

Development of a Busy Book as a Learning Medium to Enhance Numeracy Skills in Early Childhood

Hamid Patilima, Lina Marlina

Program Studi Magister Pendidikan Anak Usia Dini, FKIP, Universitas Panca Sakti Bekasi

ABSTRACT

This study aimed to determine the level of validity and attractiveness of the developed Busy Book learning media in improving early childhood numeracy skills, as well as to examine students' responses to the use of Busy Book media in enhancing counting abilities at KB Nurul Fajriah Al-Hasanah. The study employed a Research and Development (R&D) method using the ADDIE development model. Data analysis techniques were based on descriptive data obtained from expert validation, involving subject-matter experts, media experts, and educational practitioners. The validity assessment of the Busy Book media conducted by material experts, media experts, and practitioners yielded an average score of 93%, categorized as very valid. Learners' interest in using the Busy Book media reached 95%, indicating a very high level of attractiveness. Furthermore, children's numeracy skills after using the Busy Book achieved the category of Very Well Developed. Based on teacher assessments, all 12 participating students (100%) strongly agreed that children's counting abilities improved after using the Busy Book media. The findings conclude that the Busy Book is feasible and effective for use in early childhood numeracy learning.

Keywords: *Busy Book Media Development, Early Numeracy Skills, Early Childhood Education*

Corresponding author

Name: Lina Marlina

Email: marlinalina2326@gmail.com

INTRODUCTION

Numeracy skills are among the most essential abilities that must be developed in early childhood, as they equip children to face both present and future life demands. For children aged 5–6 years, numeracy abilities include recognizing numbers from 1 to 10, counting objects, matching quantities with numerals, identifying number symbols, recognizing consonants, and sequencing numerical symbols. The development of numeracy skills should be carried out through enjoyable and engaging activities, using child-appropriate methods, child-centered learning experiences, and activities aligned with children's developmental stages and needs (Sari, Zainuddin, & Akbar, 2020).

Effective numeracy learning requires appropriate instructional media and methods that support all aspects of child development. One widely recommended approach in early childhood education is learning through play, which integrates educational content into playful activities so that learning becomes meaningful and enjoyable. Play-based learning is intended to stimulate and enhance children's cognitive

abilities, including logical–mathematical intelligence (Matulesy, Ismawati, & Muhid, 2022).

The use of attractive and interactive learning media plays a crucial role in supporting numeracy instruction. One such medium is the busy book, an interactive learning tool made of colorful flannel fabric and arranged in book form (Febrisia & Hadiyanto, 2023). Each page of a busy book presents children with playful numeracy challenges, allowing them to explore numbers and counting concepts through hands-on activities. This form of media encourages active engagement and supports experiential learning.

In this study, congklak seeds were used as supporting counting tools to create meaningful numeracy learning experiences. Congklak is a traditional Indonesian game that is familiar and appealing to children. According to Matulesy et al. (2022), congklak materials are flexible and can be adapted using various objects such as small stones or seeds. The use of such concrete manipulatives helps develop logical–mathematical intelligence and enhances children’s understanding of numerical concepts through direct interaction.

Previous studies have demonstrated that busy book media can improve children’s literacy and numeracy skills (Nanda Syahputri & Sit, 2023), as well as early counting abilities (Febrisia & Hadiyanto, 2023; Amaris et al., 2018). However, existing research has primarily focused on the effectiveness of busy books as learning tools, with limited attention to the systematic development of busy book media as an instructional product designed to create meaningful and enjoyable numeracy learning experiences.

Based on preliminary observations conducted at KB Nurul Fajriah Al-Hasanah, several issues were identified in numeracy learning activities. Counting lessons were mainly conducted using worksheets, resulting in some children copying their peers’ answers, others requiring constant teacher assistance, and some completing tasks too quickly without genuine understanding. This worksheet-based approach limited meaningful learning, as children did not actively engage in counting processes. Furthermore, observations conducted on November 11, 2024, revealed that among 11 children, 3 children (27.3%) were categorized as Not Yet Developed (BB), 7 children (63.3%) as Beginning to Develop (MB), and only 1 child (9.1%) as Developed as Expected (BSH) in numeracy skills.

