant increase in scores ($p < 0.001$). These results demonstrate that plasticine media affect letter recognition in children aged 4-5 years.

Keywords*:* Plasticine media, alphabet, early childhood, kindergarten

How to cite this article:
Aprilia, P. C., Febriyanti, & Fahmi. (2025). The Effect of Plasticine Media on Alphabet Recognition in 4-5 Year Old Children in Kindergarten. JURNAL PENA PAUD, 6(2). https://doi.org/10.33369/jpp.v6i2.44420

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Published by: University of Bengkulu
Received 17 August 2025, Received 29 November, Published 21 Desember 2025

INTRODUCTION

Based on BSKAP Regulation No. 031/H/KR/2024, PAUD is directed to shape children's character that is representative of the Pancasila Student Profile. These values include faith and good morals, respect for diversity, cooperation, independence, critical thinking, and creativity. To develop independence and critical thinking skills, children are encouraged to recognize symbols, understand simple information, and connect sounds with letter shapes. One of the skills expected to develop from this process is the ability to recognize letters from an early age (Julia et al., 2022; E. Sari et al., 2022).

The ability to recognize letters plays a vital role in child development; therefore, this aspect requires specific guidance from parents or teachers at school (DRUPADI & Syafrudin, 2020). Letter recognition is a crucial stage that children must pass before they can read. At this stage, children should be introduced to various letters, understand their shapes and names, and write and spell them, as a foundation for reading skills (Amelia et al., 2022; Ratna Dewi et al., 2021). Letter recognition is a developmental milestone that begins when children do not yet understand letter symbols and their sounds, and continues until they can read fluently and understand them (Nengsi et al., 2022).

Children's letter recognition skills can be stimulated through various approaches, including media and play materials, as well as engaging, fun activities (Eka Daryati & Sadiana, 2025; Surtika et al., 2020). The use of learning media and play tools can support children in gaining knowledge and skills (Yafie et al., 2020). Learning media serve as tools to facilitate teachers in providing information (Safira, 2020). Learning media for early childhood can take the form of educational play media. One suitable medium for early childhood is plasticine. Plasticine is a material composed of flour, oil, salt, food colouring, and water, making it easy to use because it is soft and flexible. This media can be kneaded, flattened, pulled, pressed, rolled, and shaped according to the child's imagination and creativity (Eka Daryati & Sadiana, 2025; M. Sari & Aziz, 2016).

Several studies have shown that plasticine or *playdough media* has a positive effect on the development of letter recognition skills in children aged 4–5 years. Nisa (2021)found that the use of playdough significantly improves children's basic literacy skills. Furthermore, Y. Nurhayati (2024)Showed a consistent increase in letter recognition skills from pre-cycle to cycles I and II through playdough media intervention RITONGA (2023) also supports these findings. Although playdough is often associated with creativity, evidence indicates that it can stimulate children's creative cognitive abilities, particularly shape recognition skills, including letter recognition.

In a study conducted by Pratiwi et al (2024) It was shown that the use of sand and plasticine media significantly influenced the ability to recognise letters of the alphabet in children aged 4-5 years, where children more easily recognise letter shapes through forming activities with these media. Thus, various studies confirm that plasticine media is effective for improving letter recognition skills in early childhood. The research update I conducted focused on one medium, namely plasticine, for letter recognition in children aged 4-5 years.

The urgency of this research lies in its contribution to improving early childhood education services, both theoretically by enriching the literature on the use of manipulative learning media and practically by offering recommendations for PAUD educators on choosing more effective, enjoyable, and relevant learning strategies aligned with children's needs. The purpose of this study was to determine the effect of plasticine media on the introduction of letters of the alphabet to children aged 4–5 years at Baiturrahman Sako Islamic Kindergarten, Palembang.

METHODOLOGY

Types of research

This study employs a quantitative experimental approach to determine the causal relationship between the variables under study, with variable X as the independent variable and variable Y as the dependent variable. The type of research chosen is an experiment with a pre-experimental design, specifically the *One-Group Pretest-Posttest Design model*. In this design, researchers provide an initial test (*pretest*), then apply treatment (*treatment*), and then give a final test (*posttest*) to see changes after the treatment is given. Through the One-Group Pretest-Posttest design, researchers can compare conditions before and after the intervention so that they can determine any significant differences.

