

Development of BAMSİ (Busy Book for Numbers Six and Nine) as a Learning Medium for Number Recognition among Children Aged 5–6 Years

*Zahara Alfina Divanti¹, Sri Widayati², Nurhenti Dorlina Simatupang³, Afifah Rahmaningrum⁴

^{1,2,3,4}Universitas Negeri Surabaya, Indonesia

Correspondence Email: zahara.22085@mhs.unesa.ac.id

Article History: Submission: 2025-10-15 || Accepted: 2026-03-24 || Published: 2026-04-10

Abstract

The ability to recognize and differentiate numbers is a fundamental component of early childhood numeracy development; however, many children experience difficulties distinguishing visually similar numbers such as 6 and 9. This study aims to develop, validate, and evaluate the effectiveness of BAMSİ (Busy Book for Numbers Six and Nine) as an interactive learning medium for children aged 5–6 years. The research employed a Research and Development (R&D) approach using the ADDIE model, encompassing analysis, design, development, implementation, and evaluation stages. The feasibility of the media was assessed through expert validation involving media and subject-matter experts using a Likert-scale instrument, while effectiveness was tested using a one-group pretest–posttest design with 17 kindergarten children. Assessment indicators included the ability to identify, name, and classify numbers 6 and 9. The validation results indicated that the BAMSİ media was highly feasible. Furthermore, the effectiveness test showed a significant improvement in children’s number recognition abilities, as evidenced by the Wilcoxon test ($p < 0.001$) and an N-Gain score of 0.81 (high category). The novelty of this study lies in integrating sensorimotor-based activities that enable children to manipulate physical objects, thereby strengthening visual discrimination and conceptual understanding. These findings suggest that BAMSİ is an effective, engaging, and developmentally appropriate medium for enhancing early numeracy skills.

Keywords: Busy book, Early numeracy, Number recognition, Sensorimotor learning, Early childhood education.

This is an open access article under the [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.



I. INTRODUCTION

Early Childhood Education (ECE) serves children aged 0–6 years, a developmental period characterized by rapid cognitive, emotional, and neurological growth (Selvia & Nurachadijat, 2023). This phase, often referred to as the *golden age*, represents a critical window in which children’s brain development reaches its peak potential, requiring appropriate and meaningful stimulation from both educators and caregivers. To optimize this potential, learning environments must be carefully designed to support multiple domains of development, including motor skills, socio-emotional growth, moral and religious values, language, creativity, and particularly cognitive development (Azizah et al., 2023).

From a developmental perspective, Piaget posits that children aged 5–6 years are in the preoperational stage, where symbolic thinking begins to emerge, although learning remains highly dependent on concrete experiences (Simatupang et al., 2023). At this stage, children can recognize symbols such as numbers, yet they require direct interaction with tangible objects to construct meaningful understanding. Sensorimotor-based learning activities, therefore, play a crucial role in facilitating the formation of symbolic representations. In this context, the use of interactive learning media such as busy books enables children to engage in hands-on activities—including matching, sorting, assembling, and manipulating objects—that strengthen their ability to distinguish visually similar numerical forms. This aligns with Montessori’s perspective, which emphasizes the importance of concrete materials and play-based learning in supporting cognitive development and logical reasoning.

Mechanistically, sensorimotor activities allow children to interact directly with learning objects through touching, arranging, and manipulating numerical representations. These interactions help bridge the gap between concrete experiences and abstract symbols, enabling children to gradually construct mental representations of numbers. Through repeated exposure and active engagement, children become more capable of identifying subtle visual differences, such as those between the numbers 6 and 9. Thus, sensorimotor learning not only enhances fine motor

coordination but also supports higher-order cognitive processes related to symbol recognition and differentiation during the preoperational stage. Despite its importance, challenges remain in early childhood learning, particularly in children's ability to distinguish visually similar numbers. Difficulties in differentiating numbers such as 6 and 9 can hinder the development of foundational numeracy skills if not addressed through appropriate instructional media. Preliminary observations conducted at TK Dharma Wanita Kembang Belor, Mojokerto, revealed that approximately 60% of children in Group B were unable to correctly sequence numbers from 1 to 10, with notable confusion between the numbers 6 and 9. This issue appears to stem from the predominant use of conventional teaching methods, such as number posters and rote memorization, which tend to be monotonous and less meaningful for young learners.

