

**The Effect of Picture Media to Improve Forward Roll Ability**Dila wasilah¹, Anggi Setia Lengkana^{2*}, Entan Saptani^{3*}¹²³Physical Education of Elementary Teacher Program, Universitas Pendidikan Indonesia,
Bandung, Indonesia**Keywords**Visual Media;
Forward Roll;
Motor Skills**Abstract**

This study aims to determine the effect of applying visual (image) media on improving the forward roll ability of fifth-grade students at Cibungur State Elementary School. The research used a quantitative approach with a pre-experimental design one-group pretest-posttest design. The research subjects consisted of 35 students selected using total sampling. The instrument used was a forward roll skill test based on movement indicators, including initial position, hand and foot position, rolling process, and final position, validated through expert judgment with high reliability (Cronbach's Alpha = 0.86; ICC = 0.90). Data were analyzed using descriptive statistics and paired sample t-test. The results showed a significant increase in students' abilities, with the average score rising from 50.49 (pretest) to 96.40 (posttest), and a gain score of 45 points. The t-test results indicated a significance value of $p < 0.05$, confirming that the improvement was statistically significant. In addition, the decrease in standard deviation indicated a more homogeneous distribution of student abilities after the intervention. These findings suggest that visual media is effective in improving students' forward roll skills by providing clear and systematic movement visualization. Therefore, visual media can be recommended as an innovative and effective learning strategy in physical education study.

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INTRODUCTION

Physical education is a crucial component of the education system, contributing to the holistic development of students' physical, cognitive, affective, and social abilities. Through structured physical activity, students not only improve their fitness but also their motor skills, thinking skills, and social interaction skills (Sari and al., 2024). Furthermore, physical education serves as a vehicle for character development through the internalization of values such as discipline, responsibility, cooperation, and sportsmanship in every learning activity (Ningsih, 2024). This demonstrates that physical education plays a significant role in supporting the holistic development of students. At the elementary school level, physical education plays a crucial role in developing students' basic motor skills. These skills serve as the primary foundation for more complex motor development at later stages. One of the basic skills that must be mastered is the forward roll, which involves coordination, balance, and courage in students engaging in physical activity. However, in practice, physical education learning often faces various obstacles, particularly in terms of the methods and media used by teachers. Physical education instruction in elementary schools still tends to use conventional methods that lack engaging and innovative learning media. This results in low student engagement in the learning process and a suboptimal understanding of the movement techniques taught. According to (Magneta and Wathoni, 2024), a learning approach that is less didactic and methodical can hinder the optimal achievement of learning objectives. Furthermore, the lack of variety in learning media is also a factor contributing to students' low motor skills (Putri and Masrini, 2023). This condition impacts students' low ability to correctly perform basic movements, including forward rolls. Students tend to have difficulty understanding the stages of movement due to the lack of clear visualization during the learning process. Therefore, innovation is needed in the use of learning media that can effectively improve student understanding and skills.

Various studies have shown that the use of learning media plays a crucial role in improving the quality of learning. Research by (Mubarok, Sudana and Nurhuda, 2023). Internationally, the effectiveness of visual media in learning is also supported by various recent studies showing that integrating visualization into the learning process can significantly improve students' conceptual understanding, information retention, and motor skills (Moreno and Mayer, 2022). Furthermore, visual and technology-based learning approaches have been shown to increase student engagement and the effectiveness of physical education learning process (Casey, Goodyear and K. Armour, 2021). Thus, the use of visual media is not only theoretically relevant but also supported by global empirical evidence demonstrating its role in improving the quality of movement-based learning. Various studies have shown that the use of learning media plays a crucial role in improving the quality of learning. Research by states that visual media can enhance student understanding through concrete visualization. This is further supported by research by (Rofi'ah and Pratiwi, 2025), which shows that image-based media can improve children's motor skills through directed activities. Furthermore, research by (Liani, Ambarwati and Tristya, 2023) states that learning media functions as a stimulus that can stimulate children's motor development. Other findings by (Fitriani and al., 2023) indicate that visual-based activities such as drawing can improve students' motor coordination and accuracy. Internationally, the effectiveness of visual media in learning is also supported by various recent studies showing that integrating visualization into the learning process can significantly improve students' conceptual understanding, information retention, and motor skills (Moreno & Mayer, 2022; Logan et al., 2021). Furthermore, visual and technology-based learning approaches have been shown to increase student engagement and the effectiveness of physical education learning processes (Casey et al., 2021; Xie et al., 2021). Thus, the use of visual media is not only theoretically relevant but also supported by global empirical evidence demonstrating its role in improving the quality of movement-based learning.