Time and Place of Research

This research was conducted in April 2025 at Baiturrahman Sako Islamic Kindergarten, Palembang.

Research Objectives

The population of this study was 30 children aged 4-5 years who attended Baiturrahman Sako Islamic Kindergarten in Palembang, divided into two classes, A1 and A2. In this study, the sample comprised 15 children from a population of 30, selected via purposive sampling, namely, participants were selected based on recommendations from educators.

Data Collection Technique and Instrument Development

Data collection techniques are a crucial stage in research because the quality of the data determines the validity of the results. (Mekarisce, 2020). In this study, data were obtained through three methods: tests, observation, and documentation. Tests were administered to assess changes in students' abilities before and after treatment (pretest and posttest) to determine improvements in

learning outcomes. Observations were conducted to directly observe students' activities, engagement, and responses during learning. Meanwhile, documentation complemented secondary data, including school profiles, student numbers, activity photos, and other relevant notes.

Data Analysis Techniques

Data analysis in this study was conducted in three stages: (1) normality testing to assess whether the data were normally distributed; and (2) hypothesis testing to evaluate the mean difference or relationship between variables (Nurhaswinda et al., 2025).

RESULTS AND DISCUSSION

RESULTS

Before the observation items were used to collect data on children's initial and final scores after the application of the plasticine medium, the instrument was piloted with 15 children. Validity testing was conducted to determine the extent to which the instrument measured the intended constructs. Validity testing was performed using *Microsoft Excel* and SPSS. The results of the instrument validity test are as follows:

Table 1. Validity test results

Question Items	r_{hitung}	r_{tabel}	Information	Information
A1	0.764	0. 514	Valid	Used
A2	0.846	0. 514	Valid	Used
A3	0.804	0. 514	Valid	Used
A4	0.644	0. 514	Valid	Used
A5	0.735	0. 514	Valid	Used
A6	0.736	0. 514	Valid	Used
A7	0.620	0. 514	Valid	Used
A8	0.565	0. 514	Valid	Used
A9	0.734	0. 514	Valid	Used
A10	0.803	0. 514	Valid	Used
A11	0.768	0. 514	Valid	Used
A12	0.619	0. 514	Valid	Used
A13	0.577	0. 514	Valid	Used
A14	0.538	0. 514	Valid	Used
A15	0.566	0. 514	Valid	Used

From the table, the R value at the 5% significance level is 0.514. Because the calculated r exceeds this value, the indicators used in the study can be deemed valid.

Next, a reliability test was conducted to determine the extent to which the measurement results remained stable when repeated multiple times. This reliability calculation was performed using Cronbach's alpha in SPSS.

Table 2. Reliability test results

Reliability Statistics

Cronbach's Alpha	*N of items*
0.759	15

Based on the statistical test results in the table above, Cronbach's alpha is 0.759, which exceeds the significance threshold of 0.60. This indicates that the instrument used in the study has high reliability, so the resulting data are consistent and reliable for further analysis, before receiving treatment, children in Group A1 at Baiturrahman Sako Islamic Kindergarten, Palembang, were administered a pretest to assess their initial alphabet recognition skills. The following are the *pretest* scores of 15 children.

Table 3. *Pretest score results*

Name	**A1**	**A2**	**A3**	**A4**	**A5**	**A6**	**A7**	**A8**	**A9**	**A10**	**A11**	**A12**	**A13**	**A14**	**A15**	**Total Score**
KKR	3	3	4	4	3	3	4	3	1	2	2	2	2	2	3	41
KFR	4	4	4	4	3	3	4	3	4	4	3	4	4	3	4	55
MBA	3	3	1	1	1	1	1	1	1	1	1	1	3	4	4	27
DAP	2	1	2	3	1	1	1	1	1	2	3	2	3	3	3	29
MM	3	3	4	4	3	2	4	3	3	3	1	1	1	3	3	41
MKP	4	4	4	4	3	3	3	4	3	3	3	4	3	1	4	50
MTH	2	2	1	1	1	1	1	1	1	1	1	4	3	1	3	24
ANH	4	3	3	4	3	3	4	3	3	4	3	3	3	1	1	45
AF	2	2	1	1	1	1	1	1	1	1	1	1	1	3	1	19
TH	1	1	1	1	3	4	3	3	3	2	3	4	1	3	1	34
HE	4	3	3	4	3	4	4	3	3	3	4	4	1	4	1	48
MGP	1	1	1	1	4	3	4	3	3	3	3	4	4	3	3	41
MAH	4	4	4	3	4	3	4	3	4	1	1	1	1	1	4	42
MAI	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	17
KZP	3	2	2	3	2	2	3	3	2	1	2	2	2	2	2	33
															Total	546

