



The Effect of Using the *Explosion Box* Medium on the Literacy Skills of 5-6 Year Old Children

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Abstract

Literacy skills in young children, especially those aged 5–6 years, are an important foundation for their readiness to enter the next level of education. However, challenges are still found at the Pelita Doktor Bagan Pete Integrated Islamic Kindergarten (TKIT), Alam Barajo District, Jambi City, where some children have difficulty recognizing letters and associating them with sounds. Therefore, engaging learning media is needed, one of which is the explosion box. This study aims to determine the effect of using the explosion box media on the literacy skills of 5–6-year-old children. This study used a quantitative experimental method with a One Group Pretest-Posttest Design. The sample consisted of 15 children in group B2, selected through purposive sampling. The research instrument was an observation sheet that had been tested for validity. Data analysis was performed through normality tests, homogeneity tests, and hypothesis testing using a paired sample t-test. The results showed a significance value (p-value) < 0.05, indicating a significant difference between the pretest and posttest results. The conclusion of this study shows that the explosion box media has a positive effect on the literacy skills of early childhood, as evidenced by an increase in learning outcomes after treatment. This media can be used as an innovative alternative to support literacy learning for children aged 5–6 years.

Keywords: Explosion box media, literacy skills, young children

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INTRODUCTION

Based on the results of the 2022 *Program for International Student Assessment* (PISA) survey, Indonesia's reading literacy ranking rose five places compared to PISA 2018, and this increase is the highest achievement since Indonesia participated in PISA (Kemendikbudristek, 2023). However, this achievement is still below the average of the *Organization for Economic Co-operation and Development* (OECD), indicating that the literacy skills of Indonesian children still

need to be strengthened. This condition highlights the importance of instilling a foundation of literacy from an early age as the main prerequisite for future learning success.

Early Childhood Education (PAUD) plays an important role in optimally developing all aspects of a child's development. Putri et al., (2024) state that early childhood education (PAUD) is essentially education aimed at improving the overall growth and development of children in all aspects of their development. Additionally, Niati et al. (2022) emphasize that the goal of PAUD is to support all aspects of a child's growth and development. Masnipal (2018) explains that PAUD is an institution that provides educational services in various forms, ranging from TPA (0–2 years), KB (2–4 years), TK A (4–5 years), to TK B (5–6 years). At this stage, the active role of parents is very necessary to support children's development in various aspects.

Early childhood development encompasses six aspects, namely Religious and Moral Values (NAM), motor skills, cognitive skills, language skills, social-emotional skills, and aesthetic skills. Among these aspects, language development is the main focus that must be supported (Permendikbud No. 137 of 2014). Language development consists of three areas: understanding language, expressing language, and literacy. Literacy, which includes the ability to read, write, and count, is the foundation for children to master other academic skills (Listriani et al., 2020).

Reghe (2021) emphasizes that early reading and writing skills are fundamental skills that prepare children for more complex learning. Similarly, Rahmawati et al. (2020) mention that literacy is a vital aspect because, through this skill, children can read, understand the content of what they read, and communicate in writing.

The results of initial observations and interviews with teachers at TKIT Pelita Doktor Bagan Pete show that the literacy skills of 5-6 year old children are still low. Of the 16 children observed, 10 children (58.8%) were unable to recognize certain letters of the alphabet, such as b and d, and some children were unable to write their own names. This condition is influenced by limited learning media and a lack of variety in interesting learning activities.

Learning media plays an important role in the educational process. Tafonao (2018) states that media is a device that functions as a connector of messages from the sender to the receiver, which is able to stimulate the thoughts, feelings, attention, and interests of students. Similarly, Febiharsa & Djuniadi (2018) emphasize that media functions as a tool that can increase learning motivation and information absorption. Vygotsky in Utaini (2025) also emphasizes that media is a

tool in the zone of proximal development (ZPD), where children can develop new skills with the support of appropriate media.

One potential medium is the explosion box. This medium is shaped like a square box that opens up when the lid is removed, displaying pictures, writing, or illustrations on each side (Sipnaturi & Farida, 2020). Gress Chandra et al., (2024) Explosion boxes are visual graphic media that not only attract attention but also increase children's enthusiasm, motivate learning, and facilitate thinking skills (Islamy & Suputra, 2022). With its varied appearance, this media is believed to help develop children's literacy skills in a fun way.

Previous research by Nurhayani (2024) shows that the use of explosion boxes can improve students' critical thinking skills in social studies in the experimental class, namely class V-B Min 5 Labuhanbatu. The results of this study also show that students are more enthusiastic about learning with this medium. However, research specifically examining the use of explosion boxes at the early childhood education level, especially in the literacy skills of 5-6-year-old children, is still very limited.

