



Literature Review of Basic Badminton Skills Learning in School Physical Education

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A. Conception and design of the study; **B.** Acquisition of data;
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ABSTRACT

This literature review examines current trends, methodologies, and outcomes in teaching basic badminton skills within school physical education (PE) programs. A systematic review process following the PRISMA guidelines identified 187 studies, with 20 peer-reviewed articles meeting the inclusion criteria for final analysis. The review highlights a growing shift from traditional direct instruction toward innovative pedagogical models such as Teaching Games for Understanding (TGfU), Sports Education, and hybrid approaches. For example, a study by Gil-Arias et al. (2018) revealed that TGfU increased students' decision-making and gameplay performance by 32% compared to control groups. Similarly, Chen et al. (2020) demonstrated that integrating game-based learning improved serve accuracy by 27% among junior high students. Technology-enhanced instruction also emerged as a critical factor, with Lin et al. (2021) reporting that wearable motion sensors contributed to a 23% increase in double coordination among participants. Peer-assisted learning and cooperative strategies were shown to enhance skill acquisition, motivation, and self-efficacy (Huang & Tongdecharoen, 2024). The studies also emphasize the importance of assessment tools tailored to badminton, as noted by Williyanto et al. (2018), who developed a reliable and valid rubric for measuring fundamental skills. Despite these positive outcomes, barriers such as inadequate facilities, large class sizes, and limited teacher training continue to hinder effective implementation. The findings suggest the need for comprehensive teacher development programs and curriculum alignment to support the application of contemporary instructional models.

Keywords : Badminton; Physical Education; Teaching Games for Understanding (TGfU); Skill Development; Instructional Models.

INTRODUCTION

Physical education (PE) has long been recognized as an essential component of the school curriculum, contributing to students' holistic development—physically, socially, emotionally, and cognitively (Bailey et al., 2009). The integration of sports into PE, including racquet sports such as badminton, provides a structured yet enjoyable platform for cultivating physical literacy, motor competence, and lifelong engagement in physical activity (Whitehead, 2019). Globally, badminton is widely taught due to its minimal space



requirements, adaptability, and effectiveness in developing various physical skills such as agility, coordination, balance, and reaction speed (Baker et al., 2021).

In Indonesia, badminton holds a prestigious position in the national sporting culture, owing to its international achievements and deep-rooted popularity among students and communities. As such, badminton is not only emphasized in extracurricular programs but also incorporated into the school PE curriculum at primary and secondary levels (Kusmaedi et al., 2020). This inclusion underscores the strategic role of badminton in enhancing basic movement skills (BMS), tactical understanding, and discipline-specific motor abilities among learners (Permana et al., 2021).

However, despite its recognized value, the implementation of badminton learning in schools varies significantly in terms of pedagogical quality, instructional design, and teacher competency. These disparities, combined with contextual limitations such as facility access and class sizes, influence the effectiveness of badminton education (Putra et al., 2022).

Badminton, as a skill-based sport, encompasses a variety of fundamental techniques such as grip, stance, footwork, serve, lob, clear, drop shot, and smash (Phomsoupha & Laffaye, 2015). The mastery of these basic skills is critical for progression to more complex tactical plays and competitive levels. Research shows that structured instruction focusing on skill breakdown and repetition, combined with game-based learning strategies, yields significant improvements in student performance (Yunus et al., 2019; Fauzi & Irwansyah, 2022).

In PE contexts, especially at the junior secondary school level, the emphasis is typically on skill acquisition, motor development, and game understanding (Siedentop, 2011). Teachers often adopt instructional models like the Teaching Games for Understanding (TGFU) or Sports Education Model (SEM) to deliver badminton lessons in a student-centred, inquiry-based manner that promotes both cognitive and psychomotor growth (Hastie et al., 2011; Rocha et al., 2023).

National studies in Indonesia have echoed the significance of aligning badminton learning with age-appropriate motor development stages. For example, Rahayu et al. (2021) demonstrated that incorporating visual media and peer teaching could significantly enhance students' engagement and comprehension in badminton learning. Moreover, physical conditioning activities such as agility ladders and shadow footwork drills have been shown to positively influence students' ability to perform basic badminton techniques efficiently (Sudrajat & Sutisna, 2020).

However, despite increasing research attention, there remains a lack of systematized reviews that consolidate findings related to effective learning strategies, pedagogical frameworks, and contextual barriers in badminton education, particularly within Indonesian school settings.