Previous studies have explored the development of busy book media for general number recognition (Febrisia & Hadiyanto, 2023) and other educational tools such as counting-based game media (Hidayah et al., 2022). However, most of these studies focus on general number introduction (e.g., numbers 1–10) and have not specifically addressed the problem of visual discrimination between similar numerical symbols. This indicates a research gap in developing targeted, interactive learning media that address specific cognitive challenges in early numeracy. One promising solution is the use of Busy Book media, which consists of interactive, activity-based learning materials designed as educational play tools (Astuti, 2023). Busy books are particularly suitable for early childhood learners because they are concrete, engaging, and capable of simultaneously stimulating cognitive and fine motor development. Based on this rationale, the present study aims to develop and evaluate the feasibility and effectiveness of BAMSİ (Busy Book for Numbers Six and Nine) in improving children's ability to distinguish between the numbers 6 and 9 among those aged 5–6 years. Specifically, this study addresses two research questions: (1) how feasible is the BAMSİ media based on expert validation, and (2) how effective is the use of BAMSİ in enhancing children's ability to differentiate between the numbers 6 and 9.

This study is expected to contribute theoretically to the development of sensorimotor-based learning media that strengthen symbolic number representation in the preoperational stage, and practically to provide an interactive and developmentally appropriate instructional alternative for early childhood education.

II. METHOD

This study employed a Research and Development (R&D) approach using the ADDIE model, which consists of five systematic stages: Analyze, Design, Development, Implementation, and Evaluation. This model was selected due to its structured framework that enables the development of instructional media from needs analysis to product evaluation. To assess the effectiveness of the developed media, a pre-experimental one-group pretest–posttest design was applied. This design allows the measurement of changes in children's abilities before and after the intervention; however, its limitations in establishing causal inference are acknowledged due to the absence of a control group. The participants consisted of 17 kindergarten children aged 5–6 years from Group B at TK Dharma Wanita Kembang Belor, Mojokerto. The developed product was BAMSİ (Busy Book for Numbers Six and Nine), designed to facilitate children's understanding and differentiation of numbers 6 and 9 through sensorimotor-based activities involving direct object manipulation.

In the analysis stage, preliminary observations identified that most children experienced difficulties in sequencing numbers and distinguishing visually similar digits, particularly 6 and 9. Additionally, existing instructional practices were dominated by the use of posters and rote memorization, which lacked interactive and concrete learning experiences. In the design stage, BAMSİ was developed as a 20 × 20 cm activity-based book using laminated art paper to ensure durability and safety. The activities included threading, puzzle assembly, matching, grouping, and constructing numbers using sensory materials, arranged progressively from recognizing individual numbers to combining both numbers.

The development stage involved producing the media and validating it through expert judgment by two media experts and two subject-matter experts using a Likert-scale instrument. The assessed aspects included visual design, content appropriateness, clarity of instructions, and engagement level. The implementation stage consisted of three learning sessions (60 minutes

each), beginning with a pretest using flashcards, followed by structured activities using BAMSI, and ending with a posttest to measure improvement. Finally, evaluation was conducted through both formative and summative approaches. Data were analyzed using the Shapiro–Wilk test, which indicated non-normal distribution; therefore, the Wilcoxon Signed Rank Test was applied to assess differences between pretest and posttest scores. Additionally, N-Gain analysis was used to determine the magnitude of improvement. Data collection techniques included observation and documentation, while data analysis focused on both feasibility (expert validation) and effectiveness of the developed media .

III. RESULTS AND DISCUSSION

A. Results

1. Results of Product Development

Prior to the feasibility evaluation, the developed product—BAMSI (Busy Book for Numbers Six and Nine)—is presented to provide a comprehensive visual context of the learning media. This presentation illustrates the conceptual design, structural organization, and interactive features embedded within the product, enabling a clearer understanding of how the media supports early numeracy development. By presenting the product visually, readers can better grasp the alignment between the media design and the cognitive characteristics of children aged 5–6 years.

BAMSI is designed as an interactive, activity-based learning medium in the form of a compact busy book that integrates sensorimotor-based tasks. The design emphasizes hands-on engagement, allowing children to interact with learning materials through tactile and visual experiences. Each page includes progressive activities such as matching, grouping, assembling puzzles, threading, and manipulating objects that represent the numbers 6 and 9. These activities support fine motor development while strengthening children’s ability to recognize, differentiate, and internalize numerical symbols. Furthermore, the visual design of BAMSI incorporates colorful and child-friendly elements to enhance motivation and attention during the learning process. The use of laminated materials ensures that the media is safe, reusable, and suitable for repeated use in early childhood learning environments. The integration of sensory materials also reinforces learning through multi-sensory experiences, particularly at the preoperational stage of cognitive development. The presentation of the product visualization is therefore essential to demonstrate how BAMSI facilitates active learning, supports experiential engagement, and bridges the gap between concrete manipulation and abstract symbol recognition. Through direct interaction with the media, children are encouraged to construct their understanding of numerical concepts, particularly in distinguishing visually similar numbers such as 6 and 9.



