Development of Small Ball Game Learning Through Catch Ball Game to Enhance Motoric and Cognitive Skills In Elementary School Students

Bintoro Widodo[1,2*], Nurhasan[1], Suroto[1], Rizki Fitri Rahima Uulaa[3]

[1] Surabaya State University, Surabaya, Indonesia
[2] State Islamic University of Maulana Malik Ibrahim, Malang, Indonesia
[3] National Taiwan University of Science and Technology, Taipei City, Taiwan

Sections Info	ABSTRACT
	Objective: This study aims to develop a small ball game model (in this case, a catch ball game) to determine students' motor and cognitive skills. The development of this small ball game model also aims to know students' cognition, such as cooperation, problem-solving, discussion, and critical thinking. **Method:** This study has a qualitative approach, using a checklist observation method to observe motor skills in throwing and catching a ball. In cognitive, students use the results of questionnaires and student interviews. **Results:** The results obtained from this study on the motor skills of catching the ball were 80% of students with a total of 26 students in categories according to the age level of the development of ball catching skills. 20% fall into the category that needs to follow the age level of the development of ball-catching skills. For motor skills in throwing the ball, 80% of students enter the category according to the age level of the development of skills in throwing the ball. Furthermore, 20% of students in the category need to follow the age level of skills development in throwing the ball. For cognitive students, the catch ball game shows behavior during games such as cooperation, problem-solving, discussion, and critical thinking. **Novelty:** This research was conducted at PES Rampal Celaket 02 Malang City. The results of this study can also help physical education teachers, especially learning small ball material to improve students and cognitive skills of fourth-grade elementary school students.

INTRODUCTION

Physical education has a role and function to stimulate students' physical growth and development. Physical education is not only about understanding neuromuscular skills, strength, endurance, agility, flexibility, and coordination (Carolina et al., 2022; Deng et al., 2023; Sabillah et al., 2022; Utesch et al., 2019). Nevertheless, provide opportunities for meaning to social interaction and mutual understanding. So that physical education is a necessary tool for the survival of individuals in their environment. Movement skills are essential and must be continuously developed in physical education learning in elementary schools (Jiang et al., 2020; Peralta et al., 2019; Richards et al., 2019). The development of children's movement skills will be the basis for developing movement skills at a later age in junior high school. Movement skills in learning in elementary schools are listed in the education level of grades 1 to 6, which are divided according to the stages of development of children's movements according to the age of the students (Budi et al., 2019; de Waal, 2019; Kelly et al., 2019; Schembri et al., 2019; Sgro et al., 2019).

Specifically for learning movement skills in fourth-grade elementary school students, as outlined in one of the essential competencies in the 2013 Ministry of National

Education curriculum, it is stated that students "Practice variations and combinations of locomotor, non-locomotor, and manipulative basic movement patterns in small ball games based on the concept of movement in various games and or traditional small ball sports. To achieve basic competence in the fundamental movement abilities of fourth-grade elementary school students, a teacher must choose and apply appropriate learning methods to achieve the expected basic competence. Achieving the expected competency goals is more challenging than just providing material. Still, it is also necessary to consider appropriate concepts and learning models to achieve the expected competencies (Helda & Syahrani, 2022; Kistoro et al., 2021; Purba et al., 2022).

One of the teacher's successes in learning to students is being good at choosing and applying learning models following the goals and material presented to achieve the expected competencies. In physical education, many learning models are under the character of learning for physical education. The character of learning physical education is moving/activity. In the learning process, Physical Education teachers should hold strong principles that the model developed is a learning model that is based on efforts to improve basic fundamental movement skills packaged in the form of game activities (Annisa & Sutapa, 2019; Estevan et al., 2021; Gil-Arias et al., 2021; Hernawan et al., 2019; Khan et al., 2022). One of the teacher's successes in learning with students is choosing and applying learning models to the goals and material presented to achieve the expected competencies (Anwar et al., 2020; Nahar et al., 2022).

