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THE EFFECTIVENESS OF BUSY BOOK MEDIA IN IMPROVING THE ABILITY TO RECOGNIZE NUMBER SYMBOLS 1 TO 5 AMONG CHILDREN WITH MILD INTELLECTUAL DISABILITIES

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ABSTRACT

This study aimed to determine whether busy book media is effective in improving the ability to recognize number symbols from 1 to 5 among children with mild intellectual disabilities. The study employed an experimental method using a Single Subject Research (SSR) design with an A-B-A format. Data were analyzed using visual graph analysis. The results of data analysis from 17 observation sessions conducted under three conditions showed that the baseline phase (A1) yielded scores of 0%, 0%, and 0%. During the intervention phase (B), the scores increased to 20%, 20%, 40%, 60%, 40%, 60%, 60%, and 60%. Finally, in the second baseline phase (A2), the scores were 40%, 60%, 80%, 60%, 60%, and 60%. The findings indicate that the ability to recognize number symbols from 1 to 5 improved after the implementation of busy book media for a student with mild intellectual disabilities in Grade I/C at SLBN 1 Painan.

Keywords: Busy Book, Number Symbol Recognition, Mild Intellectual Disability

1. INTRODUCTION

The ability to recognize number symbols is an essential skill for children because numerical symbols are frequently encountered in daily life, such as when reading clocks, dates, months, years, and monetary values. Children who are unable to recognize number symbols may experience difficulties in solving everyday problems and in learning more advanced mathematical concepts, as number-symbol recognition serves as a prerequisite for mathematics learning.

Number symbols are representations used to indicate quantities in a numerical system and are commonly referred to as numerals (Ulum, 2014). A person is considered capable of recognizing number symbols when they understand both the form and meaning of the symbols (Busthomi, 2012). According to the operational verbs in Bloom's Taxonomy, indicators of number-symbol recognition include naming number symbols, identifying number symbols, and matching quantities of objects with their corresponding number symbols (Anderson & Krathwohl, 2001). However, mastering number symbols is not an easy

task for children with mild intellectual disabilities due to their limitations in abstract thinking. Therefore, teachers need to demonstrate patience, provide genuine support, and creatively select instructional media to facilitate understanding.

Based on a preliminary study conducted in Grade I/C, there were two students with mild intellectual disabilities in the classroom, and one of them had not yet mastered the recognition of number symbols from 1 to 5. This was evident when the student was asked to match quantities of objects with number symbols; the student matched them randomly. During learning activities, the student also appeared to have difficulty concentrating and became bored quickly. Although the teacher had employed various teaching methods and media, including lectures, question-and-answer sessions, practice exercises, counting sticks, number cards, and the whiteboard, the student still experienced difficulties.

Interviews with the classroom teacher revealed that the school implemented the 2013 Curriculum. Within this curriculum, one of the learning objectives for first-grade students with mild intellectual disabilities is the ability to recognize number symbols from 1 to 5. However, despite instructional efforts and the use of concrete teaching aids, one student remained unable to achieve this learning objective.

The assessment results showed that the student could verbally recite the numbers 1 to 5 correctly. However, when asked to identify specific number symbols, the student often selected the wrong symbol. For example, when asked to point to the symbol “1,” the student pointed to “3.” Similarly, when asked to match a picture containing three objects with the correct number symbol, the student matched it with the symbol “5.” These findings suggest that the student had memorized the sequence of numbers without understanding the corresponding numerical symbols.

To address this issue, an engaging and innovative instructional medium was needed to enhance the student’s ability to recognize number symbols. One such medium is the busy book. The researcher selected busy book media because it is an innovative and creative learning tool made from flannel fabric, featuring attractive colors and illustrations while incorporating various interactive activities that support children's learning and creativity (Yulianto, 2019). In this study, the busy book was specifically designed to teach number-symbol recognition from 1 to 5.

Busy books offer several advantages, including attractive visual presentations, enhanced comprehension through visualization, increased student interaction with learning materials, ease of use, portability, and durability. Therefore, the researcher expected that busy book media would improve the ability of children with mild intellectual disabilities to recognize number symbols from 1 to 5.