Figure 1. Front cover of BAMSI, Number 6 material



Figure 2. Number 9 material section

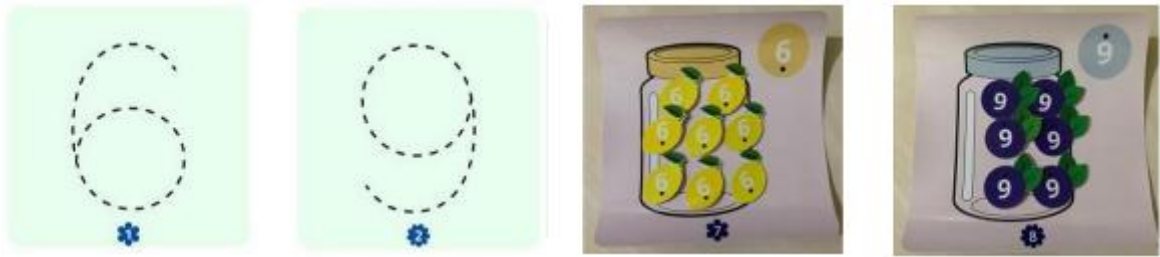


Figure 3. Number 6 and 9 material

Based on the overall presentation of the product shown in the figures above, the BAMSİ media (Busy Book for Numbers Six and Nine) demonstrates a structured, interactive design that aligns with the developmental characteristics of children aged 5–6 years. Each page is designed with varied and progressive activities, ranging from the introduction of number shapes to more complex tasks that require children to differentiate between the numbers 6 and 9. The use of attractive colors, contextual illustrations, and manipulative elements such as puzzles, threading, and object grouping provides a concrete and enjoyable learning experience for children.

In addition, the integration of sensorimotor activities within the media allows children to learn through direct interaction with objects, thereby strengthening their visual and conceptual understanding of numerical symbols. Thus, BAMSİ functions not only as a learning aid but also as an effective medium for simultaneously developing children's cognitive abilities and fine motor skills.

2. Results of Media Feasibility Analysis

To ensure that the developed BAMSİ media (Busy Book for Numbers Six and Nine) meets the feasibility standards as a learning medium for early childhood education, a validation process was conducted by experts. This validation involved two types of experts, namely media experts and subject-matter experts, who possess expertise in instructional media development and early childhood education. The assessment process used a Likert-scale instrument with a score range of 1–4. The validation instrument consisted of 8 items for media aspects and 10 items for content aspects, covering indicators such as visual appearance, content appropriateness, alignment with children's developmental stages, and ease of use. The validation data were then analyzed quantitatively to determine the feasibility level of the developed media. The percentage of feasibility was calculated using the following formula:

$$P = \frac{f}{N} \times 100\%$$

Description:

P = Feasibility percentage

f = Obtained score

N = Maximum total score

The formula is used to calculate the percentage of media feasibility based on the scores obtained from expert evaluations compared to the maximum possible score. The results are then interpreted into feasibility categories, such as highly feasible, feasible, fairly feasible, or less feasible. This interpretation provides an objective overview of the quality of the developed media and determines whether BAMSİ meets the criteria for use in the learning process. Furthermore, the results of this analysis serve as a basis for revising and refining the product before proceeding to the field implementation stage.

a) Validation by Media Experts

Media expert validation was conducted to assess the feasibility of the BAMSİ product as a learning medium for early childhood education. The validation process involved two experts with expertise in instructional media. The assessment was carried

out using a questionnaire consisting of 8 items covering several aspects, including visual appearance, media design, readability, color appropriateness, safety for children, and the quality of materials used. The scores were analyzed using a percentage formula to determine the feasibility level of the media. The resulting percentages were then interpreted into feasibility categories using the following criteria: 81–100% (highly feasible), 61–80% (feasible), 41–60% (fairly feasible), and $\leq 40\%$ (less feasible).

Based on the evaluation results, the first media expert gave a score of 31 out of a maximum score of 32 (97%), while the second expert awarded the maximum score of 32 (100%). Therefore, the average feasibility percentage reached 97.5%, which falls into the “highly feasible” category. These findings indicate that the BAMSİ media meets the required standards to be used as a learning medium for children aged 5–6 years. However, the experts also provided several suggestions for improvement, particularly regarding the alignment of images with the overall media design. Accordingly, revisions were made to enhance the quality of the product before its implementation stage.