Therefore, this study aims to develop a busy book learning medium using the ADDIE model to enhance early childhood numeracy skills and to examine its validity, attractiveness, and effectiveness in improving counting abilities. The contribution of this research lies in the development of a structured, engaging, and culturally relevant busy book that integrates concrete counting materials, offering an innovative instructional media design to support meaningful numeracy learning in early childhood education.

METHOD

Research Design

This study employed a Research and Development (R&D) approach using the ADDIE model, which consists of Analysis, Design, Development, Implementation, and Evaluation stages. The ADDIE model was selected because it provides a systematic and structured framework to guide teachers and researchers in designing effective and

meaningful learning media. The novelty of this study lies in the development of a Busy Book learning medium integrated with congklak seeds as supporting counting tools to enhance early childhood numeracy skills through meaningful and enjoyable learning experiences.

In this research, the ADDIE model was implemented up to the Development phase, focusing on product design, validation, and limited field testing.

Research Setting and Participants

The study was conducted at KB Nurul Fajriah Al-Hasanah, located in Kampung Jogjogan Hilir, RT 001 RW 001, Ciasmara Village, Pamijahan District, Bogor Regency, West Java Province. The research participants consisted of 12 children in Group B, selected purposively based on initial assessments indicating that their numeracy abilities were categorized as Not Yet Developed and Beginning to Develop.

Development Procedure

The development of the Busy Book followed these stages: Identification of potential problems in early childhood numeracy learning, Literature review, Product design, Design validation, Design revision, Product trial and final revision (Ahmad, 2018)

During the design stage, the Busy Book was developed according to learning objectives and children’s developmental needs. The steps included Determining numeracy content focused on natural numbers for early childhood, designing simple counting materials and answer keys based on classroom observations, worksheets, and interviews, developing Busy Book activities covering addition, subtraction, number recognition, number–object matching, and mathematical symbols (plus, minus, equal), Constructing an eight-page Busy Book plus a cover page (23 cm × 27 cm), made of flannel fabric for durability and safety, Preparing learning components such as flannel cloth, glue, cardboard, ribbons, printed numbers, letters, and shapes, Finalizing the Busy Book model after product trials, Congklak seeds were used as concrete manipulatives to support addition and subtraction activities, reinforcing children’s understanding through hands-on learning.

Table 1. Busy Book Learning Media Product Evaluation Instrument

Evaluator	Indicator	Description	Number of Items
Material Expert	Alignment of numeracy Busy Book content with learning objectives for children aged 5–6 years	Busy Book content aligns with the curriculum	1
		Content aligns with learning objectives	1
		Content meets instructional needs	1
		Objectives align with learning flow	1

		Content is beneficial for enhancing children's knowledge	1
		Content is easy for children to understand	1
		Content matches children's ability levels	1
		Sequence of material presentation progresses from simple to complex	1
		Congklak seeds as counting tools stimulate children's numeracy skills	1
Media Expert	Visual attractiveness of the media	Busy Book cover images attract children's interest	1
		Color selection on the cover attracts children	1
		Color selection on content pages attracts children	1
	Learning engagement	Number images are visually appealing	1
		Congklak seeds as counting tools increase learning interest	1
	Safety and comfort	Busy Book materials are safe for children	1
		Busy Book is lightweight	1
		Busy Book is comfortable for children to hold	1
Practitioner	Educational value	Busy Book aligns with numeracy development goals	1
		Busy Book use is appropriate for children's developmental stage	1
		Busy Book encourages children's curiosity	1
	Technical aspects	Materials used are safe for children	1
		Busy Book size is appropriate for children aged 5–6 years	1
		Busy Book is easy to use and practical to carry	1

Aesthetic quality	Suitability of fabric, colors, 1 images, and numbers
	Busy Book has strong 1 visual appeal for play- based learning

Data Collection Procedures

Data were collected using validation questionnaires and student response scales. The instruments were adapted from validated early childhood learning media assessment tools and were reviewed by experts prior to distribution. Product validation involved three validators, consisting of a material expert, a media expert, and an educational practitioner.