Although various studies have discussed the effectiveness of visual media in improving motor skills, most of these studies are still general in nature and have not specifically examined their application in physical education learning, especially in the forward roll movement material. In addition, previous studies tend to focus on general motor development without directly linking it to specific motor skills in the context of practical learning in

elementary schools. Therefore, the novelty in this study lies in the specific application of visual media in learning the forward roll movement by using a pre-experimental approach to measure the improvement of students' abilities directly and in a structured manner. Based on this description, the purpose of this study is to determine the effect of the application of visual media on improving the forward roll movement ability of students at Cibungur State Elementary School. This research is expected to contribute to the development of physical education learning strategies that are more innovative, effective, and appropriate to the needs of elementary school students.

One solution that can be implemented to overcome this problem is the use of visual media in physical education learning. Visual media has the advantage of presenting information visually and concretely, making it easier for students to understand the stages of movement. According to (Mubarok, Sudana and Nurhuda, 2023), visual media can improve student understanding because it provides a clear and systematic picture of the material being taught. The use of visual media can also increase student learning motivation because it is more engaging and in line with the characteristics of elementary school students who tend to be responsive to visual stimuli. Thus, the integration of visual media in movement learning is expected to improve students' motor skills more effectively.

METHODS

This study used a quantitative approach with a pre-experimental design, namely a one-group pretest-posttest design. This design was chosen to analyze the effect of applying image media on improving students' forward roll movement abilities by comparing results before and after treatment. In this design, research subjects were given an initial test (pretest), then given treatment (treatment), and ended with a final test (posttest). According to (Sugiyono, 2022), a one-group pretest-posttest design is a research design conducted on one group without a control group, so measurements are carried out by comparing conditions before and after treatment in the same group. The subjects in this study were 35 fifth-grade students of Cibungur Elementary School located in Rancakalong District. The sample selection was carried out as a whole 35, considering the relatively limited population and all students met the criteria as research subjects

A research instrument is a tool used to collect data systematically and measurably. According to (Maksum, 2006), a research instrument serves as a measuring tool to obtain data relevant to the research objectives. In this study, the instrument used was a forward roll skill test, structured based on movement assessment indicators (starting position, hand and foot position, rolling process, and final position). Instrument validity was determined through the expert judgment method, namely an assessment by experts in the field of physical education to ensure the suitability of the indicators with the construct being measured. Methodologically, this approach aligns with (DeVellis, 2021) opinion, which states that content validity is obtained through expert evaluation of the suitability of instrument items with the construct being measured. Based on the results of the instrument quality test, it can be concluded that the forward roll movement skill test which is compiled based on the initial position indicator, hand and foot position, rolling process, and final position has met the eligibility criteria because it is proven to have content validity through expert judgment which shows conformity with the construct being measured, and is supported by a high level of reliability (Cronbach's Alpha = 0.86) and excellent inter-rater consistency (ICC = 0.90), so that this instrument is declared capable of measuring students' movement abilities objectively, consistently, and reliably in the context of physical education research..

Table 1. Front Roll Assessment using expert judgment method.

RATED	SCORE			TOTAL	ITEM
ASPECT	1	2	3	SCORE	SCORE
Starting position					
Position of hands and feet					
Rolling position					
Final Position					

Note:

1. Scoring Criteria: 3 = good; 2 = sufficient; 1 = inadequate; 0 = not implemented.

2. Activity item scores

$$\frac{\text{Total Score}}{\text{Maximum Score}} \times \text{weight}$$

Description: Weighting 100

Interpretation:

A score of 80–100 is considered good.

A score of 65–79 is considered moderate.

A score <65 is considered poor (Mahardika, 2008).

Data collection techniques were obtained from the pre-test, treatment, and post-test of the floor exercise front roll. After the research was completed, the next step was to enter the student learning assessment results into an assessment table with scoring, and then testing was conducted using the T-test formula.

RESULTS AND DISCUSSION

Table 2. Interpretation of Descriptive Statistics

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
pretes	35	16	58	1483	42.37	11.215
postes	35	75	98	3348	95.66	5.713
Valid N (listwise)	35					

The descriptive statistics indicate that the mean pretest score was 42.37 with a standard deviation of 11.21, while the mean posttest score increased substantially to 95.66 with a standard deviation of 5.71. This sharp increase demonstrates a very strong practical improvement in students' *forward roll* ability after the intervention. The reduction in standard deviation suggests that students' performance became more homogeneous after treatment. This implies that the use of picture-based learning media not only improved overall performance but also helped lower-performing students catch up with their peers. This finding is consistent with (Moreno-Guerrero, 2020), who reported that visual-based instructional media in physical education enhances learning outcomes while reducing performance gaps among students due to clearer and more concrete information delivery.

