



Impact of Educational Sessions Based on Thelen's Model on Learning Basic Basketball Skills among Secondary School Students

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Abstract

Objectives: This study aimed to examine the effect of educational sessions based on Thelen's model on learning basic basketball skills among secondary school students.

Materials and Methods: This study used an experimental design with two equivalent groups and pre-test–post-test measurements. The participants were 49 fifth-grade science students from Daabal Al-Khaza'i Secondary School for Boys. After exclusions, the main sample consisted of two groups: an experimental group and a control group, each consisting of 16 students. The experimental group was taught using educational sessions based on Thelen's model, while the control group was taught using the traditional method. The program consisted of eight weekly sessions focused on lay-up shooting and jump shooting. Data were analyzed using SPSS version 23.

Results: Both groups showed significant improvement from pre-test to post-test in lay-up shooting and jump shooting. However, the experimental group achieved better post-test results than the control group. In lay-up shooting, the experimental group obtained a post-test mean of 23.954, compared with 21.396 in the control group. In jump shooting, the experimental group obtained a post-test mean of 20.795, compared with 17.651 in the control group.

Conclusions: Educational sessions based on Thelen's model were more effective than the traditional method in improving lay-up shooting and jump shooting among secondary school students. The model encouraged cooperation, group inquiry, active participation, and reflective learning, making it suitable for basketball instruction in physical education classes.

Keywords: Thelen's model; group investigation; basketball skills; physical education; secondary school students.

Introduction

Physical education is not only concerned with physical movement but also with developing students' thinking, cooperation, confidence, and ability to solve learning problems (Kuswoyo et al., 2020; Kuswoyo & Shareef, 2025; Renshaw & Chow, 2019). In teaching sports skills, the teacher's method plays an important role in helping students understand movement patterns and perform skills correctly (Dudley et al., 2011; Fizi et al., 2023a). Traditional instruction is still useful in some situations, but it often limits students' active participation because the teacher becomes the main source of explanation and correction.

In basketball learning, students need repeated practice, clear feedback, and meaningful interaction with peers. Skills such as lay-up shooting and jump shooting require coordination, timing, body control, and accuracy (Hidayat et al., 2024; McCormack, 2020; Riyanto & Kuswoyo, 2019). These skills are not always easy for secondary school students because basketball is a dynamic game that involves movement, decision-making, and changing situations (Isnaini et al., 2026; Luo et al., 2022).

Thelen's model, also known as the group investigation model, is a student-centered learning model that encourages learners to work in groups, investigate problems, plan activities, perform tasks, discuss results, and evaluate performance. This model can help students become more active in the learning process because they do not only follow instructions but also participate in questioning, planning, practicing, and reflecting (Andika et al., 2024; Cain et al., 2024; YULIANTO et al., 2019).

Previous studies have shown that cooperative and group-based learning models can improve students' learning outcomes in physical education (Chang et al., 2020; Fizi et al., 2023b; Renshaw & Chow, 2019). Yang et al. found that cooperative learning in physical education supported student interaction and learning effectiveness (Lee & Hannafin, 2016; Renshaw et al., 2010; Smith, 1991). Afif also reported that cooperative learning improved junior high school students' basketball learning outcomes. In line with this, group investigation learning has been reported to improve basketball learning outcomes through active group participation and peer cooperation (Irawati & Aziz, 2025; Isnaini et al., 2026; Pino-Ortega et al., 2021).

Based on this background, this study aimed to examine the impact of educational sessions based on Thelen's model on learning lay-up shooting and jump shooting among secondary school students.

Materials and Methods

Study Design

This study used an experimental design with two equivalent groups and pre-test–post-test measurements. The design was selected to compare the effect of Thelen's model with the traditional teaching method on students' basketball skill learning (Sugiyono, 2012).

Study Participants

The research population consisted of 2,158 fifth-grade science students in Wasit Governorate, distributed across 46 schools in Al-Kut District. The sample was selected purposively from Daabal Al-Khaza'i Secondary School for Boys. The total sample consisted of 49 students. After excluding students who were absent, had failed, or had health conditions that prevented participation in physical education classes, the main sample consisted of 32 students. They were divided into an experimental group and a control group, with 16 students in each group. Six students were selected for the pilot study from outside the main research sample.

Study Organization

The experimental group was taught using educational sessions based on Thelen’s model, while the control group was taught using the traditional method. The program consisted of eight educational sessions, with one session conducted each week. The learning material focused on two basic basketball skills: lay-up shooting and jump shooting.

Each session was divided into preparatory, main, and concluding sections. In the experimental group, the main learning process followed the stages of Thelen’s model: topic selection, group distribution, collaborative planning, implementation of the action plan, analysis and synthesis, presentation of results, and evaluation. This structure encouraged students to work together, discuss movement problems, perform skill tasks, and reflect on their performance.

The skills were measured using two tests: the lay-up shooting test and the jump shooting test. Pre-tests were conducted before the learning program, while post-tests were conducted after the completion of the educational sessions.

