



## The Effect of the Jarimatika Method on the Numeracy Skills of 4–5-Year-Old Children at TK Islam Al-Furqan Minasa Upa Makassar

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### **Abstrak**

*Penelitian ini bertujuan untuk mengetahui pengaruh metode Jarimatika terhadap kemampuan numerasi anak usia 4–5 tahun di TK Islam Al-Furqan Minasa Upa Makassar. Kemampuan numerasi merupakan bagian dari kecerdasan kognitif yang diajarkan sejak dini sebagaimana prinsip pendidikan Islam, yakni menumbuhkan akal dan potensi berpikir anak sebagai fitrah manusia. Metode Jarimatika, sebagai teknik berhitung menggunakan jari, memberikan pengalaman belajar yang konkret dan menyenangkan. Penelitian ini menggunakan pendekatan kuantitatif dengan desain eksperimen semu (quasi experiment) melalui dua kelompok, yaitu kelompok eksperimen dan kontrol. Teknik pengambilan sampel menggunakan purposive sampling dengan kriteria anak berusia 4–5 tahun, belum pernah mengikuti pembelajaran menggunakan metode Jarimatika, dan memiliki kemampuan numerasi yang belum berkembang optimal. Sampel penelitian berjumlah 20 anak yang terdiri atas 10 anak pada kelompok eksperimen dan 10 anak pada kelompok kontrol. Hasil uji Wilcoxon menunjukkan nilai signifikansi  $0,005 < 0,05$ , sehingga metode Jarimatika berpengaruh positif terhadap kemampuan numerasi anak. Metode ini sejalan dengan prinsip pembelajaran islami yang menekankan keseimbangan antara berpikir, bermain, dan beramal.*

**Kata kunci:** Metode Jarimatika, Kemampuan Numerasi, Pendidikan Anak Usia Dini

### **Abstract**

This study aims to determine the effect of the Jarimatika method on the numeracy skills of children aged 4–5 years at Al-Furqan Minasa Upa Islamic Kindergarten in Makassar. Numeracy skills are part of cognitive intelligence that is taught from an early age according to Islamic education principles, namely to develop the mind and the child's thinking potential as a human nature. The Jarimatika method, as a finger-counting technique, provides a concrete and enjoyable learning experience. This study uses a quantitative

approach with a quasi-experimental design through two groups, namely the experimental group and the control group. The sampling technique used purposive sampling with the criteria of children aged 4–5 years, who had never participated in learning using the Jarimatika method, and had underdeveloped numeracy skills. The research sample consisted of 20 children, comprising 10 children in the experimental group and 10 children in the control group. The Wilcoxon test results showed a significance value of  $0.005 < 0.05$ , indicating that the Jarimatika method has a positive effect on children's numeracy skills. This method aligns with Islamic learning principles that emphasize a balance between thinking, playing, and practicing good deeds.

**Keywords:** Jarimatika Method, Numeracy Skills, Early Childhood Education

## Introduction

Early Childhood Education (PAUD) plays a crucial role in laying the foundation for children's future learning abilities and development. At this stage, children begin to develop an initial understanding of various basic concepts related to daily life, including language, social-emotional, motor, and cognitive skills. One key component of cognitive development that needs to be nurtured from an early age is numeracy, the ability to understand, recognize, and apply number concepts in a variety of situations.

Various recent studies indicate that numeracy skills during the preschool years are strong predictors of a child's academic success in subsequent educational levels, particularly in mathematics and problem-solving (King & Purpura, 2021; Johnston & Bull, 2022; Dewi et al., 2025). Through fun and interactive activities, children can naturally learn to count, recognize patterns, and understand quantitative relationships. Early childhood education serves not only as a place for childcare but also as the primary foundation for instilling logical thinking skills and academic fundamentals that will be useful in subsequent educational levels (Setiani et al., 2023).

Early Childhood Education plays a vital role in building the foundation of children's personality, spirituality, and intellect. From an Islamic perspective, early childhood education can be defined as the fulfillment of the responsibility to nurture children's innate abilities (fitrah), as indicated in the first revelation, Quranic Surah Al-'Alaq, verses 1–5, regarding the importance of reading, thinking, and seeking knowledge. Numeracy skills play a key role in children's cognitive development because they help children understand concepts of quantity, patterns, mathematical relationships, and simple

decision-making in daily life (Elyana et al., 2025; Siregar, 2025). Through recreational and meaningful learning processes, children will develop the ability to recognize number concepts and perform simple calculations.