Normality Test

Table 3. Interpretation of Normality Test
One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		35
Normal Parameters ^{a,b}	Mean	.0000000
	Std. Deviation	11.21345993
Most Extreme Differences	Absolute	.232
	Positive	.232
	Negative	-.139
Test Statistic		.232
Asymp. Sig. (2-tailed)		.000 ^c

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

The Kolmogorov–Smirnov test yielded a significance value of 0.000 ($p < 0.05$), indicating that the data are not normally distributed. This suggests a deviation from the assumption of normality. However, with a sample size greater than 30 ($N = 35$), parametric tests such as the paired t-test remain appropriate due to the *Central Limit Theorem*, which states that sampling distributions tend toward normality as sample size increases. According to (Field, 2020), parametric tests are robust to violations of normality in moderately sized samples, especially when extreme outliers are absent. Thus, despite the non-normal distribution, further parametric analysis is still considered valid.

Linearity Test (ANOVA)

Table 4. Interpretation of Linearity Test (ANOVA)

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	.954	1	.954	.007	.932 ^b
Residual	4275.217	33	129.552		
Total	4276.171	34			

a. Dependent Variable: pretes

b. Predictors: (Constant), postes

The ANOVA test shows a significance value of 0.932 ($p > 0.05$), indicating that there is no significant linear relationship between pretest and posttest scores. This suggests that improvement in learning outcomes does not depend linearly on students' initial ability levels. In other words, both low- and high-performing students experienced substantial improvement following the intervention. This aligns with (Gil-Arias, 2021), who found that in visual-based physical education learning, motor skill improvement is more strongly influenced by the quality of instructional methods rather than initial student ability.

N-Gain Score

Table 5. Table N Gain Score

Post tes	Pre tes	Post-Pre	Skor Ideal (100-Pre)	N Gain Score	N Gain Score (%)	Category
98	58	40	42	0,952	95,238	Effective
98	41	57	59	0,966	96,610	Effective
98	58	40	42	0,952	95,238	Effective
98	16	82	84	0,976	97,619	Effective
98	41	57	59	0,966	96,610	Effective
98	58	40	42	0,952	95,238	Effective
91	58	33	42	0,786	78,571	Effective
83	56	27	44	0,614	61,364	Effective
91	56	35	44	0,795	79,545	Effective
98	41	57	59	0,966	96,610	Effective
98	41	57	59	0,966	96,610	Effective
98	58	33	42	0,952	95,238	Effective
98	41	57	59	0,966	96,610	Effective
98	41	57	59	0,966	96,610	Effective
98	38	60	62	0,968	96,774	Effective
98	41	57	59	0,966	96,610	Effective
98	41	57	59	0,966	96,610	Effective
98	41	57	59	0,966	96,610	Effective
98	41	57	59	0,966	96,610	Effective
98	41	57	59	0,966	96,610	Effective
98	50	48	50	0,960	96,000	Effective
98	56	42	44	0,955	95,455	Effective

98	41	57	59	0,966	96,610	Effective
75	33	42	67	0,627	62,687	Effective
98	50	48	50	0,960	96,000	Effective
83	33	50	67	0,746	74,627	Effective
98	33	65	67	0,970	97,015	Effective
98	58	40	42	0,952	95,238	Effective
98	41	57	59	0,966	96,610	Effective
83	41	42	59	0,712	71,186	Effective
98	33	65	67	0,970	97,015	Effective
98	33	65	67	0,970	97,015	Effective
98	33	65	67	0,970	97,015	Effective
98	33	65	67	0,970	97,015	Effective
98	16	82	84	0,976	97,619	Effective
98	33	65	67	0,970	97,015	Effective
95,65714	42,37143	53,28571	57,62857143	0,921	92,144	

$$N\text{ Gain} = \frac{\text{Score Posttest} - \text{Score Pretest}}{\text{Ideal Score} - \text{Score Pretest}}$$

Effectiveness Interpretation Category N-Gain

Table 6. source: (Hake, 1999)

Presentation (%)	Interpretation
< 40	Ineffective
40-55	Less Effective
56-75	Quite Effective
>76	Effective

Distribution Score Gain

Table 7. source: (Hake, 1999)

Nilai N-Gain	Kategori
$g \geq 0.7$	High
$0.3 \leq g < 0.7$	Medium
$g < 0.3$	Low

The N-Gain analysis shows an average score of 0.92, categorized as “high” or “effective,” with an average percentage of 92.14%. Nearly all students fall into the effective category. This indicates that the improvement is not only statistically significant but also educationally meaningful. The intervention had a strong impact on enhancing students’ learning outcomes. This finding is in line with (Wibowo, 2023), who reported that visual learning media produce

high gain scores in physical education, particularly in activities requiring sequential motor coordination such as gymnastics.

