



The Development of Obstacle Adventure Game Model for Physical Education

Firgiawan Fahrizal^{1*}, Mugiyo Hartono²

¹²Physical Education, Health, and Recreation, Faculty of Sports Science, Universitas Negeri Semarang, Semarang, Indonesia

Keywords

Obstacle Adventure Game; PE Learning; Learning model

Abstract

Research on the Development of the Obstacle Adventure Game Model aims to be an alternative to learning Physical Education, Sports and Health in elementary school students at SD Negeri Tuwel 01, Bojong District, Tegal Regency. The method used in this study is Research and Development (R&D) referring to the development of Borg and Gall. The research subjects consisted of 16 1st grade students for small-scale trials and 40 2nd graders for large scale trials. The research instruments include questionnaires, observations, interviews and documentation. The validation results of game expert lecturers, social service experts and learning experts showed the percentage of eligibility of 78%, 78% and 80%, respectively with the feasible category. In the results of the product revision then increased to 83%, 85%, 82% with the category of very feasible. The test for students showed a percentage of 89% results in small scale trials and increased to 92% in large scale trials. These results show that the Obstacle Adventure Game Model is suitable for use as an alternative to Learning because it is able to make students more active in learning activities and create an interesting, challenging and fun learning atmosphere.

*Corresponding author :

E-mail: firgiawan0612@students.unnes.ac.id

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INTRODUCTION

Education is an effort that is carried out in a planned and conscious manner to create a learning atmosphere that can develop the potential of students optimally. Education not only plays a role in improving knowledge, but also shapes children's character, skills and thinking ability (Iswanto & Esti Widayati, 2021, p. 13). Based on Law Number 20 of 2003 concerning the National Education System, Education aims to develop the ability of students to become human beings of faith, noble character, healthy, knowledgeable, skilled, creative, independent, and to become a brave and responsible society.

Physical Education, Health and Recreation is one of the subjects that has an important role in the world of Education. Physical education is a component that aims to improve physical fitness, movement skills, thinking skills and social skills (Putra & Hambali, 2024). According to Regia Erkaesda Briliyan Atmaja and Faridha Nurhayati 2023 in (Sari et al., 2024) mentioned that physical education, sports, and health in schools also have the goal of improving the physical fitness of students and helping them develop movement skills through fun, challenging activities and actively involving them. The scope of learning such as sports games, gymnastics activities, rhythmic activities and outdoor activities that aim to develop basic locomotor, non-locomotor and manipulative movement skills in elementary schools does need to be packaged with structured activities, namely involving students actively, fun and challenging in various movement activities (Fauzi, 2020, pp. 73–75).

Based on the results of observations made on January 5, 2026 at SD Negeri Tuwel 01, Bojong District, Tegal Regency, several problems were found in the implementation of learning. The observation results show that there are still students who have difficulty in doing coordination movements such as running, jumping and maintaining balance. In addition, when learning takes place, it can be seen that some students still look less enthusiastic and easily feel bored because the learning activities carried out are still monotonous and have not been packaged in the form of interesting games. Some students also look less active and feel unconfident when participating in learning activities so that student involvement in learning is still not optimal.

The results of interviews with Penjas teachers also show that learning has been carried out in accordance with the curriculum, but the activities carried out are still simple and most of them are still in the form of basic movement exercises without any interesting game variations. The teacher also said that the Obstacle Adventure Game model has never been applied specifically in learning due to the limitations of facilities and infrastructure and the lack of a structured game model. The results of interviews with several students also showed that they felt happier if learning was packaged in the form of fun and challenging game activities.