Based on the above description, this study is novel in that it examines the use of explosion boxes to improve the literacy skills of early childhood. The purpose of this study is to determine the effect of using explosion boxes on the literacy skills of 5-6 year old children at TKIT Pelita Duktora Bagan Pete, Alam Barajo District, Jambi City.

METHODOLOGY

Type of Research

This study is a quantitative study using a *pre-experimental design* with a *one-group pretest-posttest design*. The sample in this study consisted of 15 children in class B2 group B. The data collection technique used purposive sampling. This study used an observation sheet as a research instrument that had been validated. The analysis techniques used in this study were normality tests, homogeneity tests, and hypothesis tests.

Time and Place of Research

This research was conducted at TKIT Pelita Duktora, located at Jl. Raden Sayuti RT. 11 Permata Land Complex. Bagan Pete Village. Alam Barajo District, Jambi City. The research period began in the even semester of the 2024/2025 academic year and lasted for 2 months.

Research Target

The population in this study was all 16 children in class B2 at TKIT Pelita Doktor Bagan Pete, Alam Barajo District, Jambi City. The sample was determined using purposive sampling, which is selection based on certain criteria. The inclusion criteria included children aged 5–6 years, registered as active students in class B2, and participating in learning activities regularly during the study. Meanwhile, the exclusion criteria were children with specific developmental disabilities that could affect their literacy skills, as well as children who did not fully participate in learning activities. Based on these criteria, all children in the population, totaling 16, were selected as the research sample.

Data Collection Techniques and Instrument Development

Data collection was conducted using a structured research instrument, which included items related to incidents or behaviors that would occur. The format contained items related to events or behaviors that described literacy skills.

Data Analysis Technique

The data analysis technique used in this study was quantitative information analysis by conducting pretest-posttest evaluations through direct observation, and the researcher filled out observation sheets containing literacy ability indicators as a measuring tool validated by experts. The data analysis used was normality testing, homogeneity testing, and hypothesis testing with calculations assisted by the SPSS 22 program.

RESULTS AND DISCUSSION

RESULTS

Descriptive analysis was conducted to provide an overview of the participants' abilities at the pretest and posttest stages. Through this analysis, empirical values, ideal scores, means, and minimum and maximum value ranges for both types of measurements were observed. The results of the descriptive calculations are presented in Table 1 below.

Table 1. Data Description

Activity	Empirical Score	Ideal Score	Mean	X _{min}	X _{max}
<i>Pretest</i>	212	448	13.25	10.00	17.00
<i>Posttest</i>	389	448	24.31	21.00	27.00

From Table 1, it can be seen that the *pretest* data has an empirical score of 212, an ideal score of 448, a mean of 13.25, a minimum value of 10, and a maximum value of 17, while the *posttest* data has an empirical score of 389, an ideal score of 448, a mean of 24.31, a minimum value of 21, and a maximum value of 27.

An initial analysis of the students' abilities was conducted by administering a *pretest* as a measure to determine their level of understanding before receiving treatment or using learning media. The *pretest* data obtained was then processed to produce information about each participant's score, the total score, and the average score, which provided an overview of the class's initial abilities. Details of the students' *pretest* results are presented in Table 2 below.

Table 2. *Pretest* Results

No	Student Name	<i>Pretest</i> Score	Ideal Score
1.	AKA	17	28
2.	AZS	15	28
3.	AQAN	11	28
4.	IM	13	28
5.	IAP	15	28
6.	MUF	13	28
7.	AYA	13	28
8.	RCA	10	28
9.	YAL	14	28
10.	FZ	11	28
11.	NSHA	10	28
12.	AAA	12	28
13.	SAW	15	28
14.	SAA	16	28
15.	SSA	17	28
16.	MA	10	28
Total		212	448
Mean		13.3	28
Percentage		47.3%	100

Based on the table above, it can be seen that the *pretest* score before receiving the media *explosion box* treatment was 212, with the highest score being 17 and the lowest being 10. The following is the average *pretest* score:

$$Mx = \frac{\sum x}{N} = \frac{212}{16} = 13,25$$

The mean *pretest* results show an average *pretest* score of 13.25 out of the total, with a percentage of 47.3%. After the students received treatment through the use of the *explosion box* media, a *posttest* was administered to see the improvement in their abilities compared to the *pretest* results. This *posttest* became an indicator of the extent to which the media used was able to

help students understand the material provided. The *posttest* data was then processed to determine the scores of each participant, the total number of scores, and the class average. Details of the students' *posttest* results are presented in Table 3 below.