The validation instruments assessed aspects of content relevance, instructional suitability, media attractiveness, safety, usability, and aesthetic quality. Student interest and responses toward the Busy Book were collected using Likert-scale questionnaires administered after the learning activities.

Data Analysis

Data analysis consisted of qualitative and quantitative techniques. Qualitative data were obtained from expert feedback and suggestions, which were used to revise the product. Quantitative data were analyzed by converting validation and response scores into percentages using a four-point Likert scale.

Product validity was calculated using the formula:

$$\text{Validity Percentage} = (\text{Total Score} / \text{Maximum Score}) \times 100\%$$

Table 2. Criteria for Media Validity Percentage

No.	Score Range	Validation Criteria
1	85.1% – 100%	Very Valid
2	70.1% – 85%	Valid
3	50.1% – 70%	Less Valid
4	10% – 50%	Not Valid

The resulting percentages were then classified into validity criteria ranging from Very Valid to Not Valid (Fatmawati, 2016). Similar percentage formulas were applied to analyze student interest and response questionnaires, which were subsequently categorized into levels of attraction and agreement.

Table 3. Criteria for Percentage of Students' Interest in the Media

No.	Score Range	Interest Criteria
1	85.1% – 100%	Very Interested
2	70.1% – 85%	Interested
3	50.1% – 70%	Less Interested
4	10% – 50%	Not Interested

Table 4. Criteria for Percentage of Students' Responses to the Media

Statement Type	Strongly Agree	Agree	Disagree	Strongly Disagree
Positive	4	3	2	1
Negative	1	2	3	4

Through these procedures, the study systematically evaluated the feasibility, attractiveness, and instructional relevance of the Busy Book media for improving early childhood numeracy skills.

FINDING AND DISCUSSION

RESEARCH RESULT

1. Product Description Result

The final product developed in this study is a **Busy Book learning media** designed to improve early childhood numeracy skills. The Busy Book consists of **1 cover page and 8 content pages**, each measuring **23 cm × 27 cm**. The final page includes a pocket containing **20 colorful congklak seeds** as counting aids.



Final Model Busy Book

2. Results of Product Attractiveness and Children's Numeracy Skills

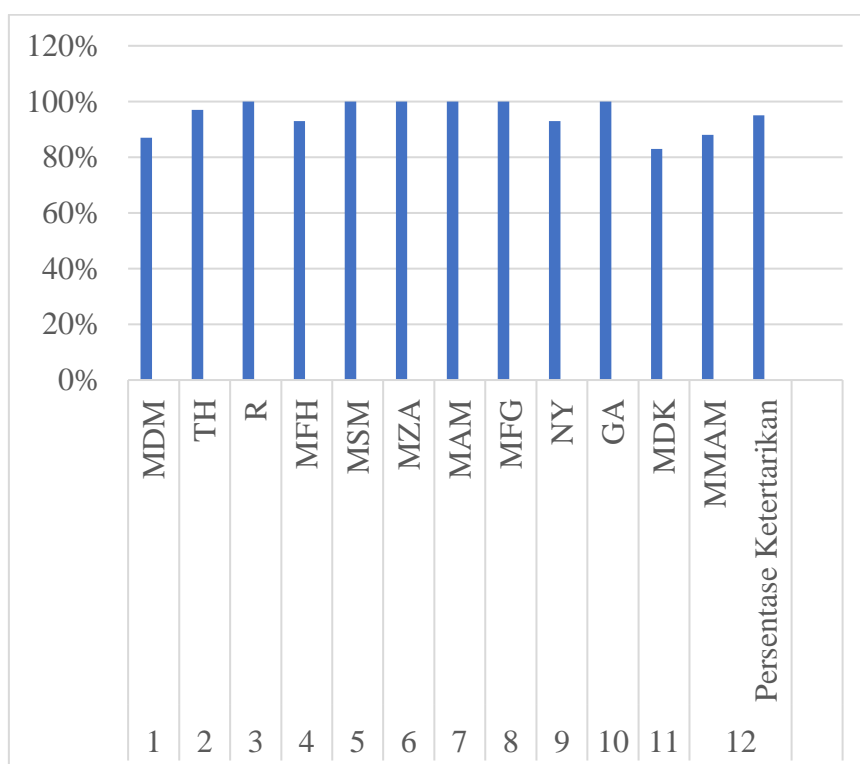
Table 5. Students' Attractiveness and Numeracy Skills After Using Busy Book