Teachers must be able to develop learning models that can support the achievement of the expected competencies. The more and more precise the teacher is in choosing the proper learning, the more it will affect the results of student success in achieving the graduation rate of achieving the expected competencies. The lack of variations in exercises in the form of games makes it an obstacle for teachers to realize an increase in students' motor skills (Pradipta & Dewantoro, 2019; Wright et al., 2020). Elementary school students' motor skills can be improved with various learning models emphasizing children's motor development principles. Besides that, learning models can also be made by considering students' cognitive development. Relationship between teaching styles and students' conditions, meaning that students learn well when taught with methods that align with their learning styles. Varied, effective, and efficient teaching styles will underlie teachers' design and implement learning models that vary depending on the learning material delivered (Adu & Duku, 2021; Bernacki et al., 2021; Moon, 2022). A fun learning model will give a distinct impression on the development of elementary school students (Arioder et al., 2020; Bulkani et al., 2022; Fauziah et al., 2020). The learning model with the game's characteristics will meet the needs of students' motor development. A learning model to improve the motoric development of fourth-grade elementary school students can be provided with a game-based learning method as the basis (Bang et al., 2022; Gusnani et al., 2020; Hafeez, 2021; Israel-Fishelson & Hershkovitz, 2020).

In addition to showing festive activities, the game fosters students' understanding of cognitive values and shows the results of organ performance through an understanding of physical fitness. Principles The development of motion in elementary school children can be carried out with the basic principles of fun learning following the developmental characteristics of elementary school-age children (Latar & Hasbullah, 2020). Physical education teachers package fun learning by providing learning in the form of games.

The chosen game can be a game with a game concept using a large ball as the medium or a game using a small ball as the medium (Dania & Harvey, 2020).

Learning with the concept of the game has an impact on improving students' cognitive and increasing the capacity of students' physical fitness. Learning with the concept of a game must be packaged with a good concept and with tiered stages of training to achieve learning competency goals (Stavropoulos et al., 2021). Competency goals can be achieved, and as expected, it is necessary to have more varied models or forms of games to support a physical education teacher in applying them to improve children's movement skills or develop children's motor skills to be good. Teaching can be improved in various ways, one of which is by developing forms of exercises or games that can support a good learning process, and the achievement of children's motor skills can be fulfilled.

Hence, the novelties of this study is to developing students' motoric and cognitive skills especially to elementary school students through the catch ball game. Furthermore, research objectives of this study is tend to develop a small ball game learning model (catch ball game) to enhance the motoric and cognitive skills by the need for physical education teachers for material concepts or learning for small ball game material for fourth-grade elementary school students.

RESEARCH METHOD
The approach used in this study is qualitative. Qualitative research aims to understand what is experienced by research subjects, for example, behavior, perceptions, motivations, actions, and so on (Cheng & Tsai, 2019). Holistically, using various scientific methods to utilize descriptions in words and language in a particular natural context. The type of research used is development research (RnD). The research produced a product in the form of a catch ball game for the development model. This study also tested the product's effectiveness.

