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Flash Card-Based Basic Throwing And Catching Movement Learning Model For Grade V Elementary School Students

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Abstract

The basic movement of throwing and catching is one of the fundamental motor skills that must be mastered by students at the Elementary School level . This study aims to develop a flash card-based learning model for basic throwing and catching movements for fifth-grade elementary school students. This study uses the Research and Development (RnD) method that refers to the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation) by involving 3 people as validators and 60 fifth-grade students as samples. Data collection was carried out through interviews, observations and tests. The results of the study showed that 21 models were considered feasible and able to improve the learning of basic throwing and catching movements in fifth-grade elementary school students as indicated by the results of the N-Gain Score test which was quite effective and the t-test with a sig. value of 0.00 <0.05 which showed a significant increase in learning basic throwing and catching movements based on flash cards in fifth-grade elementary school students. The recommendation in this study is that the throwing and catching activity can be designed with interesting variations, providing space for active student participation, and utilizing examples that are relevant to students' lives.

How to Cite

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INTRODUCTION

Physical education is one of the compulsory subjects taught to students at primary and secondary levels, contributing positively to students' achievement of 21st-century competencies (Hadiana et al., 2021). One of the factors underlying participation in the context of physical education in schools is motor competence (Cukarso et al., 2024). Motor competence is a person's ability to perform various motor actions, including coordinating fine and gross motor skills needed to handle daily tasks (Bardid et al., 2019; Matos et al., 2022). Goodway et al. (2019) refer to it as the ability to be proficient in various locomotor, stability, and manipulative gross motor skills (Lawson et al., 2021).

One form of motor competence that needs to be developed early in physical education is basic motor skills, such as throwing and catching. The basic movement of throwing and catching is one of the fundamental motor skills that students must master at the elementary school level (Hadiana et al., 2021). This skill not only plays a role in developing body coordination but also serves as a foundation in various sports such as handball, baseball, and basketball. The goal of learning throwing and catching is to train fine and gross motor skills, improve concentration, and foster cooperation and sportsmanship. (Meo et al., 2024). The urgency of mastering these basic movements lies in their function in supporting children's movement readiness for the next level of education and daily life activities (Nugroho et al., 2021). Therefore, an appropriate learning approach is essential for students to optimally master these skills.

However, the reality in the field shows that throwing and catching skills are still a challenge in the pysical education learning process at the elementary school level, especially grade V. Based on the results of the study, many students have not been able to demonstrate good motor coordination when throwing or catching, which is seen from the accuracy, strength of the throw, and accuracy when catching (Wawan et al., 2024). On the other hand, teachers often face obstacles in delivering material due to limited media and varied learning methods, so they tend to be monotonous (Putra et al., 2024). This has an impact on low student learning motivation, lack of active participation, and not achieving learning objectives optimally (A. A. Putri et al., 2024; I. A. Putri et al., 2024).

Flash cards as a learning medium have the advantage of conveying concrete visual information that is quickly understood by elementary school-aged children (Juwitami & Kristiantari, 2024). Flash cards in Physical Education learning in elementary schools are media specifically designed to support the understanding of basic movements visually and systematically (Bikalawan et al., 2024). With an attractive design and systematic movements displayed through images, flash cards encourage students to learn actively, visualize the movements to be performed, and associate them with real-life activities. This allows students to understand the sequence of movements, correct motor errors, and increase confidence during practice. These advantages make flash cards a potential learning tool in overcoming problems in pysical education learning in elementary schools.

The use of flash cards in physical education learning has been carried out by several academics such as (Bikalawan et al., 2024)who conducted research on the use of flash card learning media in physical education in improving students' locomotor skills. The study involving 46 3rd grade elementary school students aged 9-10 years resulted in flash card learning media having a significant influence on students' locomotor skills. Suwiwa et al. (2023)studied the effect of project-based learning assisted by flash cards on student learning outcomes in learning pencak silat. The study conducted on 312 11th grade students showed that there was an effect of project-based learning assisted by flash cards on student learning outcomes in learning Pencak Silat. In contrast to previous research, Kesumawati et al. (2024) developed a fun game-based learning model to improve fundamental basic movement skills in children with mild intellectual disabilities. One of the games provided was using flash card media . The results of the study showed that the learning model consisting of activities designed to improve basic movement skills, cognitive abilities, enjoyment, and attention focus in children with mild intellectual disabilities, aged 8-10 years, regardless of gender.

