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THE IMPLEMENTATION OF PROBLEM-BASED LEARNING AND THE KASVOL GAME APPROACH ON STUDENTS' MOVEMENT COMBINATION SKILLS

Febrianti Gita Hapsari[1]*, Agung Wahyudi[2]
[1,2]Universitas Negeri Semarang, Semarang, Indonesia
*Corresponding Author: febriantigita8161@students.unnes.ac.id

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Abstract. This study aims to investigate the impact of using animated media on the outcomes of basketball shooting training in children aged 10–11 years. The research employed an experimental method with a population of 40 students participating in basketball extracurricular activities at Cimahi Mandiri 2 Elementary School in Cimahi City. A total sampling technique was used, involving all 40 students. Participants were randomly divided into two groups: an experimental group (20 students) that received training with animated media and a control group (20 students) that received training without animated media. The research instrument used was a basketball shooting test. The results showed that: (a) the use of animated media significantly improved shooting training outcomes, with a t-count of 23.59 > t-table 2.262; (b) training without animated media also led to a significant improvement, with a t-count of 12.68 > t-table 2.262; and (c) the significance test of the difference between group means yielded a t-count of 25.98 > t-table 2.101, indicating a significant difference between the two groups. It is concluded that learning using animated media is more effective in improving basketball shooting performance among elementary school children aged 10–11 years.

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Correspondence address:
Kampus UNNES Sekaran Gunungpati Semarang 50229, Jawa Tengah, Indonesia. febriantigita8161@students.unnes.ac.id

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Program Studi PGSD Universitas Flores. Jln. Samratulangi, Kelurahan Paupire, Ende, Flores.
primagistrauniflor@gmail.com

INTRODUCTION

Physical education is a process that focuses on sports and physical activities, physical education serves as a means to achieve learning objective (Pitnawati et al., 2023; Sepriani et al., 2024). Through physical education, students are taught to improve their health, safety, well-being, and participation in a variety of physical activities, with an emphasis on the changes that occur throughout the process (Illahi et al., 2024; Salsabila et al., 2025). Physical education activities in schools are essential, as they provide students with opportunities to actively engage in various learning experiences related to sports and health (Paramitha & Anggara, 2018). In addition, physical education promotes the optimal development of students in terms of physical abilities, motor skills, knowledge, and social attitudes, thereby contributing to the achievement of educational goals (Sholehudin et al., 2025; Wawrzyniak et al., 2022). Physical education at the elementary school level plays a crucial role in developing students' overall movement abilities, encompassing physical, motor, and psychomotor aspect (Marta et al., 2024). However, the high prevalence of physical inactivity among children in Indonesia has become a pressing issue that demands serious attention. To address this problem, interventions are required, including improving access to physical activity facilities, integrating physical activity into the school curriculum, and eliminating social and cultural barriers to physical activity. One of the critical aspects of physical education is the mastery of fundamental movement skills, which serve as the foundation for the development of more advanced motor skills in subsequent educational stages. There are three main categories of fundamental movements: locomotor, non-locomotor, and manipulative skills (Arfi et al., 2024; Ockta et al., 2024).

In physical education, students are taught to participate in physical activities, including sports skills. It is not surprising that many believe physical education constitutes an essential component of overall education and holds strategic potential to enhance the educational process. Physical education begins at a very early age to stimulate organic, motor, intellectual, and

emotional growth (McGuckin et al., 2024). This early stage is crucial for equipping children with foundational knowledge for their future development. With the advancement of scientific knowledge, the development of physical education learning can serve as a means to facilitate successful teaching and learning activities. Development can be achieved by modifying equipment, or by developing and designing models of fundamental movement learning that relate to basic techniques within the curriculum (Southworth et al., 2023). The objective is to stimulate students to actively participate in learning activities and encourage movement without their conscious awareness that they are engaging in physical activity, making the learning process enjoyable, easy to understand, and engaging. During all activities, students inevitably engage in movements, whether consciously or unconsciously.

Motor skills involve the body's ability to coordinate and control movements either fully or partially (Sutapa et al., 2021). Basic movements such as walking, running, jumping, and throwing involve movement patterns of different body parts, including the legs, arms, and head (Komaini et al., 2022). At the elementary school level, particularly in the upper grades (grades 4–6), physical education instruction is directed toward developing fundamental movement skills in preparation for specific motor skills, including through large ball games such as volleyball (Setyawan et al., 2021). The learning objective of this game is to improve processing skills as well as to maintain fitness and promote a healthy lifestyle. After completing volleyball activities, students should possess the basic skills required to play volleyball. Volleyball comprises several fundamental techniques, including passing, smashing, serving, and blocking (Hermanzoni et al., 2025). Among these, the underhand passing technique is especially important as the foundational skill to initiate volleyball play.

