



## DEVELOPMENT OF A THROW AND CATCH BALL GAME MODEL FOR THE MANIPULATIVE SKILLS OF CHILDREN AGED 7-9 YEARS

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### ABSTRACT

**Background.** The development of manipulative skills such as throwing and catching a ball is a fundamental aspect of motor development in young children, especially those aged 7–9 years. However, many children experience delays in mastering these skills due to a lack of games that are appropriate for their characteristics and needs. **Objectives.** This study aims to develop an effective ball-throwing and catching game model to enhance manipulative skills in children aged 7–9 years. **Method.** The method used is Research and Development (R&D) with the ADDIE model approach, which includes the stages of Analysis, Design, Development, Implementation, and Evaluation. The developed product consists of three game models: Happy Ball, Cheerful Ball, and Joyful Boi. **Results.** The validation results from physical education experts showed a feasibility rate of 95%, while the validation from early childhood sports practitioners reached 98.61%. Field trials also showed a significant increase in children's manipulative skills and active participation in physical activities. **Conclusion.** The conclusion of this study is that the developed game models are highly suitable and effective in enhancing children's manipulative skills. The primary contribution of this research is to provide an alternative, enjoyable, contextual, and developmentally appropriate motor learning medium for early childhood.

**Keywords;** game model, catch and throw ball, children's manipulative skills.



## A. INTRODUCTION

Motor development is a fundamental aspect that plays a vital role in supporting a child's overall physical, cognitive, social, and emotional growth (Jylänki et al., 2022). Motor skills are generally divided into two main categories: gross motor and fine motor skills (Cederström et al., 2021). Manipulative skills, such as throwing and catching a ball, fall under the category of gross motor skills and are essential for children to master during their early school years (Crotti et al., 2022; Stanley et al., 2016). Between the ages of 7 and 9, children experience a critical period of motor development and are highly receptive to various forms of physical stimulation. Well-developed manipulative abilities contribute to a child's readiness to participate in sports activities, enhance hand-eye coordination, and build self-confidence in interacting with their environment.

However, field observations reveal that many children aged 7–9 still struggle with performing manipulative skills effectively. A significant number of children face challenges in throwing and catching a ball accurately, which are largely due to immature motor coordination, weak muscle control, and a lack of engaging and consistent practice opportunities (Oktarifaldi et al., 2024). Moreover, physical education in schools still tends to rely on monotonous, technically-oriented instruction and often lacks adaptive play-based approaches that align with the developmental characteristics of young children.

Previous studies have emphasized the importance of physical activity and play in enhancing children's motor skills. However, few have specifically focused on developing and testing structured ball-throwing and catching game models that are scientifically grounded and tailored to the developmental stages of early childhood (Lola et al., 2022). Most existing approaches remain general, unsystematic, and do not effectively integrate elements of enjoyment, challenge, and fundamental movement principles. In fact, game-based approaches have been proven more effective in stimulating children's motor skills, particularly because they align with the behavioral characteristics of children aged 6–12, who are naturally active, enjoy movement, and learn best through direct experience (Rahmani et al., 2024).

The novelty of this study lies in the development of three specific ball-throwing and catching game models designed to improve the manipulative skills of children aged 7–9

years: *Bola Bahagia* (Happy Ball), *Bola Ceria* (Cheerful Ball), and *Boi Gembira* (Joyful Boi). These models were designed based on needs assessments in the field and pedagogical design principles that incorporate motor, affective, and cognitive aspects. The games were developed using the ADDIE model (Analysis, Design, Development, Implementation, Evaluation), ensuring that the final products are both theoretically grounded and practically applicable for use in school or non-school settings.

The significance of this research lies in its contribution to providing a practical solution to the low manipulative skill levels among children through a fun, structured, and developmentally appropriate approach. This study also enriches the literature in physical education by offering innovative and ready-to-implement game-based models for teachers, coaches, and parents. Furthermore, these models have the potential to increase children's participation in physical activities in general, ultimately contributing to the promotion of an active and healthy lifestyle from an early age.

Thus, this research not only contributes to the development of game-based learning models but also addresses practical challenges in the teaching of manipulative motor skills for young children—an area that has not been optimally explored in previous studies.