The Jarimatika method is an approach to learning arithmetic that uses fingers as concrete aids, which is appropriate for the cognitive development stage of preoperational-age children. According to Ilyas & Lismayani (2023), early childhood education should be oriented toward children's individual needs and potential (differentiated learning) so that each child can optimally develop their intelligence, both cognitively and spiritually. Furthermore, the use of concrete materials and motor activities in mathematics instruction has been shown to enhance young children's engagement and understanding of numeracy (Purnamasari et al., 2024). Thus, the application of the Jarimatika method within the context of Islamic education can be viewed as an effort to foster numeracy that balances intellectual development with Islamic values.

Based on Ministry of Education and Culture Regulation No. 18 of 2018, Early Childhood Education is organized as a form of guidance focused on students aged 0 to 6 years by providing educational interventions so that they are prepared to enter the next stage of education. During this age range, children are in the golden age, a period when brain growth and development occur at a very rapid pace. Various recent studies indicate that numeracy stimulation provided during the golden age significantly contributes to the development of children's logical thinking skills, problem-solving abilities, and school readiness (Luomaniemi, 2025; Mastikawati et al., 2025). At this stage, children are expected to master basic numeracy skills, such as recognizing numbers, comparing quantities, and performing simple arithmetic operations, as a foundation for learning mathematics at the next level (Cahyaningrum et al., 2022). Mastery of numeracy from an early age also serves as a crucial foundation for the development of numeracy literacy, which is currently one of the key competencies in national and international education policies (Arifina et al., 2025; Sugiartini et al., 2025).

However, the reality on the ground indicates that the numeracy skills of young children remain at a low level. Based on field observations conducted at Al -Furqan Minasauipa Islamic Kindergarten in Makassar from October 2–23, 2024, involving 20 children aged 4–5 years, it was found that 15 children were unable to recite and write the numbers 1–10 in sequence, could not add two numbers between 1 and 10, and had difficulty comparing larger or smaller numbers. This situation reflects the suboptimal

nature of the numeracy learning strategies used in the classroom. These findings align with the research by Karim et al. (2024), indicating that the majority of early childhood educators in Indonesia are still limited to number-based numeracy instruction and basic operations, while other domains such as patterns, comparisons, and mathematical communication have not been optimally developed. The low level of numeracy skills among early childhood students also contributes to national numeracy literacy outcomes. According to PISA 2018 data, Indonesia ranked 73rd out of 78 participating countries, with a score of 379 far below the OECD average of 489 (Darmastuti et al., 2024).

Several learning approaches have been implemented to optimize the numeracy skills of preschoolers. One of these is the application of the Jarimatika method, which involves using fingers as a concrete tool to understand number concepts. Research by Purwaningsih et al. (2018) showed that applying the Jarimatika method to 4 to 5 year olds significantly improved their early counting skills, from a pre-intervention average of 37% to 88%. Similar results were also found by Halim & Almuslim (2019), who demonstrated that the application of the Jarimatika method among 4 to 5 year olds improved early numeracy skills to the point where 90% of students met the expected developmental standards (BSH). Meanwhile, Fitriati & Mustakimah (2024) state that although the Jarimatika method is relatively simple, it is a concrete, engaging approach that aligns with the cognitive characteristics of preoperational-age children (4 to 5 years) in understanding basic number concepts.

Although various previous studies have demonstrated the effectiveness of the Jarimatika method in improving early numeracy skills in young children, most studies still focus on improving general numeracy skills without examining numeracy as a competency that encompasses understanding number symbols, comparing quantities, simple mathematical reasoning, and the application of number concepts in everyday contexts (King & Purpura, 2021). Furthermore, research on the Jarimatika method for 4 to 5 year olds in the context of Islamic education remains relatively limited.

Various recent studies confirm that the development of numeracy in early childhood requires an approach that is concrete, meaningful, and aligned with children's developmental characteristics in order to build a strong foundation for mathematical thinking from an early age (Purnamasari et al., 2024; Siregar, 2025; Luomaniemi, 2025). Therefore, this study distinguishes itself from previous research by examining the impact of the Jarimatika method on the numeracy skills of 4–5-year-old children more

comprehensively through basic numeracy indicators in an Islamic-based early childhood education institution. The novelty of this study lies in the integration of the Jarimatika method with the development of early childhood numeracy skills within the context of Islamic education is an area that has not been extensively explored in previous research, while also broadening the scope of numeracy studies to focus not only on counting skills but also on a meaningful understanding of number and quantity concepts (Dewi et al., 2025; Mastikawati et al., 2025).