Based on the research analysis above, several main gaps were found: (1) there has been no development of a flash card learning model specifically aimed at improving basic throwing and catching movement skills; (2) the lack of research that measures the influence of flash card media on specific motor aspects such as movement coordination in throwing and catching. Therefore, this research focuses on the development of a flash card -based basic throwing and catching movement learning model for fifth grade elementary school students which is structured in the form of questions, namely how is the process and effectiveness of the flash card -based basic throwing and catching movement learning model for fifth grade elementary school students. Thus, through

this model it is hoped that students and teachers can improve the effectiveness of learning, strengthen the understanding of movement concepts, and encourage active student involvement in the pysical education learning process.

METHODS

This study uses Research and Development (RnD) which refers to the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation) (Branch & Varank, 2009; Larson et al., 2014; Molenda, 2015; Piskurich, 2015). The model is mapped operationally into five stages, namely Analysis, Design, Development, Implementation, and Evaluation.

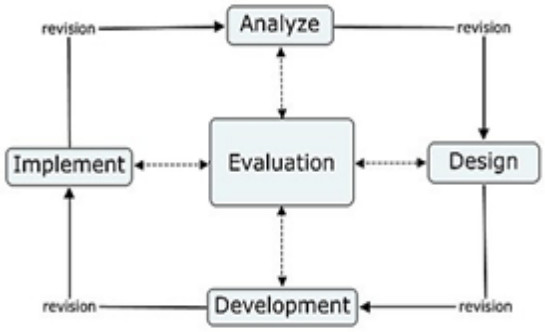


Figure 1. ADDIE Stages

In the initial stage, an analysis is carried out by conducting a needs assessment to identify existing problems or needs. In addition, a task analysis is also carried out to understand the relevant and essential tasks in developing the model (Cotter et al., 2023). The second stage of design is to formulate SMART training objectives (Specific, Measurable, Applicable, Realistic, and Time-bound). After that, a test tool or evaluation instrument is designed based on the formulated training objectives (Lestari & Sari, 2024). The third stage of Development is to realize the previously created design into a concrete product. Initial testing (trial) is carried out as an important part of this stage to ensure that the product being developed meets the standards and is in accordance with the initial objectives (Maydiantoro, 2021). This testing stage is also included in the formative evaluation step, which aims to revise and improve the product based on the findings from the trial. The fourth stage of implementation is carried out with the actual application of the system or model that has been developed (Bayangna et al., 2025). All elements that have been previously designed and tested are arranged in such a way that they can function according to their role. At this stage, the model is applied directly to the target subjects to test its effectiveness in a real context (Spatioti et al., 2022). The fifth stage of evaluation is carried out to see the extent to which the developed model has succeeded in achieving the expected goals. This evaluation can be carried out formatively (during the development process at each stage) and summatively (after implementation is complete) to ensure the effectiveness and success of the model. (Sial et al., 2024).

This study involved 60 fifth-grade students from two elementary schools in Menteng District, Central Jakarta. The study was conducted over 15 sessions. Three experts also participated to validate the model and its implementation.

Data collection was carried out using several techniques, namely field observation, interviews, and tests starting in Mei 2025. Therefore, the research instruments used consisted of observation guidelines, interview guidelines, and questionnaires. The data obtained were then analyzed using quantitative analysis techniques with the help of IBM SPSS Statistics 25.

RESULTS AND DISCUSSION

The needs analysis was conducted through observation, questionnaires, and interviews. This preliminary study involved 30 students who were randomly observed and interviewed during the throwing and catching learning process. Seventy percent of students experienced difficulties in learning throwing and catching. Interviews with fifth-grade elementary school students revealed three main problems in learning throwing and catching in fifth-grade, starting from the learning media aspect, technical difficulties, and student boredom. Sixty-seven percent of students felt that the media or aids used in learning were insufficient and lacked variety, while only 33% considered the media adequate. In terms of skills, 70% of students admitted to having difficulty throwing or catching the ball, while 30% did not experience such difficulties. Finally, regarding boredom in participating in learning, 60% of students felt bored, and 40% did not experience it.