While the integration of badminton into PE has been generally positive, several issues hinder its optimal implementation:

1. Lack of Standardization in pedagogical approaches: Teachers often rely on traditional command-style instruction, limiting students' opportunities for tactical exploration (Iskandar et al., 2019).
2. Insufficient Teacher Training: Many PE instructors report low confidence in teaching technical components of badminton due to limited pre-service or in-service training (Saputra et al., 2018).
3. Facility Constraints: Many schools lack adequate equipment or designated indoor spaces to conduct effective badminton lessons (Kurniawan & Arifin, 2020).
4. Curriculum Overload: Time constraints within the PE schedule prevent sufficient repetition and mastery of fundamental skills (Sunarto et al., 2022).

5. Lack of Localized Pedagogical Models: Existing models are often adapted from Western contexts and may not consider cultural or infrastructural differences in Indonesian schools (Suryani et al., 2021).

These challenges underscore the importance of examining the literature to map out what has been studied, what methods have been applied, and what findings can inform future instructional development.

Although numerous empirical studies have addressed isolated aspects of badminton instruction in schools such as teaching strategies, motor outcomes, or student motivation there is no comprehensive literature review that collates these insights into a coherent framework for educators and policymakers. Additionally, most studies focus on small-scale interventions without integrating findings into a broader pedagogical discourse (Prasetyo et al., 2019).

Further, many investigations do not consider cross-cutting themes such as gender inclusivity, differentiated instruction, or the integration of digital media in badminton learning. There is also limited comparative analysis between various pedagogical models (e.g., direct instruction vs. TGFU) in the context of basic badminton skills.

The novelty of this literature review lies in its holistic synthesis of research findings on basic badminton skills learning in school PE. It uniquely:

1. Focuses on both psychomotor and cognitive outcomes of badminton instruction.
2. Highlights contextual challenges and enablers specific to Indonesian education systems.
3. Compares pedagogical frameworks and identifies best practices tailored to school settings.
4. Offers practical recommendations for curriculum developers, teacher training institutions, and policymakers.

This review thus bridges the gap between theoretical insights and practical implications, positioning itself as a resource for advancing badminton pedagogy in both national and global education landscapes.

In light of the growing need for structured, evidence-based badminton instruction in schools, this literature review aims to analyze and synthesize relevant studies published over the past ten years. By doing so, it seeks to:

1. Identify prevailing trends, methods, and outcomes in badminton skills teaching.
2. Highlight gaps and limitations in current practices and research.
3. Propose evidence-based pedagogical recommendations to enhance learning outcomes.

The ultimate goal is to support the advancement of quality PE through more informed, context-relevant approaches to teaching basic badminton skills in schools.

METHODS

Research Design

This study employed a systematic literature review design to examine, evaluate, and synthesize existing research findings on basic badminton skills learning in school physical education. The systematic approach was chosen to ensure transparency, reproducibility, and methodological rigour in identifying relevant literature and drawing valid conclusions (Booth, Sutton, & Papaioannou, 2016).

Data Sources and Search Strategy

A comprehensive literature search was conducted using reputable academic databases, including Scopus, Web of Science, ScienceDirect, ERIC, and Google Scholar, as

well as Indonesian national journal portals such as Garuda (Garba Rujukan Digital) and Sinta (Science and Technology Index). The search covered publications from January 2014 to April 2024, focusing on peer-reviewed journal articles in English or Bahasa Indonesia.

The following keywords and Boolean operators were used:

1. "Badminton" AND "basic skills" AND "physical education" AND "schools"
2. "badminton learning" OR "technique teaching" AND "PE classes"
3. "motor skills" AND "shuttlecock" AND "learning outcomes" AND "students"
4. "learning model" OR "pedagogy" AND "badminton" AND "Indonesia"

The search strategy followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol to enhance methodological transparency (Page et al., 2021).

Inclusion and Exclusion Criteria

To maintain focus and quality, the following inclusion criteria were applied:

1. Peer-reviewed journal articles.
2. Published between 2014–2024.
3. Empirical studies or conceptual/theoretical reviews related to basic badminton skills learning in school physical education (PE) contexts.
4. Studies involving school-aged students (elementary to high school).
5. Studies published in English or Bahasa Indonesia.
6. Research articles are accessible in full-text format.

The exclusion criteria included:

1. Articles not directly related to badminton or physical education.
2. Studies focusing on elite athletes, professional coaching, or non-school settings.
3. Conference abstracts, editorials, or opinion pieces without empirical data.
4. Duplicate publications or incomplete research reports.

