



The Effect of the Busy Book on the Development of Fine Motor Skills in Children Aged 4–6 Years in Preschool

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Abstract

This study aims to determine the effectiveness of using the Busy Book method in developing the fine motor skills of children aged 4–5 years at the Kindegarten. This study employs a quantitative approach with a quasi-experimental design, specifically a non-equivalent control group design involving an experimental group and a control group. Data collection techniques involved tests (pre-test and post-test), whilst data analysis was conducted using descriptive and inferential methods. The results of the study indicate that there was a more significant improvement in fine motor skills in the experimental group compared to the control group. The average pre-test score for the experimental group was 32.08, increasing to 45.33 in the post-test, with an average increase of 13.25 points. Meanwhile, the control group saw an increase from an average of 32.58 to 40.58, with an average increase of 8.00 points. Furthermore, the standard deviation of the post-test scores for the experimental group (2.774) was smaller than that of the control group (3.579), indicating more stable and consistent results. Based on the research findings, it can be concluded that the Busy Book medium is effective in improving fine motor skills in early childhood. The implications of this study suggest that the use of interactive, concrete, and enjoyable learning materials is crucial in supporting the optimal development of young children.

INTRODUCTION

Early Childhood Education is the primary foundation for developing quality human resources from an early age. Within the context of national education, PAUD plays a strategic role, as affirmed by Law Number 20 of 2003 concerning the National Education System, which defines early childhood education as a developmental effort aimed at children from birth to six years of age through the provision of educational stimulation to foster physical and spiritual growth and development, ensuring their readiness for further education (*Undang-Undang Republik Indonesia Nomor 20 Tahun 2003 Tentang Sistem Pendidikan Nasional*, n.d.). This demonstrates that PAUD is not merely a preparatory stage, but rather a crucial phase in building the foundation for a child's overall development.

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Early childhood is often referred to as golden age, a golden period characterized by rapid growth and development, encompassing cognitive, socio-emotional, language, and physical-motor skills. According to Heckman (2022), investing in early childhood education has a significant long-term impact on an individual's future academic success, social skills, and productivity (Heckman, 2022). Similarly, Mursid (2015) emphasized that early childhood education focuses on the integrated development of all aspects of child development, including physical-motor skills, which form the basis of a child's practical skills in everyday life (Mursid, 2015).

One aspect of development that plays a crucial role in a child's learning readiness is fine motor skills. Fine motor skills involve the use of small muscles, particularly those in the fingers, and coordination with the sense of sight. These skills are essential for various activities such as drawing, writing, cutting, and everyday tasks like buttoning clothes or holding cutlery. Santrock (2020) states that fine motor development is closely related to a child's cognitive development and academic readiness, as these skills support more complex learning activities (Santrock, 2020). Meanwhile, Suryana (2016) explains that fine motor skills are movements involving the coordination of small muscles that require precision and good control (Suryana, 2016).

However, children's fine motor development does not always proceed optimally. In practice, many young children still experience obstacles in this skill. This condition is also found in kindergartens, where some children show difficulty in activities that require hand-eye coordination, such as cutting, pasting, and manipulating small objects. This phenomenon is thought to be influenced by a lack of appropriate stimulation, limited supporting learning media, and the increasing use of gadgets, which reduces children's opportunities for direct interaction with the physical environment.

These issues highlight the importance of using appropriate, engaging, and relevant learning media tailored to the characteristics of early childhood. Learning media plays a crucial role in creating meaningful learning experiences. According to Asyhar (2016), learning media is anything that can be used to convey messages and stimulate students' attention, interest, and thinking during the learning process (Asyhar, 2016). Appropriate media use can increase children's motivation to learn while providing concrete experiences appropriate to their developmental stage.

One innovative and relevant learning medium for developing fine motor skills is the Busy Book. It is an interactive learning medium in the form of a flannel book containing various educational activities, such as buttoning, tying laces, matching shapes, and simple sewing. According to Ulfah (2017), the Busy Book can stimulate fine motor development through manipulative activities involving hand-eye coordination (Ulfah, 2017). Furthermore, Sari (2016) states that the Busy Book not only functions as a play medium but also as a learning tool that can improve children's analytical and precision skills (Sari, 2016).