Table 3. *Posttest* Results

No	Student Name	<i>Posttest</i> Score	Ideal Score
1.	AKA	25	28
2.	AZS	24	28
3.	AQAN	21	28
4.	IM	26	28
5.	IAP	25	28
6.	MUF	26	28
7.	AYA	27	28
8.	RCA	23	28
9.	YAL	22	28
10.	FZ	25	28
11.	NSHA	21	28
12.	AAA	23	28
13.	SAW	27	28
14.	SAA	24	28
15.	SSA	26	28
16.	MA	24	28
Total		389	448
Mean		24.3	28
Percentage		86.8%	100

Based on Table 3, the *posttest* results show that the scores before and after the use of the *explosion box* media by 5-6-year-old children at TKIT Pelita Doktor were 389, with the highest score being 27 and the lowest score being 21. The following are the average *posttest* results.

$$Mx = \frac{\Sigma x}{N} = \frac{389}{16} = 24,3$$

The average *posttest* score shows an average score of around 24 out of the total score with a percentage of 86.2%. A comparison between the *pretest* and *posttest* results is necessary to see the extent of the improvement in the students' abilities after being given treatment through the use of *the explosion box* media. Analysis of this difference in scores provides an overview of each child's individual development, while also showing the effectiveness of the media used in the learning process. The difference in scores between the students' *pretest* and *posttest* results is presented in Table 4 below.

Table 4. Difference in *Pretest* and *Posttest* Scores

No	Child's Name	<i>Pretest</i> Score	<i>Posttest</i> Score	Difference
1	AKA	17	25	8
2.	AZS	15	24	9
3.	AQAN	11	21	10
4.	IM	13	26	13
5.	IAP	15	25	10
6.	MUF	13	26	13
7.	AYA	13	27	14
8.	RCA	10	23	13
9.	YAL	14	22	8
10.	FZ	11	25	14
11.	NSHA	10	21	11
12.	AAA	12	23	11
13.	SAW	15	27	12
14.	SAA	16	24	8
15.	SSA	17	26	9
16.	MA	10	24	14
Total		212	389	177
Mean		13.3	24.3	11
Percentage		47.3%	86.8	39.5

From the table above, the *pretest* and *posttest* scores show the results before and after the test using *the explosion box* media for 5-6 year old children at TKIT Pelita Doktor. The *pretest* results show a total of 212, a mean of 13.3, and a percentage of 47.3%. In contrast, the *posttest* results show a total of 389, a mean of 24.3, and a percentage of 86.8%. Thus, it can be concluded that the difference between the *pretest* and *posttest* results is 39.5%. Next, a homogeneity test was conducted to determine whether the data had homogeneous variance or not. The data is said to have homogeneous variance if Sig > 0.05. However, if the significance value is < 0.05, the data is considered to have non-homogeneous variance. The following table shows the results of the data homogeneity test.

Table 5. Data Homogeneity Test

Levene Statistic	df1	df2	Sig.
1.340	1	30	.256

Based on the table above, the significance level is 0.256 > 0.05, which means that the data has homogeneous variance. Data analysis in this study used the T-test, but before conducting the T-

test, a normality test was performed to determine whether the data was normally distributed or not. The following table shows the results of the data normality test.

Table 6. Data Normality Test

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest	.139	16	.200*	.924	16	.198
Posttest	.140	16	.200*	.938	16	.328

Data is said to be normally distributed if the significance value is greater than 0.05 ($p > 0.05$). Conversely, if the significance is less than 0.05 ($p < 0.05$), the data is considered not normally distributed. Based on the table above, it can be seen that the significance levels of the pretest and posttest are 0.198 and 0.328, respectively, which are greater than 0.05, meaning that the data is normally distributed. In the final stage, a hypothesis test was conducted to determine the validity or rejection of the proposed hypothesis. One of the statistical tests used was the t-test, which aims to see the difference in means between two groups. In this study, the hypothesis tested was the significant positive effect of using the explosion box media on the literacy skills of 5-6-year-old children. The following are the results of the analysis.