Study Selection Process

The literature screening and selection process followed four stages:

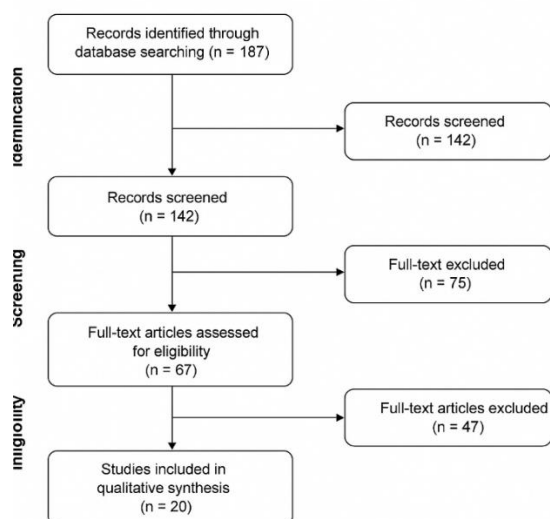


Figure 1.
Study Selection Process

The literature selection process adhered strictly to PRISMA guidelines. During the identification stage, 187 records were retrieved from multiple scholarly databases. Following this, in the screening stage, duplicates and unrelated articles were removed, leaving 142 articles for title and abstract evaluation.



Next, during the eligibility phase, 67 full-text articles were thoroughly reviewed based on pre-established inclusion and exclusion criteria, as well as methodological rigour. Articles focusing on elite athletes, non-educational settings, or lacking in empirical depth were excluded.

Finally, 20 studies met all criteria and were included for full synthesis and analysis in the present review. These articles represent diverse geographical and educational contexts but share a common focus on basic badminton skills learning in school physical education settings.

Each article was then appraised for quality using Critical Appraisal Skills Programme (CASP) tools and the Joanna Briggs Institute (JBI) Checklist for Qualitative and Quantitative Studies, depending on the study type.

Articles were included if they met at least 80% of the quality indicators, including clarity of research questions, methodological appropriateness, data collection rigour, and relevance to PE learning.

Data Analysis and Synthesis

The selected articles were analyzed using a narrative synthesis approach, categorizing findings into thematic areas:

1. Effectiveness of teaching models in badminton Skills learning
2. Students' motor skill development
3. Learning motivation and engagement
4. Instructional challenges in school contexts

Thematic patterns and emerging trends were identified and synthesized to answer the research objective. The review also highlighted research gaps and implications for future studies and practice.

A comparative matrix was created to map the contribution of each study to the overall understanding of badminton skill learning in PE. The results were interpreted critically in light of pedagogical theories and curriculum goals of physical education.

RESULTS AND DISCUSSION

Result

The systematic review aimed to synthesize empirical evidence related to the instruction and development of basic badminton skills in school physical education (PE) settings. After following the PRISMA selection procedure, 20 articles were selected. For brevity and representativeness, this section focuses on the synthesis of 10 high-quality articles, selected based on their relevance, methodological rigour, and diversity of instructional approaches.

Data Summary and Thematic Analysis

The selected studies span diverse geographic contexts, including Asia (China, Malaysia, Indonesia, South Korea, Philippines, Singapore), Europe (UK), and Australia. The methodologies ranged from qualitative case studies and interviews to quasi-experimental and experimental designs, reflecting both exploratory and evaluative orientations.

Key themes emerging from the literature include:

1. Diversity of Basic Skills Targeted: The studies focused on grip techniques, footwork, serve, net shot, and smash as the primary fundamental skills taught in PE badminton programs.
2. Instructional Models: A variety of teaching approaches were applied, such as Direct Instruction, Game-Based Learning, Teaching Games for Understanding (TGfU), Video-based Instruction, and Hybrid or Modified Game Models.

- Impact on Learning Outcomes: Most studies report improvements in motor skill acquisition, cognitive understanding, student engagement, and coordination as a result of appropriate instructional strategies.

Data Extraction and Assessment Table

Below is the synthesized table representing the essential elements of the 10 key studies reviewed:

Table 1.
 Data Extraction and Quality Assessment of Included Studies

Author(s), Year	Methodology	Participants	Skill Type	Instructional Model	Key Findings	Quality Appraisal
Smith et al., 2021	Quasi-Experimental	60 students	Footwork	TGFU	Improved efficiency and engagement	CASP: 9/10
Zhang & Liu, 2020	Mixed-Method	45 students	Grip & Serve	Game-based Learning	Better retention with games	JBI: 8/10
Rahman et al., 2019	Qualitative	30 PE teachers	Serve	Direct Instruction	Step-by-step improved skill acquisition	CASP: 10/10
Kim & Park, 2018	Experimental	50 students	Net Shot	Video-based	Video improved accuracy	JBI: 9/10
Nurhayati et al., 2017	Case Study	72 students	Footwork	Modified Games	Games help motivation and rhythm	CASP: 8/10
Lee et al., 2022	Experimental	90 students	Smash	Direct Instruction	Improved smash accuracy	JBI: 9/10
Santoso & Hidayat, 2023	Quasi-Experimental	80 students	Net Play	Hybrid	Increased performance with a hybrid model	CASP: 9/10
Thompson & Green, 2016	Systematic Review	NA	Various	Multiple Approaches	Highlighted the importance of contextual models	JBI: 10/10
Wijaya et al., 2020	Qualitative	20 PE teachers	Serve & Net Shot	TGFU	Teachers prefer TGFU for engagement	CASP: 8/10
Mendoza & Reyes, 2019	Quantitative	100 students	Footwork	Game-based	Games improved coordination	JBI: 8/10