In early childhood learning, creating a comfortable environment is very important for children's development to recognize the potential that exists within them. Children's potential arises when stimuli are given appropriately to all aspects of child development which include cognitive, psychomotor and affective development (Banna, 2022, p. 2). The stimulus can be developed through games, games are activities that are carried out without coercion with the aim of getting personal or group pleasure and satisfaction (Sembiring, 2019). Live 2021 in (Harahap et al., 2025, p. 91) Explaining that play is an activity that children do through interaction with other people and objects around them of their own volition, full of imagination and using all members of the five senses to gain experience of thinking, socializing, leading, cooperating, focusing and practicing patience. Elementary school-age children tend to like physical activity accompanied by a wide variety of games. Game Activities that feature a wide variety of movement skills and playing skills will be mastered by students to achieve success in the game (Aprial et al., 2023).

One of the games that can be used in learning is the Obstacle Adventure Game. The Obstacle Adventure Game is a game developed from the Circuit Training method. Circuit Training is an exercise that combines physical activity in sequence with rest breaks, Circuit Training usually consists of 8-16 training posts (Sukron & Ahmad Firjatulloh, 2025, p. 2). From this statement, it can be understood that the Obstacle Adventure Game is a series of game activities consisting of several posts with different order of levels and then run continuously

or sequentially. In each of these posts, children will face various game challenges that illustrate an obstacle. This game is classified into parallel play, which is the type of activity that children do independently even though they are in the same play environment.

Previous research that discussed the use of game models in learning showed a significant impact. Research conducted by (Harahap et al., 2025) It shows that the development of a physical activity game model is able to improve the motor skills of elementary school students with a category that is very feasible for use in learning. Other research conducted by (Ellisa et al., 2025) showed that adventure education-based game design received a positive response from teachers and students and had a high level of eligibility. Further research was conducted by (Prasetyo, Synthiawati, and Susanto 2023) also showed that the game-based learning model is very effective to be carried out in learning in elementary schools. Other research conducted by (Hartono, 2011) also shows that the use of appropriate media in learning can improve enthusiasm and a sense of pleasure for children.

Several studies have developed a game model in learning, although the research is still focused on games or physical activities in general or based on outdoor games. Research that specifically develops an obstacle adventure game model that is adjusted to the facilities and infrastructure as well as the conditions of elementary schools is still relatively limited, therefore there is a need to develop a game model that is more structured and easy to apply by teachers in learning in elementary schools.

Based on the above problems, this study aims to develop a model of Obstacle Adventure Games that can be used in the teaching of Physical Education, Sports and Health in lower grade elementary school students at SD Negeri Tuwel 01 Bojong District, Tegal Regency. The game model developed is expected to be a more fun, interesting, challenging learning alternative and increase student involvement in the learning process.

METHODS

This research uses the Research and Development (R&D) method referring to the development model proposed by Borg and Gall as described and developed by (Sugiyono, 2013, p. 297). The design of this research was used to develop a product in the form of an obstacle course adventure game model in learning in elementary schools. The research and development steps carried out by Borg and Gall include several stages, namely (1) preliminary studies through literature review and field observations, (2) planning and manufacturing of initial products in the form of Obstacle Adventure Game model design, (3) design validation by experts, (4) product revision based on expert suggestions and inputs, (5) product trials on a small scale, (6) product revision, (7) large-scale product trial, (8) finalization of final product. The stages carried out aim to produce a decent game model according to the characteristics of elementary school students.

In the product validation phase, researchers involve several experts to assess the feasibility of the developed game model. Validation is carried out by lecturers who are experts in games, physical education experts and learning experts. The expert validation process is carried out to obtain input and suggestions on the products developed so that the products produced have good feasibility and quality in learning. The research instrument used in the validation stage is an assessment questionnaire that is measured using a likert scale to assess the feasibility aspects of the product.

The research subjects in this study are elementary school students at SD Negeri Tuwel 01, Bojong District, Tegal Regency. The small-scale trial subjects involved 16 1st grade students and the large-scale trial subjects involved 40 students in grades 2A and 2B of SD Negeri Tuwel 01. A small scale trial was conducted to determine the feasibility of the initial product and to see the students' response to the applied game model, while a large-scale trial was conducted to determine the effectiveness of using the Obstacle Adventure Game model in learning.