No	Student Name	Busy Book Task Result (%)	Numeracy Skill Criteria
1	MDM	87%	BSB
2	TH	97%	BSB
3	R	100%	BSB

4	MFH	93%	BSB
5	MSM	100%	BSB
6	MZA	100%	BSB
7	MAM	100%	BSB
8	MFG	100%	BSB
9	NY	93%	BSB
10	GA	100%	BSB
11	MDK	83%	BSB
12	MMAM	88%	BSB
Attractiveness Percentage		95%	Very Interested

Note:

BB = Not Yet Developed,
 MB=Beginning to Develop,
 BSH = Developed as Expected,
 BSB = Very Well Developed



3. Results of Students' Responses to Busy Book Media

Table 6. Students' Responses to Busy Book Media

No	N	Name	SS	S	T	ST
1		MDM	4			
2		TH	4			
3		R	4			

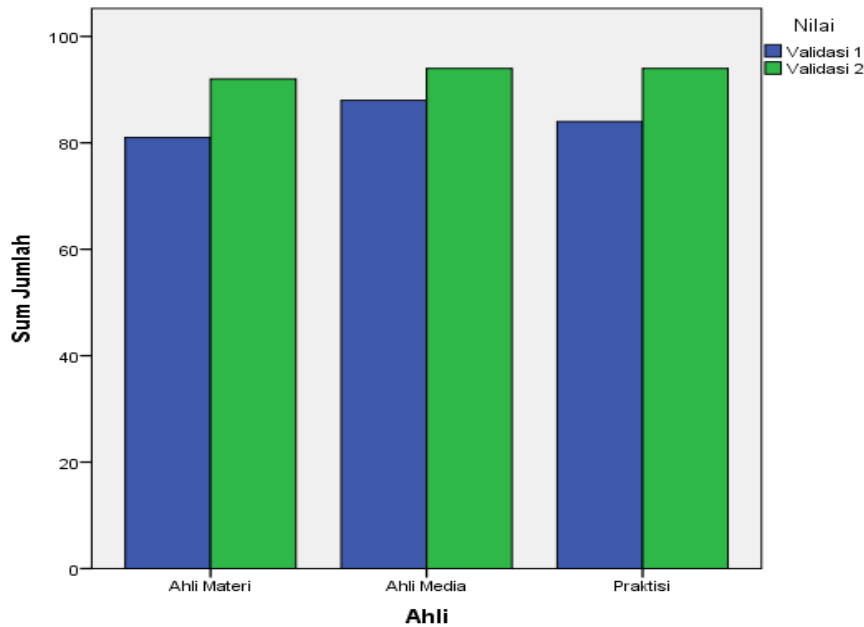
4	MFH	4			
5	MSM	4			
6	MZA	4			
7	MAM	4			
8	MFG	4			
9	NY	4			
1	GA	4			
0					
1	MDK	4			
2	MMA	4			
	M				
	Total Score Obtained	48	0	0	0
	Expected Total Score	48			
	Response Percentage	100			
		%			