In the design stage of the ADDIE development model, the development of a flash card-based basic throwing and catching movement learning model for fifth-grade elementary school students is focused on designing activities that are appropriate to the developmental characteristics of students and the objectives of throwing and catching learning in a fun and effective way. This stage includes the preparation of a systematic exercise structure, starting from simple games to more complex games that resemble real match situations. Each game design is designed by considering pedagogical principles that are appropriate for children, such as aspects of playing while

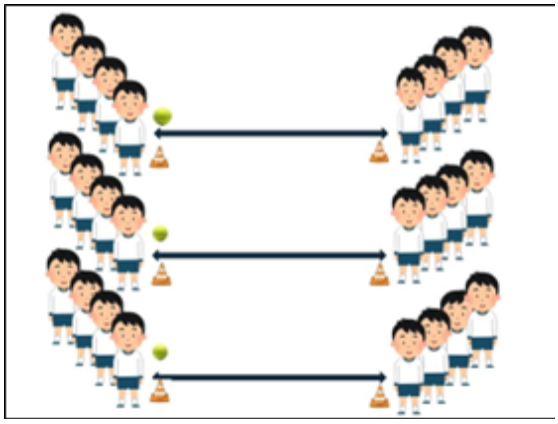
learning, variations in activities, and challenges that trigger movement exploration and cooperation. The following is a design for a flash card-based basic throwing and catching movement learning model for fifth-grade elementary school students:

Model 1. Dada Dahsyat

Objective: Practice throwing and catching the ball straight to the chest without falling.

How to play: Participants are divided into 3 groups, each consisting of 2 teams facing each other, approximately 3 meters apart. Each participant holds a ball. When the whistle blows, participants throw the ball straight to their teammate's chest and simultaneously catch the ball from their opponent. Those who fail to catch the ball are eliminated. After time runs out, the team with the most remaining members gets 1 point for their group.

Simulation

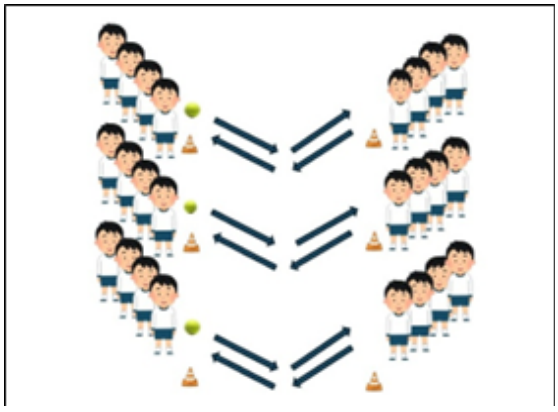


Model 2. Pantulan Seru

Objective: To train coordination and accuracy of bouncing throws.

How to play: Participants are divided into three groups, each group facing each other in front of cones. Players bounce the ball towards their opponents, then catch it and bounce it back. The team that completes the bounce-catch throw fastest is declared the winner and receives one point.

Simulation

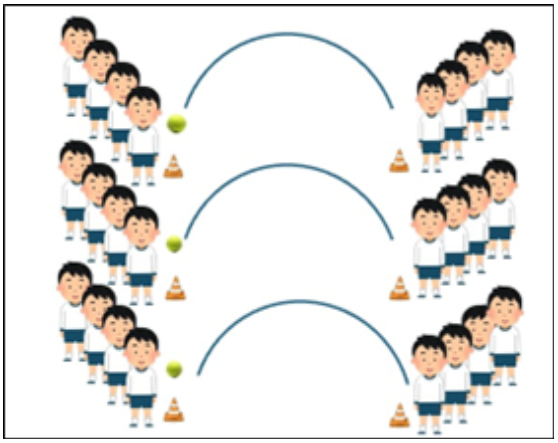


Model 3. Lempar Langit

Objective: To train the strength and accuracy of overhead throws.

How to play: Participants are divided into three groups, each group forming two teams facing each other. The ball is thrown overhead to the opposing team, where it is caught without dropping. Participants who fail to catch or throw the ball are eliminated. The team with the most remaining members gets one point.