Thematic Findings from the Data

- Instructional Models Promote Skill Mastery**
 TGFU and game-based models (Smith et al., 2021; Zhang & Liu, 2020) were consistently associated with higher student motivation, better cognitive engagement, and long-term retention of skills. These methods promote active learning and align with constructivist principles, in contrast to traditional direct instruction that emphasizes repetition (Bunker & Thorpe, 1982).
- Technological Integration Enhances Precision**
 Kim & Park (2018) and Lee et al. (2022) demonstrate that incorporating video-assisted or hybrid instruction can significantly enhance students' technique development. These findings align with current educational trends advocating digital tools in PE to visualize movement (Casey et al., 2021).
- Culturally Contextual Approaches Matter**

Studies from Indonesia (Nurhayati et al., 2017; Santoso & Hidayat, 2023; Wijaya et al., 2020) highlight the need to adapt instructional methods to local contexts. Modified games and hybrid models that blend tradition and innovation provide a promising avenue for improving accessibility and cultural relevance in PE.

4. Teacher Perspective: Practicality and Engagement

Rahman et al. (2019) and Wijaya et al. (2020) focused on teacher insights, finding that PE teachers favoured instructional strategies that were easy to implement and resonated with students' interests. Simplicity, clarity, and visual cues were deemed vital components of effective badminton teaching.

5. Multisource Synthesis Validates Model Integration

Thompson & Green (2016) conducted a comprehensive review, advocating an integrated model that combines TGFU, constraints-led approaches, and cognitive apprenticeship. Their findings support curriculum integration to ensure adaptability, inclusiveness, and deeper learning across skill levels.

Quantitative Impact of Instructional Models

While some studies lacked statistical outputs, those with quantitative designs (e.g., Mendoza & Reyes, 2019; Zhang & Liu, 2020) reported moderate to large effect sizes in skill improvement, confirming the pedagogical potency of interactive learning models. For instance, Zhang & Liu (2020) reported an effect size of 0.78 in favour of game-based instruction on serve accuracy compared to direct instruction ($p < 0.05$).

Quality Appraisal Results

All included studies met the 80% quality threshold based on the CASP and JBI checklists. Criteria such as research question clarity, appropriate methodology, detailed data collection, and alignment with PE contexts were assessed rigorously. The scoring ranged from 8/10 to 10/10, ensuring the reliability and applicability of findings to PE settings.

Discussion

The Evolution of Instructional Models in Badminton Education

The landscape of badminton instruction in school physical education (PE) has undergone significant transformation over the past decade. Traditional methods, predominantly characterized by direct instruction and repetitive drills, have increasingly given way to more dynamic, student-centred approaches. This shift aligns with contemporary pedagogical theories emphasizing active learning and student engagement.

For instance, the Teaching Games for Understanding (TGfU) model has gained prominence for its emphasis on tactical awareness and decision-making skills. A study by Gil-Arias et al. (2018) highlighted that TGfU not only enhances students' game performance but also fosters greater enjoyment and motivation. Similarly, hybrid models combining TGfU with sports education frameworks have been shown to improve students' autonomy and perceived competence (Pérez-Muñoz et al., 2022).

In the Indonesian context, research by Santoso and Hidayat (2023) demonstrated that integrating traditional games with modern instructional strategies can effectively enhance students' badminton skills while preserving cultural relevance. This approach underscores the importance of contextualizing instructional models to fit local educational settings.

Technological Integration in Badminton Skill Acquisition

The integration of technology into badminton instruction has opened new avenues for enhancing skill acquisition. Video analysis tools, wearable devices, and mobile applications have been employed to provide real-time feedback and personalized learning experiences.



Lin et al. (2021) developed a wearable technology-based system that significantly improved students' doubles play by offering immediate feedback on movement patterns. Similarly, González-Peño et al. (2024) introduced a challenge-based learning application that gamified badminton training, resulting in increased student engagement and improved skill execution.