Note: SS = Strongly Agree, S = Agree, TS = Disagree, STS = Strongly Disagree

4. Results of Media Feasibility Validation by Experts

Table 7. Media Feasibility Evaluation Results by Experts

No	Validator Name	Expertise	Validation 1 (%)	Criteria	Validation 2 (%)	Criteria
1	Tety Srihayati, S.Ag., M.Pd.	Material	81%	Valid	92%	Very Valid
2	Herlina, M.Pd.	Media	88%	Very Valid	94%	Very Valid
3	Mila Daniaty, M.Pd.	Practitioner	84%	Valid	94%	Very Valid
	Average Score		84%	Valid	93%	Very Valid



5. Results of Busy Book Implementation

Table 8. Implementation of Busy Book Learning Media

No	Stage	Description	Score
1	Opening	Preparation of learning tools	4
		Singing "Number Sequence" together	4
		Students mention numbers 1–10	4
		Explanation of Busy Book rules	4
		Counting activities using congklak seeds	4
2	Core Activity	Teacher explains each Busy Book activity	4
		Students work independently following instructions	4
		Counting congklak seeds when tasks are unfinished	4
3	Closing	Completion of tasks and reinforcement	4
		Reward given to students	4
Total Score			40
Maximum Score			40
Implementation Percentage			100%
Criteria			Very Well Implemented

DISCUSSION

Based on the research findings, the aggressive behavior exhibited by the child QS is strongly associated with the authoritarian parenting style applied within the family environment. This finding is consistent with the theory proposed by Diana Baumrind (1971), which states that authoritarian parenting emphasizes control and obedience without being accompanied by warm emotional dialogue. In the context of QS, caregiving practices that position the father as the sole authority figure, while the mother remains passive and waits for instruction, prevent the child from internalizing rules independently. The child complies out of fear rather than understanding. Consequently, when outside the home environment, particularly at school, the child reproduces patterns of dominance and control in the form of aggressive behavior toward peers.

Furthermore, inconsistency in the implementation of rules at home further reinforces QS's aggressive tendencies. On the one hand, the child receives mild physical punishment when perceived to violate rules; on the other hand, the child's desires are frequently fulfilled due to the status as the first child and first grandchild who was highly anticipated by the extended family. This inconsistent parenting pattern deprives the child of stable behavioral guidelines. The child becomes accustomed to having desires immediately satisfied at home; therefore, when encountering rejection at school, the child reacts with resistance, grabbing, and domineering behavior. This reinforces the notion that the child's aggressive behavior does not emerge spontaneously but is shaped by caregiving experiences that fail to provide consistent emotional and behavioral boundaries.

The findings also indicate that the social environment contributes significantly to the formation of QS's aggressive behavior. Referring to Lev Vygotsky's (1978) sociocultural theory, children's behavioral development is strongly influenced by social interactions experienced in daily life. QS's residential environment, located in a garment-production area characterized by high activity intensity, noise, and harsh adult communication patterns, serves as a source of social learning. QS observes and subsequently imitates how adults express emotions, particularly during conflict situations. These learned patterns are then transferred to the school environment and manifested through physical and verbal aggression.

Within the school context, limited opportunities for the child to learn positive conflict resolution further exacerbate aggressive behavior. Although teachers provide guidance and verbal advice, QS often responds superficially (e.g., saying "yes, yes") without sustained behavioral change. This indicates insufficient emotional regulation skills. A school environment that has not fully implemented structured social-emotional learning limits the child's ability to acquire adaptive conflict-resolution strategies, resulting in continued reliance on aggression as the primary means of expressing dissatisfaction.

QS's low emotional regulation capacity is evident in difficulties recognizing emotions, expressing feelings verbally, and self-soothing when experiencing anger. Instead, the child tends to discharge emotions through physical actions such as hitting, pushing, and shouting. This condition aligns with the perspective of Grolnick and Farkas (2002), who argue that emotional regulation develops optimally when children receive

emotional support, consistent guidance, and opportunities to reflect on their feelings. In QS's case, the lack of emotional coaching both at home and at school has resulted in underdeveloped emotional regulation skills.

