

The Use of Hanging Bottle Media in Improving Pencak Silat Front Kick Skills among Seventh-Grade Students

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ABSTRACT

Purpose – This study aims to determine the effect of using hanging bottles as a training aid on Pencak Silat front kick skills among seventh-grade students. This research was prompted by students' low proficiency in performing front kick techniques, as evidenced by incorrect kick direction, poor balance, and suboptimal motor coordination.

Methods – This study employed a quantitative approach with a pre-experimental one-group pretest-posttest design. The sample consisted of 26 seventh-grade students. The instrument used were a practical test assessing front kick skills based on movement technique indicators. Data was analyzed using descriptive statistics, the Shapiro-Wilk normality test, the Wilcoxon Signed-Rank Test, and N-Gain analysis.

Findings – The results revealed a significant improvement between pretest and posttest scores, with an asymptotic significance value of $p < 0.001$. The mean pretest score increased from 43.65 to 86.15 on the posttest. Furthermore, the average N-Gain value of 0.76 (76.47%) fell into the "high" and "effective" categories. These findings indicate that hanging bottle media can help students achieve specific learning goals, improve concentration, and refine movement techniques.

Research Implications – Therefore, hanging bottle media serves as an innovative and effective instructional alternative for improving front kick skills in Pencak Silat within the Physical Education (PJOK) curriculum. However, this study is limited to a specific student sample at a single grade level and focuses solely on one technique, the front kick. Consequently, its effectiveness across other age groups or kick types cannot yet be generalized.

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Introduction

Education serves as a platform for individuals to develop their abilities (Lesmana et al., 2025). Physical Education, Sports, and Health are an integral part of the national education system, aimed at developing physical fitness, motor skills, and character values. The objectives of physical education are also inseparable from the objectives of national education as outlined in Law No. 20 of 2003 on the National Education System. Syafruddin et al., (2022) state that Physical Education, Sports, and Health (PJOK) is an inseparable part of the national education system that plays a strategic role in developing students' physical fitness, motor skills, and character values. Therefore, physical education instruction in schools serves as a means for students to acquire and experience a variety of meaningful learning experiences.

Learning is a process of interaction between educators, students, and learning resources within a learning environment (Djamaluddin, 2021). Meanwhile, Astri Azani et al., (2024), according to learning is the assistance provided by educators to facilitate the acquisition of knowledge, understanding, and mastery. From these explanations, it can be inferred that physical education is a form of learning carried out through physical activities to develop students' affective, cognitive, and psychomotor aspects in an integrated manner (Sari et al., 2024). One discipline capable of representing these three aspects is pencak silat, as it incorporates not only elements of motor skill training and physical agility (psychomotor) but also an understanding of techniques and strategies (cognitive), as well as the instillation of values such as discipline, sportsmanship, responsibility, and self-control (affective).

One of the learning objectives of pencak silat is to improve students' skills in mastering basic techniques rrectly and effectively. The Kamus Besar Bahasa Indonesia (KBBI), improvement is the process or effort to make something better than its previous state, both in terms of quality and quantity. In the context of learning, improvement indicates a change in students' abilities as a result of a planned learning process. One manifestation of this change is the development of students' skills in performing a movement. The Kamus Besar Bahasa Indonesia (KBBI), defines "skill" as a person's proficiency or ability to carry out a task accurately and effectively. Thus, skill improvement can be understood as the process by which students' ability to master a technique or movement develops through a systematic and continuous learning process.

Pencak silat is one of the martial arts that is rapidly growing in Indonesia. According to Rachman et al., (2021),pencak silat is an intangible cultural heritage recognized by UNESCO in 2019. Kholis et al., (2017) explain that pencak silat encompasses four main aspects: mental and spiritual, cultural arts, self-defense, and sports. These four aspects do not stand alone but are interrelated and form an integrated system. In line with Ediyono and Widodo (2019) pencak silat is part of Indonesian culture that has been

developing for centuries. In pencak silat, basic movements are learned through several basic techniques Putri and Agusni (2025) The basic techniques covered in the curriculum include (1) footwork and footwork patterns, (2) stances and their variations, (3) defensive techniques, (4) offensive techniques, (5) takedown techniques, and (6) joint-lock techniques (Lubis & Wardoyo, 2014)

One of the attacking techniques is the kick. According to Anggara et al. (2025) the front kick is an attacking technique that uses the leg as the primary tool to strike an opponent, especially at medium to long range. Kriswanto (2015) states that: "A front kick is a kick that uses the tips of the toes with the leg straight. The part of the foot that makes contact during the kick is the base of the toes. The body is positioned facing the target." It can be concluded that the front kick technique is an attack that uses the foot, with the kick directed straight forward, targeting the solar plexus and the chin. To execute a good and proper kick, students must master the basic kicking techniques, from body posture to foot positioning. Students need to acquire the knowledge and skills related to the front kick as a foundation for learning pencak silat so that learning objectives can be achieved.

