



The Effect Of Using Smart Wheel Media To Improve Literacy Skills In 5-6 Year Old Children

Nurmila¹, Azizah Amal², Tri Sugiarti M Bakri³.

nmila5722@gmail.com¹, azizahamal@umm.ac.id², trisugiartimb@gmail.com³.

Early Childhood Education Teacher Education, University of Makassar, Indonesia

Abstract

This study was motivated by the low level of early literacy among young children, often influenced by the limited availability of attractive, suitable learning media. Literacy in children aged 5–6 years is an important foundation for the development of reading, writing, and critical thinking skills in subsequent levels of education. This study aims to determine the effect of using smart windmill media on the literacy skills of 5-6-year-old children at Adilika Makassar Kindergarten. The research method is quantitative, using a quasi-experimental one-group pretest-posttest design. The research subjects were 30 children in group B at Adilika Makassar Kindergarten. The data collection instrument was an observation sheet on literacy skills that included letter recognition, simple reading, and basic writing. The data were analyzed using a paired-samples t-test to assess the difference between the pretest and posttest results. The results showed that the use of smart wheel media significantly improved children's literacy skills. The average posttest score was higher than the pretest score, with a statistically significant difference ($p < 0.05$), indicating an increase in literacy skills after the children learned to use this medium. Thus, it can be concluded that smart windmill media is an effective, innovative learning tool for improving early childhood literacy.

Keywords: Smart wheel, literacy, early childhood, reading, letters

How to cite this article:

Author's name (2024). Manuscript Title. Jurnal Pena Paud, 5(2), 1-9. doi: <https://doi.org/10.33369/jpp.xxx.xxxx>

Copyright (c) 2026



Published by: Bengkulu University

✉ Corresponding author:

Email Address: nmila5722@gmail.com (Nurmila)

Received August 22, 2026, Accepted January 30, Published February 28

INTRODUCTION

Early childhood is a stage of rapid and fundamental development that is crucial for later life. This period is often referred to as the golden age, a critical period in human life when various aspects of development, such as physical, motor, cognitive, social-emotional, language, and moral-spiritual, grow rapidly and significantly (Hasana, 2022). During this period, children have extraordinary learning abilities through direct experience, play, and interaction with their surroundings. Therefore, every educational stimulus provided at an early age will have a major impact on the formation of a child's character and basic abilities in the future.

Early Childhood Education (PAUD) plays a very important role in stimulating all aspects of this development. According to Hasan et al. (2021), PAUD aims to support children's physical and spiritual growth and development so that they are ready to enter higher levels of education. PAUD is not just a place to play, but an educational facility designed to nurture children's full potential through fun, meaningful activities that are appropriate for their stage of development (Irmawati et al., 2025) .

The Ministry of Education and Culture (Kemendikbud, 2022) emphasizes that early childhood education is the main foundation in shaping children's character, personality, and social skills from an early age. Education at an early age is expected to instill moral values, build self-confidence, and develop critical and creative thinking skills. The learning process in PAUD must take into account the principles of child development, such as learning through play, being oriented towards the needs of children, and creating a safe and enjoyable learning environment (Hasana, 2022).

According to research conducted by Hurlock (2015), early childhood is the most sensitive period to environmental stimuli. This means that a lack of stimulation during this period can hinder a child's development in various aspects. Therefore, the role of families and educational institutions is very important in providing quality learning experiences. A positive environment and appropriate education will help children develop their full potential as a foundation for future success.

Early childhood education plays a significant role in shaping children's personalities, social skills, and academic readiness. Early childhood education serves as the main foundation for optimal child development, so that they are ready to face challenges in the next level of education and in social life (Hasana, 2022) .

METHODOLOGY

This study used a quasi-experimental method with a nonequivalent control group design, involving two groups, namely the experimental group and the control group. The experimental group was given treatment in the form of learning using the Kincir Pintar media, while the control group followed conventional learning without this media. Before and after the treatment, both groups underwent pre-tests and post-tests to measure the improvement in literacy skills of 5-6 year old children at Adilika Kindergarten in Makassar. This design was chosen because it allowed for an

objective comparison of learning outcomes between the two learning conditions, even though not all external variables could be fully controlled. (Farid Wajdi et al., 2024)

Type of Research

The type of research used in this study is a quasi-experimental design. A quasi-experimental design is a design that controls external variables that affect the implementation of the experiment (Rika Widianita, 2023) . The quasi-experimental quantitative research was conducted to determine the literacy skills of 5-6-year-old children using the Kincir Pintar media in improving the literacy skills of 5-6-year-old children at Adilika Kindergarten in Makassar.