The advantage of Busy Book lies in its flexible, safe nature, and its ability to provide play-based learning (play-based learning). The activities in Busy Book are designed in stages according to the child's abilities, allowing them to learn independently and enjoyably. Wibirani (2018) added that this media can also increase children's learning motivation because it is designed with attractive colors and shapes and provides a real exploratory experience (Wibirani, 2018).

Various previous studies have also shown that the use of Busy Books has a positive impact on children's fine motor development. Firdaus (2021) found that Busy Books can significantly improve hand-eye coordination skills (Firdaus, 2021). Furthermore, Prasko and Husna (2019) stated that this medium can increase

children's engagement in learning due to its interactive and fun nature (Prasko & Husna, 2019).

Based on this description, it can be concluded that the use of innovative learning media such as Busy Books is a potential solution to address the problem of fine motor skills in early childhood. Therefore, this study was conducted to empirically assess the effectiveness of Busy Books on the development of fine motor skills in children aged 4–5 years in kindergarten.

METHODS

This research uses a quantitative approach with a quasi-experimental method. (quasi experimental research) A quantitative approach is used to objectively test hypotheses through numerical data and statistical analysis (Sugiyono, 2018). The quasi-experimental method was chosen because the research was conducted under conditions that did not allow for full subject randomization, while still attempting to control external variables that could influence the research results (Suryani & Hendryadi, 2015).

The research design used was a non-equivalent control group design, involving two groups without randomization: an experimental group and a control group. Both groups were given pre- and post-tests, but only the experimental group received the Busy Book media treatment. The research design is as follows:

Table 1. Research Design

Group	Pre-test	Treatment	Post-test
Experiment	O ₁	X	O ₃
Control	O ₂	–	O ₄

Information:

O¹ : Pre-test of Experimental class. O² : Pre-test of control class.

X : Busy Book Media Treatment

O³ : Post-test of experimental class O⁴ : Post-test of control class

The population in this study was all 45 children in kindergarten. The population is the entire research subject who has certain characteristics (Sinambela, 2014). The research sample was taken using a random sampling technique. purposive sampling, namely a sampling technique based on certain considerations (Lusiana, 2015). The sample consists of two groups, namely:

Table 2. Research Sample

No	Class	Sampel	Information
1	TK1	12	Experiment
2	TK2	12	Control

Sample selection was based on similar age, initial abilities, and relatively similar learning conditions. The variables in this study consisted of:

o Independent variable (X) : Media Busy Book

o Variables depend on (Y) : Children's fine motor skills

Fine motor skills are operationalized as a child's ability to coordinate small muscle movements, especially of the hands and fingers, with vision in performing certain activities. The instrument used is performance test which is compiled based on indicators of fine motor skills in early childhood. The research instrument is a tool used to collect data systematically (Arikunto, 2013).

Assessment indicators include:

- Eye and hand coordination
- Fine muscle control of the fingers and hands
- Independence in activities

d. Accuracy and perseverance

The assessment uses the following developmental scale:

- a. Very Well Developed (BSB) = 4
- b. Developing as Expected (BSH) = 3
- c. Starting to Develop (MB) = 2
- d. Not Yet Developed (BB) = 1

In this study, the quality of the instrument was first tested through validity and reliability tests. Validity tests aim to determine the extent to which the instrument is able to measure what it is supposed to measure, so that the data obtained truly reflects the variables studied (Triana & Widyarto, 2013). Meanwhile, reliability tests were conducted to ensure the level of consistency of the instrument in producing stable and reliable data (Zein, 2020). After the instrument was declared feasible, the data collection process was carried out through several stages, namely a pre-test to determine the initial abilities of children's fine motor skills, then providing treatment in the form of the Busy Book media in the experimental group, and ending with a post-test to measure the improvement in fine motor skills after being given treatment.

Next, the obtained data was analyzed using statistical techniques with the help of the SPSS program through several stages of analysis. The first stage was a normality test aimed at determining whether the data were normally distributed as a requirement for using parametric analysis (Sinambela, 2014). The second stage was a homogeneity test used to determine the similarity of variance between the experimental and control groups (Nuryadi, 2017). After these two requirements were met, a hypothesis test was conducted using an independent sample t-test to determine whether there were significant differences between the two groups. This test aimed to determine whether the use of Busy Book media had a significant effect on children's fine motor skills (Simanjuntak, 2020).