## Methodology

This research is a quantitative study designed as a quasi-experiment using a non-equivalent control group design. The initial population of the study consisted of 54 students. Sampling was conducted using purposive sampling based on the following criteria: children aged 4 to 5 years, who had never used the abacus method, and whose numeracy skills were considered suboptimal. From this population, a final sample of 20 children was selected and subsequently divided into a treatment group and a comparison group. The experimental group was taught using the jarimatika method, while the control group received conventional instruction at school, specifically using the finger-calculator method.

Data collection in this study was conducted through structured observation, numeracy ability tests using the Children's Worksheet and documentation of learning activities. Observations were used to gain an understanding of the children's numeracy skills during the learning process, while tests were used to measure numeracy skills before (pre-test) and after the intervention (post-test). Documentation was collected as supporting data in the form of photos of activities and notes on the learning process (Sugiyono, 2022).

The numeracy aspects used as research indicators include the ability to recognize the numerals 1–10, the ability to compare quantities (more and fewer), and the ability to perform simple arithmetic operations using concrete objects. These indicators were established based on the cognitive development of young children in the areas of symbolic thinking and basic numeracy, as described by the National Association for the Education of Young Children (NAEYC) and the National Council of Teachers of Mathematics (NCTM), which emphasize the importance of mastering the concepts of numbers, quantities, and simple operations during the preschool years (NAEYC & NCTM, 2010;

Sarama & Clements, 2020). Descriptive analysis and the nonparametric Wilcoxon signed-rank test were used for data analysis. The study design is illustrated as follows:

O <sub>1</sub>	X	O <sub>2</sub>
O <sub>3</sub>	-	O <sub>4</sub>

Information :

- O<sub>1</sub> : Pre-test results for the experimental class before the Jarimatika was applied  
 X : The treatment involved the use of the jarimatika method  
 O<sub>2</sub> : Post-test results for the experimental class on children's numeracy skills after being taught the Jarimatika method  
 O<sub>4</sub> : Results of the post-test for the control class that was not taught the jarimatika method

## Results and Discussion

This study was conducted over a period of approximately one month at Al-Furqan Minasa Upa Islamic Kindergarten. It took place from late May to mid-June 2025. All research activities proceeded according to the planned schedule, encompassing three main stages: a pre-test, followed by the treatment phase, and concluding with a post-test.

The pre-test was conducted on May 26, 2025, in a classroom at Al-Furqan Islamic Kindergarten to assess the children's initial numeracy skills before the treatment phase. The treatment phase then consisted of three face-to-face sessions held on June 11, June 17, and June 18, 2025. During this phase, the experimental group received instruction using the Jarimatika method, while the control group participated in numeracy instruction using the conventional method typically employed by school teachers. Each session lasted approximately 30 minutes and included an opening activity, a main activity, and a closing activity. After the entire intervention was completed, a post-test was administered on June 19, 2025, to measure the improvement in the children's numeracy skills following instruction using the Jarimatika method.

Table 1. Analysis of Data for the Experimental Group (Descriptive Statistics)

	N	Minimum	Maximum	Mean	Std. Deviation
Experiment Pretest	10	8.00	18.00	11.5000	3.17105
Experiment Posttest	10	17.00	23.00	20.5000	1.90029
Valid N (listwise)	10				

Source: SPSS 25 Data Analysis of Pre-test and Post-test Numeracy Skills of Children in the Experimental Group: Descriptive Statistics, 2025

Based on the descriptive analysis in the table above, it was found that the experimental group consisted of 10 research subjects. Before the intervention was administered, the average pre-test score for this group was 11.50. After the experimental group received the treatment (the jarimatika method), their average post-test score increased significantly to 20.50. These results indicate an average increase of 9.00 points in the experimental group.