Simulation

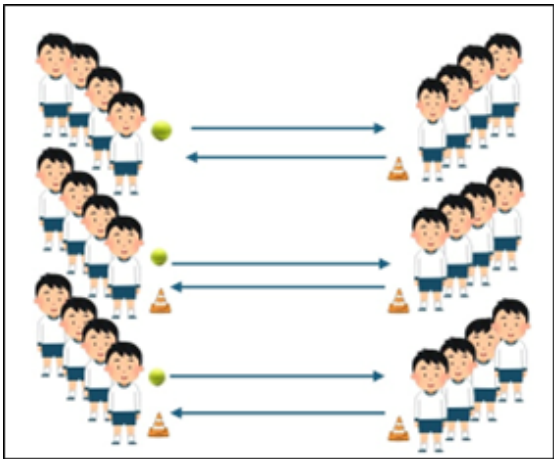


Model 4. Lempar Kilat

Objective: To train quick reactions to catch hard and fast balls.

How to play: Participants are divided into three groups, each group forming two opposing teams. The ball is quickly thrown towards the opponent and must be caught swiftly. Participants who fail to catch the ball are eliminated. The winner is determined by the number of remaining players.

Simulation



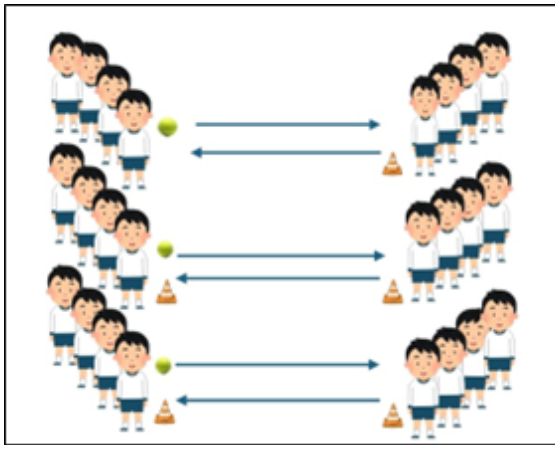
Model 5. Tangkap Cepat

Objective: To train fast catching and throwing reflexes.

How to play: Participants are divided into three groups, each group forming two opposing teams. The ball is caught and immediately thrown back to the opponent. Participants who

fail to catch the ball are eliminated. The team with the most points at the end of the game wins.

Simulation

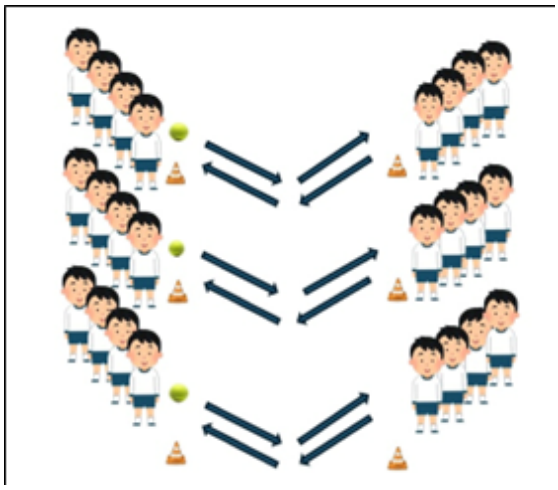


Model 6. Rebut Pantul

Objective: To train the speed of catching a bouncing ball while moving forward.

How to play: Participants are divided into three groups, each group forming two opposing lines. Players bounce the ball alternately for their partners to catch while moving forward together. The group that completes the activity with the most successful catches wins.

Simulation

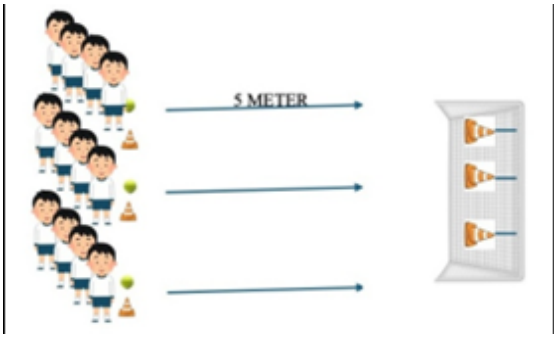


Model 7. Serang Lurus

Objective: To train accuracy of throwing at the target.