Learning models are defined as blueprints for teaching strategies, course content, and assessment (Raković et al., 2022). Students are better able to comprehend content and actively participate in their own learning when instructors use learning models to design and deliver lessons in a more organized, efficient, and engaging manner (Bhadri & Patil, 2022). One way to systematically organize learning events to meet specific learning objectives is through the use of learning models, which serve as conceptual frameworks. To keep students engaged and positive throughout the learning process, learning models detail all planned activities thoroughly. Problem-Based Learning (PBL) is a teaching strategy that encourages students to solve complex problems in small groups while simultaneously strengthening their analytical reasoning, problem-solving, and collaboration skills (Xu et al., 2023). Learning models are defined as blueprints for curriculum development, instructional resource creation, and student achievement in the classroom (Supriani et al., 2022). To ensure that learning occurs efficiently and successfully, these models assist educators in selecting appropriate strategies, approaches, methods, and procedures for instruction.

Addressing the challenges in physical education requires teachers to provide motivation that encourages students to actively participate in physical education learning. However, this task is not easy, considering the need to adapt the material to the diverse characteristics of students to achieve optimal learning outcomes. Teacher creativity plays a crucial role in capturing students' interest in the learning process, one of which is through modifying games. This study focuses on the modification of the "Kasti Voli" (KASVOL) game, a combination of kasti (a traditional bat-and-ball game) and volleyball. The purpose of this modification is to make volleyball games more varied and engaging. The modification approach in teaching volleyball is highly suitable for physical education because, in addition to providing variety in instructional methods, adapting to students' abilities increases their motivation, prevents boredom, and encourages physical activity.

According Nugraha (2022) game-based learning models have been proven effective in enhancing fundamental motor skills in children. Through enjoyable activities that align with children's natural tendencies, students can optimally develop their motor abilities. Furthermore, a contextual approach to physical education also yields positive outcomes, with research indicating a strong correlation between contextual learning models in sports and the improvement of students' fundamental motor skills. This approach emphasizes full student

engagement in discovering the material and relating it to real-life situations, thereby encouraging its application in daily life. Additionally, the use of audiovisual media in instruction can enhance students' understanding of basic fitness movements. Study by Ramadita et al. (2023) it has been demonstrated that learning methods using audiovisual media can enhance students' interest and understanding in studying fundamental physical fitness movements. Then, study by Amanullah et al. (2024) the findings indicate that the implementation of the modified KASVOL game is highly effective in enhancing student learning during the instructional process.

Therefore, a thorough understanding of the concept and application of fundamental movement skills is essential in the physical education process at the elementary school level. Innovative teaching approaches that align with children's characteristics, such as game-based learning, contextual approaches, and the use of audiovisual media, can enhance the effectiveness of fundamental movement skill instruction and contribute to the development of students' motor skills and physical fitness. The success of physical education in elementary schools largely depends on the creativity of teachers and the implementation of appropriate teaching approaches tailored to the material being taught. However, studies indicate that field training, including volleyball, often lacks a strong theoretical foundation and insufficiently considers the developmental stages of children, thereby hindering the effectiveness of learning. Inappropriate selection of teaching approaches can negatively impact students' learning outcomes (Hidayah & Setiawan, 2023).

Several previous studies have shown that innovative teaching approaches aligned with children's characteristics can significantly enhance the effectiveness of physical education. Purwanto et al. (2024) found that game-based learning models are effective in improving children's fundamental motor skills through enjoyable activities that match their interests. Similarly, Taufik et al. (2022) demonstrated that the use of audiovisual media increases students' interest and understanding of basic fitness movements. Batez et al. (2021) also reported that modified game, positively impact student engagement and learning outcomes in volleyball instruction. However, most of these studies focus on general ball games or contextual and game-modification approaches and have yet to specifically investigate the use of animated media in teaching fundamental basketball techniques. Moreover, Irwanti et al. (2023) emphasized that inappropriate teaching strategies that do not consider children's developmental stages may hinder learning effectiveness.

Addressing this research gap, the present study aims to examine the effect of animated media on improving basketball shooting skills among students aged 10–11 years. This research is expected to contribute to the development of more engaging and effective physical education strategies, particularly in teaching basic basketball skills at the elementary school level. Therefore, the objective of this study is to analyze the effectiveness of implementing the Problem-Based Learning model and to examine the extent of the influence of the KASVOL game approach on learning outcomes related to combined movement skills. This study provides valuable insights into the effectiveness of 50- and 80-meter sprint training in enhancing the physical performance of volleyball players. The findings can be utilized by coaches and sports educators to design more targeted training programs that improve speed, endurance, and acceleration. Additionally, this research contributes to the existing literature by offering empirical evidence on sprint-based conditioning specific to volleyball, and may serve as a reference for future studies in sports science and physical education.

