



Development of A Game-Based Pencak Silat Learning Model for Students in Elementary School

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Abstract

Learning game functions as a strategy that provides a learning experience that is natural and relevant to real-life situations, therefore able to relate learning materials to daily experiences for students. This research aims to produce a game-based learning model on pencak silat martial arts materials for elementary school grade V students that can be applied in small and large groups in Margoyoso District, Pati Regency. This research applies a Research and Development (R&D) approach that aims to produce and validate learning products in the form of a "Pencak Silat Learning Through Games" model for elementary school students. The population in this study consisted of students in the elementary school class of Margoyoso District, with a sample of 15 students in a small-scale pilot study and 60 students in a large-scale study taken from three public elementary schools. The data analysis technique used is quantitative descriptive analysis, which includes calculating the percentage of results from expert validation, questionnaires, and observation sheets. The results of the study showed that the learning model of pencak silat through the developed game obtained "very good" based on expert evaluation and test results with students. Thus, this learning model is considered feasible to be used to improve basic pencak silat activities and skills among elementary school students. The conclusion that the existence of a pencak silat learning model through games can overcome the problem of limited facilities and infrastructure, including open areas, needs to be done to support the effectiveness and smooth learning process.

How to Cite

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INTRODUCTION

Sports education focuses on developing students' physical abilities and skills through various sports to achieve educational goals, especially in the subjects of Physical Education, Sports, and Health Physical education (PE) which plays an important role in improving cognitive, affective, psychomotor and social values (Daniyati et al., 2023). Physical education is also considered a fundamental element in the overall education system. According to (Hidayah and Setiawan, 2022) emphasizing that physical education learning aims to optimize students' potential and motor skills, support physical development, increase intellectual capacity, and comprehensively build students' character. In general, education is an important factor in improving the quality of human resources, forming character, and developing individual abilities in facing global competition and determining the quality of life (Fahira et al., 2023). Physical education (PE) provides learning experiences through motor, knowledge, sportsmanship, emotional intelligence, and healthy living. In addition, Physical education (PE) learning also plays a role in developing discipline, cooperation, and sportsmanship skills in daily life through planned and systematic activities (Melyza and Agus, 2021).

The learning process is an interaction between teachers as facilitators and students as recipients of messages that include cognitive, affective, and psychomotor aspects. So it requires media and learning resources as intermediaries to support the success of learning (Hasan, 2021). The effectiveness of learning is influenced by the suitability of the media with the material and the psychological development of students, therefore it is necessary to develop an interesting learning model so that it is not monotonous (Lestari and Pahmi, 2023). Learning also refers to the process of providing guidance or assistance to students in carrying out the learning process. (Thommah and Setiawan, 2023) Learning development can also be carried out through a variety of tools and methods, one of which is through fun games, able to develop various skills, characters, and thinking processes of students (Kusmiati, Purnamasari and Rahmiani, 2024). Therefore, the selection of games and learning media must be adjusted to the characteristics for the development stage of students, because learning media not only functions as a tool, but also becomes an important factor in the success of the learning process.

The use of learning media packaged in the

form of games provides opportunities for students to learn basic pencak silat techniques, such as tide attitudes, punches, deflects, kicks, and step patterns through fun activities (Thommah and Setiawan, 2023). The application of these media can encourage increased learning motivation, active involvement, and students' understanding of the material taught. In addition, the use of game-based learning media also plays a role in developing the cognitive, affective, and psychomotor realms, as well as instilling the values of sportsmanship, cooperation, discipline, and responsibility in the learning process (Mustafa, 2022).

Play-play learning functions as a strategy that provides a learning experience that is natural and relevant to real-life situations, therefore able to relate learning materials to daily experiences for students. The application of game-based learning can create a vibrant, creative, and interactive learning atmosphere through planned classroom management, selection of appropriate learning media, and active involvement of students (Irmadurisa, Istiningsih and Widodo, 2022). In addition, games also play a role in supporting the development of psychological, social, and physical aspects of students, while improving movement skills, physical fitness, and the formation of a healthy lifestyle (Aulia, Suryansah and Oni, 2022).