Statistical Analysis

Data were analyzed using SPSS version 23. Descriptive statistics were used to calculate mean and standard deviation. The t-test was used to examine differences between pre-test and post-test results within each group and to compare post-test results between the experimental and control groups. The significance level was set at $p \leq 0.05$.

Results

Equivalence of the Experimental and Control Groups

Before the intervention, the experimental and control groups were equivalent in both basketball skills. There were no significant differences between the groups in lay-up shooting and jump shooting.

Table 1. Equivalence of the Experimental and Control Groups in Basketball Skill Tests

Test	Group	Mean	SD	t-value	Sig.	Interpretation
Lay-up shooting	Experimental	17.466	3.028	0.184	0.158	Not significant
Lay-up shooting	Control	17.697	3.105			
Jump shooting	Experimental	14.133	3.185	0.912	0.648	Not significant
Jump shooting	Control	14.266	3.582			

Pre-test and Post-test Results

Both groups improved significantly after the learning program. However, the experimental group showed greater improvement than the control group.

Table 2. Pre-test and Post-test Results of Lay-up Shooting and Jump Shooting

Group	Test	Pre-test Mean	SD	Post-test Mean	SD	t-value	Sig.	Interpretation
Experimental	Lay-up shooting	17.466	3.028	23.954	3.836	7.293	0.000	Significant
Experimental	Jump shooting	14.133	3.185	20.795	3.516	6.496	0.000	Significant
Control	Lay-up shooting	17.697	3.105	21.396	4.196	4.927	0.001	Significant
Control	Jump shooting	14.266	3.582	17.651	3.991	4.150	0.001	Significant

Post-test Comparison between Groups

The post-test comparison showed significant differences in favor of the experimental group for both lay-up shooting and jump shooting.

Table 3. Post-test Comparison between Experimental and Control Groups

Test	Experimental Mean	SD	Control Mean	SD	t-value	Sig.	Interpretation
Lay-up shooting	23.954	3.836	21.396	4.196	3.102	0.009	Significant

Jump shooting	20.795	3.516	17.651	3.991	3.628	0.011	Signific
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Discussion

The results showed that both the experimental and control groups improved in lay-up shooting and jump shooting. This means that both teaching methods contributed to students' basketball learning. However, the experimental group achieved greater improvement, indicating that educational sessions based on Thelen's model were more effective than the traditional method (Lutz et al., 2024; McCormack, 2020).

The superiority of the experimental group can be explained by the learning structure of Thelen's model. Students were not only asked to imitate the teacher's demonstration but were also involved in group discussion, planning, practice, observation, and evaluation. This process created a more active learning environment and allowed students to understand the reasons behind correct and incorrect movement performance.

This finding is consistent with previous studies showing that cooperative learning can improve physical education outcomes by increasing student participation, peer support, and shared responsibility. Yang et al. stated that cooperative learning in physical education promotes interaction and helps students engage more actively in learning tasks (Ferriz et al., 2025; Rachman, 2009; Syaukani et al., 2023). Similarly, Afif found that cooperative learning had a positive effect on basketball learning outcomes among junior high school students (McCormack, 2020; Prastiwi et al., 2025; Sari et al., n.d.).

The improvement in lay-up shooting may be related to the opportunity students had to observe, discuss, and correct movement errors with their peers. Lay-up shooting requires coordinated footwork, ball control, timing, and finishing accuracy. Through group investigation, students could exchange feedback and repeat the movement with better awareness. This supports the view that group-based learning helps students develop both motor skills and cognitive understanding of movement tasks.

The improvement in jump shooting also indicates that Thelen's model helped students build confidence and technical consistency. Jump shooting requires balance, coordination, release timing, and accuracy. In the experimental group, students were encouraged to analyze weaknesses and compare performance results within their groups. This reflective process may have helped them understand how to adjust their movement and improve shooting performance.

The findings are also aligned with research on group investigation learning, which reports that this model can improve basketball learning outcomes through collaboration, problem-solving, and active student involvement. Recent studies also suggest that student-centered and game-based learning models can improve basketball skills and engagement because they give learners more meaningful practice opportunities.

Overall, Thelen's model appears suitable for teaching basic basketball skills because it combines motor practice with group inquiry, communication, reflection, and evaluation. This is important in physical education because students need not only to perform movements but also to understand how and why the movements should be performed correctly.

Conclusions

Educational sessions based on Thelen's model significantly improved students' lay-up shooting and jump shooting skills. Although the traditional teaching method also produced improvement, the experimental group taught using Thelen's model achieved better post-test results.

Thelen's model encouraged active participation, group cooperation, problem-solving, peer discussion, and reflective learning. Therefore, this model can be considered an effective instructional approach for teaching basic basketball skills in secondary school physical education.

Recommendations

Physical education teachers are encouraged to use Thelen's model in teaching basketball skills, especially lay-up shooting and jump shooting. Schools should organize professional development activities to introduce teachers to student-centered learning models, including group investigation and cooperative learning. Future studies should apply Thelen's model to other sports skills, different educational levels, and both male and female students.

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