RESEARCH METHODS

This study employs a qualitative approach using a survey method to provide an in-depth description of students' perceptions and experiences regarding the implementation of the PBL model and the KASVOL game approach in combined movement skills material. A qualitative survey enables the researcher to systematically collect data from a number of respondents to understand their views on a particular educational phenomenon. The population of this study consists of all fourth-grade students at MI Roudlotul Huda in Semarang City. A

total of 30 samples were collected using total sampling technique. The instrument used was a closed-ended questionnaire with yes/no answer options. Data were analyzed descriptively and quantitatively using SPSS univariate tests. This approach was selected to thoroughly describe the implementation process of the Problem-Based Learning model and the KASVOL game approach in teaching combined fundamental movement skills, as well as to reveal students' perceptions and experiences during the learning activities. Qualitative surveys are used when researchers aim to gather data from a group of individuals regarding their views, feelings, or experiences about a particular situation.

RESULTS AND DISCUSSION

This study aimed to examine the influence of the Problem-Based Learning (PBL) approach combined with the modified volleyball game "KASVOL" on students' motivation, understanding, motor skills, and social interaction. The research was conducted at MAN 2 Banjarnegara over a period of approximately one month, consisting of 14 sessions, including pretest and posttest assessments. The research employed a quantitative experimental design with a Two Groups Pretest-Posttest Design. Two groups of students were selected using ordinal pairing and were given a treatment in the form of volleyball instruction through the PBL approach integrated with the KASVOL game. Instruments used to measure outcomes included basic volleyball motor skill tests and learning motivation questionnaires (Table 1).

Based on Table 1, the majority of students demonstrated positive interest and attitudes toward learning through the KASVOL game. Eighty percent of students expressed enjoyment in participating in the KASVOL-based learning and reported increased enthusiasm for studying. Furthermore, 86.7% of students preferred learning activities that involved physical movement rather than passive sitting in class. A significant 93.3% indicated that this learning approach increased their liking for physical education, and 90% hoped that such learning activities would be conducted more frequently. These findings align with school observations indicating inadequate sports facilities and infrastructure, which often result in monotonous and passive physical education classes. Children who are accustomed to active movement tend to be more focused and better problem solvers. This suggests that the KASVOL learning approach can effectively foster students' motivation and interest in learning.

Previous research also reported a 67% increase in student learning motivation and an average 18% improvement in learning outcomes following the implementation of modified volleyball game (Dwi Putri & Wijaya, 2024; Siti Nur Hayati & Taufiq Hidayat, 2023). Furthermore, the implementation of varied teaching methods, such as KASVOL, is an important strategy for enhancing students' learning motivation (Rahmasari, 2023). In terms of material comprehension and fundamental movement skills, the majority of students reported positive outcomes. Seventy percent of students stated that the teacher explained the material in an easily understandable manner; however, only 50% indicated that they fully understood what they were supposed to do when playing KASVOL. This suggests that challenges remain in comprehending the rules or procedures of the game thoroughly. According to John Dewey's perspective (Mubarok, 2024), John Dewey stated that education is not merely a transfer of knowledge from teacher to student. Rather, education is an active process in which students interact with their environment and others, meaning that understanding the material requires time and a process of adaptation.

Seventy percent of students reported that the KASVOL game helped them practice locomotor and manipulative movements, as well as successfully complete challenges assigned within their teams. Additionally, 76.7% of students experienced improvements in their ability to catch and throw the ball and felt more confident in performing combined fundamental movements. Furthermore, 86.7% of students found it easier to understand basic movements after learning through the PBL approach. KASVOL shares several similarities with the traditional game of kasti. This finding aligns with previous research Hari (2024) which demonstrates that the game of kasti can enhance students' manipulative movement skills.

Table 1. Descriptive Analysis of Questionnaire Responses

Student Statement	Frequency (n=30)	Percentage (100%)
Enjoy participating in learning with the KASVOL game		
Yes	24	80
No	6	20
Learning with the game increases enthusiasm for studying		
Yes	24	80
No	6	20
Teacher explains material in an easily understandable way		
Yes	21	70
No	9	30
Understand what to do when playing KASVOL		
Yes	15	50
No	15	50
Able to follow teacher's instructions well during learning		
Yes	21	70
No	9	30
KASVOL game helps train locomotor and manipulative movements		
Yes	21	70
No	9	30
Able to complete tasks or challenges given in teams		
Yes	21	70
No	9	30
Experienced improvement in catching and throwing the ball		
Yes	23	76,7
No	7	23,3
Feel easier to understand fundamental movements after PBL		
Yes	26	86,7
No	4	13,3
Prefer learning while moving rather than just sitting in class		
Yes	26	86,7
No	4	13,3
Feel more confident performing combined fundamental movements		
Yes	23	76,7
No	7	23,3
Peers support and cooperate during activities		
Yes	29	96,7
No	1	3,3
This learning method increases liking of physical education		
Yes	28	93,3
No	2	6,7
Do not experience difficulty performing taught movements		
Yes	22	73,3
No	8	26,7
Want this type of learning conducted more often		
Yes	27	90
No	3	10