Learning basic pencak silat techniques includes several main skills, including stance, tidal stance, attack techniques, avoidance, and parrying. At the elementary school level, pencak silat learning emphasizes safety, instilling ethics, obedience to rules, and respect for others (Ananzar and Mistar, 2022). In addition, learning activities are also directed to foster the ability to work together, improve communication, and build trust between students through group learning activities so that they can strengthen togetherness in the learning process. Between the Learners (Wijaya and Muhyi, 2024).

Pencak silat is a martial sport that originated in Indonesia and can be played individually, in pairs, or in teams. This sport grows and develops from the culture of the people in various regions, therefore it has its own characteristics. Pencak silat prioritizes elements of art through the beauty of movement, while silat focuses on martial techniques such as attacking, parrying and defending with or without the use of martial arts (Khoirul and Setiawan, 2022). Pencak silat also has the value of unity, self-defense, and instilling the values of faith and piety. To develop and preserve pencak silat, the Indonesian Pencak

Silat Association (IPSI) was formed on May 18, 1948 in Surakarta as a forum for the coaching and development of pencak silat in Indonesia (Permana and Hadiana, 2024).

The results of previous research show that the use of game-based learning media is considered feasible to be applied in learning basic pencak silat techniques. The development of these media can help students in understanding the learning material well (Suryani and Resky, 2022). In addition, other research states that the learning model of the basic movement of pencak silat punches and kicks packaged in the form of games has very good quality and is able to create a fun learning atmosphere, so that students can easily understand and feel comfortable when learning the basic techniques of pencak silat (Fahrian and Simatupang, 2022).

Based on the results of observations, the implementation of pencak silat learning in elementary schools in Margoyoso district has not been running optimally. This is due to the limited mastery of the material by the teacher so that the delivery of basic techniques and concepts of pencak silat is not optimal, which has an impact on students' low understanding and difficulties in doing learning evaluations. The results of the needs analysis through observation with Physical education (PE) teachers also show that there are no game-based learning models or media that can support the learning process of basic pencak silat techniques. Previous research states that the pencak silat learning model packaged in the form of games has a very good feasibility level because it is able to create a calming learning atmosphere and increase students' understanding (Fahrian and Simatupang, 2022). Therefore, the development of a game-based learning model is needed as an alternative solution to increase learning effectiveness, motivation, and student learning outcomes.

This research aims to produce a game-based learning model on pencak silat martial arts materials for elementary school grade V students that can be applied in small and large groups in Margoyoso District, Pati Regency. The model developed is in the form of learning Physical education (PE) pencak silat martial arts material which is packaged in the form of a game without changing the essence of basic techniques. The model consists of four game forms that contain basic technique mater, including punches, parries, evasion, and step patterns. This development is designed to support the creation of learning that is more effective, interesting and easy to understand by teachers and students.

METHOD

This study applies the Research and Development (R&D) which aims to produce and validate learning products in the form of a "Pencak Silat Learning Through Games" model for elementary school students. According to (Gustina et al., 2024) Research and development methods Research and Development is one type of research that is widely applied in the field of education. This approach is a scientific procedure that is carried out systematically to obtain data as a basis for designing, developing, and validating a product. The development stages refer to the Brog and Gall procedure have 10 stages that include (1) preliminary study, (2) research planning, (3) design development, (4) initial field test, (5) revision of field test results, (6) wider field trial, (7) revision of field test results, (8) feasibility test, (9) final revision of feasibility test results, and (10) dissemination and implementation of final product (Assyauqi, 2020). Here is an overview of the 10 steps according to Brog and Gall;



Figure 1. Stages of development of Brog and Gall. Sources: (Assyauqi, 2020)

The design of this trial went through two stages, namely a small-scale group test conducted using 15 students at State Elementary School Ngemplak Kidul 02 and 60 large group test students who were students from State Elementary School Ngemplak Kidul 02, State Elementary School Sekarjalak 01, State Elementary School Ngemplak Lor. Trial

This is done to obtain information that is important for the purpose of product revision. This trial involved several subjects, namely: 1) lecturers (social service experts), 2) Penjasorkes teachers (learning experts), 3) students (small-scale trials), and 4) students (field or large-scale trials)

Data collection techniques include observation, documentation and questionnaire distribution. Observations are used to identify and record directly various events during the imple-

mentation of product trials. At the stage of expert validation and field trials, the instrument is aimed at validation by health experts and learning experts, as well as to obtain student responses to the developed product.