Based on the background described above, the research question of this study was: "Is busy book media effective in improving the ability to recognize number symbols from 1 to 5 among first-grade students with mild intellectual disabilities at SLBN 1 Painan?"

2. METHODOLOGY

This study employed an experimental research method using a Single Subject Research (SSR) design. Experimental research aims to determine whether a causal relationship exists between the treatment administered and the observed outcomes (Arikunto, 2013). The SSR design used in this study was the A-B-A design.

The first baseline phase (A1) represented the participant's initial ability before receiving the intervention. The intervention phase (B) represented the participant's performance during the implementation of the treatment. The second baseline phase (A2) represented the participant's performance after the intervention had been withdrawn.

The study involved two variables: a dependent variable and an independent variable. The dependent variable was the ability to recognize number symbols from 1 to 5, while the independent variable was the use of busy book media. The participant was a female student with mild intellectual disabilities, identified by the initials NR, enrolled in Grade I/C at SLBN 1 Painan.

Data were collected using a test consisting of five items. Each correct response was awarded one point, while each incorrect response received zero points (Riyanto, 2020). The target behavior was measured using percentage scores. Percentage measures are commonly used to assess academic and social behaviors (Sunanto, 2005). The percentage score was calculated by comparing the number of successful responses with the total number of opportunities and multiplying the result by 100% (Purwanto, 2013).

3. RESULTS

The purpose of this study was to determine whether busy book media is effective in improving the ability to recognize number symbols from 1 to 5 among children with mild intellectual disabilities. Data were collected through a test consisting of five items administered during each session. The study was conducted over 17 sessions under three conditions: baseline (A1), intervention (B), and baseline (A2). During the first baseline phase (A1), which represented the participant's initial performance before the intervention, observations were conducted across three sessions. The participant achieved scores of 0%, 0%, and 0%, indicating no demonstrated ability to recognize number symbols from 1 to 5. The intervention phase (B), during which the participant received instruction using busy book media, was conducted over eight sessions. The participant's scores during this phase were 20%, 20%, 40%, 60%, 40%, 60%, 60%, and 60%, indicating a gradual improvement in performance.

Following the intervention, a second baseline phase (A2) was conducted seven days later to evaluate the maintenance of learning outcomes after the intervention had been withdrawn. This phase consisted of six observation sessions, during which the participant achieved scores of 40%, 60%, 80%, 60%, 60%, and 60%. The findings indicate that the participant's ability to recognize number symbols from 1 to 5 improved during the intervention phase and remained higher than the initial baseline level after the intervention was discontinued.