Time and Place of Research

This research was conducted from the beginning of the observation until the completion of the study at Adilika Makassar Kindergarten, located at Jl. Tidung IX, Mapala, Rappocini District, Makassar City, South Sulawesi. Adilika Makassar Kindergarten is managed by a foundation chaired by Mr. Drs. H. Safaruddin P. Adilika Makassar Kindergarten has two educators, including one principal and two teachers.

The selection of the research location at Adilika Makassar Kindergarten was based on several considerations. First, this school has a group of 5-6 year old children, which is in line with the research focus on improving literacy skills in early childhood. Second, Adilika Makassar Kindergarten has adequate learning facilities and teachers who are open to innovations in learning media, thus supporting the implementation of experiments using Kincir Pintar media. Third, based on preliminary observations, the literacy skills of children at this school still vary and tend to need strengthening, so this location is considered representative for observing the effectiveness of new learning media in improving children's literacy. In addition, the proximity of the location to the researcher also facilitates the process of supervision, coordination, and intensive and continuous research implementation.

Research Objectives

The population in this study was all students at Adilika Makassar Kindergarten. From this population, the researcher selected a sample of 15 children in the experimental group and 15 children in the control group. The sample was selected based on specific considerations, namely children aged 5–6 years, in line with the focus of the research conducted at Adilika Makassar Kindergarten.

Data Collection Techniques and Instrument Development

The data collection techniques in this study included observation, testing, and documentation, with an emphasis on observation and testing. Observation was used to directly observe children's behavior and activities during the learning process, particularly in terms of participation, attention, and the ability to recognize letters and words when using the Kincir Pintar media. Meanwhile, tests are used to measure children's literacy skills before and after treatment through pre-tests and post-tests, so that quantitative improvements in learning outcomes can be determined. Documentation serves as supporting data in the form of activity notes, photos, and children's work. All collected data is then analyzed and interpreted to obtain objective, valid, and accountable research results.

Data Analysis

The data analysis techniques used in this study were descriptive statistical analysis and non-parametric statistical analysis. Descriptive statistics were used to describe the results of children's literacy abilities before and after treatment, such as average scores, percentages, and increases in pretest and posttest scores in the control and experimental groups. Meanwhile, non-parametric statistical analysis (e.g., Wilcoxon test or Mann-Whitney test) was used to test the difference in learning outcomes between the two groups and determine whether the use of Kincir Pintar media had a significant effect on improving the literacy skills of 5-6-year-old children.

RESULTS AND DISCUSSION

RESULTS

Based on Table 4.1, it is known that in the *pretest* stage, the experimental group showed that the majority of children, namely 9 children (60%), were in the "Not Yet Developed" category. The remaining 6 children (40%) were in the "Starting to Develop" category. No children in this group reached the "Developing as Expected" or "Developing Very Well" categories. Meanwhile, in the *posttest* of the experimental group, 5 children s (33.3%) were in the "Developing as Expected" category and 10 children (66.7%) were in the "Developing Very Well" category. No children in this group reached the "Not Yet Developed" or "Starting to Develop" categories.

Table 1. Frequency Distribution of Literacy Ability Scores for 5-6 Year Old Children in the Pretest and Posttest of the Experimental Group

Interval	Category	Pretest		Posttest	
		Frequency	Percentage	Frequency	Percentage
6-9	Not yet developed (ND)	9	60	0	0
10-13	Emerging (EM)	6	40	0	0
14-17	Developing as Expected (BSH)	0	0	5	33.3
18-21	Very Good Development (VGD)	0	0	10	66.7
Total		15	100%	15	100

Based on Table 4.2, there was a significant increase in the literacy skills of 5-6-year-old children in the experimental group after being given treatment using the Kincir Pintar media. At the pretest, the average literacy score of the children was 9.27 with a standard deviation of 1.580 and a range of 7 to 12. After the intervention, the posttest results showed an increase in the average score to 18.00 with a standard deviation of 1.195 and a range of 16 to 20.

Table 2. Descriptive Statistics of Pretest and Posttest Data on Children's Literacy Skills in the Experimental Group

Variable	N	Min	Maximum	Mean	Standard Deviation
<i>Pre-test</i>	15	7	12	9.27	1.580
<i>Posttest</i>	15	16	20	18.00	1,195

Based on Table 4.3, it is known that in the *pretest* stage, the control group showed that the majority of children, namely 9 children (60%), were in the "Not Yet Developed" category. The remaining 6 children (40%) were in the "Starting to Develop" category. No children in this group reached the "Developing as Expected" or "Developing Very Well" categories. Meanwhile, in the *posttest* control group, 9 children (60%) were in the "Developing as Expected" category and 6 children (40%) were in the "Developing Very Well" category. No children in this group reached the "Not Yet Developing" or "Starting to Develop" categories.