The research instrument used was in the form of a questionnaire sheet for the purpose of product valuation. Data analysis is performed using a scale Likert as a basis for assessment. Scale Likert is a psychometric scale used in questionnaires to conduct research in the form of surveys (Gusniawati et al., 2025). The assessment instrument uses five (5) categories, namely (5) Very Good, (4) Good, (3) Adequate, (2) Not Good, and (1) Not Good. The questionnaire for experts is focused on product quality assessment, including aspects of competence, student involvement, learning safety, material suitability, comfort, and feasibility of the developed model. The questionnaire for students is directed to assess cognitive, affective, and psychomotor aspects as an indicator of product effectiveness.

Quantitative data analysis is carried out by calculating the percentage to determine the level of validity and feasibility of the product. Meanwhile, data in the form of suggestions and responses from respondents were analyzed qualitatively descriptively. The percentage calculation refers to the formula proposed by Muhammad Ali (1987). The following is the formula used in the processing of quantitative data in the form of percentages; According to Muhammad Ali (1987):

$$F = f/N \times 100\%$$

f = turnover score

N = maximum score value

% = percentage x 100%

F = final score

Table 1. Likert Scale Score

Score	Answer Options
5	Excellent
4	Good
3	Enough
2	Less
1	Not Good

Source: Riduwan & Sunarto, (2021) in (Gusniawati et al., 2025)

Table 2. Learning media eligibility

Rating	Category
81% - 100%	Highly Worth Using
61% - 80%	Worth Using
41% - 60%	Quite Worth Using
21% - 40%	Fixed
0% - 20%	Not Fit to Use

Source: Riduwan (2014) in (Gusniawati et al., 2025).

RESULTS AND DISCUSSION

In order to find out the problems contained in the Educational, Physical, and Health learning process at State Elementary School Ngemplak Kidul 02, State Elementary School Sekarjalak 01, and State Elementary School Ngemplak Lor, Margoyoso District, Pati Regency, several problems were identified. These problems include: (1) limited mastery of the material by teachers so that the delivery of basic pencak silat techniques is not optimal, (2) the implementation of pencak silat learning in elementary schools in Margoyoso District has not run optimally, (3) there are no models or game-based learning media available. Based on the results of the needs analysis, the researcher plans to develop a product in the form of a model "Pencak Silat Learning Through Games".

After completing the design process, the researcher produced an initial product in the form of a model "Pencak Silat Learning Through Games" which was specially designed for grade V students in Margoyoso district. The initial product then underwent the validation stage by two experts, namely a social service expert and a learning expert. Before the "Pencak Silat Learning Through Games" model is applied to students, an evaluation process is carried out through the submission of an initial draft of the product to experts equipped with assessment instruments and suggestions for improvement. The instrument is prepared in the form of a questionnaire that contains a number of evaluation indicators, including aspects of competence, student involvement, learning safety, material suitability, comfort, and feasibility of the developed model.

The results of data collection obtained through filling out questionnaires by health experts and learning experts are used as a basis for consideration in determining the feasibility of the game product "Pencak Silat Learning Through Games" to be carried out at the small and large-scale trial stage. The following is presented the data of the results of the questionnaire assessment given by physical education experts and learning experts.