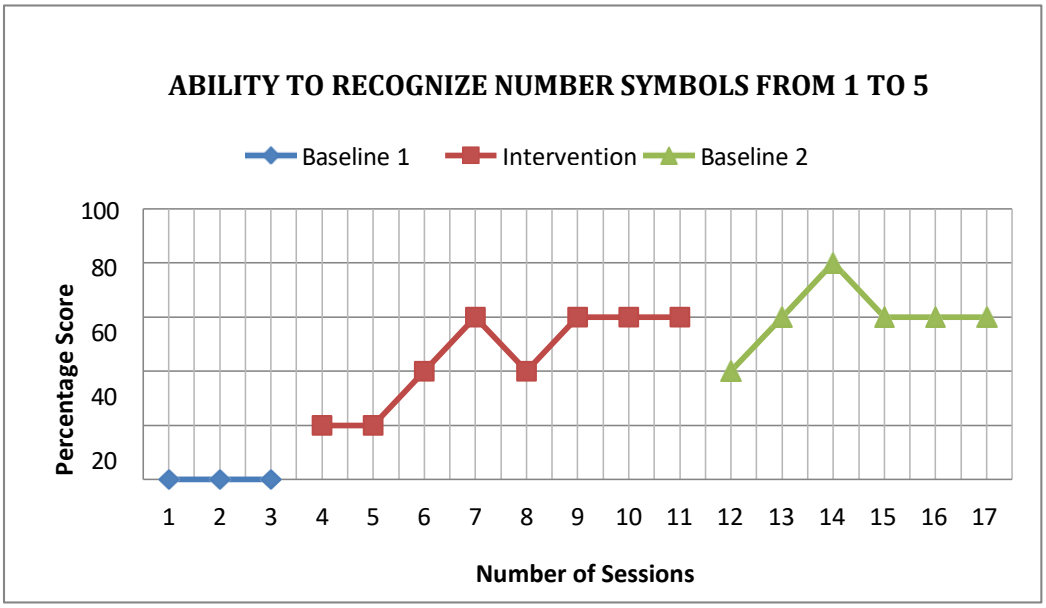

Figure 1. Recapitulation of the Ability to Recognize Number Symbols from 1 to 5 Across Baseline (A1), Intervention (B), and Baseline (A2) Conditions

Based on visual analysis, the first baseline condition (A1) showed stable performance across the three observation sessions, with a consistent score of 0%. During the intervention phase (B), stable performance was observed between sessions nine and eleven, with scores reaching 60%. Similarly, during the second baseline phase (A2), stable performance was observed between sessions fifteen and seventeen, with scores consistently remaining at 60%.

To determine the effect of the intervention on the target behavior, both within-condition and between-condition analyses were conducted. The within-condition analysis revealed that the baseline phase (A1) consisted of three observations, the intervention phase (B) consisted of eight observations, and the second baseline phase (A2) consisted of six observations.

The estimated trend direction indicated no change during A1 (=), an increasing trend during B (+), and a continuing increase during A2 (+). Stability analysis showed that the mean level during A1 was 0%, with upper and lower stability limits both at 0%, resulting in a stability

range of 0% and a stability percentage of 0% (unstable). During the intervention phase (B), the mean level increased to 45%, with an upper limit of 50%, a lower limit of 40%, a stability range of 9%, and a stability percentage of 25% (unstable). In the second baseline phase (A2), the mean level increased further to 60%, with an upper limit of 66%, a lower limit of 54%, a stability range of 12%, and a stability percentage of 67% (unstable).

The data path analysis demonstrated no change during A1, an increasing trend during B, and a continuing increase during A2. The stability levels and ranges were 0%–0% for A1, 20%–60% for B, and 40%–60% for A2. The level changes were calculated as 0 for A1, 40 for B, and 20 for A2.

Table 1. Summary of Within-Condition Analysis Results for Number Symbol Recognition Skills (1–5) Using Busy Book Media in a Child with Mild Intellectual Disabilities

No	Condition	A1	B	A2
1	Condition Length	3	8	6
2	Estimated Trend Direction	(=)	(+)	(+)
3	Stability Trend	0% Unstable	25% Unstable	67% Unstable
4	Data Path Trend	(=)	(+)	(+)
5	Stability Level and Range	Variable 0% – 0%	Variable 20% – 60%	Variable 40% – 60%
6	Level Change	0 – 0 = 0	60 – 20 = 40	60 – 40 = 20

The between-condition analysis showed that only one variable was manipulated, namely the participant's ability to recognize number symbols from 1 to 5 through the use of busy book media. The direction of change indicated no improvement during A1, followed by improvement during both B and A2. This finding suggests that the busy book intervention had a positive effect on the target behavior.

The stability trend analysis further revealed that the participant's ability during baseline (A1) remained very low, with scores of 0%, 0%, and 0%. During the intervention phase (B), performance improved substantially, with scores of 20%, 20%, 40%, 60%, 40%, 60%, 60%, and 60%. Improvement continued during the second baseline phase (A2), with scores of 40%, 60%, 80%, 60%, 60%, and 60%.

The level change between A1 and B was 20%, while the level change between B and A2 was 40%. Furthermore, the overlap percentage between A1 and B was 0%, whereas the overlap percentage between A2 and B was 17%. These findings indicate that the intervention produced meaningful changes in the participant's performance and that the improvement was maintained after the intervention ended.