Instructional media are tools that serve as intermediaries to facilitate the acquisition of knowledge, skills, or attitudes (Arsyad, A., 2011). According to Nurrita, (2018), instructional media are tools that can be used to support the teaching and learning process. Instructional media also function as a source of information provided by teachers so that the material can be effectively conveyed to students. One type of instructional media that is easy to create and use is modified media. Specifically, modification refers to an effort to create and present something new, unique, and engaging (Ediyono & Widodo, 2019). Here, modification refers to the creation, adaptation, and presentation of new, unique, and engaging equipment, facilities, and infrastructure for the teaching and learning process in physical education (Suryani & Abadi, 2022). Physical education teachers need to make modifications as solutions or alternatives to address problems that arise during the teaching and learning of pencak silat or martial arts.

However, the reality on the ground reveals a gap between theory and practice. Based on interviews with physical education teachers at SMPN 4 Belawang, it was found that seventh-grade students tend to make technical errors when performing a front kick. A physical education teacher stated, "Students often kick by swinging their leg from bottom to top, rather than lifting it and pushing it straight forward." From this statement, it is clear that this movement pattern causes the ball's trajectory to curve, similar to the technique used for kicking a soccer ball, resulting in inaccurate hits to targets such as the solar plexus or chin. An appropriate solution must be found immediately for this problem occurring at the school.

A kicking technique that results in inaccurate hits to targets such as the solar plexus or chin. The problems occurring in schools require an immediate and appropriate solution. Therefore, the researcher sought to provide teachers with a solution for instructional media by modifying teaching aids. The researcher utilized a modified hanging bottle device consisting of a bottle, a rope, and water. This study aims to improve students' skills and precision in the front kick technique of pencak silat through the use of the hanging bottle teaching aid. This learning aid, made from a bottle, string, and water, is used to help students perform kicks correctly and with proper aim. Through the application of this teaching aid, this study focuses on measuring the extent of improvement in students' motor skills after receiving instruction during the learning process.

Based on the results of previous studies, it is known that the use of learning aids can improve kicking skills in pencak silat instruction. The study titled (Makhmud & Prasetyo, 2024) "Efforts to Improve Learning Outcomes in Pencak Silat Front Kicks Using Learning Aids for Seventh-Grade D Students at SMP Negeri 15 Semarang in the 2023–2024 School Year" demonstrated that the use of chairs as learning aids can improve students' learning outcomes in front kicks through classroom action research. Furthermore, the study (Fadillah, 2025) "Efforts to Improve Straight Kick Skills Using PVC Pipe Media Among Extracurricular Students at Taruna Terpadu Junior High School" proved that PVC pipe media can improve students' straight kick skills. However, both studies still employed action research designs and different learning media, so they have not yet examined the use of hanging bottle media in improving front kick skills in physical education classes. Therefore, the study titled "Improving Pencak Silat Front Kick Skills Using Hanging Bottles Among Seventh-Grade Students at SMP Negeri 4 Belawang, Barito Kuala Regency" was conducted to fill this research gap using a pre-experimental design with a one-group pretest-posttest design.

The purpose of this study was to analyze differences in the front kick skills of seventh-grade students at SMPN 4 Belawang in before and after instruction using hanging bottles as teaching aids, and to calculate the extent of skill improvement based on the results of the N-Gain analysis.

Methods

This study employs a quantitative approach, specifically a type of pre-experimental design. Sugiyono (2015), "It is called a pre-experimental design because this design does not yet constitute a true experiment." This study uses a one-group pretest-posttest design.

$$O_1 \rightarrow X \rightarrow O_2$$

Explanation:

O₁: Pretest (initial test)

X : Intervention using learning media

O₂: Posttest (final test)

This study began with a pretest assessment to determine the students' initial proficiency in the pencak silat front kick. Next, the students were given an intervention consisting of training in the pencak silat front kick using a hanging bottle, the height of which was gradually increased and the exercise was repeated. A pre-experimental design was chosen for this study because it involved only one group without a control group and aimed to determine the improvement in pencak silat front kick skills after the intervention using the hanging bottle. Data collection for this study was conducted at SMP NEGERI 4 Belawang, located on Jl. Kunci, Karang Buah Village, Belawang Subdistrict, Barito Kuala Regency, South Kalimantan. The study was conducted in April 2026 and consisted of 4 sessions.