Table 1. Total Trial Samples

Class	Total	Trial type
Class 1	16	Small-scale
Class 2A	20	Large-scale
Class 2B	20	Large-scale

Source: 2026 research

Data collection techniques are carried out by several methods, including observation, interviews, documentation and questionnaires. Observations were carried out to find out the condition of students when participating in Penjas learning activities. Interviews were conducted with health care teachers to obtain information about the needs of game-based learning. Documentation was used to collect data in the form of photos of activities and questionnaires were used to obtain data on product feasibility assessments from experts as well as students' responses to game models.

The data in this study was analyzed using qualitative descriptive and quantitative descriptive analysis. Qualitative data analysis is used to analyze input and suggestions from experts as material for product improvement (citations must be made). Quantitative data analysis was carried out to analyze the results of the assessment questionnaire given to experts and students. The quantitative data obtained was analyzed using the percentage technique to determine the level of product feasibility. The results of the percentages obtained are then interpreted based on product feasibility criteria so that it can be known whether the Obstacle Adventure Game model is suitable for use in learning in elementary schools. The data generated from the questionnaire is then processed into development targets with a formula from Arikunto in (Az-zahra et al., 2024) according to **table 2**:

$$\text{Feasibility Percentage} = \frac{\text{Score Obtained}}{\text{Maximum Score}} \times 100$$

Table 2. Interpretation of values

Percentage	Grade	Category
81%-100%	A	Very Feasible
61%-80%	B	Feasible
41%-60%	C	Fairly Feasible
21%-40%	D	Less Feasible
0%-20%	E	Very Infeasible

RESULTS AND DISCUSSION

This study aims to develop a model of Per Obstacle Adventure Toy for learning penjas at SD Negeri Tuwel 01, Bojong District, Tegal Regency. The development model used is Research and Development (R&D) referring to the Borg and Gall steps, which include preliminary studies, needs analysis, product design, expert validation, design revision, small-scale trials and large-scale trials.

Learning problems found in the field, especially in the learning process of social justice and alternative solutions, need to be analyzed through direct observation and supported by conducting literature studies. In accordance with the problems that exist in the field in the learning process of penjas at SD Negeri Tuwel 01 is still not optimal, including less varied and interesting learning, low basic movement camps and lack of student involvement in learning. In addition, the learning model still uses the old models without the learning variation that emphasizes obstacle adventure games. Another limitation is inadequate facilities and infrastructure so that teachers still do not think about or design a learning model that is a structured game.

After conducting a needs analysis, the Obstacle Adventure Game model is designed in draft form. The game design includes an explanation of the game's plot and levels as well as instructions on how to do it.

Game model

a) Level 1: early explorer (easy)

The initial explorer level is the introductory stage of adventure games. The child walks in a straight line made from duct tape on the floor, then stops and jumps once on the spot according to the teacher's cue. This game aims to introduce the rules of the game, train concentration, and get children used to doing simple basic movements without pressure.

b) Level 2: cheerful adventurer (moderate)

At the level of the cheerful adventurer, the child jumps from one circle to another arranged close together, then continues by walking on a curved line. This level aims to help children control body movements, improve coordination, and gradually practice balance with a fun game atmosphere.

c) Level 3: Agile Explorer (Intermediate)

The level of agile explorers requires children to be more active in moving. Children run small through zig-zag obstacles made of bottles or cones. This Level aims to train agility, reaction speed, and the ability of children to change the direction of movement quickly and controllably. An example of the image is as follows:

d) Level 4: Tough Adventurer (hard)

At the level of a tough adventurer, the child pushes a foam box or small tire towards the finish line, then walks on a longer walkway board without falling. This activity trains the child's muscle strength, balance, focus, and courage in facing more difficult challenges

e) Level 5: adventurous hero (very difficult/complex)

The adventurous hero level is the culmination of the entire series. The child runs fast to a certain point, jumps over small obstacles, walks on a board, and then picks up a flag or ball as a sign of completion. This level combines all the physical abilities of a child such as speed, agility, balance, and coordination in a series of adventure games.