															Average	36.4

From the results of *the pretest data* that has been carried out, the highest score was obtained, namely a score of 55, and the lowest score was 17. The *pretest data* on letter recognition for children aged 4-5 years at Baiturrahman Sako Islamic Kindergarten, Palembang, yielded an average score of 36.4 (total score = 546).

After undergoing five treatments using plasticine, the children were tested again using the same instrument. The results showed significant improvement. They were able to form letters with plasticine, pronounce letters more accurately, and connect letter sounds with simple words. Posttest scores improved compared to the pretest, both for individual achievement and the class average. The following are the *posttest* scores :

Table 4. *Posttest score results*

Name	**A1**	**A2**	**A3**	**A4**	**A5**	**A6**	**A7**	**A8**	**A9**	**A10**	**A11**	**A12**	**A13**	**A14**	**A15**	**Total Score**
KKR	3	3	4	4	3	3	4	3	3	3	3	4	3	4	3	50
KFR	4	4	4	4	3	3	4	3	4	4	3	4	4	3	4	55
MBA	3	3	3	4	3	4	4	4	3	3	3	4	3	4	4	52
DAP	2	1	2	3	2	2	3	2	3	2	3	2	3	3	3	36
MM	3	3	4	4	3	2	4	3	3	3	3	3	3	3	3	47
MKP	4	4	4	4	3	3	3	4	3	3	3	4	3	3	4	52
MTH	2	2	2	4	1	2	4	3	3	2	3	4	3	4	3	42
ANH	4	3	3	4	3	3	4	3	3	4	3	3	3	3	4	50
AF	2	2	3	4	2	3	4	2	3	2	3	4	4	3	4	45
TH	3	3	3	4	3	4	3	3	3	2	3	4	3	3	4	48
HE	4	3	3	4	3	4	4	3	3	3	4	4	3	4	4	56
MGP	4	3	3	4	4	3	4	3	3	3	3	4	4	3	3	51
MAH	4	4	4	3	4	3	4	3	4	3	4	4	3	4	4	55
MAI	2	2	1	2	2	2	3	2	1	2	2	4	2	3	4	35
KZP	3	2	2	3	2	2	3	3	2	1	2	2	2	2	2	33
															Total	707
															Average	47.1

The posttest data indicate that the highest score was 56, and the lowest was 33. The *pretest data* on letter recognition for children aged 4-5 years at Baiturrahman Sako Islamic Kindergarten,

Palembang, yielded an average of 47.1, with a total score of 707. From the results of the pretest and posttest that have been carried out, a comparison graph of the results was obtained as follows:

Figure 1. Comparison graph of *pretest* and *posttest scores*

The pretest-posttest comparison graph indicates substantial improvement in student learning outcomes. The difference in scores, with the posttest exceeding the pretest, confirms that the treatment was effective in improving student abilities.

Next, statistical analyses of the data were performed. The results of the prerequisite tests were necessary to ensure that the research data met the assumptions required before conducting further study, particularly for hypothesis testing. These prerequisite tests ensured that the chosen analysis method was appropriate for the data characteristics and would not yield erroneous conclusions.

Table 5. Normality Test Results

	Kolmogorov-Smirnov			Shapiro-Wilk		
	statistics	df	sig	statistics	df	sig
Plasticine media	0.190	15	0.152	0.963	15	0.747
Introduction to the alphabet	0.183	15	0.192	0.893	15	0.075

The table shows that the p-value exceeds 5%. This indicates that the data are normally distributed (p = 0.0747). Furthermore, the t-test results are as follows.