The population in this study consists of 79 seventh-grade students. According to Sugiyono (2023), "A sample is a subset of a population that shares the characteristics of that population." The sample size in this study consists of 26 students from SMPN 4 Belawang, selected using purposive sampling. The sample in this study was determined using purposive sampling based on the following criteria: (1) Students must be registered as active seventh-grade students at SMPN 4 Belawang; (2) Students must regularly attend Physical Education (PJOK) classes; (3) Sampling was conducted based on the criterion of selecting a class with lower proficiency in pencak silat. Class VII A was selected because it met all of these criteria.

The assessment of the pencak silat front kick practical test is conducted by observing how many movements the students perform correctly (Fadillah, 2025). The movements assessed include the preparatory position, the leg-lifting position, the kicking position, the leg-retraction position, and the final position. Each of the 5 movements has 4 indicators, and each indicator is scored on a scale of 1–4. Each movement consists of several indicator components that students must perform correctly. Assessment is based on scores reflecting the quality of the students' movements, which are then converted into a grade. The maximum score achievable is 80, while the minimum is 20. The resulting grade is on a scale of 1–100. The scores obtained from each assessment indicator are then added together to determine the total score and the grade for the front kick skill in pencak silat. The higher the score, the better the student's grade and skill level in performing the front kick technique. After the grade is determined, it is categorized according to Hartono et al. (2022).

The data analysis in this study employs a quantitative approach because the data collected consist of scores from front kick skill tests administered before and after the

intervention, which involved the use of hanging bottles. The pretest and posttest data will be analyzed using descriptive statistics, normality tests, the Wilcoxon Signed-Rank Test, and N-Gain analysis. The analysis will be conducted using the statistical software SPSS and Excel.

Result

1. Descriptive Statistics

This study aims to determine the effectiveness of using hanging bottles as a training aid in improving students' front kick skills in pencak silat. The pretest and posttest results are shown in the following table

Table 1. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Pretest	26	35	65	43,65	8,666
Posttest	26	76	100	86,15	8,609

The research results were described using descriptive statistical analysis as follows: the minimum score was 35, the maximum score was 65, the mean score was 43.6538, and the standard deviation was 8.66691 prior to instruction or treatment. Meanwhile, for the posttest, the minimum score was 76, the maximum score was 100, the mean was 86.15, and the standard deviation was 8.609. These results indicate a significant improvement compared to the pretest scores.

2. Analysis Prerequisite Tests

2.1. Normality Test

The results of the normality test using the Shapiro-Wilk test showed that the p-value for the pretest data on front kicks was 0.00, which is less than 0.05. This indicates that the data are not normally distributed. For the posttest, the results showed a p-value of 0.01, which is less than 0.05. This indicates that the data are not normally distributed ($0.01 < 0.05$). Since not all of the data met the assumption of normality, the subsequent analysis used a nonparametric statistical test to examine the difference between the pretest and posttest results.

Tabel 2. Normality Test

Variabel	Statistic	Shapiro-Wilk	
		df	Sig.
Pretest front kick	,721	26	,000
Posttest front kick	,837	26	,001

2.2. Wilcoxon Signed-Rank Test

Table 3. Wilcoxon Signed-Rank Test

Category	N	Mean Rank	Sum Off Rank
Negative Ranks	0	,00	,00
Positive Ranks	26	13,50	351,00
Ties	0	-	-
Total	26	-	-

The results of the Wilcoxon Signed-Rank Test show that the significance value (Asymp. sig., 2-tailed) for the difference in front kick performance between the posttest and pretest was 0.000. Since the significance value for the front kick was less than 0.05, it can be concluded that there was a significant difference in the students' front kick performance before and after the intervention.

Table 4. Uji Wilcoxon

	Posttest - Pretest
Z	-4,463 ^b
Asymp. Sig. (2-tailed)	,000

2.3. N-Gain Test

Table 5. N-Gain Test

Variabel	Rata-rata
<i>Pretest</i>	43,65
<i>Posttest</i>	86,15
N-Gain Score	0,76
N-Gain Persen	76,47%

Based on the table above, the average pretest score of the students before the intervention was 43.65. This figure indicates that the students' initial ability or mastery of the front kick was relatively low at the outset. However, after the intervention using the hanging bottle method, the students' learning outcomes showed a significant improvement, as evidenced by an average posttest score of 86.15.