The qualification of the Obstacle Adventure Game model is then taken through the validation of lecturers, game experts, and learning experts. The validation results of these experts can be presented according to **table 3**.

Table 3. Expert validation results

Expert	Score Obtained	Maximum Score	Percentage	Category
Game Expert	47	60	78%	Feasible
Social Service Expert	47	60	78%	Feasible
Learning Expert	48	60	80%	Feasible

Source: 2026 research

Based on **table 3**. An overview can be obtained on the assessment assessed by game expert lecturers, social service experts and learning experts. In the assessment conducted by the game expert lecturer, he got a score of 47 with the formula $47/60 \times 100\% = 78\%$ with a decent category. The assessment carried out by the social service expert received a score of 47 with the formula $47/60 \times 100\% = 78\%$ with the feasible category, and the assessment carried out by the learning expert received a score of 48 with the formula $48/60 \times 100\% = 80\%$ with the feasible category.

Based on the results of validation from lecturers who are experts in games, social science experts and a learning model who assess that the Obstacle Adventure Game model is feasible to use, then the researcher conducts small-scale trials. The scale trial was carried out with 16 1st grade students of SD Negeri Tuwel 01. Students are given an explanation of the flow of the Obstacle Adventure Game which is then asked to fill out a questionnaire after the game is over. The results of the student respondents' questionnaire in the small-scale trial are presented in the following table below:

Based on the data on the results of the student respondents' questionnaire on the development of the Obstacle Adventure Game model, an average of 89% was obtained from the calculation of $1,770/20 \times 100\% = 89\%$ in the "very feasible" criterion so that the product

can be said to be feasible and can be continued in the next trial, namely a large-scale trial, but there are still notes and revisions provided by experts.

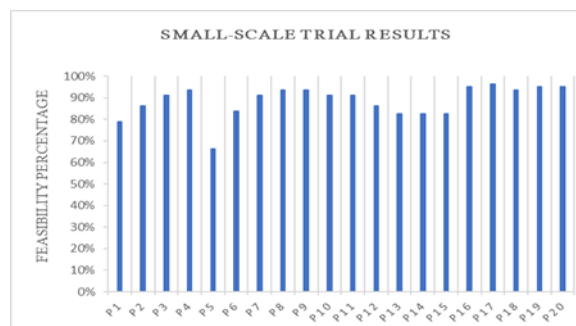


Figure 1. Small-scale test results

Source: 2026 research

After a small-scale trial, then revisions were made according to criticism and suggestions by lecturers who are game experts, health care experts and learning experts by providing questionnaires that have been made and adjusted to the needs of the product. The results of filling out the validation questionnaire for game expert lecturers, social service experts and learning experts are shown according **table 4**.

Table 4. Expert revision results

Expert	Score Obtained	Maximum Score	Percentage	Category
Game Expert	50	60%	83%	Very Feasible
Social Service Expert	51	60%	85%	Very Feasible
Learning Expert	49	60%	82%	Very Feasible

Source: 2026 research

The results of the assessment conducted by game experts got a percentage of 85% with the category "very feasible". The assessment criteria assessed by game expert lecturers contain the suitability of the game model for children's development, the suitability of the game with the basic movement activities of elementary school students, the suitability of facilities and infrastructure, and the attractiveness of games for students during learning. Product revisions carried out by game experts in small-scale tests consisted of group divisions and the provision of trigger questions before making movements. At level 4 the tires as a push tool plus their number to shorten the time allocation of the game, at level 5 the Obstacle Adventure Game is made more complex with slightly more difficult obstacles. Furthermore, the expert lecturer gave the opinion that the game design in this obstacle adventure game is appropriate, namely from an easy level to a more complex level.

