

The Effect of the Tactical Games Model on Psychomotor Learning Outcomes in Badminton at SMAN 1 Ciampel Karawang

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Abstract

This study was conducted to analyze the impact of the Tactical Games Model (TGM) on students' psychomotor learning achievement in badminton. The methodology employed was an experimental approach using a pretest–posttest control group design. The research was carried out over ten learning sessions, beginning with an initial evaluation using a modified badminton game for one set, assessed with the Game Performance Assessment Instrument (GPAI). This was followed by eight learning sessions with the application of TGM as the primary intervention, and concluded with a final evaluation using the same format as the initial assessment. Data analysis of the pretest and posttest results employed the Paired Sample T-test. The results indicated a significant improvement in students' learning outcomes after the implementation of the TGM learning model. The findings revealed that the final evaluation scores of the experimental group in each test instrument produced a Paired Sample T-test result with a significance value (2-tailed) < 0.05 ($0.010 < 0.05$). Thus, it can be concluded that the implementation of the TGM learning model had a significant effect on students' psychomotor learning outcomes in badminton at SMAN 1 Ciampel Karawang.

Keywords: Badminton; TGM; learning

1. Introduction

Physical education is essentially a learning process that involves physical activity to promote the holistic development of an individual's body, mind, and psychological well-being. Through physical activities, individuals gain valuable experiences such as critical thinking, emotional regulation, empathy, cooperation, and more. The main purpose is to influence the development of psychomotor aspects in relation to human growth while also supporting other developmental domains. In general, physical education is part of the overall educational process, designed, structured, and maintained to provide knowledge, skills, character, health, and physical fitness [1]. Play is one domain of physical education that can serve as a method of learning to meet students' educational needs while also having a positive impact on children's growth and development. The implementation of play has been widely recognized around the world, particularly in its ability to enhance cognitive aspects and social skills, which in turn contribute to children's growth and development [2]. (Wiwik Pratiwi, 2017).

Educators must possess the ability to develop, master, and implement various teaching models that are well-accepted by students in order to achieve optimal learning outcomes.

Teachers play a crucial role in ensuring that all learners reach the targeted competencies while creating a learning environment that is both meaningful and challenging. Learning is the core of the entire educational process. However, achieving these goals requires support from various contributing factors [3]. Thus, the success of educational objectives largely depends on the quality of the learning process experienced by students as the main subjects of education [4]. When physical education and sports learning are properly designed and implemented, they

can make a positive contribution to children's holistic development—physically and mentally—ultimately enhancing their skills, physical fitness, and spiritual well-being, while shaping a well-rounded personality.

Based on observations and discussions with physical education teachers, the teaching process at SMAN 1 Ciampel has generally been carried out according to the lesson plans. However, in badminton lessons, the overall outcomes did not meet expectations, with students' skill mastery remaining unsatisfactory. This indicates that the learning process has not been fully effective. Limited active student participation has been identified as one of the factors affecting skill development. During lessons, students are often observed spending much of their time interacting with peers and showing low enthusiasm in completing teacher-assigned tasks. This lack of commitment hinders the achievement of educational objectives. In essence, physical education is designed to develop students' motor abilities and functional values across cognitive, affective, and psychomotor domains. Through physical activities, students are expected to undergo meaningful transformations in personality, mental health, and social competence within their environment [5]. According to [6], Physical Education, Sports, and Health is an educational process that primarily employs physical activity as its main medium of instruction.

Another issue is the lack of instructional variety in high schools, which often causes boredom and disengagement among students. As a result, learning outcomes—particularly in the psychomotor domain—are underdeveloped, even though physical activities should ideally help shape students' motor skills, thinking patterns, and social development in sports, including cooperation, enjoyment, and mutual respect. All of these can be effectively achieved through well-designed physical education.

2. Theoretical Framework

a. Badminton

Badminton is one of the most popular sports both in Indonesia and internationally. This sport belongs to the category of games and can be played either indoors or outdoors on designated courts. Badminton is an activity in which players strike a shuttlecock with a racket, directing it over the net into the opponent's area with the aim of preventing the opponent from returning it [7]. The sport can be enjoyed by individuals of all ages and skill levels, both male and female, for either recreational or competitive purposes [8]. As a racket sport, badminton has unique characteristics that distinguish it from other sports. It requires a high level of flexibility, optimal physical conditioning, and full-body coordination that are rarely found in other disciplines [9]. Since it can be played both indoors and outdoors, and because it involves minimal physical contact, badminton is suitable for various settings—from recreation to serious competition [10]. Additionally, badminton fosters social interactions among players, which may develop into sustainable relationships beyond the court, including in business contexts [11].

In badminton, a number of fundamental techniques must be mastered accurately. Mastery of basic skills must be learned in depth to ensure that players can apply them effectively in games, thereby supporting their ability to win through technical execution [12]. Once coordination in basic techniques has been established, advanced training becomes

easier [7]. Technical mastery is essential for players to implement various strokes that can score points and disrupt opponents' defensive strategies [13]. Fundamental badminton techniques include racket grips, strokes, and footwork.