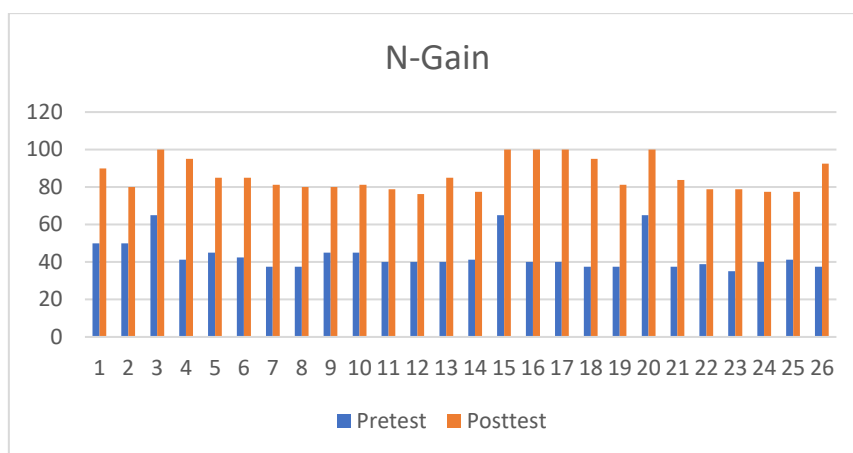


Figure 1. N-Gain Test

According to Hake's (1999) criteria, an N-Gain score of 0.76 falls into the high category because it lies within the range of $g \geq 0.70$. Meanwhile, an N-Gain percentage of 76.47% falls into the effective category, indicating that the use of hanging bottle media contributes significantly to improving seventh-grade students' front kick skills.

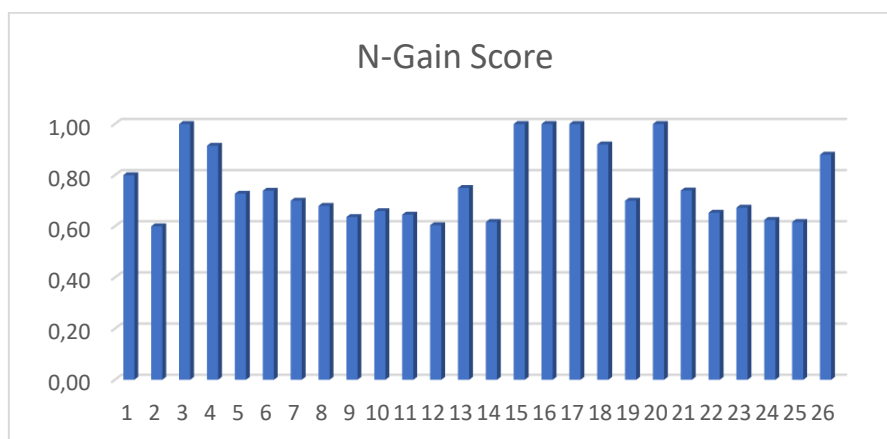


Figure 2. N-Gain Score

N-Gain analysis is used to describe the extent of improvement in students' skills after receiving an intervention. Although N-Gain was initially widely used to measure improvements in cognitive learning outcomes, several studies in the field of physical education have also utilized it to demonstrate the degree of improvement in motor skills based on pretest and posttest scores. Therefore, in this study, N-Gain was used as a supplementary analysis to describe the magnitude of improvement in front kick skills, while the Wilcoxon Signed-Rank Test was used to test for differences.

It can be concluded that the use of hanging bottles is effective in improving seventh-grade students' front kick skills in pencak silat. This is evidenced by the N-Gain score falling into the high category and the N-Gain percentage falling into the effective category. Thus,

hanging bottles can be used as an alternative teaching aid that supports the improvement of front kick skills in pencak silat instruction at school.

Discussion

Based on the research results, it was found that the front kick skills of seventh-grade students in pencak silat improved after instruction using hanging bottles as teaching aids. This is evident from the average pretest score of 43.65, which increased to 86.15 on the posttest. The results of the Wilcoxon Signed-Rank Test showed an Asymp. Sig. (2-tailed) value of $0.000 < 0.05$, indicating a significant difference between the pretest and posttest results. These findings suggest that the use of hanging bottles as teaching aids has a positive effect on students' mastery of the front kick technique in pencak silat.