## **B. METHOD**

### *Participant*

This study was conducted in three elementary schools in the city of Serang that have regular sports activities, namely SDN Sempu 1 in Serang subdistrict, SDN Gowok, and SDN Cipete 1 in Curug subdistrict. The study was conducted over a period of four weeks after the research permit was issued, covering the media testing, small-scale testing, and large-scale testing stages. The population in this study consisted of children aged 7-9 years who were active in physical activities at school. The sample was taken using cluster sampling techniques from the three schools.

### *Research Design*

This study uses a Research and Development (RnD) approach. According to Sugiyono (2020), RnD is a research method used to produce specific products and test their effectiveness. Using the ADDIE development model, which consists of five stages: Analysis,

Design, Development, Implementation, and Evaluation. In the analysis stage, the researcher identified the need for appropriate game media to develop the manipulative skills of children aged 7–9 years through observation and preliminary studies of PJOK activities in elementary schools. The design stage was carried out by designing a ball throwing and catching game model in the form of Bola Ceria and Bola Bahagia, including the components of the tools, rules of the game, and indicators of manipulative skills developed. The development stage included the creation of physical media, validation by subject matter experts and media experts, and revisions based on the feedback received. Subsequently, in the implementation stage, the media was tested in two phases: a small-scale test at SDN Sempu 1 (20 students) and a large-scale test at SDN Gowok and SDN Cipete (50 students). The evaluation stage was conducted to assess the effectiveness and feasibility of the game media through questionnaires, observations, and interviews with trainers and students, which were then used as the basis for refining the final product.

Data collection techniques included observation, structured interviews, and questionnaires. Observations were conducted during physical education classes at school, while interviews were conducted with physical education teachers to gather in-depth information about children's skill development. Questionnaires were used to assess the suitability of the media by subject matter experts, media experts, and physical education teachers based on aspects such as design, safety, effectiveness, and relevance to child development.

#### *Data Analysis*

The research instrument was developed based on a validated grid and used a 4-point Likert scale. The assessment results were analyzed quantitatively and converted into percentages. The criteria for product validity were determined based on the percentage range:  $\geq 80\%$  (highly valid), 60–80% (valid), 40–60% (sufficiently valid), 20–40% (less valid), and  $\leq 20\%$  (highly less valid).

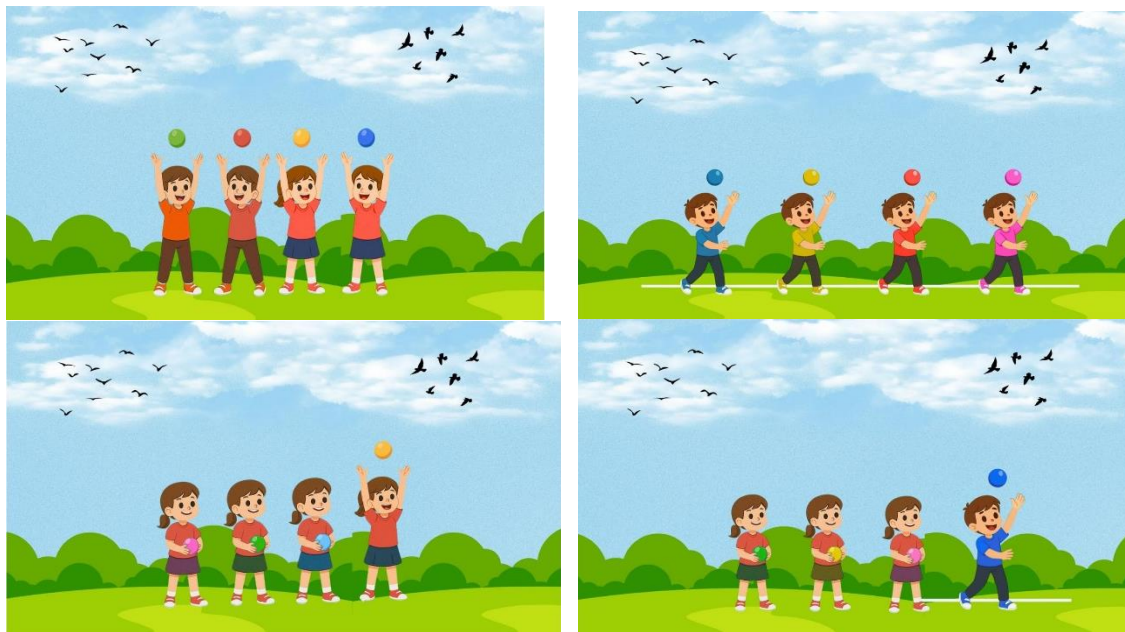
### **C. RESULTS AND DISCUSSION**

#### **Results**

The game model developed in this study consists of three types of ball throwing and catching games, namely happy ball, cheerful ball, and joyful ball. All three are designed to