Table 6. t-Test Results

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Standard Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	pestest - postest	10,733	8,216	2.121	15,283	6,184	5,060	14	0.000

The results of this study showed a statistically significant difference between the pretest and posttest conditions. These findings confirm that the plasticine intervention significantly improved early childhood alphabet recognition skills.

DISCUSSION

The statistical analysis shows that plasticine media influence children's alphabet recognition. The average score increased from 36.4 (*pretest* **)** to 47.1 (*posttest*). The t-test showed a significant difference ($p < 0.05$), indicating that the use of plasticine media has a positive effect on children's letter recognition in the 4-5-year age range. This demonstrates that forming letters with plasticine helps children more easily understand letter shapes concretely through fine-motor activities. This finding strengthens the view that early childhood tends to grasp concepts more quickly through direct experience and multisensory activities (Feni Ayu Mutiara Bru Surbakti et al., 2021; N. Nurhayati et al., 2022).

The results of this study align with those of N. Nurhayati et al (2022), which demonstrated that plasticine play is effective in helping children recognize values and symbols. Other research has found that using plasticine can improve children's fine motor skills and creativity, thereby indirectly supporting early literacy readiness (Fadillah & Suryadi, 2025; Oktaviani et al., 2021). Furthermore, research conducted by Pratiwi et al (2024) found that a combination of sand and plasticine can improve children's ability to recognize letters of the alphabet at the age of 4–5 years. Thus, the

findings of this study are consistent with previous research that confirms that plasticine has a significant influence.

This study shows that the use of plasticine media improves letter recognition in early childhood; however, its effectiveness remains relative and is influenced by multiple other variables. The observed improvements in learning outcomes cannot be attributed solely to the media used, as some children still did not achieve the maximum score. This indicates limitations in the study, particularly in controlling for external factors such as family support, differences in motivation, learning readiness, and children's prior experiences (Suryanti, 2021).

This research contributes to early childhood literacy research by demonstrating that simple, inexpensive media, such as plasticine, can effectively introduce the alphabet. These findings are essential for early childhood education (PAUD) teachers, especially in areas with limited access to digital media and modern teaching materials (N. Nurhayati et al., 2022). Therefore, this research supports the implementation of creative learning based on local materials that is contextual and accessible.

Theoretically, the results of this study support Piaget's theory of cognitive development, which states that children learn best through concrete-operational experiences (Kulsum et al., 2023). In this context, the activities of squeezing, pressing, and shaping plasticine foster multisensory experiences that support children's recognition of letter shapes (Amelia et al., 2022). Practically, early childhood education teachers can use plasticine to train fine motor skills while introducing the alphabet in a fun, interactive, and meaningful way (Nurkhasyanah & Herlindah, 2024).

Limitations of this study include the relatively small sample size (15 children) and the short treatment period (five sessions). Furthermore, the study focused solely on letter recognition, without assessing other literacy skills, such as phonemic awareness or early writing skills. Therefore, the results of this study cannot be broadly generalized to all aspects of early literacy.

Future research should include a larger sample size and extend the treatment period to yield more comprehensive results. Furthermore, research variables could be expanded to include other aspects of literacy, such as phonological abilities, early writing skills, and vocabulary mastery. Comparisons of the effectiveness of plasticine with other manipulative media, such as alphabet blocks, letter cards, or interactive digital media, could also be conducted. Longitudinal research is needed to assess the consistency of plasticine's effect on children's literacy development over time.

CONCLUSION

Based on the research results, it can be concluded that the use of plasticine media significantly influences 4-5-year-olds' ability to recognize letters of the alphabet. This is supported by statistical tests showing a calculated t-value with $p < 0.01$, indicating that plasticine.