Table 1. Media Expert Validation Score Results

No.	Assessed Aspects	Item Number	Media Expert 1 Score	Percentage	Media Expert 2 Score	Percentage
1.	BAMSİ media appearance	1–5	19	95%	20	100%
2.	Use of BAMSİ media	6–7	8	100%	8	100%
3.	Application in learning	8	4	100%	4	100%
Total Score			31	97%	32	100%

Based on Table 1, the results of the media expert validation indicate that the BAMSİ learning media achieved a very high level of feasibility across all assessed aspects. The visual appearance of the media obtained a score of 95% from the first expert and 100% from the second expert, indicating that the design is attractive, clear, and appropriate for early childhood learners. The aspects of media usage and application in learning both reached 100% from both experts, demonstrating that the media is easy to use, functional, and effectively supports the learning process. Overall, the average feasibility score reached 97.5%, which falls into the “highly feasible” category. These findings suggest that BAMSİ meets the required standards in terms of design quality, usability, and instructional applicability. Therefore, the media is considered appropriate for use in early childhood education settings, particularly for supporting children’s ability to recognize and differentiate numbers 6 and 9.

b) Validation by Subject Matter Experts

Subject matter expert validation was conducted to assess the feasibility of the BAMSİ media in terms of content quality and its alignment with early childhood learning objectives. The validation process involved two experts with expertise in early childhood education. The assessment was carried out using a questionnaire consisting of 10 items covering several aspects, including the alignment of content with learning objectives, suitability with children’s developmental stages, accuracy of the material, and the relevance of activities to the indicators of recognizing numbers 6 and 9. The scores were analyzed using a percentage formula to determine the feasibility level of the content. The results were then categorized based on the following criteria: 81–100% (highly feasible), 61–80% (feasible), 41–60% (fairly feasible), and $\leq 40\%$ (less feasible).

Based on the validation results, the first subject matter expert gave a score of 40 out of a maximum score of 40 (100%), while the second expert gave a score of 39 (97.5%). Thus, the average feasibility percentage reached 98.75%, which falls into the “highly feasible” category. This indicates that the BAMSİ media is highly appropriate in terms of content quality and relevance to learning objectives. However, although the media was generally rated as highly feasible, the experts provided several minor suggestions,

particularly regarding the refinement of supporting materials. These suggestions were used as a basis for revising and improving the product before its implementation stage.

Table 2. Subject Matter Expert Validation Score Results

No.	Assessed Aspects	Item Number	Expert 1 Score	Percentage	Expert 2 Score	Percentage
1.	Learning objectives	1-2	8	100%	8	100%
2.	Content	3-5	12	100%	12	100%
3.	Presentation method	6-7	8	100%	8	100%
4.	Content accuracy	8-9	8	100%	8	100%
5.	Supporting learning materials	10	4	100%	3	95%
Total Score			40	100%	39	97.5%

Based on Table 2, the results of the subject matter expert validation indicate that the BAMSİ learning media achieved an excellent level of feasibility across all assessed aspects. Most indicators, including learning objectives, content, presentation, and content accuracy, obtained a perfect score (100%) from both experts, demonstrating that the material is highly relevant, accurate, and well-aligned with early childhood learning needs. Although the aspect of supporting learning materials received a slightly lower score from the second expert (95%), it still falls within the “highly feasible” category. Overall, the average feasibility score of 98.75% confirms that the BAMSİ media meets high standards in terms of content quality and instructional relevance. Therefore, the media is considered highly appropriate for use in supporting children’s ability to recognize and differentiate numbers 6 and 9.

c) Media Effectiveness Analysis

The effectiveness analysis of the BAMSİ media was conducted to determine the extent to which the developed media could improve the ability of children aged 5–6 years to recognize and differentiate the numbers 6 and 9. The data used in this analysis were obtained from pretest and posttest results, which were further analyzed using the Wilcoxon test and N-Gain calculation to measure the level of improvement.

1) Pretest and Posttest Results

The pretest was conducted to assess children’s initial ability before the implementation of the BAMSİ media. The assessment was carried out using an observation sheet consisting of three indicators: the ability to identify, name, and classify the numbers 6 and 9. Each indicator was scored on a scale of 1–4, resulting in a maximum possible score of 12 for each child. The percentage of ability was calculated using the following formula:

$$\text{Percentage} = \frac{\text{Obtained Score}}{\text{Maximum Score}} \times 100\%$$

The pretest results indicated that the children’s initial ability was relatively low. Based on descriptive analysis, the average pretest score was 4 out of a maximum score of 12, equivalent to 33%. This finding suggests that most children were not yet able to correctly identify, name, or classify the numbers 6 and 9. After the implementation of the BAMSİ media across three learning sessions, a posttest was conducted to measure changes in children’s abilities. The posttest results showed a notable improvement, with the average score increasing to 8 out of 12, or 67%. This improvement indicates that most children were able to recognize numerical symbols, name, and differentiate the numbers 6 and 9, and begin to classify them correctly. However, some children had not yet fully mastered number recognition, as evidenced by minor errors during certain learning activities.