Making products in the form of a catch ball game model is expected to be a solution for developing the motor skills of fourth-grade elementary school students. This study used research development to produce a small ball game model to improve motor and cognitive development by modifying the development steps from Borg & Gall (2003). Borg & Gall propose a series of steps that must be taken in this approach, namely "research and information collecting, planning, developing the preliminary form of product, preliminary field testing, main product revision, main field testing, operational product revision, operational field testing, final product revision, and dissemination and implementation" (Aka, 2019; Gustiani, 2019). Conceptually, the research and development approach includes ten general steps, such as in Figure 1.
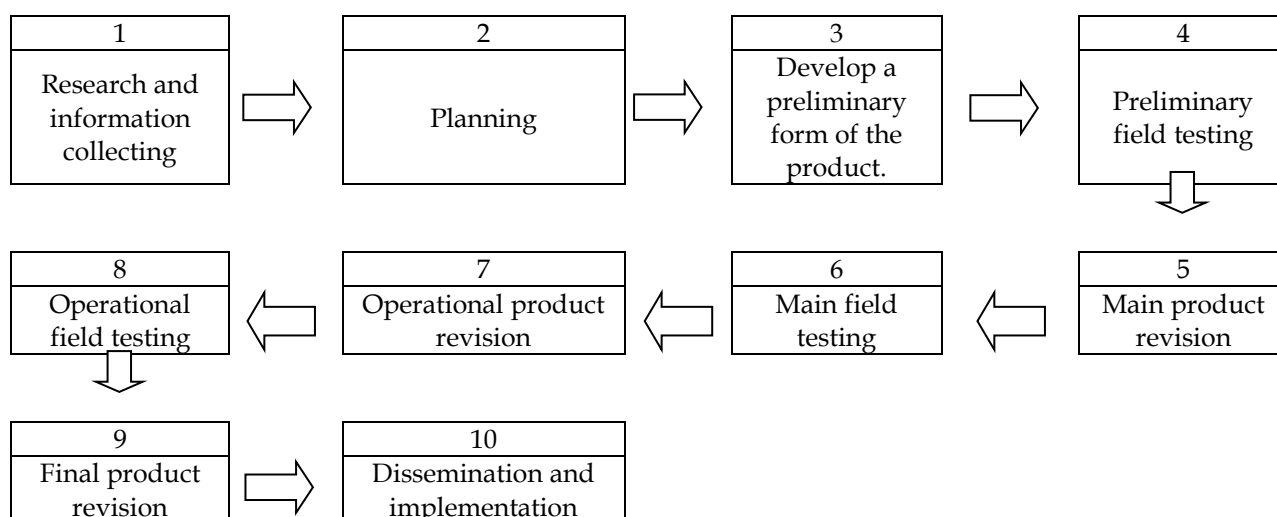
1 Research and information collecting	→	2 Planning	→	3 Develop a preliminary form of the product.	→	4 Preliminary field testing

8 Operational field testing	←	7 Operational product revision	←	6 Main field testing	←	5 Main product revision

9 Final product revision	→	10 Dissemination and implementation

Figure 1. Research and development research.

Research Subjects
The research subjects were fourth-grade students at Public Elementary School (PES) Rampal Celaket 2 Malang City for the 2020-2021 academic year. This school has two fourth-grade students, and each class has 30 students.

Data Analysis
Based on the data collection techniques and tools, as mentioned above, the data analysis techniques used are as follows:
1. Assessment of Motor Skills
   Under the concept of an assessment that wants to know the motor skills of fourth graders at PES 2 Rampal Celaket Malang City, especially in the motor skills of ball handling and ball catching, the data collected is a type of ratio data.
2. Cognitive
   Following the research objective of wanting to know the cognitive abilities of fourth-grade students at PES Rampal Celaket Malang City, the data obtained was from student interviews.

RESULTS AND DISCUSSION
Results
Development of a Catch Ball Game Learning
This research and development resulted in a product in the form of a booklet or book on the catching ball game learning model.
1. Research and information collecting.
   At this stage, an initial diagnosis is carried out, which includes literature study activities and field studies.
2. Planning
   Production planning for developing a catching ball game learning model (small ball material).

3. Develop a preliminary form of the product.
   Product development in the form of a catching ball game for learning model book. This catching ball game development book is arranged sequentially, consisting of a front cover, inside cover, preface, table of contents, instructions for using teaching materials, and learning lesson plan.
4. Preliminary field testing
   Initial trials in small groups and trial activities at this stage used eight grades at PES Rampal Celaket 2 Malang, and students practiced the catching ball game learning model.
5. Main Product Revision
   a) material or contents of product information: The research made improvements to the previous materials, namely to clarify more about the mechanism for the sequence of implementation of the learning model, the absence of lesson plans, and the sequence of mechanisms for implementing the game of catch ball.
   b) Media researchers made revisions to previous materials, namely changing the front cover design and the color of the contents in the book.
6. Main field testing
   Initial trials in large groups, trial activities at this stage using 16 grades at PES Rampal Celaket 02 Malang, students practicing the catch ball game for the learning model.
7. Operational product revision
   After a large group trial was conducted to determine the product's attractiveness in the catch ball game for the learning model, the product was said to have a very high attractiveness, so no repeat trials were carried out.
8. Operational field testing
   After conducting field trials of this catching ball game for the learning model, the product was said to have very high attractiveness, so no repeat trials were carried out.
9. Final product revision
   The final product of the product development of the catching ball game for the learning model has been packaged in a series of fourth-grade elementary school students' physical education learning materials in the small ball game sub-material.
10. Dissemination and implementation,
    The product produced is a book containing learning model products for catching the ball to improve students' motor skills and cognitive development.