The improvement in pencak silat front kick skills occurred because the hanging bottle served as a clear and tangible target during the learning process. When performing a front kick, students not only practiced the kicking technique but were also required to direct their kicks precisely at the designated target. The presence of this target helps students understand the correct direction of the kick, making the learning process easier to grasp compared to learning without the use of such aids. This aligns with motor skill learning theory, which states that improvements in motor skills occur through repeated practice accompanied by feedback on the movements performed (Rohisfi & Neviyarni, 2021). In this study, students received feedback when their kicks hit the target, allowing them to correct their movement techniques in subsequent practice sessions. The findings of this study are also supported by motor skill theory, which explains that mastery of sports skills develops through structured and continuous practice (Abdullah & Nurrochmah, 2021).

Instructional media are tools that can support the teaching and learning process, making the material presented clearer and enabling learning objectives to be achieved effectively and efficiently (Nurrita, 2018). The appropriate use of media also shows that the use of media can create a more concrete learning experience compared to learning that relies solely on verbal explanations. Hasan et al. (2021) explain that instructional media serve as a means of conveying information that can help students understand the material more effectively. This view is reinforced Saleh et al. (2023), who state that instructional media can increase students' attention, interest, and participation during learning activities. During the study, students appeared more active in participating in each stage of the learning process because they could immediately practice the movements they were learning and gain a more tangible learning experience.

Thus, the use of hanging bottles has proven effective in improving students' front kick skills in pencak silat. The findings of this study support the theory that the use of appropriate teaching aids in the physical education learning process can help students achieve optimal skill improvement. The results of this study also align with Fauzan et al.,

(2023), which found that the use of bottles as teaching aids in pencak silat instruction significantly improved students' side kick technique skills. Additionally, Dwi E. L. (2024) demonstrated that the use of modified teaching aids is effective in improving students' front kick abilities. These similar findings suggest that the use of appropriate learning aids can facilitate the process of mastering motor skills while improving the quality of pencak silat instruction.

The accuracy of this study's results is supported by the instrument used to measure pencak silat front kick skills. The assessment instrument was developed based on indicators of basic front kick techniques, which include the preparatory position, the leg-lifting position, the kicking position, the leg-retraction position, and the final position. These indicators represent the movement stages that students must master to perform a front kick correctly. Therefore, the instrument used has a strong correlation with the pencak silat front kick skill variable that is the focus of this study. The increase in scores obtained by the students indicates the development of abilities in each assessed movement component, allowing the research results to objectively and measurably illustrate skill improvement.

The findings of this study imply that the use of simple learning media can be an effective alternative for improving students' motor skills in Physical Education (PJOK) classes. The significant improvement in learning outcomes, as indicated by the N-Gain score, demonstrates that the hanging bottle media can help students achieve mastery of the front kick skill more effectively. These findings demonstrate to Physical Education teachers that the use of readily available and relatively low-cost teaching aids can still result in effective learning. In addition to improving motor skills, the use of the hanging bottle teaching aid can also increase student participation, motivation, and engagement during the learning process. Thus, the hanging bottle teaching aid can serve as an alternative for pencak silat instruction that can be implemented in schools to support improvements in the quality of Physical Education instruction.

Thus, the data obtained support the conclusion that hanging bottle media empirically improves students' front kick skills through a more active learning process, as students are directly involved in every activity.

Conclusion

Based on the research results, it can be concluded that the front kick skills of seventh-grade students at SMP Negeri 4 Belawang improved after learning using hanging bottles as teaching aids. This improvement was demonstrated by the difference between pretest and posttest results, as determined by the Wilcoxon Signed-Rank Test, as well as by N-Gain scores that fell into the high category. These findings indicate that the use of the hanging bottle as a teaching aid is associated with an improvement in front kick skills among the study sample.

The hanging bottle provides a clear target, thereby helping students understand kicking techniques, improve movement accuracy, coordination, and engagement during instruction. In addition to being easy to make and utilizing simple materials, this teaching aid can serve as an alternative for physical education teachers in supporting pencak silat instruction.

This study still has limitations because it used a pre-experimental design without a control group, involved students from only one school, and did not evaluate skill retention after the intervention. Therefore, future research is recommended to use a quasi-experimental or experimental design with a control group, involve a broader sample, and conduct follow-up measurements to obtain stronger empirical evidence.

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