Table 3. Pretest Results of Number Recognition Ability (6 and 9)

No	Student Name	Item 1	Item 2	Item 3	Total	Percentage
1	ZAK	3	3	3	9	75%
2	AKH	3	3	3	9	75%
3	ZEN	1	1	1	3	25%
4	VIC	1	1	1	3	25%
5	BAR	3	2	2	7	58.3%
6	FAZ	3	2	2	7	58.3%
7	REN	2	3	3	8	67%
8	DAN	1	1	1	3	25%
9	DEV	1	1	1	3	25%
10	NAZ	1	1	1	3	25%
11	REG	3	2	2	7	58.3%
12	SHE	1	1	1	3	25%
13	RAF	1	1	1	3	25%
14	REI	1	1	1	3	25%
15	RAY	1	1	1	3	25%
16	ZEH	1	1	1	3	25%
17	RAS	3	3	2	8	67%
	Total	30	28	27		

Based on Table 3, the pretest results indicate that children's initial ability to recognize and differentiate the numbers 6 and 9 was relatively low. The majority of students obtained scores in the lower range, with many achieving only 25%, reflecting limited mastery of identifying, naming, and classifying the target numbers. Only a few students reached moderate scores (58.3%–75%), suggesting partial understanding.

The total scores for each item (30, 28, and 27) further confirm that performance across all indicators was generally weak and uneven. These findings indicate that most children had not yet developed sufficient visual discrimination and symbolic understanding of the numbers 6 and 9 prior to the intervention. Therefore, the pretest results highlight the need for an interactive and concrete learning medium to support early numeracy development.

Table 4. Posttest Results of Number Recognition Ability (6 and 9)

No	Student Name	Item 1	Item 2	Item 3	Total	Percentage
1	ZAK	4	4	4	12	100%
2	AKH	4	4	4	12	100%
3	ZEN	3	3	3	9	75%
4	VIC	3	3	3	9	75%
5	BAR	4	4	3	11	92%
6	FAZ	4	4	4	12	100%
7	REN	4	4	4	12	100%
8	DAN	3	3	2	8	67%
9	DEV	3	2	2	7	58.3%
10	NAZ	3	3	3	9	75%
11	REG	4	4	4	12	100%
12	SHE	4	4	3	11	92%
13	RAF	4	3	3	10	83.3%
14	REI	4	4	3	11	92%
15	RAY	3	3	3	9	75%
16	ZEH	4	3	3	10	83.3%
17	RAS	4	4	4	12	100%
	Total	62	59	55		

Based on Table 4, the posttest results show a significant improvement in children's ability after the implementation of the BAMSI media. Most students achieved high scores, with several reaching 100%, indicating that they were able to correctly identify, name, and classify the numbers 6 and 9. The distribution of scores shifted from predominantly low in the pretest to moderate and high categories in the posttest. The total scores for each item (62, 59, and 55) demonstrate a consistent increase across all indicators, reflecting overall improvement in performance. Although a few students still showed moderate results, the majority displayed substantial progress in recognizing and differentiating numerical symbols.

Overall, these findings suggest that the BAMSI media is effective in enhancing children's early numeracy skills, particularly in addressing difficulties related to visual discrimination between similar numbers through interactive and sensorimotor-based learning activities.

The comparison between pretest and posttest results is illustrated in Figure 5, which shows a clear improvement in children's abilities after the use of the BAMSI media.