Throwing and Catching the Ball
From the table of motor skills for catching the ball, 80% have motor skills in the appropriate category. In comparison, 20% fall into the less appropriate category and 0% in the inappropriate category.

The Assessment of Motor Skills in Throwing The Ball
The results of the ball throwing motor skill test showed that of the 26 students who took the ball throwing skill test, the results were presented in the table of the recap results. Motor skills throwing a ball on average, 80% have motor skills in the appropriate category. In comparison, 20% fall into the less appropriate category and 0% in the inappropriate category.

Student Cognitive Analysis Results

In this initial section, the author will describe the data obtained from interviews with all participants. The results of the interviews were classified based on the group and the variety of answers to the interview questions. The results of the interviews were also distinguished before, during, and after the small ball-throwing game. Interviews were conducted with all participants after they played the first capture sheet game. From the exposure to data from interviews with students above related to student cognition, it can be concluded that:

1. Critical Thinking

   The research results obtained through the results of a questionnaire during the catch ball game stage showed students to think critically, primarily when the group/team discussed determining the position of each team player. Based on the results or recap, the team did the same thing when discussing the second game. First, students think critically to develop strategies so that the games carried out by the team get maximum results. Besides, one team member's mistakes never happen again in the second game.

2. Troubleshooting

   The research results obtained through the questionnaire during the catch ball game stage showed that students or teams could solve the problems encountered in the catch ball game. It was proven when the group/team discussed determining the position of each team player. The team did the same thing when discussing the second game based on the results or recap of the first game. Students or teams can solve problems faced by teams or team members, such as throws that are too slow, throws that are too low, or throws that are not on target. What students or teams do in solving this problem is to change the position of the players in the team, according to the data in group or team III who exchange player positions so that there are no throwing errors or it can make it easier for students to throw and catch the ball.

Discussion

The discussion carried out by each team was not only carried out once, but at least two discussions were carried out, namely when the first game was about to start and when the second game was going to be held. The research results obtained through the results of a questionnaire during the catch ball game stage showed that students or teams were able to discuss to develop speaking skills (Farias et al., 2019), problem-solving, and collaboration in the sense of responsibility towards the tasks and responsibilities assigned to each group member in completing a game of catch ball.

Physical Education

The definition of physical education can be interpreted as education that leads to the physical or science that studies our physical bodies. Physical education is the cultivation of formal knowledge and values through physical activity. Physical education is an integral part of education, namely educational processes or activities using physical activity media (Cid et al., 2019; Zheng et al., 2021). Physical education is part of the education that conveys material through physical activity or sports. The physical activity carried out impacts increasing growth and development and increasing the body's muscles. Physical education focuses on all forms of physical

activity that activate large muscles (gross motor) and focuses on physical movement in games, sports, and essential functions of the human body (Hasan et al., 2021; Kurniawan et al., 2021; Sutapa et al., 2021; Sutapa & Suharjana, 2019).