Table 3. Frequency Distribution of Literacy Ability Scores for Children Aged 5-6 Years in the Posttest and Control Group Posttest

Interval	Category	Frequency (Pretest)	Percentage (Pre-test)	Frequency (Posttest)	Percentage (Posttest)
6-9	Not yet developed (ND)	9	60	0	0
10-13	Emerging (EM)	6	40	0	0
14-17	Developing as Expected (BSH)	0	0	9	60
18-21	Very Well Developed (VWD)	0	0	6	40
Total		15	100	15	100

Based on Table 4.4, it is known that the mean literacy ability of 5-6-year-old children in the control group also increased from the pretest to the posttest, although not as much as the experimental group. At the pretest, the average score was 9.07 with a standard deviation of 1.831 and a range of 7 to 12. After the posttest was conducted without any special treatment, the average score increased to 16.93 with a standard deviation of 1.438, with scores ranging from 15 to 19.

Table 4. Descriptive Statistics of Pretest and Posttest Data on Children's Literacy Skills in the Control Group

Variable	N	Min	Maximum	Mean	Std. Deviation
<i>Pre-test</i>	15	7	12	9.07	1.831
<i>Posttest</i>	15	15	19	16.93	1.438

Table 5. Normality Test of Children's Literacy Ability in the Control and Experimental Groups (Posttest)

Variable	Kolmogorov-Smirnov	
	Statistic	Sig
<i>Control Pretest</i>	0.187	0.169
<i>Posttest Control</i>	0.185	0.177
<i>Experimental Pretest</i>	0.167	0.200
<i>Experimental Posttest</i>	0.143	0.075

Based on Table 4.5, the results of the normality test using Kolmogorov-Smirnov show that all data in the pretest and posttest, both in the control and experimental groups, have a significance value (Sig.) greater than 0.05. The significance values for the control group's pretest and post s are 0.169 and 0.177, respectively, while the experimental group shows values of 0.200 for the pretest

and 0.075 for the posttest. Since all Sig. values are > 0.05, it can be concluded that the data are normally distributed in both the control and experimental groups. Thus, the data meets one of the assumptions for the use of parametric statistical tests in further analysis.

Table 6. Homogeneity Test of Literacy Language Ability in the *Posttest* Data of the Control Group and Experimental Group

Variable	Sig.
Experimental Value	0.170
Control Value	0.215

Based on Table 4.6, the results of the homogeneity test of language literacy ability in the *posttest* data show that the significance value (Sig.) for the experimental group is 0.170 and for the control group is 0.215. Because both significance values are greater than 0.05, it can be concluded that the data variance between the experimental group and the control group is homogeneous or not significantly different. Thus, the *posttest* data from both groups meet the assumption of homogeneity, which means that parametric tests can be used for further analysis, such as the paired t-test.

Table 7. Hypothesis Test of Literacy Language Ability on Pretest and Posttest Data of the Control Group

	Paired Differences					Sig. (2-tailed)
	Std. Mean	Std. Error	95% Confidence Interval of the Difference		t	
			Lower	Upper		
Pair 1 Pre-Test Control - Post-Test Control	5.6002,720	.702	4,094	7,106	7,97314.000	

Based on Table 4.7, the t-test results for the pretest and posttest data in the control group show a significance value (Sig.) of 0.001 with a degree of freedom (df) = 14. Because the significance value is less than 0.05, it can be concluded that there is a significant difference between the pretest and posttest scores in the control group.

The following are the results of the hypothesis test using the Wilcoxon test from the *pretest-posttest* data of the experimental group.

Table 8. Hypothesis Test of Children's Literacy Ability on *Pretest* and *Posttest* Data of the Experimental Group

	Paired Differences					Sig. (2-tailed)
	Std. Mean	Std. Error	95% Confidence Interval of the Difference		t	
			Lower	Upper		

Pair Pre-Experiment	-	2,052	.530	-9,870	-7,597	-16,486	14 .000
1 Test - Post-Experiment Test	8,733						

Based on Table 4.8, the t-test results for the pretest and posttest data in the control group show a significance value (Sig.) of 0.000 with a degree of freedom (df) = 14. Because the significance value is less than 0.05, it can be concluded that there is a significant difference between the pretest and posttest scores in the experimental group.