Based on this discussion, the study emphasizes the importance of modifying both parenting approaches and the child's learning environment. A responsive-democratic parenting style represents a relevant alternative, as it prioritizes two-way communication, clear boundaries, and acknowledgment of children's emotions. Children need to be actively engaged in emotional dialogue to develop the ability to understand and regulate their feelings adaptively. In the school setting, interventions such as social-emotional learning (SEL) activities, role-play, and guided conflict resolution facilitated by teachers can support the development of healthier coping strategies. With consistent, warm, and supportive environments provided by both family and school, QS's aggressive behavior is likely to decrease, while emotional regulation abilities can develop more optimally.

CONCLUSION

This study concludes that the Busy Book learning media is highly feasible, effective, and well accepted for improving numeracy skills in early childhood education. The implementation of the Busy Book at KB Nurul Fajriah Al-Hasanah was carried out optimally, achieving an implementation rate of 100%, categorized as Very Well Implemented. Expert validation involving material experts, media experts, and practitioners yielded an average feasibility score of 93%, indicating that the Busy Book is Very Valid and suitable for classroom use without further revision.

Furthermore, students showed a very high level of interest in the Busy Book, with an attractiveness percentage of 95%, categorized as Very Interested. The numeracy skills of children after using the Busy Book reached the Very Well Developed (BSB) category, demonstrating that students were able to perform counting activities independently and accurately. In addition, all participating students (100%) expressed Strong Agreement with the use of the Busy Book, indicating positive responses and high engagement during learning activities.

Based on these findings, the Busy Book can be recommended as an alternative and innovative learning media to support meaningful and enjoyable numeracy learning for children aged 5–6 years. Future research is suggested to involve a larger sample size, longer implementation periods, and diverse educational settings. Further studies may also explore the integration of Busy Book media with digital or hybrid learning approaches to enhance learning effectiveness and sustainability in early childhood education.

REFERENCES

- Ahmad, M.A. (2018) 'Penelitian Research And Development', in I. Ismail (ed.)
Amaris, D.U., Rakimahwati, R. and Marlina, S. (2018) 'Pengaruh Media Busy Book Terhadap Kemampuan Berhitung Anak Usia Dini Di Taman Kanak-Kanak Fadhilah Amal 3 Padang', *Jurnal Usia Dini*, 4(2), p. 8. Available at: <https://doi.org/10.24114/jud.v4i2.12099>.

- Fatmawati, A. (2016) 'Pengembangan Perangkat Pembelajaran Konsep Pencemaran Lingkungan Menggunakan Model Pembelajaran Berdasarkan Masalah Untuk SMA Kelas X', *EduSains*, 4(2), pp. 94–103.
- Febrisia, T. and Hadiyanto, H. (2023) 'Pengembangan Busy Book untuk Meningkatkan Kemampuan Berhitung pada Anak Usia Dini', *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, 7(4), pp. 4741–4751. Available at: <https://doi.org/10.31004/obsesi.v7i4.4837>.
- Matulesy, A., Ismawat and Muhid, A. (2022) 'Efektivitas Permainan Tradisional Congklak Untuk Meningkatkan Kemampuan Matematika Siswa: Literature Review', *AKSIOMA: Jurnal Matematika dan Pendidikan Matematika*, 13(1), pp. 165–178.
- Mufliharsi, R. (2017) 'Pemanfaatan Busy Book Pada Kosakata Anak Usia Dini di PAUD Swadaya PKK', *Jurnal Universitas PGRI Indraprasta*, 5(2), pp. 146–155.
- Nanda syahputri and 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), pp. 260–271. Available at: <https://doi.org/10.31004/aulad.v6i2.512>.
- Sari, D.R., Zainuddin, M. and Akbar, S. (2020) 'Kemampuan Berhitung Pada Anak Usia 5-6 Tahun', *Jurnal Pendidikan*, 5(11), pp. 1 535–1539.