Table 2. Overall Condition Analysis

Conditions	**A2/B/A1**		
1. Number of Variables Changed	1		
2. Change in Trend Direction and Its Effect	**(=)**	**(+)**	**(+)**
3. Change in Stability Trend	Unstable – Unstable – Unstable		
4. Level Change a. Level Change between B and A1 b. Level Change between B and A2	20% - 0% = 20% 60% - 20% = 40%		
5. Percentage of Overlap a. PBetween Baseline (A1) and Intervention (B) Conditions b. Between Baseline (A2) and Intervention (B) Conditions	0 % 17%		

4. DISCUSSION

The findings of this study demonstrate that the use of busy book media effectively improved the ability of a child with mild intellectual disabilities to recognize number symbols from 1 to 5. The improvement was evident from the comparison of performance across the three phases of the Single Subject Research (SSR) design. Before the intervention was introduced, the participant showed no ability to correctly identify number symbols, as indicated by a consistent score of 0% during the baseline phase (A1). However, after the implementation of the busy book intervention, a gradual and consistent increase in performance was observed during the intervention phase (B), and the acquired skills were maintained during the second baseline phase (A2). These findings suggest that busy book media can serve as an effective instructional tool for teaching basic mathematical concepts to children with mild intellectual disabilities.

The improvement observed in this study may be attributed to the characteristics of busy book media, which combines visual, tactile, and kinesthetic learning experiences. Children with mild intellectual disabilities often experience difficulties in abstract reasoning, memory retention, and information processing. Consequently, they require instructional approaches that emphasize concrete experiences and active engagement. The busy book used in this study provided opportunities for the participant to interact directly with learning materials through touching, matching, attaching, and manipulating objects. Such activities transformed abstract numerical symbols into meaningful and concrete learning experiences. As a result, the participant was able to establish stronger associations between numerical quantities and their corresponding symbols.

From a cognitive perspective, the effectiveness of busy book media can be explained through Piaget's theory of cognitive development. According to Piaget (1972), children learn more effectively when concepts are presented through concrete experiences rather than abstract explanations. Although children with mild intellectual disabilities may experience delays in cognitive development, they still benefit significantly from learning activities that involve direct manipulation of objects. In the present study, the busy book provided a concrete representation of number concepts, enabling the participant to understand numerical symbols through hands-on exploration. This finding supports the view that instructional materials designed according to learners' developmental characteristics can facilitate conceptual understanding.

Furthermore, the findings of this study align with the principles of multisensory learning. Multisensory instruction involves engaging multiple sensory modalities simultaneously, such as visual, auditory, and tactile channels. Research has shown that children with intellectual

disabilities often learn more effectively when information is presented through multiple sensory pathways. The busy book incorporated colorful illustrations, numerical symbols, and hands-on activities that stimulated visual and tactile perception. By engaging more than one sensory system, the participant was able to process information more effectively and retain learning outcomes for a longer period. This may explain why the improvement observed during the intervention phase remained relatively stable during the second baseline phase.

Another factor contributing to the effectiveness of the intervention was the increased level of student engagement. During the implementation of the busy book activities, the participant appeared more interested, motivated, and attentive compared to the baseline phase. Children with mild intellectual disabilities frequently experience difficulties sustaining attention during conventional instructional activities, particularly when instruction relies heavily on verbal explanations. The interactive nature of the busy book encouraged active participation and reduced passive learning behaviors. Increased engagement may have contributed significantly to the participant's improved performance, as attention and motivation are widely recognized as important determinants of successful learning outcomes.

The results of this study are consistent with previous research highlighting the effectiveness of busy book media for children with special educational needs. Indahwaty (2020) found that busy books improved beginning reading skills among students with mild intellectual disabilities. Similarly, Wilujeng (2020) reported improvements in early writing skills following the implementation of busy book-based learning activities. These findings suggest that the benefits of busy books extend beyond a single academic domain and may support the development of multiple foundational skills. The present study contributes to this growing body of evidence by demonstrating the effectiveness of busy books in the area of number-symbol recognition.