How to play: Participants are divided into three groups, each group taking turns throwing the ball at target cones hung on goal posts from a distance of 5 meters. Each shot on target earns a point. The team with the most points wins.

Simulation

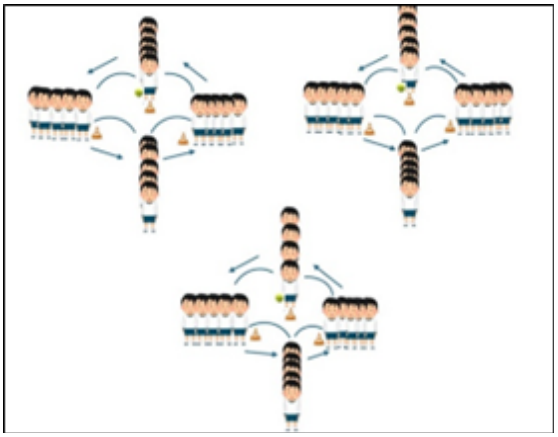


Model 8. Lempar Pelangi

Objective: To train high throw and team coordination.

How to play: Participants are divided into three groups, each forming a square at each corner of the cones. The ball is thrown to the other corner alternately. Missing three times equals a loss. The team with the most points wins.

Simulation

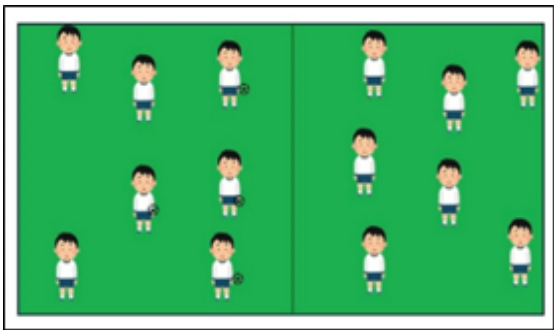


Model 9. Lempar Jitu

Objective: To train the accuracy of throwing at the opponent's feet.

How to play: Participants are divided into four groups, each with two opposing teams separated by a boundary line. The ball is thrown at the opponent's feet. Any player hit is eliminated from the field. The team with the most remaining players wins.

Simulation

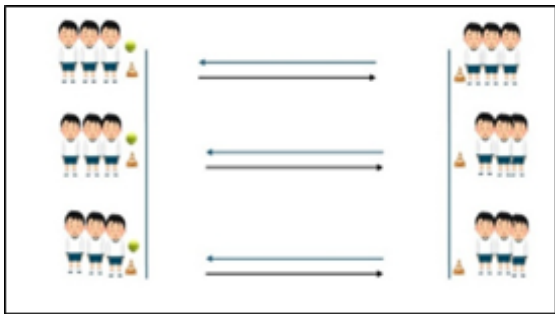


Model 10. Tangkap Tanah

Objective: Practice catching low rolling balls.

How to play: Participants are divided into three groups, each group facing each other 5 meters apart. The ball is rolled to the opposing team to be caught. The team that completes the pass back to the first player first wins.

Simulation

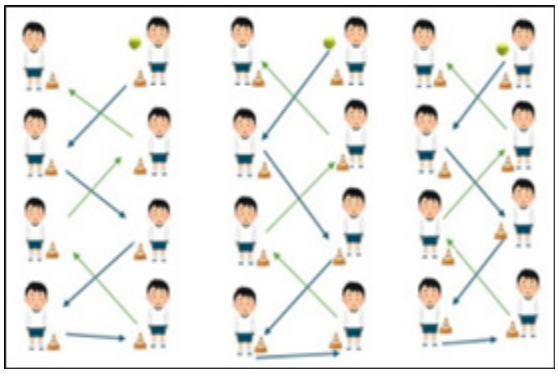


Model 11. Raih Silang Langit

Objective: Practice catching cross-bound balls.

How to play: Participants are divided into three groups, each group forming two opposing teams. The ball is thrown back and forth in turns until the last player reaches the end. The fastest team wins.