Table 7. Hypothesis Test Data

		<i>Paired Differences</i>							
		<i>Mean</i>	<i>Std. Deviation</i>	<i>Std. Error Mean</i>	<i>95% Confidence Interval of the Difference</i>		<i>t</i>	<i>df</i>	<i>Sig. (2-tailed)</i>
					<i>Lower</i>	<i>Upper</i>			
Pair 1	Pre-test - Post-test	-11.06250	2.26477	.56619	-12.26931	-9.85569	-19.538	15	.000

From the table above, the Sig. (2-tailed) value is $0.000 < 0.05$, which means H_0 is rejected and H_a is accepted. It can be concluded that there is a significant difference in the literacy skills of 5-6 year old children at TKIT Pelita Doktor between the *pretest* and *posttest*. After that, the t-value was calculated, which was $19.538 > 2.145$, so H_0 was rejected and H_a was accepted. Variable X is said to influence variable Y. Cohen's formula was used to identify the effect on paired samples tests as follows:

$$d = \frac{\text{Posttest Average Score} - \text{Pretest Average Score}}{\text{Standar Deviasi}}$$

$$d = \frac{24,3 - 13,3}{(1,922 + 2,436): 2}$$

$$d = \frac{11}{2,179}$$

$$d = 5,05$$

Based on the impact size calculation using Cohen, the results of the media *explosion box* study on children's literacy skills were 5.05. However, the interpretation criteria based on the table fall into the "*strong effect*" category.

DISCUSSION

Based on the data analysis results, there was a significant difference between the pretest and posttest scores for the literacy skills of 5-6 year old children at TKIT Pelita Doktor, with the average increasing from 13.25 to 24.31 after using the media explosion box. These findings indicate that the explosion box media is capable of providing effective stimuli in literacy learning, particularly in the aspects of letter recognition, simple word formation, and symbol comprehension.

The effectiveness of the explosion box media can be understood through the characteristics of early childhood children who are in the preoperational stage according to Piaget. At this stage, children tend to think symbolically and imaginatively, and find it easier to understand abstract concepts when they are presented in concrete and interesting forms. The explosion box presents a combination of colors, shapes, and visual surprises that stimulate children's curiosity. When children feel emotionally and sensorily involved, their attention increases, thereby optimizing the process of internalizing literacy concepts.

In addition, the effectiveness of this medium is also supported by its interactive and contextual nature. Children do not only receive information passively, but are also directly involved in opening, exploring, and discovering the contents of the explosion box. This exploratory process is in line with the principle of experiential learning, which emphasizes children's active involvement in discovering meaning. Thus, this medium is not only visually appealing but also activates thinking, memory, and social skills through discussions with teachers and peers.

The findings of this study are in line with the research of Dwiredy et al. (2021), Wijayanti (2023), Nurhayani (2024), Deviana (2021), Victorya (2024), Anggraini (2023), and Gress Chandra et al. (2024), which emphasize the importance of innovative media in increasing children's engagement and motivation to learn. However, findings in the context of TKIT Pelita Doktor show that the explosion box media not only functions as a visual aid but also as a medium that provides emotional experiences and curiosity. This is what makes children more focused, motivated, and show significant improvement in literacy skills.

The contribution of this study is to clarify that the use of explosion boxes is effective because it utilizes the cognitive and affective mechanisms of early childhood simultaneously: cognitive in symbol recognition, and affective in fostering a sense of joy and motivation to learn. Theoretically, these findings reinforce Piaget's cognitive development theory, while practically, this study offers a simple but effective alternative medium that early childhood educators can use to improve children's early literacy.

This study has limitations, namely a small sample size and a one-group pretest-posttest design without a control group. This opens up the possibility of external factors influencing the results. Therefore, future research should use an experimental design with a control group and a larger sample size, as well as explore other aspects such as the impact of explosion boxes on children's learning motivation, creativity, and social skills.

CONCLUSION

Based on the research conducted at IT Pelita Doktor Kindergarten on the impact of using explosion boxes on children aged 5 to 6 years, it can be concluded that explosion boxes contribute significantly and positively to improving children's literacy.

REFERENCES

- Anggraini, G. F. (2023). The effect of interactive multimedia on the ability of early literacy in recognizing letters in children aged 5-6 years at RA Muslimat NU 14 Made Lamongan [Thesis (Undergraduate), Maulana Malik Ibrahim State Islamic University]. <http://etheses.uin-malang.ac.id/id/eprint/56880>
- Deviana, E. (2021). The Effect of Explosion Box Media on Increasing the Interest in Learning History of Grade X IIS Students at SMA Negeri 12 Banda Aceh. *JIM: Scientific Journal of History Education Students*, 6(4), 163–171. <https://doi.org/10.24815/jimps.v6i4.22271>