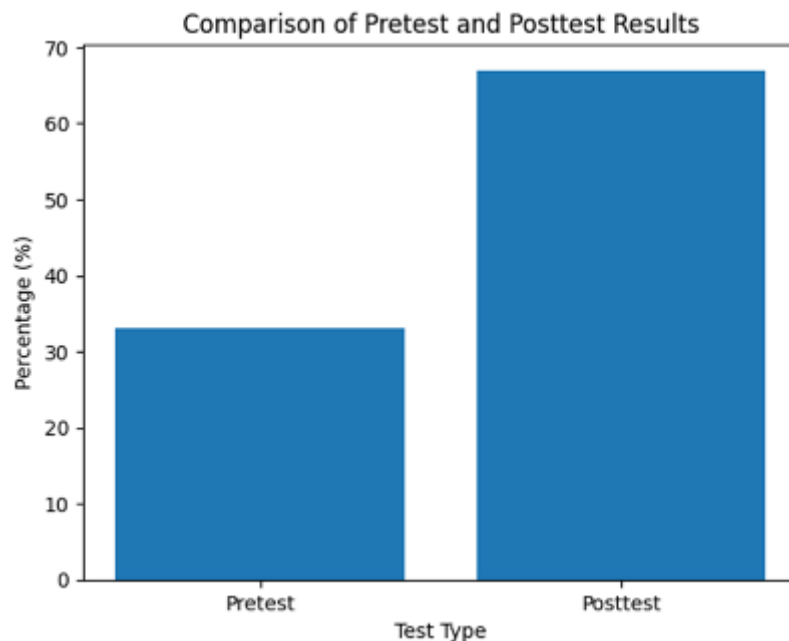


Figure 4. Comparison Graph of Pretest and Posttest Results

Based on Figure 4, the average percentage of children's ability increased from approximately 33% in the pretest to around 67% in the posttest. This substantial increase indicates that the implementation of the BAMSI media contributed positively to enhancing children's ability to recognize and differentiate the numbers 6 and 9. The upward trend shown in the graph reflects a significant shift from low to moderate levels of achievement, suggesting that the learning activities provided through BAMSI effectively facilitated children's understanding of numerical symbols. The use of interactive and sensorimotor-based tasks appears to support meaningful learning experiences, enabling children to engage actively and improve their performance.

Overall, the graphical comparison reinforces the findings from the descriptive data, confirming that BAMSI is an effective learning medium for improving early numeracy skills, particularly in addressing difficulties related to visual discrimination between similar numbers.

2) Wilcoxon Test Results

The normality test results using the Shapiro–Wilk test indicated that the data were not normally distributed. Therefore, the Wilcoxon Signed-Rank Test was employed to analyze the differences in children’s abilities between the pretest and posttest results. The results of the Wilcoxon test showed an Asymp. Sig. (2-tailed) value of 0.000 (< 0.05), indicating a statistically significant difference in children’s abilities before and after the implementation of the BAMSİ media. This finding confirms that the use of BAMSİ had a significant effect on improving children’s ability to recognize and differentiate the numbers 6 and 9.

The detailed results of the Wilcoxon Signed-Rank Test are presented in the following table:

Table 5. Wilcoxon Signed-Rank Test (Ranks)

Comparison	Category	N	Mean Rank	Sum of Ranks
Posttest – Pretest	Negative Ranks	0	0.00	0.00
	Positive Ranks	17	9.00	153.00
	Ties	0		
	Total	17		

Table 6. Wilcoxon Test Statistics

Variable	Value
Z	-3.635
Asymp. Sig. (2-tailed)	0.000

Based on Table 5, all participants (N = 17) fall into the positive ranks category, indicating that every child showed an improvement in performance from pretest to posttest. There were no negative ranks or ties, meaning that no participant experienced a decline or remained unchanged. The mean rank value of 9.00 and the sum of ranks of 153.00 further confirm a consistent upward trend in children’s abilities after the intervention. Table 6 presents the statistical results of the Wilcoxon Signed-Rank Test, showing a Z value of -3.635 with an Asymp. Sig. (2-tailed) of 0.000 (< 0.05). This indicates that the difference between pretest and posttest results is statistically significant.

These findings provide strong evidence that the BAMSİ media has a significant effect on improving children’s ability to recognize and differentiate the numbers 6 and 9. The absence of negative ranks and the dominance of positive ranks suggest that the intervention was consistently effective across all participants.

3) N-Gain Results

The N-Gain analysis was conducted to determine the level of improvement in children’s abilities after the implementation of the BAMSİ media. The results indicate that the average N-Gain score is 0.8123 (81.23%), which falls into the high category. This finding suggests that the use of BAMSİ is highly effective in improving children’s ability to recognize and differentiate the numbers 6 and 9.

Table 7. N-Gain Score Results

Variable	N	Minimum	Maximum	Mean	Std. Deviation
N-Gain Score	17	0.44	1.00	0.8123	0.17935
N-Gain (%)	17	44.00	100.00	812.325	1.793.502
Valid N (listwise)	17				

Based on Table 7, the N-Gain score shows a substantial improvement in children’s learning outcomes after the intervention. The mean N-Gain value of 0.8123 indicates that the level of improvement is categorized as high, meaning that the majority of children experienced significant progress in their ability to recognize

and differentiate the numbers 6 and 9. The minimum N-Gain value of 0.44 suggests that even the lowest improvement still falls within a moderate range, while the maximum value of 1.00 indicates that some children achieved optimal learning gains. The relatively moderate standard deviation (0.17935) reflects that the improvement is fairly consistent across participants.