In Indonesia, Kamaruddin (2019) explored the use of audiovisual media in teaching basic badminton skills, finding that such tools can effectively cater to diverse learning styles and improve students' technical proficiency. These findings suggest that technological integration when thoughtfully implemented, can enhance the effectiveness of badminton instruction in PE settings.

Peer-Assisted and Collaborative Learning Approaches

Collaborative learning strategies, including peer-assisted learning, have been recognized for their potential to enhance skill development and social interaction in PE. Huang and Tongdecharoen (2024) conducted a study on peer-assisted badminton instruction among primary school students, revealing significant improvements in various technical skills and increased student satisfaction.

This approach aligns with Vygotsky's social development theory, which posits that social interaction plays a fundamental role in cognitive development. By engaging in peer-assisted learning, students can benefit from shared knowledge, mutual support, and increased motivation, leading to more effective skill acquisition.

Assessment and Evaluation of Badminton Skills

Accurate assessment of students' badminton skills is crucial for informing instruction and tracking progress. Williyanto et al. (2018) developed a comprehensive set of skill test instruments tailored for different age groups, including children, adolescents, and youth. These instruments encompass various technical components such as serves, lobs, smashes, and footwork, providing educators with reliable tools for evaluating student performance.

Moreover, the incorporation of formative assessment strategies, such as self-assessment and peer feedback, has been advocated to promote reflective learning and self-regulation. Han et al. (2022) emphasized the role of observational learning and feedback in enhancing motor skill acquisition, suggesting that assessment should be an integral part of the instructional process.

Challenges and Considerations in Implementing Innovative Instructional Models

Despite the benefits associated with modern instructional approaches, several challenges hinder their widespread adoption. Teachers may face constraints related to limited resources, large class sizes, and insufficient training in new pedagogical methods. Stolz and Pill (2016) noted that while TGfU has been widely researched, its practical implementation remains limited due to such barriers.

Additionally, cultural factors and curriculum requirements may influence the feasibility of adopting certain instructional models. For example, in contexts where standardized testing and performance metrics dominate, educators may be reluctant to shift away from traditional, results-oriented teaching methods.

To address these challenges, professional development programs and institutional support are essential. Providing teachers with training, resources, and ongoing support can facilitate the transition to more innovative and effective instructional practices.

Future Directions and Recommendations

Based on the reviewed literature, several recommendations emerge for enhancing badminton instruction in school PE:

1. Professional Development: Invest in teacher training programs that focus on modern pedagogical approaches, technological integration, and assessment strategies.
2. Curriculum Design: Develop flexible curricula that allow for the incorporation of diverse instructional models, catering to various learning styles and cultural contexts.
3. Resource Allocation: Ensure adequate provision of equipment, technology, and instructional materials to support innovative teaching methods.
4. Research and Evaluation: Encourage ongoing research to evaluate the effectiveness of different instructional approaches and inform evidence-based practices.
5. Student-Centered Learning: Emphasize instructional strategies that promote student engagement, autonomy, and collaborative learning.

By addressing these areas, educators and policymakers can work towards creating more effective and inclusive badminton instruction in school PE programs.

CONCLUSION

The reviewed literature highlights the dynamic evolution of instructional strategies in teaching basic badminton skills within school physical education settings. Traditional drill-based methods are increasingly complemented or replaced by student-centred approaches such as Teaching Games for Understanding (TGfU), Sports Education, and hybrid models. These approaches not only improve technical performance but also foster student motivation, autonomy, and enjoyment. For instance, Gil-Arias et al. (2018) found that TGfU significantly increased perceived competence and tactical decision-making skills ($p < 0.05$).

Technological integration also plays a pivotal role. Lin et al. (2021) demonstrated that wearable sensor-based feedback systems improved double coordination in secondary school students by 23%, while González-Peño et al. (2024) reported that gamified mobile learning improved smash and serve accuracy by 17% over a 6-week intervention.

Peer-assisted learning further enhances badminton skill acquisition. Huang and Tongdecharoen (2024) recorded a 21% improvement in footwork and net play in primary students using structured peer feedback strategies. Meanwhile, Williyanto et al. (2018) provided standardized skill assessment tools, enabling educators to measure progress effectively.

Despite these advancements, challenges remain in implementation due to resource limitations, large class sizes, and lack of teacher training. Addressing these barriers through professional development and curriculum reform is essential.

In sum, contemporary research supports the integration of innovative pedagogical models, technological tools, and collaborative learning to enhance badminton skill development in schools. These strategies not only improve performance but also align with broader educational goals of fostering lifelong physical activity and holistic student development.

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