RESULT AND DISCUSSION

The results of this study indicate that the use of Busy Book media has a significant influence on improving fine motor skills in children aged 4–5 years in kindergarten. Based on descriptive analysis, the initial abilities (pre-test) in the experimental and control groups were relatively equivalent, indicating that both groups had comparable initial conditions before being given treatment. This condition strengthens the internal validity of the study, so that changes that occur in the post-test results can be more convincingly attributed to the use of Busy Book media.

Table 3. Comparative Value Data Pre-test & Post-Test Experimental class and Control class

No	Experimental class				Control Class			
	Child's name	Pre-Test	Post Test	Difference	Child's Name	Pre-Test	Post Test	Difference
1	FGR	31	45	14	AK	32	40	8
2	IRA	31	48	17	ANH	26	34	8
3	JSB	36	48	12	GHS	29	38	9
4	KSA	30	44	14	HA	34	40	6
5	MDI	35	47	12	MAK	36	47	11
6	MAA	30	45	15	MAA	37	42	5
7	MA	34	46	12	RAW	35	40	5
8	NKS	32	49	17	MAI	28	36	8
9	MAA	36	47	11	FM	35	45	10
10	SA	30	40	10	GH	37	43	6
11	UA	34	44	10	AFP	29	41	12

12	MM	26	41	15	SAM	33	41	8
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The data above is a group of data from the experimental and control classes, including pre-test and post-test. gain score is the difference between each class, with details post-test reduced by pre-test To see the descriptive test data statistics, please refer to the following table:

Table 4. Descriptive Statistics Comparison of Values Pre-test & Post Test Experimental class and Control class

Descriptive Statistics									
	N	Range	Mini mum	Maxi mum	Sum	Mean	Std. Deviation	Variance	
	Statistic	Statistic	Statis tic	Statis tic	Statis tic	Statis tic	Std. Error	Statistic	Statistic
Pre-Test experiment	12	10	26	36	385	32.08	.866	2.999	8.992
Post Test experiment	12	9	40	49	544	45.33	.801	2.774	7.697
Pre-Test Control	12	11	26	37	391	32.58	1.083	3.753	14.083
Post Test Control	12	13	34	47	487	40.58	1.033	3.579	12.811
Valid N (listwise)	12								

Data statistics descriptive The above explains the comparison of children's scores in the experimental class and the control class. In the experimental class, pre-test shows a total score of 385 and an average of 32.08, while in post-test The experimental class obtained a total score of 544 and an average of 45.33. The experimental class showed an increase in children's scores of 159 points. When viewed in the control class, pre-tests showed a total score of 391 with an average of 32.58 while post-test The control class showed a total score of 487 with an average of 40.58. The control class showed a 96 score increase. When comparing the total score increase in each class, a higher increase was obtained in the experimental class, although the children's scores both increased, the comparison of score increases was 159 in the experimental class and 96 in the control class.

After treatment, there was a higher increase in fine motor skills in the experimental group compared to the control group. The experimental group experienced an average increase of 13.25 points, while the control group only experienced an increase of 8.00 points. Furthermore, the smaller standard deviation value of the experimental group compared to the control group indicates that the increase was more consistent and even. These findings indicate that the Busy Book media is not only effective in improving fine motor skills but also capable of producing stable development in children.

The results of the analysis prerequisite test showed that the data were normally distributed and homogeneous, thus fulfilling the assumptions for parametric testing. Hypothesis testing using the t-test (independent sample t-test) showed a significance value (Sig. 2-tailed) <0.05, so H_a was accepted and H_0 was rejected. This means there was a significant difference between the experimental group and the control group, which confirms that the use of Busy Book media has a higher effectiveness than conventional learning in improving children's fine motor skills.

Theoretically, these findings align with Jean Piaget's theory of cognitive development, which states that children aged 2–7 are in the preoperational stage. At this stage, children learn optimally through concrete experiences, symbolic activities, and direct object manipulation. Busy Book provides a variety of concrete activities such as buttoning, tying, pinning, and arranging shapes, allowing children to learn through hands-on experience, thus perfectly aligning with the characteristics of early childhood cognitive development.

Furthermore, Maria Montessori's approach also reinforces these findings. Montessori emphasized that early childhood learning should be based on sensory activities and independent exploration, where children learn through direct interaction with their environment. Busy Books provide opportunities for children to learn independently, choose activities, and practice concentration and attention to detail. This activity aligns with Montessori's principle of "auto-education," or independent learning through direct experience.