DISCUSSION

The results of the study indicate that the use of *Kincir Pintar* media has a positive effect on improving the literacy skills of children aged 5–6 years. This is evident from the increase in the average *pretest* and *posttest* scores in the experimental group compared to the control group. Children who learn with this media show increased activity, enthusiasm, and ability to recognize letters and simple words. The *Kincir Pintar* media was able to transform literacy learning, which was initially abstract, into something more concrete, interactive, and enjoyable. Thus, the learning process became more meaningful and child-centered, which had an impact on increasing children's focus and involvement during learning activities (Wulandari, 2021).

These findings are in line with the results of research Hasana, (2022) which shows that the use of interactive media can improve the cognitive and language development aspects of early childhood. In addition, research by Rika Widianita, (2023) also found that innovative learning media such as educational toys can increase learning motivation and literacy outcomes in kindergarten children. Furthermore, research by also found that digital educational games can improve basic literacy skills through play activities that actively involve children. Overall, this research reinforces the findings of this study, namely that educational game-based media is effective in improving the basic literacy skills of early childhood, as it actively involves children in the learning process through enjoyable play experiences.

The implications of these findings indicate that attractive and interactive learning media such as *Kincir Pintar* need to be applied more widely in early childhood education institutions. Teachers can use this media as an alternative in literacy learning so that learning activities become more varied and less monotonous (Sumenep & Sumenep, 2025) . This media can also help teachers develop a more child-centered learning approach, in accordance with their characteristics and needs. In

addition, the results of this study can be used as a basis for developing similar media tailored to the local context and the developmental level of students in each PAUD institution.

This study has several limitations that need to be considered. First, the sample size is limited to one PAUD institution, so the results cannot be generalized to the entire population of early childhood. Second, the study period was relatively short, so the researchers were unable to assess the long-term impact of using *Kincir Pintar* media on children's literacy skills. Third, external factors such as teacher support and family environment were not fully controlled, which may have affected the results of the study. Similar studies conducted over a longer period show that the positive effects of interactive media on children's literacy can decline if not accompanied by continuous support from teachers and parents (Nurbaiti, 2024) .

In general, this study has a positive impact on early childhood education (PAUD). The findings show that *Kincir Pintar* media can be an innovative solution in improving children's literacy skills from an early age. PAUD teachers can use this media to foster reading interest, enrich learning experiences, and increase children's interaction with the learning environment. More broadly, this research encourages PAUD institutions to continue innovating in developing creative, interactive, and age-appropriate learning media and methods (Ibtidaiyah, 2025) .

CONCLUSION

Based on the results of the research conducted, it can be concluded that the use of *Kincir Pintar* media has a significant effect on improving the literacy skills of 5-6 year old children at Adilika Kindergarten in Makassar. Children who learn using *Kincir Pintar* media show an increase in their ability to recognize letters, read simple words, and understand the meaning of words compared to children in the control group. This media has been proven to make the literacy learning process more interesting, interactive, and enjoyable, thereby increasing children's motivation to learn. Thus, this study shows that innovative learning media such as *Kincir Pintar* can be an effective alternative in supporting the development of basic literacy in early childhood and can be implemented by early childhood teachers as an effort to improve the quality of the learning process and prepare children to enter the next level of education.