Table 3. Expert Assessment Score Results

Validation Expert	Percentage Results
Jasper Member	89,33%
Learning Expert I	93,33%

Source: Validation test of financial services experts and learning

The validation results provided by the health expert before the implementation of the small-scale trial showed a percentage of 89.33%

with the category of "excellent", so that the product was declared "very suitable for use". The same assessment was also obtained from a learning expert at State Elementary School Ngemplak Kidul 02 (Mohammad misbachul huda), with a percentage of 93.33% and a category of "very good", which means that the product is declared "very suitable for use". Therefore, the results obtained meet the criteria to be implemented.

The implementation of small-scale trials of development products was carried out in class V of State Elementary School Ngemplak Kidul 02 involving 15 students in the class on January 21, 2026. This activity aims to find various obstacles that arise, as well as recognize the weaknesses, shortcomings, and level of effectiveness of the product when used by students.

The results obtained from these small-scale trials are used as a basis for conducting assessments and improvements before the product is applied to large-scale trials. The assessment indicators taken on the affective aspect include sportsmanship, honesty and responsibility. For psychomotor assessment indicators, among others, stance, punches, kicks, and avoidance. Meanwhile, in the cognitive aspect, there are several questions related to "Learning Pencak Silat Melalui Game". In addition, this activity also aims to find out the initial response of students to the products that have been developed. Data collection was carried out through the distribution of questionnaires and the use of observation sheets that included assessments of psychomotor, affective, and cognitive aspects. The following are the results of the data obtained from these three aspects.

Table 4. Affective aspects of small test data

Indicator	Sporty	Honest	Responsibilities
Number of questions	4	4	4
Total scores obtained	49	48	49
Average	3,37	3,33	3,45
Percentage %	81,67	83,33	86,67
Overall average	83,89		

Source: Affective test results

Table 5. Psychomotor aspects of small test data

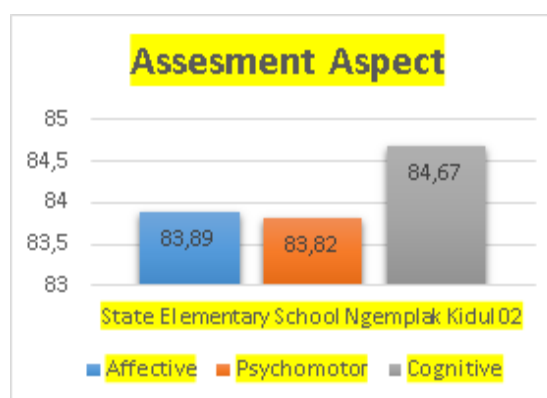
Indicator	1	2	3	4
Number of Questions	4	4	4	4
Total scores obtained	49	50	52	50
Average	3,27	3,33	3,47	3,33
Percentage %	81,67	83,33	86,33	83,33
Overall average	83,82			

Source: Affective test results

Table 6. Cognitive aspects of small test results

Number of students	Question number	Total scores obtained	%
15	1	14	93,33
	2	14	93,33
	3	13	86,67
	4	13	86,67
	5	12	80,00
	6	13	86,67
	7	12	80,00
	8	12	80,00
	9	12	80,00
	10	12	80,00
Average			84,67

Source : Cognitive test results



Graph 1. Aspects of Small-scale test assessment

Based on the results of the evaluation conducted by physical education experts and learning experts through a validation sheet in the form of a questionnaire on the product "Pencak Silat Learning Through Games" described above, the product revision was carried out as an effort to improve quality and minimize errors. The following table presents the results of product quality assessment by experts at the small-scale trial stage.

Table 7. Results of product quality evaluation sheets from experts in small trials

Member Name	Suggestions for Improvement
Muhammad Bakhtiar Subardi	Further develop the game pattern to be more organized
Mohammad Misbachul Huda	It is recommended to be clear, game rules and implementation flow so that they are systematic and easy to implement.

Source: Validation test of financial services experts and learning

In the **Table 7**, the advice given by experts concluded that "Learning Pencak Silat Through Games" still needs improvement. This is because

the game pattern still needs to be developed in a structured manner with clear rules and a systematic implementation flow so that it is easy to understand and apply. Therefore, improvements are needed to "Pencak Silat Learning Through Games" to be more optimal and can be declared feasible as an alternative learning model of physical education for elementary school students in grade V.