Furthermore, the use of the Problem-Based Learning approach has proven effective in improving learning outcomes in physical education (Parwata, 2021) and basic engineering skills such as bottom passing (Waskita et al., 2024). In the social aspect, students also demonstrated positive responses. A total of 29 students (96.7%) reported that their peers were supportive and cooperative throughout the learning activities. This finding indicates that the KASVOL-based learning approach also fosters positive social interaction and effective teamwork among students. Research by Putri et al. (2024) research suggests that structured physical activities promote social interaction, which in turn contributes to the development of social, emotional, and character skills. This finding is supported by studies indicating that volleyball instruction

using a cooperative learning approach encourages active participation and peer support, thereby fostering social interaction and enhancing students' learning motivation (Wahyudi, 2025).

Most students reported not experiencing significant obstacles during the learning process. Only 8 students (26.7%) stated that they had difficulty performing the taught movements, while the remaining 22 students (73.3%) indicated they encountered no difficulties. These findings suggest that the KASVOL-based learning is fairly inclusive and can be followed well by the majority of students, although special attention is still needed for the small number of students who continue to experience challenges. Research by Fajrin et al. (2023), research highlights that each student possesses varying abilities in receiving instruction from educators, which underscores the need to further explore alternative learning models that can optimize the material transfer process. The survey results from 30 students revealed that they responded positively to the PBL approach combined with the modified volleyball game KASVOL.

The findings are in line with previous research highlighting the benefits of game-based and student-centered learning in physical education. For example, Cruz (2024) demonstrated that the use of games significantly boosted student engagement in volleyball learning, while Susilawati & Doyan (2023) found that PBL models improved both cognitive and psychomotor skills in primary school students. However, other studies suggest potential challenges, especially when PBL is implemented without sufficient teacher training or in large classes with limited supervision. These contrasting views underscore the importance of equipping teachers with adequate knowledge and resources to effectively implement such methods. The implications of this research are particularly relevant for physical education teachers and curriculum developers. The combination of PBL and game-based learning such as KASVOL offers an effective strategy to promote holistic student development, especially in schools where access to traditional sports equipment is limited. This approach not only supports the acquisition of physical skills but also fosters motivation, teamwork, and student confidence. Teachers are encouraged to incorporate such models more regularly into their lesson plans, ensuring that clear and structured explanations of game rules are provided to maximize student understanding and participation. Furthermore, professional development opportunities such as workshops or training sessions are recommended to enhance teachers' competence in implementing PBL effectively in physical education settings.

Nonetheless, this study had several limitations. The duration of the intervention—only one month—may not have been sufficient to observe sustained changes in student outcomes. The relatively small sample size, limited to one school, restricts the generalizability of the results. Additionally, external factors such as the level of parental involvement, availability of school facilities, and prior student experience with volleyball were not controlled, which may have influenced the results. Future research should address these limitations by extending the duration of the intervention, involving a more diverse and larger sample of schools, and controlling for additional variables that might affect student learning outcomes. The integration of the PBL approach with the KASVOL modified volleyball game provides a valuable and innovative alternative in physical education. The approach enhances student engagement, understanding, and social development while aligning with the learning characteristics of elementary and middle school students. With proper support, training, and curriculum integration, this model holds the potential to improve the overall quality of physical education instruction and promote a more inclusive and motivating learning environment.

CONCLUSIONS AND SUGGESTIONS

Based on the results of this study, it can be concluded that the application of the PBL model combined with the modified volleyball game KASVOL has a positive impact on students' motivation, understanding, motor skill development, and social interaction in physical education. Most students responded positively to the learning process, expressing enjoyment, increased enthusiasm, and improved ability in fundamental movement skills. The KASVOL model also fostered teamwork and boosted students' confidence during physical activities. Despite some students experiencing difficulties in understanding the game instructions, the

overall findings suggest that this approach is effective, engaging, and inclusive, making it highly suitable for elementary school learning environments. In light of these findings, several suggestions are proposed. First, the KASVOL model should be more widely implemented, particularly in schools with limited physical education facilities, due to its simple yet impactful design. Second, physical education teachers should receive training or workshops to improve their ability to deliver PBL and game-based learning strategies effectively. Third, clearer and more structured instructions need to be emphasized in future applications to ensure all students understand the game rules. Fourth, education stakeholders should support the integration of innovative, active, and student-centered learning models into the curriculum to promote holistic development. Lastly, further research is recommended to evaluate the long-term effects of the KASVOL model across different student groups and educational levels.

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