From a sociocultural perspective, Lev Vygotsky's theory is also relevant in explaining the effectiveness of Busy Books. Vygotsky emphasized the importance of mediating tools in children's cognitive development. Busy Books function as tools that facilitate children's skill development through structured play activities. Furthermore, the Zone of Proximal Development (ZPD) concept suggests that children can achieve optimal development through the aid of media and a supportive environment. Busy Books serve as a form of scaffolding that helps children complete challenging tasks.

Furthermore, Diane E. Papalia states that fine motor development is greatly influenced by rich and varied environmental stimulation. Busy Books provide a variety of sensory stimulation through textures, colors, and manipulative activities that involve hand-eye coordination. This supports the development of basic skills such as writing, drawing, and other functional activities.

This view is reinforced by John W. Santrock, who stated that early childhood is a crucial period for neuromotor development. Activities involving repetitive hand and finger movements can strengthen neuromuscular connections, thereby improving children's coordination and fine motor dexterity. Therefore, the use of Busy Books, which involve hands-on manipulative activities, is highly effective in supporting this development.

Furthermore, Suryana (2016) explains that fine motor skills develop through repeated practice and appropriate stimulation (Suryana, 2016). The activities in Busy Books provide children with the opportunity to practice continuously in a fun atmosphere, thereby accelerating the development of fine motor skills. This opinion is reinforced by Ulfah (2017), who stated that Busy Books are effective in stimulating fine motor development because they provide interactive and challenging manipulative activities (Ulfah, 2017).

From a learning motivation perspective, Komalasari (2017) stated that engaging learning media can increase children's engagement and interest in learning (Komalasari, 2017). Busy Books are designed with engaging colors, shapes, and activities to create a fun learning environment. This makes children more focused, enthusiastic, and active in learning compared to conventional methods.

Furthermore, Wibirani (2018) stated that Busy Books not only develop motor skills but also cognitive, social, and emotional aspects in an integrated manner (Wibirani, 2018). Through their use, children are trained to be independent, meticulous, patient, and responsible in completing tasks. This demonstrates that Busy Books have comprehensive educational value in early childhood learning.

The findings of this study are also supported by previous research. Huang & Chen (2023) found that textile-based learning media such as Busy Books

significantly improved children's fine motor skills due to their flexible, tactile, and interactive nature (Huang & Chen, 2023). Research by Yuliani & Sari (2022) also showed that functional game-based learning can improve children's hand-eye coordination more effectively than conventional learning (Yuliani & Sari, 2022).

Thus, based on descriptive and inferential analysis, supported by various theories and previous research findings, it can be concluded that Busy Books are an effective learning tool for improving fine motor skills in early childhood. This tool not only provides optimal motor stimulation but also increases children's motivation, independence, and engagement in the learning process. Therefore, the use of Busy Books is highly recommended as an alternative learning tool that is innovative, interactive, and in accordance with the principles of play-based learning in early childhood education.

CONCLUSION

Based on the research conducted, it can be concluded that the use of Busy Book media is effective in improving fine motor skills in 4–5-year-old children in kindergarten. This is demonstrated through descriptive and inferential data analysis.

Descriptively, in the experimental group using Busy Book media, the average pre-test score of 32.08 increased to 45.33 in the post-test, with a total score increase of 159 points or an average increase of 13.25 points per child. Meanwhile, in the control group using conventional learning, the average pre-test score of 32.58 increased to 40.58 in the post-test, with a total increase of 96 points or an average increase of 8.00 points per child. This difference in increase indicates that the experimental group experienced higher development of fine motor skills than the control group.

Furthermore, based on the standard deviation, the experimental group had a post-test score of 2.774, while the control group had a score of 3.579. This indicates that learning outcomes in the experimental group were more stable and even than those in the control group.

Inferentially, the results of the prerequisite test indicate that the data are normally distributed and homogeneous, thus fulfilling the requirements for parametric testing. The results of the hypothesis test using the independent sample t-test show a significance value (Sig. 2-tailed) <0.05 , so H_a is accepted and H_0 is rejected. Thus, there is a significant difference between the experimental group and the control group, which means that the use of Busy Book media has a significant effect on improving children's fine motor skills.

Based on these overall results, it can be concluded that Busy Books not only significantly improve fine motor skills but also produce more optimal, consistent, and effective development compared to conventional learning. Therefore, Busy Books can be used as an alternative, innovative learning medium that aligns with the developmental characteristics of early childhood.

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