Overall, these findings confirm that the BAMSİ media is highly effective in enhancing early numeracy skills, particularly in overcoming children's difficulties in distinguishing visually similar numbers through interactive and sensorimotor-based learning activities.

B. Discussion

The results of this study indicate that the BAMSİ media is effective in improving children's ability to recognize and differentiate the numbers 6 and 9. This is evidenced by the comparison between pretest and posttest results, where the average percentage of children's ability increased from 33% to 67% after participating in learning activities using BAMSİ. This improvement suggests that the use of concrete and interactive media facilitates children's understanding of numerical concepts through direct engagement.

The effectiveness of BAMSİ can be further explained through Piaget's cognitive development theory, which states that children aged 5–6 years are in the preoperational stage, where learning is still highly dependent on concrete experiences. The sensorimotor activities embedded in BAMSİ, such as threading, assembling, and grouping, provide meaningful hands-on experiences that help children construct their understanding of number forms and distinctions. These activities enable children not only to recognize symbols but also to internalize the structural differences between numbers. Several design features of BAMSİ also contribute to children's improved understanding. For instance, the use of visual markers—such as a dot at the bottom of the number 6 and at the top of the number 9—helps reduce visual discrimination errors caused by the similarity of the two symbols. In addition, manipulative activities such as threading and constructing number shapes allow children to gradually understand numerical structures, supporting deeper conceptual learning rather than mere memorization.

These findings are consistent with previous studies. Heratriana (2024) reported that the use of busy book media can enhance early numeracy skills, while Syahputri and Sit (2023) found that busy book-based learning improves children's ability to recognize letters and numbers at the age of 5–6 years. In line with these findings, the present study confirms that BAMSİ is particularly effective in addressing specific difficulties related to distinguishing visually similar numbers. From a feasibility perspective, the validation results indicate that BAMSİ is highly appropriate for use in learning contexts. Media experts provided an average score of 97.5%, while subject matter experts rated it at 98.75%, covering aspects such as visual design, safety, clarity of presentation, alignment with learning objectives, and content accuracy. The Wilcoxon test results further revealed a statistically significant difference between pretest and posttest scores, confirming the effectiveness of the intervention. This is supported by the N-Gain value of 0.81, which falls into the high category, indicating substantial improvement in children's early numeracy abilities.

Practically, BAMSİ can be implemented through play-based learning approaches, such as threading numbers, assembling puzzles, and grouping objects according to numerical symbols. These activities make learning more engaging and participatory while helping children differentiate similar number forms more effectively.

However, this study has several limitations. The sample size was relatively small (17 children), and the study was conducted in a single institution using a pre-experimental design without a control group. Additionally, the use of observational assessment may introduce potential bias. Therefore, future studies are recommended to involve larger and more diverse samples and to apply experimental or quasi-experimental designs with control groups to enhance the generalizability and robustness of the findings.

IV. CONCLUSION

This study demonstrates that the BAMS media (Busy Book for Numbers Six and Nine) is effective in improving the ability of children aged 5–6 years to recognize and differentiate the numbers 6 and 9. The findings indicate that the integration of sensorimotor activities within the BAMS media helps reduce children's errors in distinguishing visually similar numerical forms, particularly the numbers 6 and 9. BAMS functions not only as a cognitive learning aid but also as a medium that stimulates motor activities, thereby supporting holistic learning processes in early childhood education. These results suggest that numeracy learning involving the manipulation of concrete objects and hands-on activities is more effective in helping children understand numerical concepts compared to rote memorization alone.