Simulation

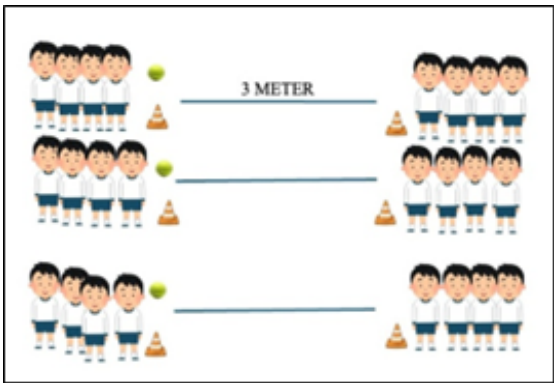


Model 12. Bola Acak

Objective: To train quick response according to instructions.

How to play: Participants are divided into three groups, each group forming two opposing teams. The teacher gives a color signal (red must throw with the chest, yellow must throw with the rebound, green must throw with the free throw). The ball is passed according to the signal. A wrong throw or missed catch is the same as losing.

Simulation

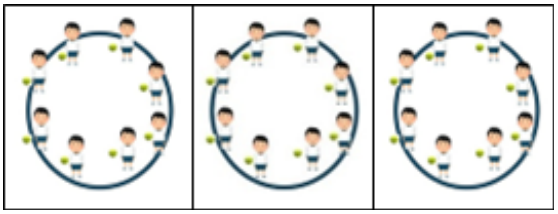


Model 13. Lempar Terbang

Objective: To practice teamwork in throwing and catching in a circle.

How to play: Participants are divided into three groups, each forming a circle. The ball is thrown clockwise from side to side for 5 minutes. A team member is eliminated if they fail to catch the ball passed to them by a teammate. The team with the most remaining members wins.

Simulation

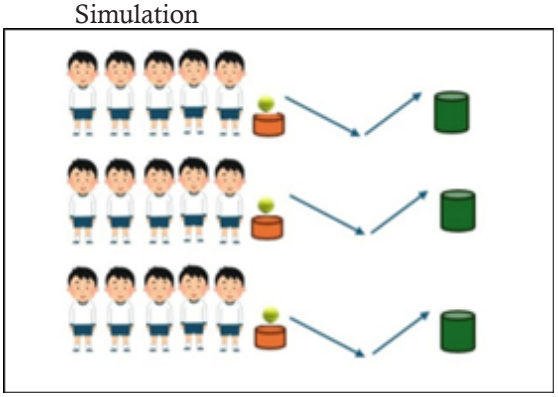


Model 14. Pantulan Licik

Objective: Train the accuracy of bouncing to the target container.

How to play: Participants are divided into 3 groups, each consisting of 2 teams. The goal is to bounce balls into the container as many times as possible in 5 minutes. The team with the most balls wins.

Simulation

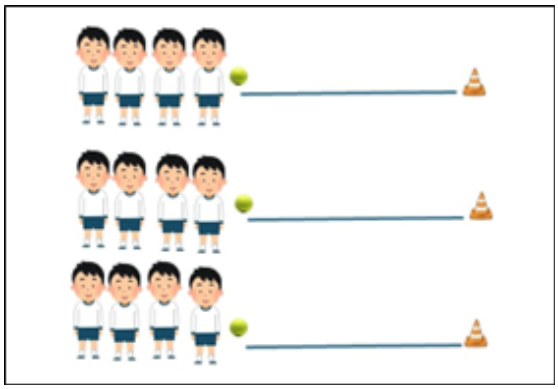


Model 15. Tembak Samping

Objective: Practice throwing at targets from the side.

How to play: Participants are divided into three groups, each group forming two teams. The ball is thrown at target cones. Each correct throw scores a point. The team with the most points wins.

Simulation

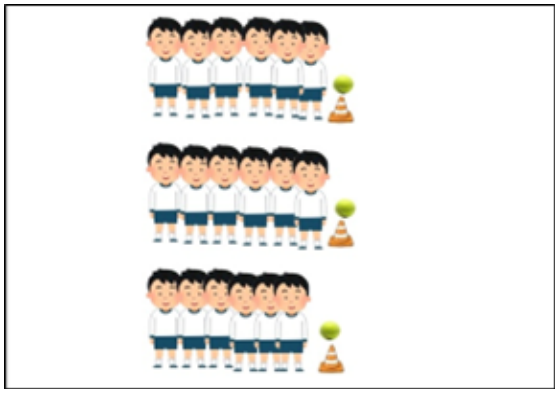


Model 16. Gerakan Misterius

Objective: To practice adapting throwing and catching techniques according to the card instructions.