The results of the next assessment were carried out by a health care expert who got a percentage of 85% with the category of "very feasible". The assessment criteria assessed by the health expert contained the suitability of the game movements with the motor ability of elementary school lower-class children, the suitability of the order of the game level, the suitability of the level of safety, the suitability of the rules of the game and the duration used at the time of the game. The revision to this product is that during the game each child is ensured to take turns playing without exception. The game is also carried out with the right time allocation according to the lesson hours, then during the game the children are explained in advance about the game or movements that will be carried out in easy-to-understand language. Furthermore, the creeping movements in the game should be eliminated and replaced with other movements because the field conditions do not allow to make creeping tools. The expert then gave input that the product of the obstacle adventure game development model could be implemented in the learning of the martial arts for the lower

class and the researcher was asked to make a complete guide to the game so that the game could be carried out not only in SD Negeri Tuwel 01 but also in other elementary schools.

The results of the last assessment conducted by learning experts got a percentage of 82% with the category of "very feasible". The assessment criteria assessed by game experts include the suitability of the steps of the game with learning, the suitability of the game with the learning curriculum and the game encourages the development of the motor, affective and cognitive aspects of the child. Product revisions carried out by learning experts include researchers must ensure that each level of the game contains the concept of early childhood learning, ensure that each game that is run must contain learning objectives on the physical activity of low-class children and ensure that the learning model in the Obstacle Adventure Game is able to hone children's motor, affective and cognitive skills. The input provided by the learning expert is that the material in the obstacle adventure game is in accordance with the characteristics of lower-class children, namely containing fun and challenging games so that the product can be applied to the learning materials.

After the Obstacle Adventure Game development model product is tested on a small-scale trial, the next stage is to test the obstacle adventure game development model product on a large-scale trial. The series of large-scale trials was carried out using the same stages as the small-scale trials. In this large-scale test stage, the researcher used 40 students in the lower class, namely class 2A and Class 2B of SD Negeri Tuwel 01. The results of the student respondents' questionnaire in the large-scale trial are presented in the following **figure 2**:

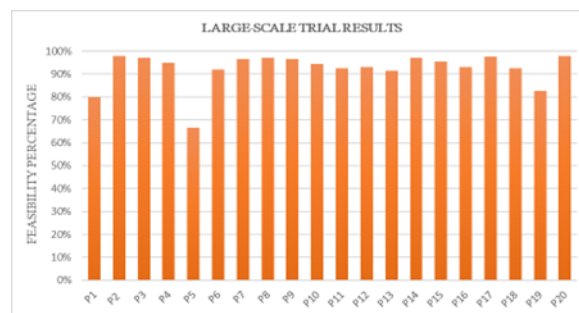


Figure 2. Large-scale trial results
Source: 2026 research

From the data that has been obtained related to the results of large-scale tests with a total of 40 students divided into 2, namely 20 students of class 2A and 20 students of class 2B of SD Negeri Tuwel 01 Bojong district, Tegal Regency, the average result of the percentage of 92% was obtained from the calculation of $1884/20 \times 100\% = 92\%$ entered the category of "very feasible". Based on the large group trial data above, with the addition of the number of students, it still gives a good assessment of the development model of the Obstacle Adventure Game.

After small-scale and large-scale trials were carried out, the researcher then compared the data results from the two trials to the feasibility of the development product of the Obstacle Adventure Game Model. The data from the comparison is presented in the **figure 3**.

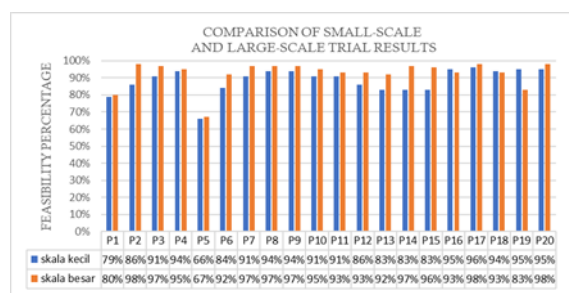


Figure 3. Comparison Result
Source: 2026 Research

Based on the results of the comparison of trials that have been carried out, a score on a small scale of 89% and on a large scale of 92% was obtained. A comparison of the two results showed a percentage difference between tests involving fewer participants and tests involving more participants. Although the scores are different, both are in the category of good assessment, so it can illustrate that the game developed was able to be positively accepted by students in both test conditions. These results also show that the game model can be implemented well in a wide range of participants without compromising the quality of user acceptance. Based on the comparative data, it can be concluded that the game developed is well received and declared suitable for use as a learning model.