Based on the results of the first phase of the trial, the researcher continued the research to the large-scale trial stage carried out in three schools before the development product was declared suitable for use. The large-scale trial will take place from January 26 to February 6, 2026 at State Elementary School Sekarjalak 01, State Elementary School Ngemplak Kidul 02, and State Elementary School Ngemplak Lor. The objective stage of this large-scale trial is to assess the effectiveness of product improvements that have been carried out based on the results of small-scale trials, as well as to test the feasibility level of the product that can be applied optimally in real situations as part of the feasibility determination process. The data collection process is carried out through the distribution of questionnaires and direct observation activities.

After the implementation of the revision based on the results of small-scale trials at State Elementary School Ngemplak Kidul 02, a valuation stage by experts is needed as a continuation of the series of development processes. This is done to ensure that the product "Pencak Silat Learning Through Games" has achieved in terms of quality and feasibility. The data obtained is the result of research from three experts involved in the validation process.

Table 8. Results of expert assessment scores

Member's name	Percentage results
Baktiyaningsih	97,33%
Mohammad Misbachul Huda	97,33%
Erika Wahyu Hidayah	96%

Source: learning expert validation test

Based on the implementation of large-scale trials, the results of the validation assessment were carried out by physical education learning experts on the product before the large-scale implementation stage at State Elementary School Sekarjalak 01, State Elementary School Ngemplak Kidul 02, and State Elementary School Ngemplak Lor. Shows the percentage of scores of 97%, 97%, and 96%, respectively. All of these achievements are included in the "very good" category, so the development process is declared "very feasible to use".

The results of large-scale trials on the affective aspect showed that State Elementary School Sekarjalak 01 obtained an average score of 92.81%, State Elementary School Ngemplak Kidul 02 reached an average of 89.60%, and State Elementary School Ngemplak Lor obtained an average of 85.94%. Based on these achievements, all results are included in the "excellent" classification, so the product is declared very suitable for use

Table 9. Affective aspects of large-scale test results

Affective Aspect	Results
Sekarjalak 01	92.81%
Ngemplak Kidul 02	89.60%
Ngemplak Lor	85.94%

Sourch : Affective test results

In the psychomotor aspect, the results of the evaluation showed that State Elementary School Sekarjalak 01 obtained an average score of 96.25%, State Elementary School Ngemplak Kidul 02 reached an average of 91.25%, and State Elementary School Ngemplak Lor obtained an average of 90.83%. All of these percentages are in the "excellent" category, which indicates that the product has a very high level of feasibility to implement.

Table 10. Psychomotor aspects of large-scale test results

Psychomotor Aspect	Results
Sekarjalak 01	96.25%
Ngemplak Kidul 02	91.25%
Ngemplak Lor	90.89%

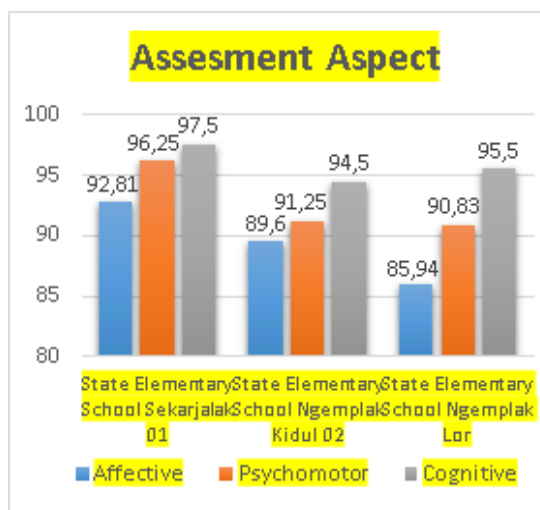
Sourch : Psychomotor test results

As for the cognitive aspect, the results of large-scale trials showed that State Elementary School Sekarjalak 01 obtained an average score of 97.50%, State Elementary School Ngemplak Kidul 02 reached an average of 94.50%, and State Elementary School Ngemplak Lor obtained an average of 95.50%. Thus, all results are classified as "excellent", so the product is declared "very feasible" for use in the learning process.