- Dwiredy, M., Qalbi, Z., Kemampuan, K. K., & Kasar, M. (n.d.). The Effect of Picture Puzzle Games on Children's Cognitive Development. <https://doi.org/https://doi.org/10.17509/recep.v2i1.31070>
- Febiharsa, D., & Djuniadi, D. (2018). Development of 3D Interactive Learning Media for Teaching Environmental Awareness to Young Children in Indonesia. *Journal of Studies in Early Childhood Education (J-SECE)*, 1(1), 75. <https://doi.org/10.31331/sece.v1i1.590>
- Gress Chandra, S., Fitrotun Nisa, A., & Henu Cahyani, B. (2024). E D U K A S I Application of Explosion Box Learning Media to Increase Elementary School Students' Interest in Learning Science (Vol. 16, Number 1). <https://doi.org/https://doi.org/10.31603/edukasi.v16i1.10773>
- Islamy, C., & Nyoman Suputra, I. (n.d.). Development of Explosion Box Learning Media in Correspondence Subjects to Improve Learning Outcomes of Grade X OTKP Students at SMKN 2 Blitar Citra Islamy I Nyoman Suputra. <https://doi.org/https://doi.org/10.26740/jpap.v10n1.p1-15>
- Ministry of Education, Culture, Research, and Technology. (2023). Reading Literacy, Indonesia's Ranking in PISA 2022. PISA Report by the Ministry of Education, Culture, Research, and Technology, 1–25.
- Listriani, A., Hapidin, H., & Sumadi, T. (2020). Literacy Skills of 5-6 Year Old Children in the Application of the Spalding Method at Quantum Indonesia Kindergarten. *Journal Obsesi: Journal of Early Childhood Education*, 5(1), 591. <https://doi.org/10.31004/obsesi.v5i1.680>
- Masnipal. (2018). *Becoming a Professional Early Childhood Educator*. PT REMAJA ROSDAKARYA.
- Niati, A., Sofyan, H., & Utami, W. S. (2022). The Effect of Bottle Caps on the Ability to Recognize Letters in Children Aged 4-5 Years. In *Online* (Vol. 9, Number 2). <https://doi.org/10.22460/ts.v9i2.4002>
- Nurhayani, N., L. R., & Y. E. (2024). The Effect of Explosion Box Media on Students' Critical Thinking Skills in Grade 5 Social Studies at Min 5 Labuhanbatu. <https://doi.org/https://doi.org/10.61722/jssr.v2i3.1861>
- Putri, M. M., Ismiatun, A. N., & Rosyadi, A. F. (2024). The Effect of Smart Box Media on the Beginning Reading Skills of Children in Group B1 at Pertiwi 1 Kindergarten in Merangin Regency. *JECIE (Journal of Early Childhood and Inclusive Education)*, 8(1), 99–105. <https://doi.org/10.31537/jecie.v8i1.1584>
- Rahmawati, A. (2020). The Effect of Puzzle Games on the Literacy Skills of 5-6 Year Old Children at Tkit An-Nahl Percikan Iman in Jambi City.
- Reghe, M. (2021). Improving Early Literacy Skills in 5-6 Year Old Children Through the Use of Smart Boxes at Aisyiyah Layang Selatan Kindergarten.
- Sipnaturi, E. R., & Farida, F. (2020). Development of Edutainment-Based Explosion Box Media in Mathematics Learning. *Indonesian Journal of Science and Mathematics Education*, 3(1), 57–65. <https://doi.org/10.24042/ij sme.v3i1.5866>
- National Standards for Early Childhood Education. (2014). Ministry of Education and Culture Regulation No. 137.

- Tafonao, T. (2018). The Role of Learning Media in Increasing Student Interest in Learning. *Journal of Educational Communication*, 2(2). <https://doi.org/10.32585/jkp.v2i2.113>
- Utaini, R. (2025). Teacher Strategies in Improving Quality Learning in Early Childhood Through Puzzle Media at Aisyiyah Kindergarten in Bima City. *NIZAM: Journal of Early Childhood Education*, 1(2), 107-115. <https://rumahjournal.yayasanassyifa.com/index.php/jpauldi/article/view/103>
- Victorya, E. K. (2024). The Effect of Using Smart Explosion Box Media on Student Learning Outcomes in Pancasila Education Subjects in Grade IV Elementary School [Thesis (S1), University of Jambi]. <https://repository.unja.ac.id/id/eprint/66972>
- Wijayanti, F. D., U. H. B., W. I. D., & L. A. (2023). Explosion box: Interactive media to improve logical thinking skills in early childhood. <https://doi.org/https://doi.org/10.32665/abata.v3i1.1391>