Table 2. Control Group Analysis Data (Descriptive Statistics)

	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
Pretest_Kontrol	10	7.00	12.00	10.3000	1.63639
Posttest_Kontrol	10	18.00	23.00	19.5000	1.50923
Valid N (listwise)	10				

Source: SPSS 25 Data Analysis of Pretest and Posttest Numeracy Skills of Children in the Control Group: Descriptive Statistics

A descriptive statistical analysis of Table 2 for the control group (N=10) shows a significant increase in the children's numeracy skills. The mean score for this group rose from 10.30 (pre-test) to 19.50 (post-test); this increase is classified as high. However, a comparison with the experimental group (separate data) revealed that the increase in the mean score for the treatment group was quite optimal; the difference in the average increase between the two groups was recorded at 1.00, indicating a clear difference in the improvement in scores before the treatment was administered.

Furthermore, the researcher conducted a Wilcoxon signed-rank test to determine the significance of the Jarimatika method's effect on children's numeracy skills. The decision criteria were as follows: if the significance value (p-value) was below the 0.05 threshold ( $p < 0.05$ ),  $H_0$  was rejected, and Hypothesis  $H_1$  was accepted.

Table 3. Results of the Wilcoxon Signed-Rank Test

<b>Group</b>	<b>Z Count</b>	<b>Sig. (2-tailed)</b>	<b>Information</b>
Experiment (Arimatics)	-2.812	<b>0.005</b>	Significant
Control (Conventional)	-0.524	0.601	Not significant

Based on the results of the Wilcoxon Signed-Rank test, the experimental group showed a p-value (significance) of 0.005. Since this value is far smaller than 0.05 ( $p < 0.05$ ), this proves that the use of the finger-counting method has an effect on improving the

numeracy skills of children aged 4 to 5 years. The findings of this study indicate that the Jarimatika method is effective in improving children's numeracy skills, as it provides a concrete, participatory, and enjoyable educational experience through the use of fingers as counting aids. These findings align with the research by Fitriati & Mustakimah (2024), who studied additional Jarimatika activities conducted with children in Class A (aged 4–5 years) at Bunga Harapan Bringin Preschool. Based on the research conducted, evidence was found that the Jarimatika method can help children recognize the numerals 1–10, distinguish between “many” and “few,” and perform simple arithmetic operations using concrete objects in a fun way.

Furthermore, the study by Laela & Suyadi (2020) also confirms that the Jarimatika educational toy is highly effective when used with early childhood students at RA Baiturrahman, as it gradually improves children's numeracy skills. Children become more enthusiastic, are able to count quickly without scribbling, and demonstrate progress reaching developmental levels ranging from “As Expected” to “Very Good”. Another study by Adriani (2022) notes that numeracy skills need to be developed starting at ages 4–5 using concrete materials and fun play-based activities like Jarimatika, as children at this stage are in the preoperational phase according to Piaget's theory. Using fingers as a counting aid helps children more easily grasp number concepts and the relationship between numerical symbols and the quantity of objects.

The Jarimatika method has proven to be an effective numeracy learning strategy for 4- to 5-year-old students, consistent with the findings of previous studies. This effectiveness stems from the method's alignment with the characteristics of children's numeracy development, in which children learn optimally through concrete, visual, and motor activities. Thus, it can be concluded that the implementation of Jarimatika is effective in improving children's numeracy skills at Al-Furqan Islamic Kindergarten, located in Minasa Upa, Makassar.

## Conclusion

This study, conducted at Al-Furqan Minasa Upa Islamic Kindergarten in Makassar, concluded that the implementation of the Jarimatika method significantly improved the numeracy skills of 4- to 5-year-old children. Compared to the group taught using conventional methods, children who used Jarimatika showed greater progress, particularly in recognizing number symbols, distinguishing quantities, and performing basic

calculations. This confirms that the use of concrete media, namely fingers, facilitates a more tangible and engaging understanding of number concepts for children. Based on these findings, the Jarimatika method is recommended as an effective learning option for early childhood educators to hone basic numeracy skills. Additionally, this method offers the added benefit of boosting children's self-confidence and motivation in learning mathematics. Further research is recommended to test the effectiveness of the Jarimatika method across a broader age range with a larger sample size so that the research findings can be more strongly generalized. Follow-up research could also combine the Jarimatika method with interactive digital media or technology-based educational games to determine its impact on numeracy development and other cognitive aspects in early childhood. Furthermore, a stronger experimental design with comparative analysis between groups could be employed to obtain more in-depth empirical evidence regarding the effectiveness of the Jarimatika method.

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