REFERENCES

Amelia, T., Suryadi, D., Melia, D., Daryati, E., Menulis, K., Kelompok, A., Di, B., Segugus, P., Kota, A., Jurnal, B., Paud, P., 1∗, T. A., & Daryati, M. E. (2022). Kemampuan Menulis Anak Kelompok B Di PAUD Segugus Anyelir Kota Bengkulu. *Jurnal PENA PAUD*, *3*(1), 52–63. https://ejournal.unib.ac.id/index.php/penapaud/index

DRUPADI, R. D., & Syafrudin, U. (2020). Kemampuan mengenal huruf pada anak usia 5-6 tahun di perumahan guru kecamatan Kotabumi Selatan kabupaten Lampung Utara. *Jurnal Pendidikan Anak*, *6*(2). https://doi.org/https://doi.org/10.23960/jpa.v6n2.22256

Eka Daryati, M., & Sadiana, M. (2025). The Influence of Cooking Activities on the Introduction of Healthy Food for Early Childhood Education. *HealthSmart: Jurnal Kesehatan Masyarakat*, *1*(1), 14–26. https://doi.org/10.64146/1js56e90

Fadillah, & Suryadi, D. (2025). The Relationship Between Parenting Patterns and Balanced Nutritional Intake with Nutritional Status of Young Children. *HealthSmart: Jurnal Kesehatan Masyarakat*, *1*(1), 52–65. https://doi.org/10.64146/7g6t1b06

Feni Ayu Mutiara Bru Surbakti, P., Saparahayuningsih, S., & Eka Daryati, M. (2021). Tinjauan Guru Tentang Evaluasi Perkembangan Motorik Halus Selama Pembelajaran Daring Di Kelompok B Se-Gugus Asparagus Kota Bengkulu. *Jurnal PENA PAUD*, *2*(2), 17–26. https://ejournal.unib.ac.id/index.php/penapaud/index

Julia, J., Wahira, W., & Suriani, S. (2022). Penggunaan Media Kartu Huruf Untuk Meningkatkan Kemampuan Mengenal Huruf di TK Mardi Santosa Sumedang Jawa Barat. *Jurnal Pemikiran Dan Pengembangan Pembelajaran*, *4*(2), 95–103.

Kulsum, U., Adawiyah, R., & Dirgayunita, A. (2023). Meningkatkan Kemampuan Fisik Motorik Halus Anak Usia 3-4 Tahun Melalui Media Sederhana (Plastisin) Di Paud Al–Firdaus Kecamatan Wonomerto–Kabupaten Probolinggo. *Al-ATHFAL: Jurnal Pendidikan Anak*, *4*(2), 148–160. https://doi.org/10.46773/alathfal.v4i2.787

Mekarisce, A. A. (2020). Teknik pemeriksaan keabsahan data pada penelitian kualitatif di bidang kesehatan masyarakat. *Jurnal Ilmiah Kesehatan Masyarakat: Media Komunikasi Komunitas Kesehatan Masyarakat*, *12*(3), 145–151. https://doi.org/https://doi.org/10.52022/jikm.v12i3.102

Nengsi, K. J., Haryono, M., & Sari, R. P. (2022). Meningkatkan Kemampuan Mengenal Huruf Melalui Permainan Mencari Jejak (Maze) Pada Anak Kelompok B. *Journal Of Dehasen Educational Review*, *3*(3), 63–66. https://doi.org/10.33258/joder.v3i3.3464

Nisa, Z. (2021). Pengaruh Permainan Playdough terhadap Kemampuan Keaksaraan Awal Anak Usia 4-5 Tahun: Pengaruh Permainan Playdough terhadap Kemampuan Keaksaraan Awal Anak Usia

4-5 Tahun. *Journal of Islamic Education for Early Childhood*, *3*(1), 71–78. https://doi.org/10.30587/jieec.v3i1.3970

Nurhaswinda, N., Zulkifli, A., Gusniati, J., Zulefni, M. S., Afendi, R. A., Asni, W., & Fitriani, Y. (2025). Tutorial uji normalitas dan uji homogenitas dengan menggunakan aplikasi SPSS. *Jurnal Cahaya Nusantara*, *1*(2), 55–68.