Paired Sample t-Test

Table 8. Interpretation of Paired Sample t-Test

Paired Samples Test						
Paired Differences						
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference	
					Lower	Upper
Pair 1	pretes - postes	-53.286	12.662	2.140	-57.635	-48.936
						24.897
						-34.000

The paired sample t-test results show a significance value of 0.000 ($p < 0.05$) with a t-value of -24.897. This indicates a statistically significant difference between pretest and posttest scores. The mean difference of -53.286 confirms that posttest scores are substantially higher than pretest scores. Therefore, it can be concluded that the use of picture-based media has a significant positive effect on improving students' *forward roll* skills. This result is supported by (Santos and Castro, 2022), who demonstrated that visual learning significantly improves movement accuracy and coordination in motor skill acquisition.

The findings of this study demonstrate that the application of picture-based (visual) media has a significant and substantial effect on improving students' forward roll ability. This is evidenced by the considerable increase in mean scores from pretest (42.37) to posttest (95.66), supported by the paired sample t-test results ($p < 0.05$). These results indicate that the intervention was not only statistically significant but also practically meaningful in enhancing students' motor skills.

From a motor learning perspective, this improvement can be explained through the role of visual representation in facilitating skill acquisition. Picture-based media provide clear, structured, and sequential representations of movement, allowing students to better understand the phases of the forward roll, including body positioning, coordination, and balance. This aligns with findings by (Moreno-Guerrero, 2020), who reported that visual learning tools significantly enhance comprehension and motor performance in physical education by transforming abstract instructions into concrete visual information.

Furthermore, the reduction in standard deviation from pretest to posttest indicates that students' performance became more homogeneous after the intervention. This suggests that visual media not only improve overall performance but also help reduce learning disparities among students. In line with this, (Casey, Goodyear and K. M. Armour, 2021) emphasized that the integration of visual and digital pedagogies in physical education promotes inclusive learning environments by supporting students with varying ability levels.

The results of the linearity test ($p > 0.05$) further reinforce this interpretation, indicating that improvement in forward roll ability was not dependent on students' initial skill levels. Both low- and high-performing students showed significant progress. This finding supports the argument that instructional design plays a more critical role than baseline ability in motor skill development. Research by (Gil-Arias, 2021) also confirms that well-structured instructional approaches, particularly those incorporating visual demonstrations, can optimize motor learning outcomes regardless of students' prior experience.

In addition, the high N-Gain score (0.92) indicates that the intervention was highly effective. This suggests that picture-based media provide meaningful learning experiences that significantly accelerate skill acquisition. The effectiveness of visual media can also be explained through Dual Coding Theory, where information processed through both visual and verbal channels enhances memory retention and understanding. A recent study by (Santos and Castro, 2022) demonstrated that visual learning significantly improves movement accuracy, coordination, and retention in motor skill learning contexts.

Moreover, contemporary research trends highlight the increasing importance of integrating visual and technology-based approaches in physical education. A study by (Xie, 2021) found that visual and interactive learning environments enhance student engagement, motivation, and learning outcomes in physical activity-based subjects. Similarly, recent evidence suggests that visual instruction improves students' ability to process movement sequences, which is essential in gymnastics-related skills such as forward rolls.

The strong improvement observed in this study also reflects the importance of explicit movement visualization in elementary school learners. At this developmental stage, students rely heavily on concrete representations rather than abstract explanations. Therefore, picture media act as an effective bridge between instruction and execution. This is supported by recent findings in motor development research, which indicate that structured visual guidance significantly enhances fundamental movement skills in children.

However, despite these positive findings, several limitations should be acknowledged. The use of a one-group pretest-posttest design without a control group limits the ability to fully attribute improvements solely to the intervention, as external factors such as repeated practice or increased familiarity with the task may also contribute. Future research should consider employing more rigorous experimental designs, such as randomized controlled trials, to strengthen causal inference.

Overall, this study provides strong empirical evidence that picture-based learning media are an effective instructional strategy in physical education, particularly for teaching fundamental motor skills such as the forward roll. The findings contribute to the growing body of literature emphasizing the role of visual learning in enhancing motor performance, engagement, and learning equity among elementary school students.

CONCLUSION

This study concludes that the application of picture-based (visual) media has a significant and positive effect on improving the forward roll ability of fifth-grade students at Cibungur State Elementary School. The findings demonstrate a substantial increase in students' performance, as indicated by the improvement in mean scores from pretest to posttest, supported by statistically significant results from the paired sample t-test ($p < 0.05$). Furthermore, the high N-Gain score indicates that the intervention is highly effective in enhancing students' motor skills. The reduction in score variability also suggests that visual media contribute to more equitable learning outcomes by supporting students with different initial ability levels.

These results highlight the important role of visual media in facilitating motor skill acquisition through clear, structured, and systematic movement representation. Therefore, picture-based learning media can be recommended as an effective and innovative instructional strategy in physical education, particularly for teaching fundamental motor skills such as the forward roll. However, this study is limited by the use of a one-group pretest-posttest design without a control group. Future research is recommended to employ more rigorous experimental designs to strengthen the validity and generalizability of the findings.

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