REFERENCES

- Anggriani, M., Sulaiman, S., & Hasan, H. (2026). The Effect of the Experiential Learning Model on Elementary School Students' IPAS Learning Outcomes: Pengaruh Model Pembelajaran Experiential Learning Terhadap Hasil Belajar IPAS Siswa Sekolah Dasar. *Jurnal Evaluasi Dan Kajian Strategis Pendidikan Dasar*, 3(1), 63–68. <https://doi.org/10.54371/jekas.v3i1.905>
- Astuti, R. P. F. (2023). *Busy Book Tematik (Media Multiliterasi Anak) Sleman: Deepublish.*
- Ati, R. W., Watini, S., & Kurniawaty, L. (2025). Implementasi Model Atik dalam Permainan Congklak untuk meningkatkan Kemampuan Motorik Halus Anak Usia 4–5 Tahun. *Jurnal Inovasi, Evaluasi Dan Pengembangan Pembelajaran (JIEPP)*, 5(1), 65–73. <https://doi.org/10.54371/jiepp.v5i1.661>
- Azizah, D. R., Simatupang, N. D., & Surabaya, U. N. (2023). Peningkatan Kemampuan Motorik Halus Anak Melalui Kegiatan Melipat Kertas (Origami) Kelompok B1 Di TK Labschool UNESA 1 Surabaya. *Al Fitrah: Journal Of Early Childhood Islamic Education*, 7. <https://ejournal.uinfasbengkulu.ac.id/index.php/alfitrah/article/view/4395/3417>
- Fauzi, M., & Jannah, F. L. (2026). The Effect of Three-Dimensional Learning Media on Elementary School Students' Learning Outcomes in the Cube Topic: Pengaruh Media Pembelajaran Tiga Dimensi pada Materi Kubus terhadap Hasil Belajar Siswa Sekolah Dasar. *Jurnal Evaluasi Dan Kajian Strategis Pendidikan Dasar*, 3(1), 57–62. <https://doi.org/10.54371/jekas.v3i1.894>
- Febrisia, T., & Hadiyanto. (2023). Pengembangan Busy Book untuk Meningkatkan Kemampuan Berhitung pada Anak Usia Dini. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, 7(4), 4741–4751. <https://doi.org/10.31004/obsesi.v7i4.4837>
- Halim, F. A., & Fauzi, M. . (2025). Pengaruh Media Pembelajaran Papan Jari terhadap Hasil Belajar Matematika Siswa Sekolah Dasar. *Jurnal Evaluasi Dan Kajian Strategis Pendidikan Dasar*, 2(2), 29–33. <https://doi.org/10.54371/jekas.v2i2.895>
- Hidayah, N., Fauziyah, R., Khoirotunnisya, W. A., & Alawiyah, Z. (2022). Pengembangan Alat Permainan Edukatif Kincir Kelinci Berhitung untuk Meningkatkan Kognitif Anak. *Indonesian Journal of Islamic Early Childhood Education*, 7(2), 122–129.
- Kresnawaty, A. (2024). Strategi Pengelolaan Barang Bekas yang Baik dalam Pendidikan Anak Usia Dini. *Jurnal Inovasi, Evaluasi Dan Pengembangan Pembelajaran (JIEPP)*, 4(1), 53–60. <https://doi.org/10.54371/jiepp.v4i1.364>
- Nanda syahputri, & Sit, M. (2023). Pengembangan Media Busy Book untuk Meningkatkan Kemampuan Aksara dan Angka pada Anak Usia 5-6 Tahun. *Aulad: Journal on Early Childhood*, 6(2), 260–271. <https://doi.org/10.31004/aulad.v6i2.512>
- Nujum, N., & Fadjar, D. N. M. (2026). Strengthening Al-Islam Kemuhammadiyah Character

- Education through the 'Magic Fingers' Media in Addition Learning among Elementary School Students: Penguatan Pendidikan Karakter Al-Islam Kemuhammadiyah melalui Media Jari Ajaib pada Materi Penjumlahan Siswa Sekolah Dasar. *Jurnal Evaluasi Dan Kajian Strategis Pendidikan Dasar*, 3(1), 69–74. <https://doi.org/10.54371/jekas.v3i1.1006>
- Nurachadijat, K., & Selvia, M. . (2023). Peran Lembaga Pendidikan Anak Usia Dini dalam Implementasi Kurikulum dan Metode Belajar pada Anak Usia Dini. *Jurnal Inovasi, Evaluasi Dan Pengembangan Pembelajaran (JIEPP)*, 3(2), 57–66. <https://doi.org/10.54371/jiepp.v3i2.284>
- Syoleha, I., & Yuliantina, I. (2025). Peran Komunitas Belajar dalam Implementasi Kurikulum Merdeka di Gugus 11 PKG PAUD. *Jurnal Inovasi, Evaluasi Dan Pengembangan Pembelajaran (JIEPP)*, 5(1), 27–33. <https://doi.org/10.54371/jiepp.v5i1.646>
- Wiarati Heratriana, I. A. (2024). Pengaruh Busy Book terhadap Pengenalan Bilangan dan Bentuk Geometri pada Anak Usia 4-5 Tahun di Tk Nurul Hidayah Kebumen. *JOTE: Journal On Teacher Education*, 5, 73–82.
- Winarsih, A., & Raharja, S. L. (2025). Pemanfaatan Media Boneka Tangan untuk Mengembangkan Keterampilan Berbicara , Keterampilan Sosial, dan Kemandirian Anak. *Jurnal Inovasi, Evaluasi, Dan Pengembangan Pembelajaran*, 5(April), 14–18. <https://doi.org/10.54371/jiepp.v5i1.633>