How to play: Participants are divided into three groups, each group consisting of two teams. A representative draws a technique card at random, and all members perform the technique. The best team wins a point.

Simulation



Model 17. Estafet Ajaib

Objective: To train the coordination of throwing, bouncing and rolling.

How to play: Participants are divided into three groups, each group forming two teams. Odd numbers bounce the ball, and even numbers roll the ball. The team with the fastest player to the end wins.

Simulation

Model 18. Putar Acak

Objective: To practice variations of the soaring and sitting throw.

How to play: Participants are divided into three groups, each group forming two teams. Odd-numbered players throw the ball in the air, while even-numbered players throw the ball in the air. The fastest team wins.

Simulation

Model 19. Lempar Target

Objective: Practice throwing at the target in the middle of the area.

How to play: Participants are divided into three groups, each with two teams. The team outside the area throws the ball at a target in the center, guarded by an opponent. Points are awarded if the ball hits the target without being caught by an opponent.

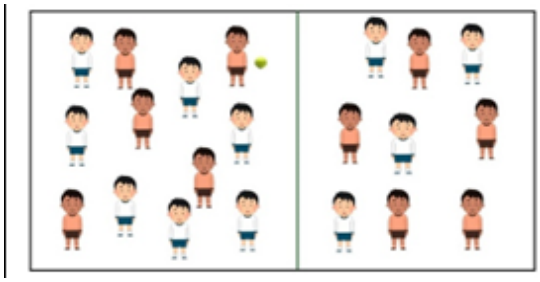
Simulation

Model 20. Tak-Tik Bom

Objective: Practice ball passing strategies with special patterns.

How to play: Participants are divided into 3 groups, each group consisting of 2 teams. The team in possession passes the ball 5 times while saying "Tak-Tik" on the first 4 throws and "Bom" on the 5th throw. If the ball is taken by the opponent before the 5th throw, the roles switch.

Simulation

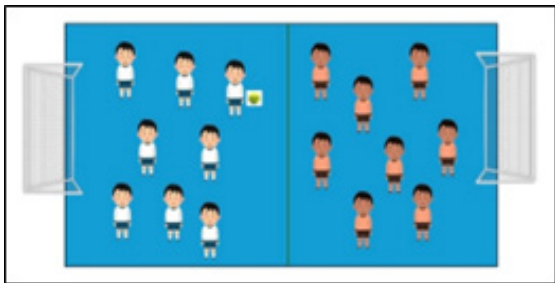


Model 21. TaLem Games

Objective: To train cooperation to score goals through throwing and catching.

How to play: Participants are divided into three groups, each with two competing teams. Players pass the ball a maximum of five steps or bounce it before aiming it towards the opponent's goal. The team with the most goals wins.

Simulation



Development

After the data collection stage and the initial design of the flashcard-based throwing and catching learning model for fifth-grade elementary school students were completed, the researcher then conducted a validation test to ensure the feasibility of the model that had been developed. This validation test involved three experts consisting of one throwing and catching expert, one game expert, and one expert in physical education learning in elementary schools. The results of the model feasibility test conducted by the validator stated that 21 models were accepted with several notes: 1) adapted to the characteristics of students; 2) easy to play and; 3) safe for all groups.

Implementation

The implementation phase was carried out after the flashcard-based throwing and catching learning model for fifth-grade elementary school students was declared feasible by experts. A total of 21 models that had been declared feasible by experts were tested on a limited number of 30 children to see their implementation in the field. The results of the limited trial showed no obstacles during the limited trial process. Therefore, the research process could be continued to a broader trial phase to determine whether this flashcard-based throwing and catching learning model could improve students' throwing and catching abilities. In this broader trial phase, the researchers used a quasi-experiment to compare the groups given the conventional model with those given the flashcard-based basic throwing and catching learning model.

The results of the implementation are presented in descriptive statistics, N-Gain Score and t-test consisting of the results of throwing and catching at two schools located in Menteng District.