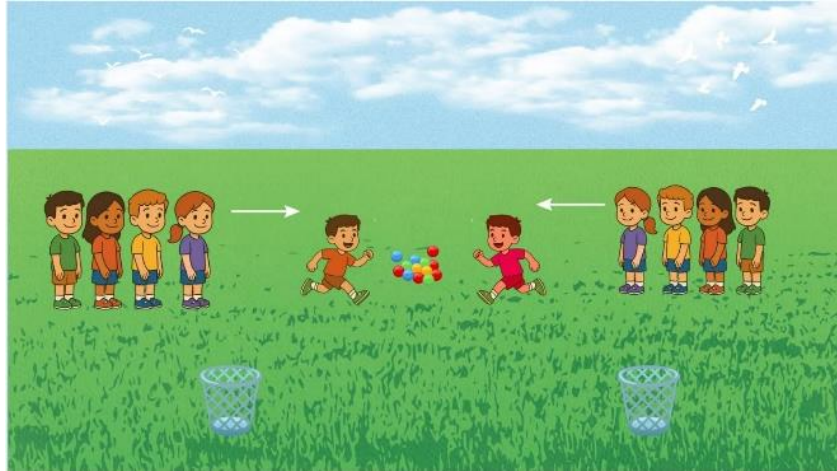
improve the manipulative skills of children aged 7–9 years, such as hand-eye coordination, reaction speed, and object control. The games were developed through the ADDIE stages and have been validated by subject matter experts and media experts.

The Happy Ball game is designed to train hand-eye coordination, concentration, and manipulative skills in children aged 7–9 years, particularly in throwing and catching a ball. This game consists of several variations of activities, namely throwing and catching in place, throwing and catching while moving forward, and variations based on ball colors. With attractive visuals and simple rules, this game combines quick reactions and fun to support children's overall motor development.



**Figure 1.** Design of the Happy Ball game  
Source: Personal collection

The cheerful ball game aims to train children's skills in throwing and catching balls accurately, as well as introducing them to colors. The game activities include group work, throwing balls at targets, and throwing and catching balls overhead. Designed for children aged 7–9 years, this game combines elements of speed, precision, reflexes, and visual stimulation through colorful balls, making it an attractive and educational medium.



**Figure 2.** Design of the Bola Ceria game.  
Source: Personal collection.

The boi gembira game is a modification of the traditional boi-boian game that has been adapted to support children's motor development in the context of physical education. This game trains agility, precision of movement, and teamwork through fun competitive activities. Activities include throwing a ball at a target, responding quickly to the direction of the ball, and dividing the ball into active and inactive in group play.



**Figure 3.** Design of the Boi Gembira game.  
Source: Personal collection.

The results of validation by subject matter experts and media experts each gave a score of 38 out of 40 with an average percentage of 95%, with the category of highly suitable for use with minor revisions. Input from subject matter experts included the development of more systematic and easy-to-understand game steps, while media experts suggested simplifying the guide to only include key information such as the title, description, and how

to play. Following this, the researcher made revisions in the form of improving instructions, simplifying language, reorganizing the guide format, and adding video narration that aligns with the game flow. These revisions were made prior to small-scale and large-scale trials to ensure the media optimally supports children's manipulative skills.

Feasibility assessments were also conducted by three physical education teachers from the schools where the trials were held. Based on the results of the questionnaire, a total score of 142 out of a maximum score of 144 was obtained, with an average feasibility percentage of 98.61%. The results can be seen in Table 1.

Overall, the results of the game trial showed that the developed ball-throwing and catching game media were highly effective in increasing children's physical participation and engagement in manipulative movement activities. The positive responses from teachers and students reinforce that this media can be an attractive and applicable alternative in sports activities for children aged 7–9 years in elementary school environments.