Racket grips

- American grip: used for overhead strokes, especially smashes
- Forehand grip: used for strokes on the right side of the body
- Backhand grip: used mainly for defensive strokes, particularly below the waist
- Combination grip: integrates all grip techniques

Strokes

- Service: the initial stroke, either short or long
- Drive: a fast, flat shot intended to pressure the opponent
- Smash: a powerful attacking shot aimed at ending the rally
- Drop shot: a deceptive shot designed to score by surprise
- Lob: a high shot directed toward the backcourt

Footwork

- Coordinated foot movements to optimize player positioning
- Proper stance to maintain balance and agility

b. Tactical Games Model

The Tactical Games Model is an instructional approach that emphasizes skill acquisition in a particular sport through game-based formats [14]. Using games as the basis of learning, students are exposed to sport-specific techniques within real play situations. The tactical approach is student-centered, as learners are directly placed in game contexts while simultaneously developing the techniques of the sport being studied. This model provides opportunities for students to identify challenges during play and encourages them to autonomously explore and discover solutions, thereby fostering active engagement, adaptability, and independence [15].

By adopting the basic principles of *Tactical Games for Understanding (TGfU)* and integrating them into educational contexts, researchers developed an instructional model emphasizing the use of modified games [16]. The objectives of the tactical games model include:

1. Improving students' understanding of game concepts by applying proper techniques in game situations.
2. Developing mastery of the game through strategies and building skills through integrated abilities.
3. Creating enjoyment during activities.
4. Fostering decision-making skills to solve problems during play [17].

According to [18], the tactical approach in teaching physical education is oriented toward leveraging students' interests as a game structure to promote the development of both tactical knowledge and essential skills.

c. Hypothesis Development

The Tactical Games Model (TGM) is an instructional model that significantly

influences students' skill development in badminton learning, making it highly suitable for use in physical education, particularly in badminton instruction. Learning success is strongly influenced by this model, as its purpose is to enhance students' understanding of skills and learning outcomes.

The tactical games model is considered effective because it integrates tactical play elements into learning, thereby increasing the quality of the physical education learning process in schools. In this study, the use of TGM refers to an instructional approach that emphasizes understanding and decision-making in game situations rather than focusing solely on technical skills. The purpose of this research is to improve student learning outcomes in badminton by applying the Tactical Games Model at SMAN 1 Ciampel.

3. Methodology

This research applied an experimental approach in the form of a true experimental design, as it is "a statistical approach used to establish causal relationships between different variables" [19]. The research design implemented was a pretest-posttest control group design, where both groups were assessed before and after treatment.

- Group A (Control group): received no special treatment.
- Group B (Experimental group): received the Tactical Games Model (TGM) treatment.

The study was conducted over 10 sessions, with a total sample of 64 students divided into two groups: 32 in the control group and 32 in the experimental group. The instrument used is the GPAI (Game Performance Assessment Instrument). Several aspects observed in this instrument include behaviors that reflect how students play in order to address various tactical problems in the game, namely through the processes of decision-making, body movement, and the execution of selected skills. Observed aspects included:

- Decision Making (DMI)
- Skill Execution (SEI)
- Support (SI)

Table 1. Badminton Game Performance Assessment (GPAI)

| Scoring Key | Description |
|-----------------|--|
| 5 | Very effective performance |
| 4 | Effective performance |
| 3 | Fairly effective performance |
| 2 | Less effective performance |
| 1 | Poor performance |
| Skill execution | The student positions themselves under the falling shuttlecock and performs the technical movement sequence correctly. |
| Decision making | The student makes the right choices during play. |
| Support | The student delivers the shuttle accurately and provides defensive support. |

Table 2. Assessment Format (GPAI)

| No | Name | Aspects of Assessment | | | | | | | | | | | | | | | |
|----|------|-----------------------|---|---|---|---|-----------------|---|---|---|---|---------|---|---|---|---|-------|
| | | Decision Making | | | | | Skill Execution | | | | | Support | | | | | Total |
| | | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | |
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |

| Aspect | Criteria |
|--------------------|--|
| 1. Decision Making | <ul style="list-style-type: none"> • Making the correct decision regarding the position of the incoming shuttle. • Directing the shuttle to an area that is difficult for the opponent to reach. |
| 2. Skill Execution | <ul style="list-style-type: none"> • Positioning oneself under the falling shuttle. • Performing the movement sequences of the lob and smash. |
| 3. Support | <ul style="list-style-type: none"> • Delivering the shuttle in a way that is easy for a teammate to receive or return. • Performing defensive actions. |

Table 3. Observation Instrument for Badminton Game Performance Assessment (GPAI)

The formula for assessing game performance is as follows:

$$\text{Game Performance} = (\text{DMI} + \text{SEI} + \text{SI}) / 3$$

Research Procedures:

1. Conducting a pretest with all students using GPAI.
2. Administering treatment through TGM over 8 sessions.
3. Conducting a posttest with all students using GPAI.
4. Performing data analysis.
5. Drawing conclusions.

4. Results and Discussion

a. Descriptive Results of Pretest and Posttest

The badminton performance data used for analysis were obtained from the pretest and posttest results after 8 treatment sessions using GPAI.