Physical education is a process of organic, neuromuscular, intellectual, social, cultural, emotional, and aesthetic adaptation and learning that results from selecting various physical activities. The concept of physical education is not only in the dimensions, aspects, and scope of physical education but also pays more attention to the complex goals, including cognitive, affective, psychomotor, intellectual, social, cultural, and aesthetic aspects (Stevens & Culpan, 2021). The results of cognitive ability research, namely highlighting children's motor skill performance, are supported by an association of cognitive style preferences in a unique teaching approach. Cognition is acquiring and manipulating knowledge. The style of teaching physical education also influences children's motor skills development. Movement or physical activity is natural and the basis of existence for every human being. Movement is a feature of humanity, and movement is a feature of life, and the absence of movement is death (Lykesas et al., 2020).

Physical education is an educational process that utilizes physical activity to produce holistic changes in individual quality, both physically, mentally, and emotionally. The point of concern is the increase in human movement. Physical education is an educational process that utilizes systematically planned physical activity. Physical education aims to develop and improve individuals organically, neuromuscularly, perceptually, cognitively, and emotionally. Many movement abilities in adolescents and adults, due to the influence of motion learning when they are in the developmental period in elementary school, can be fulfilled according to the developmental needs of their movements (Pramandhika et al., 2020). It can be concluded that learning physical education is necessary at school age, especially elementary school children related to physical development, movement, and body organs (Corbin, 2021).

Cognitive Development

The term cognitive comes from the word cognition, whose equivalent is knowing, meaning knowledge. The broader meaning of cognitive is the acquisition, organization, and use of knowledge. Following subsequent developments, the term cognitive became famous as a domain or area/realm of human psychology, which includes every cognitive behavior related to understanding, consideration, information processing, problem-solving, intentionality, and belief. This brain-centered mental realm is also associated with conation (will) and affection (feelings) related to taste. So the development of cognition is a gradual and orderly change that causes mental processes to become increasingly complex and sophisticated (S. Chen et al., 2021; Gunawardena & Wilson, 2021; Sweller et al., 2019).

Adaptation is an adjustment to environmental and intellectual demands through two things, namely, assimilation and accommodation. Assimilation is a child's interpretation of new experiences based on preschoolers' worldviews. Accommodation is the second aspect of adaptation, and individuals try to adapt the adaptation process to several new experiences. For example, a school child tries to hold a big ball, and accommodation will occur when the child recognizes that the ball is more significant than the toys he usually plays with during the adaptation process. The school children then modify it to carry out the adaptation process (Ma et al., 2021). Cognition is usually

thought of as mental. In a broader sense, it is a reflection of the mind. Each student is expected to be able to build cognition according to their age development. Cognition can develop properly if the teacher is beneficial in guiding students in obtaining student cognition levels (Coman et al., 2021).

Learning Model
The learning model is a plan or pattern to guide learning in or outside the classroom. Learning models help teachers understand the world of students by providing a framework or work structure to help teachers understand large or complex problems. The learning model assists teachers in forming an organized system to create learning in the learning environment. The Learning Model inspires teachers to be creative and provides opportunities for teachers to develop the best learning (Onyema et al., 2019).

An appropriate learning model will make it easier for students to learn. It is a concern for teachers that teaching is essentially assisted by using the suitable learning model. The creative thinking process in students is seen as more important than the end product and creative teaching (based on teachers using imaginative approaches to make learning more exciting and effective) (Al Hashimi et al., 2019; S. Y. Chen et al., 2022). The learning model is a guideline for teaching designers and teachers in learning. Choosing a learning model is strongly influenced by the nature of the material to be taught, the goals to be achieved, and following the students' ability level. Besides that, each learning model also has stages (syntax) that students can do with teacher guidance (Ramdani et al., 2021; Supena et al., 2021). These differences include the opening and closing of learning, which are different. Teachers must have the skills and abilities to manage classes with appropriate learning models.

The learning model has four unique characteristics that specific learning strategies or procedures do not possess. Teachers can assist this process by teaching in ways that make the information meaningful and highly relevant to students, providing opportunities for students to discover or apply ideas themselves, and inviting students to use their strategies for learning consciously (Hermino & Arifin, 2020). The teacher can provide students with ladders that can help students reach a higher level of understanding. Therefore, efforts must be made for students to climb the ladder themselves.