**Table1.** Feasibility Assessment Results

NO	Teacher's Name	School of Origin	Score Obtained	Maximum Score	Percentage
1.	Haningrum	SDN Sempu 1	48	48	100%
2.	Nurhayati	SDN Cipete 1	46	48	95,83%
3.	Ayu Astiani	SDN Gowok	48	38	100%
	Jumlah		142	144	
	Rata-rata				98,61%

## Discussion

The results of expert validation indicate that the developed ball-throwing and catching game media is highly feasible for use in teaching manipulative skills to children aged 7–9 years. Both the subject matter expert and the media expert awarded a score of 38 out of a maximum of 40, equivalent to an average percentage of 95%. This rating falls into the "highly feasible with minor revisions" category, suggesting that the content and design of the media generally meet the established criteria for instructional use but still require refinement in certain technical and pedagogical aspects.

Feedback from the subject matter expert emphasized the need for a more systematic and easier-to-understand structure in presenting the game steps. This is critical because overly complex instructions may hinder effective implementation, especially among early primary school children who are still in the concrete operational stage of cognitive development (Suryadi, Nasrulloh, et al., 2024; Suryadi, Okilanda, et al., 2024). Meanwhile, the media expert recommended simplifying the instructional guide to focus only on core information such as the game title, a brief description, and the steps to play. This suggestion is highly relevant in classroom contexts where clarity and brevity are essential for effective teaching (Hardinata et al., 2023).

In response to these inputs, the researchers conducted a series of revisions, including refining game instructions to be more concise and clear, simplifying language to suit children's comprehension levels, reorganizing the guidebook format for better readability, and adding a video narration that aligns with the flow of the game (Harianto et al., 2023). These revisions were implemented prior to both small-scale and large-scale trials to ensure that the media would be fully optimized for real-world application in supporting children's manipulative skills.

In addition to expert validation, feasibility assessments were also conducted by three physical education (PE) teachers from the participating schools. Based on the questionnaire results, a total score of 142 out of a maximum 144 was obtained, yielding an average feasibility percentage of 98.61%. This reinforces previous findings and indicates that the game media is highly appropriate and well-received by practitioners in the field. The teachers noted that the games were easy to implement, aligned with the physical education curriculum, and effectively engaged students in physical activity (Ashwani et al., 2025).

Trial implementation during both small-scale and large-scale testing phases showed that the developed game media was highly effective in increasing children's physical participation and engagement in manipulative activities such as throwing and catching. The children demonstrated high enthusiasm throughout the activities, consistently followed instructions, and showed noticeable improvements in movement coordination (Mariati et al., 2024; Yusroni, 2024; Zulnadila et al., 2025). These findings align with developmental theories which assert that enjoyable and appropriately challenging play activities can

significantly accelerate the acquisition of fundamental motor skills during the golden period of motor development.

Positive responses from both teachers and students further affirm that this media is not only theoretically sound but also practical and adaptable for use in primary school learning environments. The game models offer an innovative alternative to traditional teaching methods that are often perceived as monotonous and less interactive (Zulnadila et al., 2025). Through a game-based approach, PE teachers now have access to a more effective instructional tool to help children develop motor skills in a fun and meaningful way (Capio et al., 2024; Mavilidi et al., 2018; Petrigna et al., 2022).

In conclusion, this study demonstrates not only the success of the media development process but also highlights the importance of integrating pedagogical design, expert validation, and practitioner involvement to produce instructional media that is effective, contextual, and developmentally appropriate for young learners.

#### **D. CONCLUSION**

Based on the results of this research, and considering the methodology applied, as well as the limitations of the sample and data collection tools used, the researchers draw several key conclusions. First, the study found that commercial revenues and media broadcasting rights contribute significantly to the financing of the Iraqi Olympic Committee. Specifically, media broadcasting rights play an important role in supporting the committee's budget, and the quality of media coverage has a direct influence on the level and effectiveness of business partnerships. However, the study also identified several obstacles that hinder the optimal utilization of these financial resources. Notably, the Iraqi Olympic Committee suffers from weak relationships with major media institutions, and the local market lacks a strong culture of investment in sports.

In light of these findings, the researchers put forward several recommendations. They suggest strengthening the Iraqi Olympic Committee's relations with prominent media outlets to enhance media exposure and attract more business partnerships. Additionally, it is recommended to promote a culture of sports investment within the domestic market by implementing targeted awareness and training programs. Improving sports marketing strategies is also essential to attract sponsors and commercial partners. Lastly, investing in

the development of media infrastructure is necessary to enhance media broadcasting rights and increase the organization's financial revenues.

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