Table 4. Data Description

| | N | Minimum | Maximum | Mean | Std. Deviation |
|--------------------|----|---------|---------|--------|----------------|
| PretestA | 32 | 1.00 | 2.67 | 1.9063 | .41630 |
| PosttestA | 32 | 1.33 | 2.67 | 1.9456 | .40443 |
| PretestB | 32 | 1.00 | 3.00 | 1.9578 | .60312 |
| PosttestB | 32 | 2.00 | 3.67 | 2.6981 | .46758 |
| Valid N (listwise) | 32 | | | | |

Minimum pretest scores for both control (A) and experimental (B) groups were 1.00. Maximum pretest and posttest scores for the control group were 2.67, with mean scores of 1.90 (pretest) and 1.94 (posttest). Maximum pretest and posttest scores for the experimental group were 3.00 and 3.67, with mean scores of 1.95 (pretest) and 2.69 (posttest). This shows that while both groups started at similar levels, the experimental group demonstrated greater improvement after the treatment.

b. Normality Test

Normality testing results indicate that both pretest and posttest data from the control and experimental groups were normally distributed. For example, in the pretest, the control group obtained $L_{count} = 0.056$ and the experimental group $L_{count} = 0.060$, both smaller than L_{table} at $\alpha = 0.05$.

Similarly, in the posttest, the control group obtained $L_{count} = 0.068$ and the experimental group $L_{count} = 0.078$, again showing data normality.

Table 5. Normality Test

| | Kolmogorov-Smirnov ^a | | | Shapiro-Wilk | | |
|-----------|---------------------------------|----|------|--------------|----|------|
| | Statistic | df | Sig. | Statistic | df | Sig. |
| PretestA | .184 | 32 | .056 | .935 | 32 | .054 |
| PosttestA | .221 | 32 | .060 | .908 | 32 | .010 |
| PretestB | .153 | 32 | .068 | .932 | 32 | .045 |
| PosttestB | .211 | 32 | .078 | .907 | 32 | .009 |

c. Homogeneity Test

Based on Table 6, the homogeneity test shows a significance value of 0.080. Since the significance value of 0.080 is greater than 0.05, it can be concluded that the data are homogeneous.

Therefore, it can be concluded from the results of the homogeneity test that the pretest and posttest scores of both the control group and the experimental group have the same variance and are homogeneous.

Tabel 6. Homogeneity Test

| Levene Statistic | | | df1 | df2 | Sig. |
|------------------|--------------------------------------|-------|-----|--------|------|
| Study Result | Based on Mean | 3.177 | 1 | 61 | .080 |
| | Based on Median | 2.530 | 1 | 61 | .117 |
| | Based on Median and with adjusted df | 2.530 | 1 | 48.302 | .118 |
| | Based on trimmed mean | 2.881 | 1 | 61 | .095 |

d. T-Test

Based on the results in Table 7, it can be stated that the calculated t value in the

experimental group is negative, namely -9.383, while the t table value is 1.690. If the calculated t value is negative, then the t table value is also adjusted. The positive or negative sign only indicates the direction of hypothesis testing and linearity, not the magnitude (Sarwono in Dwi Poernomo et al., 2015). Therefore, it can be concluded that the calculated t value is less than the table t value ($-8.313 < -1.690$), and the obtained significance value is 0.01, which is less than 0.05. This indicates that there is a significant effect of the Tactical Games Model on psychomotor learning outcomes in the pretest and posttest data.

Table 7. T-Test

| | Mean | Pair Std. Deviation | d Difference Std. Error Mean | nces 95% Confidence Interval of the Difference | | t | df | Significance Sig. (2-tailed) |
|---------------------------------------|--------|---------------------|------------------------------|--|--------|--------|----|------------------------------|
| | | | | Lower | Upper | | | |
| Control Group (Pretest - Posttest) | -0.039 | 0.1067 | 0.0189 | -0.078 | -9E-04 | -2.087 | 31 | 0.01 |
| Experimental Group (Pretest-Posttest) | -0.74 | 0.4463 | 0.0789 | -0.901 | -0.579 | -9.383 | 31 | 0.01 |

Based on the data analysis of the research results, a significant improvement was observed in the sample studied. The implementation of the Tactical Games Model had a significant impact on students' learning outcomes in badminton at SMAN 1 Ciampel.

The Tactical Games Model is effective in improving badminton learning outcomes because it is presented in a game-based format. Students learn badminton techniques through a game-based approach, which makes them more interested and motivated. Through this approach, various aspects of students' development can be fostered, including physical fitness, teamwork skills, technical abilities, and competitive attitudes. This indicates that badminton learning delivered in a game-based format not only enhances technical skills but also supports the development of other important aspects.

5. Conclusion

The Tactical Games Model can have a significant effect on badminton learning outcomes. By using the Tactical Games Model, students find it easier to engage in the playing process. Through a comprehensive tactical approach, students are able to learn how to position themselves in various situations and develop playing skills in accordance with the rules of the game [20]. This learning model directly enables students to gain meaningful learning experiences and a deeper understanding of playing badminton. Furthermore, by applying specific learning models, it is also possible to identify factors that hinder the learning process.

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