Nurhayati, N., Suwika, I. P., & Saphira, D. (2022). Pengaruh Permainan Plastisin Terhadap Pengenalan Nilai Agama Anak Pada Masa Pandemi Covid-19. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, *6*(5), 4255–4265. https://doi.org/10.31004/obsesi.v6i5.2544

Nurhayati, Y., Aliya, M., Muarif, M., & Chandra, R. D. A. (2024). Peningkatan Kemampuan Mengenal Huruf pada Anak Usia 4-5 Tahun Melalui Media Playdough di POS PAUD Nusa Indah 96 Jember. *JECIE (Journal of Early Childhood and Inclusive Education)*, *7*(2), 482–490. https://doi.org/10.31537/jecie.v7i2.1903

Nurkhasyanah, A., & Herlindah, H. (2024). Meningkatkan Kemampuan Motorik Halus Pada Anak Melalui Bermain Media Plastisin Pada Kelompok A. *Jurnal Anak Bangsa*, *3*(2), 264–288. https://doi.org/10.46306/jas.v3i2.71

Oktaviani, S., Priyantoro, D. E., & Hasanah, U. (2021). Penggunaan media plastisin dalam mengembangkan motorik halus di KB Nurul Arif. *IJIGAEd: Indonesian Journal of Islamic Golden Age Education*, *2*(1), 31–53. https://doi.org/10.32332/ijigaed.v2i1.3781

Pratiwi, A., Jati, S. N., & Maulina, I. (2024). Kemampuan Mengenal Huruf Abjad Melalui Bermain Dengan Media Pasir dan Plastisin Terhadap Anak 4-5 Tahun. *ALAYYA : Jurnal Pendidikan Islam Anak Usia Dini*, *4*(1), 70–83. https://doi.org/10.51311/alayya.v4i1.616

Ratna Dewi, Enda Puspitasari, & Rita Kurnia. (2021). Pengembangan Media Kartu Huruf Elektrik untuk Meningkatkan Kemampuan Mengenal Huruf Anak Usia 4-5 Tahun. *Jurnal Pendidikan Tambusai*, *5*(3), 9600–9609.

RITONGA, J. (2023). Pengaruh Bermain Plastisin Terhadapperkembangan Kreativitas Anak Dipaud An-Nisah Padang Malakka. *Qalam Lil Athfal*, *1*(2). https://doi.org/10.58822/qla.v1i2.144

Safira, A. R. (2020). *Media pembelajaran anak usia dini*. Caremedia Communication.

Sari, E., ∗1, A., Saparahayuningsih, S., & Daryati, M. E. (2022). Pemahaman Guru Mengenai Pelaksanaan Belajar Dari Rumah Di Taman Kanak-Kanak. *Jurnal PENA PAUD*, *3*(1), 2022–2023. https://ejournal.unib.ac.id/index.php/penapaud/index

Sari, M., & Aziz, Y. (2016). Peningkatan Kreativitas Anak melalui Bermain Plastisin di Tk Satu Atap Sdn Lamlheu Kabupaten Aceh Besar. *Jurnal Ilmiah Mahasiswa Pendidikan Anak Usia Dini*, *1*(3). https://doi.org/10.61992/tiflun.v1i1.77

Surtika, T., Sumardi, S., & Yasbiati, Y. (2020). Pengaruh Media Puzzle Huruf Terhadap Kemampuan Mengenal Huruf Pada Anak Kelompok a Di Tk Ar-Rahman Kecamatan Sukahening. *Jurnal Paud Agapedia*, *3*(1), 101–111. https://doi.org/10.17509/jpa.v3i1.26672

Suryanti, C. M. (2021). *Pengembangan media papan pintar huruf untuk mengenalkan huruf abjad pada anak usia 4-5 tahun*. UPT. PERPUSTAKAAN. https://doi.org/https://doi.org/10.22373/bunayya.v7i2.10485

Yafie, E., Kustiawan, U., Astuti, W., Haqqi, Y. A., Boedi, D., & Ilhami, B. S. (2020). Pengaruh Pelatihan Pembuatan Media Pembelajaran terhadap Peningkatan Keterampilan Mengembangkan Alat Permainan Edukatif (APE) dari Bahan Bekas. *Abdimas Pedagogi: Jurnal Ilmiah Pengabdian Kepada Masyarakat*, *3*(2), 124–135. https://doi.org/10.17977/um050v3i2p124-135