REFERENCES

- Dian Pertiwi, Syafrudin, U., & Drupadi, R. (2021). Persepsi Orangtua terhadap Pentingnya CALISTUNG untuk Anak Usia 5-6 Tahun. *PAUD Lectura: Jurnal Pendidikan Anak Usia Dini*, 4(02), 62–69. <https://doi.org/10.31849/paud-lectura.v4i02.5875>
- Fahmiah, A. U., Kuswandi, D., & Wahyuni, S. (2025). *Penggunaan Media Belajar Untuk Meningkatkan Kemampuan Membaca Permulaan*. 14(2), 308–326. <https://doi.org/10.26877/paudia.v14i2.1568>
- Fitriyati, L., & Juherna, E. (2024). Pengembangan Media Papan Sosial Emosional (Pansos) untuk Meningkatkan Perkembangan Sosial Emosional Anak Usia 5-6 Tahun. *Jurnal Pelita* (Fahmiah et al., 2025) *PAUD*, 8(2), 532–538. <https://doi.org/10.33222/pelitapaud.v8i2.3328>
- Farid Wajdi, R. (2024). (n.d.). *Buku Metodologi pendidikan*.
- Firdaus, U. R., & Prasetyo, S. (2025). *Effectiveness of Using Interactive Multimedia For Early Childhood Learning*. 07(02), 102–112.
- Gerigk, Y., Freudenberger, F., Hunze, M. S., Valtin, G., Nieding, G., Ohler, P., Gerigk, Y., Freudenberger, F., & Hunze, M. S. (2025). A Digital Training Program Fostering Media Sign Literacy in Preschool Children . An Evaluation Study. *Media Psychology*, 00(00), 1–26. <https://doi.org/10.1080/15213269.2025.2531418>
- Hasan, M., Milawati, Darodjat, Khairani, H., & Tahrim, T. (2021). Media Pembelajaran. In *Tahta Media Group*.
- Hasana, U. (2022). Konsep Pendidikan Karakter Anak Usia Dini. *EDUKIDS : Jurnal Inovasi Pendidikan Anak Usia Dini*, 2(2), 116–126. <https://doi.org/10.51878/edukids.v2i2.1775>
- Ibtidaiyah, D. I. M. (2025). *Penggunaan media interaktif untuk meningkatkan partisipasi siswa dalam pembelajaran ilmu pengetahuan alam di madrasah ibtidaiyah 1,2,3*. 01(01), 55–68.
- Irmawati, I., Herdiansyah, E., Arimbawan, F., & Priawasana, E. (2025). *Media Digital dalam Pendidikan Anak Usia Dini : Antara Inovasi Pedagogis dan Tantangan Etis*. 7(02), 797–812.
- Kemendikbud. (2022). Capaian Pembelajaran Fase Fondasi. *Kemendibudristek*, 1–38. https://kurikulum.kemdikbud.go.id/file/1678157827_capaian.pdf
- Munawwarah, H., Farida, N., & Duha, D. R. (2025). *Pengaruh Media Pembelajaran Kincir Pintar Terhadap Kemampuan Keaksaraan Awal Anak Usia 5-6 Tahun di TK Santo Thomas 1 Medan*. 07(02), 8655–8659.(Nayla et al., 2024).
- Nayla, M. R., Nurhayati, K., Islam, U., & Sunan, N. (2024). *Exploring the Role of Game-Based Learning in Early Childhood Cognitive Development : Perspectives from Teachers and Parents*. 9(December), 733–745.
- Nurbaiti, A. (2024). *Habitiasi literasi di keluarga dan ra rumah kreatif wadas kelir karangklesem purwokerto selatan banyumas*.
- Rika Widianita, D. (2023). jurnal. *AT-TAWASSUTH: Jurnal Ekonomi Islam*, VIII(I), 1–19.
- Royani, A., & Muafia, E. (2024). Peningkatan Hasil Belajar Siswa melalui Pembelajaran Interaktif

- pada Materi Huruf Hijaiyah Bersambung dan Harakat di Kelas II SD Negeri 1 Plangan Situbondo. *Journal of Pedagogical and Teacher Professional Development*, 1(1), 160–169.
- Satriana, M., Haryani, W., Jafar, F. S., Maghfirah, F., Dewi, A., Sagita, N., & Septiani, F. A. (2022). *Media Pembelajaran Digital dalam Keterampilan Literasi Anak Usia 5-6 Tahun Menstimulasi*. 10, 408–414.
- Sumenep, S. P., & Sumenep, S. P. (2025). *INOVASI MEDIA PEMBELAJARAN DIGITAL UNTUK*. 3(1).
- Tri, L., Swastyastu, J., Visual, M., & Pembelajaran, M. (2020). Manfaat Media Pembelajaran Dalam Pemerolehan Bahasa Kedua Anak Usia Dini. *Pendidikan Anak Usia Dini*, 5(1).
- Wahyudi, A., Akhbar, M. T., & Prasrihamni, M. (2023). Pengembangan Media Pembelajaran KINTAR (Kincir Pintar) Terhadap Kemampuan Membaca Kelas II SD. *Journal on Teacher Education*, 5(1), 208–213.
- Wulandari, E. (2021). *Pengaruh Penggunaan Media Pembelajaran Video Animasi Dalam Meningkatkan Keterampilan Membaca Permulaan Di Kelas 1/a Sd*
<https://repository.bbg.ac.id/handle/1000>
- Wulandari, S. W., & Puspitasari, I. (2023). Pengaruh Minat Baca Terhadap Kemampuan Literasi Awal Pada Anak Usia 5-6 Tahun di TK Se-Kabupaten Temanggung. *Edu Happiness : Jurnal Ilmiah Perkembangan Anak Usia Dini*, 2(2), 313–328.
<https://doi.org/10.62515/eduhappiness.v2i2.263>
- Zakiah, A., Riyanto, Y., & Jacky, M. (2021). Pengembangan Media Game Edukasi Kincir Pintar Asean Melalui Pembelajaran Daring Untuk Meningkatkan Motivasi Dan Hasil *Jurnal Education and*, 9(2), 572–579. <http://journal.ipts.ac.id/index.php/ED/article/view/2805>