Small Ball Game Learning Model
Following the physical education paradigm, which emphasizes overall individual development, physical education in schools is not directed at mastering sports games as has been the case, but rather prioritizing developing students' motor skills from time to time. As a foundation in primary education which states that physical education uses physical activity as a medium for achieving goals, a teacher must be able to develop and have concept development in physical education learning. In addition, learning can also be developed with playing techniques as the median. The use of games or modified games in the learning process must pay attention to the level of conformity with the level of development of students (Yürük, 2019).

The research results obtained through teamwork during the catch ball game stage show that students can work in teams. It is evidenced by providing input or suggestions from one team member to another team member. This form of cooperation aims to get the best results in completing the catch-ball game. Team members always

remember to encourage and advise a team member who makes a mistake (Candra, 2020). The formulation of the problem studied in this study is how can the development of a small ball game learning model (catch ball game) make a solution or show that we can create other elements in the small ball game learning concept through catch ball games, such as cognitive development of students or students' motor skills. The catch ball game can understand or analyze the motor movements of elementary school children in Rampal Celaket 2 Malang City. The results obtained in this study show that developing a small ball game learning model (catch ball game) can provide an alternative for teachers in developing small ball game material. In addition, this study also provides input to physical education teachers regarding the development of this game, which can automatically determine students' motor skills through observations when children play to catch the ball. In addition to motor skills, this catch ball game provides new references in providing small ball game material to elementary school children, especially grade IV PES. So far, the learning material for small ball games has only been limited to rounders or rounders. Apart from that, small ball learning material for baseball and rounders games, prioritizing simple games that only show the concept of the game, is not supported by the development of cognitive or affective aspects.

CONCLUSION

Fundamental Finding: The research results is the development of a small ball game learning model (catch ball game), motivated by the need for Physical Education teachers for material concepts or learning for small ball game material for fourth-grade elementary school students. So far, the learning material for small ball games has only been limited to rounders or rounders. Apart from that, small ball learning material for baseball and rounders games, prioritizing simple games that only show the concept of the game, is not supported by the development of cognitive or affective aspects. **Implication:** The formulation of the problem studied in this study is how can the development of a small ball game learning model (catch ball game) make a solution or show that we can create other elements in the small ball game learning concept through catch ball games, such as cognitive development of students or students' motor skills. The catch ball game can understand or analyze the motor movements of elementary school children in Rampal Celaket 2 Malang City. The results obtained in this study show that developing a small ball game learning model (catch ball game) can provide an alternative for teachers in developing small ball game material. In addition, this study also provides input to physical education teachers regarding the development of this game, which can automatically determine students' motor skills through observations when children play to catch the ball. In addition to motor skills, this catch ball game provides new references in providing small ball game material to elementary school children, especially grade IV PES. **Limitation:** This research is only conducted in Malang city**.** Hence, it can be broader implementation in others cities. **Future Research:** Developing a small ball game (catch the ball) is easy and practical for elementary school children, especially fourth graders. Development of this small ball game learning model can be used as a foothold or reference for other researchers related to physical education material, such as a sense of responsibility is preferred.

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*Dr. Bintoro Widodo (Corresponding Author)
State Islamic University of Maulana Malik Ibrahim,
Jl. Gajayana No.50, Malang, East Java, 65144, Indonesia
Email: bennymalang@yahoo.com

Prof. Dr. Nurhasan, M.Kes.
State University of Surabaya,
Jl. Lidah Wetan, Surabaya, East Java, 60213, Indonesia
Email: nurhasan@unesa.ac.id

Prof. Dr. Suroto, M.Pd.
State University of Surabaya,
Jl. Lidah Wetan, Surabaya, East Java, 60213, Indonesia
Email: suroto@unesa.ac.id

Rizki Fitri Rahima Uulaa
Graduate Institute of Digital Learning and Education, National Taiwan University of Science and Technology,
No. 43號, Section 4, Keelung Rd, Da'an District, Taipei City, 106, Taiwan
Email: m11011801@mail.ntust.edu.tw