The results of the research of the Obstacle Adventure Game model show the level of feasibility to be used in physical learning, this can be seen from the results of the validation of experts and student respondents during the small-scale and large-scale trials in the table above. The results obtained show that the Obstacle Adventure Game Model has met the eligibility criteria in the learning process.

Physical education learning that exists and is carried out in elementary school students should indeed be made into activities that are fun, interesting and in accordance with the characteristics of child development. Children at an early age tend to be more interested in varied activities or activities through play (Mulyati, 2019).

The Obstacle Adventure Game developed in this study has varied movement characteristics, namely running, jumping, maintaining balance, agility and the ability to pass obstacles. The activities contained in the game help develop students' basic movement skills which is one of the main goals of learning in the military. According to Vygotsky's theory 1978 in (Rani, 2025) emphasizing the importance of play in learning. According to him, playing can help children develop thinking skills, imagination and cooperation with their friends. In early childhood learning, one of the effective strategies to create a fun learning atmosphere and support children's development is to play.

The concept of the Obstacle Adventure Game is compatible with the Circuit Training method, which is a training method consisting of several posts or levels that are carried out in circles. Each level in this game is considered a post or activity that needs to be completed by the children. Children will try to pass each level from level 1 (easy) to level 5 (difficult), thus the game model in this Obstacle Adventure Game not only provides an element of fun but also contains elements of structured physical activity that are considered suitable to attract the enthusiasm of students in learning skills.

The results of expert validation are then used to get input and suggestions as material for product improvement. The suggestions given include improving the rules of the game, adjusting the difficulty level of the game level according to the child's abilities and dividing groups so that the game can run more effectively. Other inputs provided by experts are related to the safety of facilities and infrastructure and ensuring that each child gets the opportunity to play in turn.

The results of small-scale and large-scale trials conducted on students show that the Obstacle Adventure Game Model is able to provide a more active, interactive and fun learning atmosphere. The response given by students during small-scale trials and large-scale trials was also quite positive, students were enthusiastic in overcoming every obstacle that existed. The games presented are also able to increase student participation and activeness during the learning process.

The next suggestions and inputs are related to the final product which will later be made into a video guide to the implementation of the game. Input from game expert lecturers is to maintain a level that is in accordance with early childhood abilities. The next input from learning experts is that this obstacle adventure game model can be used to hone children's cognitive, psychomotor and affective skills. The last input from the expert is to ask the Obstacle Adventure Game to make a complete guidebook regarding the flow of the Obstacle Adventure Game.

The results then state that the developed obstacle adventure game model is suitable for use as an alternative to the physical education learning model in elementary schools,

especially to increase student engagement and its fun, varied and challenging atmosphere in learning activities.

CONCLUSION

Based on the results of the research and development that has been carried out, it can be concluded that the obstacle adventure game model developed can be used as an alternative to learning activities in the subject of Physical Education, Sports, and Health in elementary schools. The validation results carried out by experts show that the developed obstacle adventure game model has a good level of feasibility and can be used in learning activities. In addition, the results of the test for students show that the use of this game model is able to increase student involvement in participating in learning and create a more active, fun, and interesting learning atmosphere.

This shows that the obstacle adventure game model also provides students with the opportunity to carry out various movement activities through several obstacles or game posts that must be completed in order. These activities not only help increase students' physical activity, but can also train basic movement skills, agility, and cooperation between students during the learning process. This, the obstacle adventure game model developed in this study can be one of the effective learning innovations in supporting the implementation of learning in elementary schools. This game model is expected to help teachers in creating a more varied, interesting, and able to increase student participation in physical education activities.

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