Table 11. Cognitive aspects of large-scale test results

Cognitive Aspect	Results
Sekarjalak 01	97.50%
Ngemplak Kidul 02	94.50%
Ngemplak Lor	95.50%

Sourch : Cognitive test results



Graph 1. Graph of Large-Scale Test Assessment Aspects

The results of the research on the development of the pencak silat learning model through games in grade V elementary school students were carried out through two stages of testing, namely small-scale tests and large-scale tests. A small-scale test was carried out involving 15 students at Ngemplak Kidul State Elementary School 02. After this stage, the research continued with a large-scale test involving 60 students from three elementary schools in Margoyoso District, namely Sekarjalak State Elementary School 01, Ngemplak Kidul State Elementary School 02, and Ngemplak Lor State Elementary School, with a total of 20 students each from each school.

Based on the results of validation conducted by material experts and learning experts, the developed products obtained a percentage of value of 89.33% and 93.33% which are included in the very good category. These findings show that the learning model of pencak silat through games is considered feasible to be applied and can be continued in large-scale tests.

At the large-scale test stage, the results of research from physical education experts in three schools showed a very high level of eligibility. The percentage of assessments obtained was 97% at Sekarjalak 01 State Elementary School, 97% at Ngemplak Kidul State Elementary School 02, and 96% at Ngemplak Lor State Elementary School. If averaged, the overall score of the three schools reached 96.9% with the category of "very good" so that the products developed were declared very feasible for use in learning pencak silat in elementary schools.

In the implementation of a small-scale trial at Ngemplak Kidul 02 State Elementary School, the assessment of students was carried

out through three main domains, namely affective, paikomotor, and cognitive. The results of the assessment showed that the affective aspect obtained an average score of 81.11%, the psychomotor aspect 80.45%, and the cognitive aspect of 84.67%. These results indicate that the training model developed can support the improvement of attitudes, knowledge understanding, and movement skills of students in learning pencak silat.

Furthermore, the results of large-scale trials carried out in three schools showed an improvement in the three aspects of the assessment. The average score on the affective aspect was 90.83%, the psychomotor aspect 92.81%, and the cognitive average was 97.50%. All of these results were found in the very good category, so that the game-based pencak silat learning model was declared "very feasible" to be applied in learning activities.

The results of the study show that the pencak silat learning model through games is able to increase student involvement in physical education learning. This can be seen from the results of the assessment of affective, psychomotor, and cognitive aspects which are categorized as very good, both in small-scale and large-scale trials. The game-based approach provides a more engaging learning experience so that students become more active in participating in learning.

A game-based learning approach has also been proven to increase students' motivation to learn. Through game activities, students not only practice movements, but also learn to work together, obey rules, and develop basic motor skills. This is in line with research that states that the application of game-based learning in physical education can increase student participation and help understand movement skills more effectively (Fauziah, Gustiawati and Ernawati, 2025).

In addition, the use of games in learning pencak silat makes it easier for students to learn basic techniques gradually and is fun. Exercises packaged in the form of games allow students to perform a variety of movement variations, such as punches, kicks, and gesture coordination more naturally. Other research has also shown that the integration of games in sports learning can improve physical activity as well as students' motor skills (Ferdian Julia Rahmawati and Mochamad Ridwan, 2025).