Table 1. Descriptive Statistics

Group		Mean	N	Min	Max	Std. Devia-tion
Experi-ment	Pre-test	9,63	30	6	14	7,7515
	Postest	20,37	30	19	23	1,0333
Control	Pre-test	9,67	30	7	14	1,6470
	Postest	15,43	30	14	19	1,2507

After all the data was obtained, the researcher then conducted a classical assumption test, namely the normality test to determine whether the data was normal and the homogeneity test to determine whether the data was homogeneous. The normality and homogeneity tests were carried out by processing data from the N-Gain Score results. The results of the normality test using Shapiro Wilk showed that the experimental group obtained a value of 0.198 > 0.005 (normally distributed) and the control group obtained a value of 0.410 > (normally distributed). Because the data was normally distributed, the next step was to conduct a homenity test using the test of homogeneity of variance. The results of the homogeneity test showed that the experimental and control groups obtained a value of 0.342 > 0.05 (homogeneously distributed). Thus, because all values from the experimental and control groups were declared normal and homogeneous, the researcher could test the data to the next stage, namely the N-Gain Score Test and the t-test.

Table 2. Hasil N-Gain Score

Group	N-Gain Score	N-Gain Percent	Interpretation
Experiment	74,1677	74	Quite Effective
Control	39,6274	39	Less Effective

The results of the N-Gain Score test interpreted that the experimental group was quite effective compared to the control group. Therefore, further testing using the t-test was needed to determine the effectiveness of the flashcard-based basic throwing and catching movement learning model for fifth-grade elementary school students. The t-test results showed a Sig. (2-tailed) value of $0.000 < 0.05$. This indicates that there is a significant average difference between the experimental and control classes. Thus, it can be concluded that the flashcard-based basic throwing and catching movement learning model has proven to be quite effective in improving the basic throwing and catching movement abilities of fifth-grade elementary school students.

Evaluation

The evaluation phase was conducted after the implementation of the flashcard-based basic throwing and catching movement learning model for fifth-grade elementary school students. This evaluation included two main aspects: implementation testing by experts and effectiveness testing based on implementation results in the field. Based on the evaluation results, it was concluded that all items in the implemented training model could be executed as designed. The implementation process also went well and was in line with the development objectives, indicating that this model is suitable for use in improving children's passing skills effectively and enjoyably.

The findings of this study indicate that the flashcard-based learning model for basic throwing and catching movements significantly improved the motor skills of fifth-grade elementary school students compared to conventional methods. This is evident from the N-Gain score of 74% for the experimental group (quite effective), while the score was only 39% for the control group (less effective). These results reinforce the findings of Bikalawan et al. (2024), who demonstrated that flashcards effectively improve locomotor skills in elementary school students. They also align with Suwiwa et al. (2023), who found improved pencak silat learning outcomes through project-based learning with the aid of flashcards. Furthermore, in a different context, Kesumawati et al. (2024) demonstrated the effectiveness of flashcards in developing basic motor skills in children with mild intellectual disabilities.

The relationship between these results and the literature can be explained through motor learning theory (Goodway et al., 2019), which asserts that successful mastery of physical skills is strongly influenced by clear visual stimuli and structured movement repetition. In this model, flashcards serve as visual guides that help students systematically process movement sequences, reducing technical errors, and accelerating motor adaptation. Furthermore, the integration of game variations in accordance with child-centered pedagogical principles Lawson et al. (2021) increases students' intrinsic motivation, encourages active participation, and strengthens social relationships through teamwork.

This research also provides a novel contribution compared to previous studies, namely the development of flashcards specifically targeting throwing and catching skills a fundamental manipulative skill that underpins various sports. This finding addresses a previously identified research gap, namely the lack of systematic visual media for specific motor skill learning in the context of elementary school physical education. Thus, this study not only strengthens empirical evidence on the effectiveness of flashcards but also expands their application to more focused fundamental movement skills.

CONCLUSION

The flash card–based basic throwing and catching learning model is proven to be significantly more effective than conventional methods in improving motor skills among fifth-grade elementary school students. Its strength lies in combining movement visualization, game variation, and motor learning theory, which collectively enhance technical mastery, active participation, and student motivation. This model holds strong potential as an innovative strategy for elementary physical education instruction.

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