The findings are also supported by studies investigating the broader developmental benefits of busy book media. Ramadhan (2019) reported that busy books enhanced color perception skills among children with mild intellectual disabilities, while Mardalena (2019) found positive effects on fine motor development. These studies indicate that busy books function as multifunctional educational tools capable of simultaneously promoting cognitive, academic, perceptual, and motor development. In the context of the present study, the participant not only learned to recognize numerical symbols but also engaged in activities requiring visual discrimination, hand-eye coordination, and fine motor control. Such integrated learning experiences may have further reinforced the acquisition of number-recognition skills.

An important finding of this study is the maintenance of learning outcomes during the second baseline phase. Although the intervention was withdrawn, the participant continued to demonstrate improved performance compared to the initial baseline condition. This suggests that the participant did not merely memorize task responses but developed a meaningful

understanding of the relationship between quantities and numerical symbols. The maintenance of learning gains is particularly important in special education because it indicates the potential for long-term retention and practical application of acquired skills. Therefore, the results suggest that busy book media can contribute not only to immediate learning improvements but also to sustained educational outcomes.

The practical implications of this study are noteworthy for teachers, parents, and special education practitioners. Teachers working with children with mild intellectual disabilities often face challenges in identifying instructional materials that are both engaging and effective. The findings suggest that busy books represent a low-cost, adaptable, and user-friendly instructional medium that can be customized according to individual learning needs. Teachers may incorporate busy books into mathematics instruction to support number recognition, counting, matching activities, and other foundational mathematical skills. Likewise, parents can utilize busy books at home to reinforce classroom learning and provide additional opportunities for practice.

Despite its positive findings, this study has several limitations. First, the research involved only one participant, which limits the generalizability of the findings to a broader population of children with mild intellectual disabilities. Second, the study focused exclusively on number-symbol recognition from 1 to 5; therefore, the effectiveness of busy book media for more advanced mathematical concepts remains unclear. Third, the duration of the intervention was relatively short, making it difficult to determine the long-term effects of the intervention over extended periods.

Future research should involve larger samples and multiple participants to strengthen the generalizability of the findings. Researchers may also investigate the effectiveness of busy book media in teaching other mathematical concepts, such as counting, addition, subtraction, and number sequencing. Furthermore, comparative studies examining busy books alongside other instructional media would provide valuable insights into the relative effectiveness of different teaching approaches for children with intellectual disabilities.

Overall, the findings of this study provide strong evidence that busy book media is an effective instructional tool for improving number-symbol recognition among children with mild intellectual disabilities. The combination of concrete learning experiences, multisensory stimulation, active participation, and engaging visual elements appears to facilitate meaningful learning and support skill retention. Consequently, busy books may be recommended as an effective educational resource for promoting foundational mathematical skills and enhancing learning experiences among children with special educational needs.

5. CONCLUSION

Based on the findings obtained from the study conducted at SLB Negeri 1 Painan, it can be concluded that the use of busy book media is effective in improving the ability to recognize

number symbols from 1 to 5 among children with mild intellectual disabilities. The improvement was evident from the results of 17 observation sessions, consisting of three sessions during the first baseline phase (A1), eight sessions during the intervention phase (B), and six sessions during the second baseline phase (A2).

During the initial baseline phase (A1), the participant's performance remained at a very low level, with a success rate of 0%. Following the implementation of busy book media, the participant demonstrated substantial improvement, as reflected in the increased percentage scores and mean level during the intervention phase (B). This improvement was maintained during the second baseline phase (A2), indicating that the acquired skills persisted even after the intervention had been withdrawn.

The findings of this study provide evidence that busy book media can serve as an effective, engaging, and developmentally appropriate instructional tool for children with mild intellectual disabilities. Through concrete, visual, and interactive activities, busy books help children better understand and recognize number symbols from 1 to 5.

Therefore, busy book media is recommended for teachers and parents as an alternative learning resource to support the development of foundational academic skills, particularly number-symbol recognition, among children with mild intellectual disabilities.

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