Based on these results, the game-based pencak silat learning model can be an effective alternative in physical education learning in elementary schools. This model not only improves basic pencak silat technique skills, but can also increase students' motivation to learn and phy-

sical activity during the learning process. The following is an overview of pencak silat learning games through games;

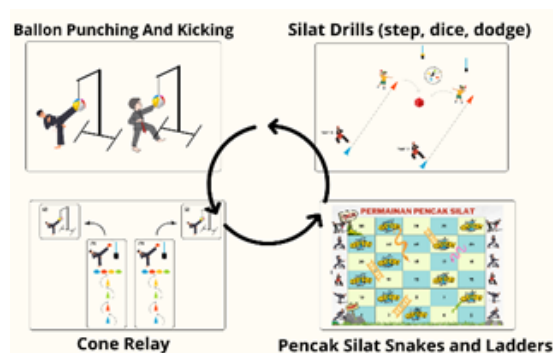


Figure 2. Pencak Silat Learning Through Games

The illustration in the figure shows the design of a pencak silat learning area developed using a game-based approach. This learning area consists of four types of activities: The Ballon Punching And Kicking Game, Cone Relay, Silat Drills (Step, Dice, Dodge), and The Pencak Silat Snakes And Ladders. These four types of games are structured and interconnected, as indicated by the circular arrows, forming a series of game-based learning activities in physical education. The game-based learning approach is known to enhance physical activity, learning motivation, and student participation during sports instruction, including in pencak silat lessons. Integrating game elements into movement training makes the learning process more interactive, enjoyable, and effective in improving students' mastery of basic techniques and physical activity (Manik and Sary, 2025).

The Ballon Punching And Kicking Game is designed to train basic attack techniques in pencak silat, particularly punching and kicking movements. In the activity, students are asked to punch or kick toward a target in the form of a ball. This activity allows students to develop motor coordination, muscle strength, and precision in executing techniques. In pencak silat practice, striking and kicking techniques are crucial for attacking opponents, so they must be trained progressively and systematically starting from the foundational learning stage (Moch. Miftachurrohman, Wasil Himawanto and Moh. Nurkholis, 2023).

The cone relay game aims to develop foot agility, body balance, and movement coordination when performing basic pencak silat techniques. In this activity, students move through several obstacles arranged using cones while performing specific punching or kicking movements. Such

movement exercises play a crucial role in pencak silat instruction because foundational movement skills such as body posture, balance, and coordination are prerequisites that must be mastered before students learn more complex techniques (Adama, Sudarjat and Bayu, 2021).

The silat drills (step, dice, dodge) game was developed to train students' basic movement abilities, agility, and body coordination through activities involving movement along predetermined paths. Additionally, this game involves interaction among students, fostering teamwork and increasing participation in learning activities. The application of a game-based learning model in pencak silat instruction has proven to enhance student engagement while making the technical training process more engaging and easier to understand (Manik and Sary, 2025).

The Pencak Silat Snakes and Ladders game is a learning tool that combines a board game with question and answer activities regarding pencak silat material. Through this game, students not only engage in physical activity but also gain cognitive understanding of basic pencak silat techniques. Integrating game elements into the learning process can enhance learning motivation and help students understand the material more effectively, as the learning process occurs through enjoyable play experiences (Nugroho and Aminudin, 2025).

In general, these four types of games form a series of learning activities designed to develop basic pencak silat movement skills, increase physical activity, and foster students' interest in traditional martial arts. A game-based learning approach is considered effective in physical education because it creates active, enjoyable, and meaningful learning experiences for students (Manik and Sary, 2025).

CONCLUSION

Based on all the stages of research that have been passed, it can be concluded that this research has succeeded in producing a product in the form of a learning model of pencak silat through games for elementary school students in grade V. The product has gone through a testing process through small-scale and large-scale trials, and is validated by experts. So that it is declared to meet the feasibility standards to be applied in learning activities.

The results of the validation process and the implementation of the trial show that the process obtained the category of "very good" and was able to support achievements in the affective,

psychomotor, and cognitive aspects of students. Therefore, the learning model developed in this study can be stated as a valid, effective, and very feasible product to be applied in physical education learning, especially in pencak silat materials at the elementary school level

In addition, it can overcome the problem of limited facilities and infrastructure, including open areas, it is necessary to support the effectiveness and smooth learning process.

Through this development, students are proven to be able to achieve learning goals, especially in pencak silat martial arts materials. These achievements include the ability to practice movement skills in various forms of martial arts, as well as the ability to analyze and evaluate facts, concepts, and procedures related to movement skills in martial arts.

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