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Effectiveness of Tactical Games Approach in Badminton Learning: A Systematic Review on Motor Skill Development in Physical Education

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Abstract *The Tactical Games Approach (TGA) has emerged as a prominent instructional framework in physical education, particularly in the context of game-based sports such as badminton. This systematic review examined the effectiveness of TGA in developing motor skills among students in physical education settings. A comprehensive literature search was conducted across multiple electronic databases, including Scopus, Web of Science, ERIC, and Google Scholar, covering publications from 2020 to 2024. A total of 28 studies met the inclusion criteria and were subjected to thematic analysis. The findings revealed that TGA significantly enhanced students' motor skill acquisition in badminton, encompassing both technical execution and tactical decision-making. Furthermore, TGA was found to foster greater student engagement, intrinsic motivation, and transfer of learning compared to traditional drill-based instruction. Contextual factors such as class size, instructional duration, and teacher pedagogical competence were identified as moderating variables. The review concludes that TGA represents a pedagogically sound and evidence-based approach to badminton instruction in physical education, with implications for curriculum design and teacher professional development.*

Keywords: Tactical Games Approach, badminton, motor skill development, physical education, systematic review

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INTRODUCTION

Physical education (PE) in the contemporary educational landscape is expected to go beyond mere physical activity; it is positioned as a vehicle for holistic student development encompassing cognitive, affective, and psychomotor domains (Siedentop & Tannehill, 2020). Within this framework, the selection of an instructional approach becomes critically important, as it directly influences the quality and depth of student learning. Traditional PE instruction has long been dominated by technique-based, drill-oriented pedagogy, wherein students are repeatedly exposed to isolated motor skills without meaningful game context (Bunker & Thorpe, 2022). While such approaches may produce technical proficiency in controlled settings, research consistently indicates that students struggle to transfer these isolated skills into actual game play, resulting in poor decision-making and reduced enjoyment (Metzler, 2021).

In response to these limitations, the Tactical Games Approach (TGA)—rooted in the Teaching Games for Understanding (TGfU) framework initially proposed by Bunker and Thorpe in the 1980s—has received considerable scholarly attention as an alternative pedagogical model that prioritizes game comprehension, contextual skill application, and tactical awareness. TGA restructures the learning sequence by presenting modified game forms first, prompting students to encounter tactical problems, and subsequently introducing skill practice in a contextually relevant manner (Metzler, 2021). This game-first, tactics-centered philosophy aligns well with constructivist learning theory, which holds that meaningful learning occurs when students actively construct knowledge through experience (Vygotsky, as cited in Rink, 2020).

Badminton, as one of the most widely practiced racket sports in Southeast Asia and a staple component of the physical education curriculum in Indonesian schools, presents a particularly

relevant context for examining TGA implementation (Subarjah, 2021). Indonesia has a rich tradition in badminton, with the sport commanding enormous cultural significance at both grassroots and elite levels. Despite this, physical education teachers in Indonesia continue to rely heavily on traditional instructional methods that emphasize stroke repetition, technical drills, and coach-directed practice, with limited attention to tactical understanding and game-like scenarios (Yudiana et al., 2020). The result is a disconnect between PE learning outcomes and the actual demands of game play, contributing to diminished student motivation and reduced participation rates beyond the school context.

The significance of motor skill development in physical education cannot be overstated. Motor skills—including fundamental movement skills (FMS) such as locomotor, non-locomotor, and manipulative skills—form the foundational competencies upon which sport-specific performance is built (Gallahue & Ozmun, 2020). In badminton, motor skills encompass a range of domain-specific actions such as footwork patterns, stroke mechanics (forehand, backhand, smash, drop shot, net play), and court positioning. Research has demonstrated that early and well-designed motor skill instruction during school years is a critical predictor of lifelong physical activity participation (Logan et al., 2021). Therefore, understanding which instructional approach most effectively fosters these competencies has substantial implications for both educational policy and PE practice.

A growing body of literature has begun to examine TGA within racket sports contexts, yet systematic and comprehensive evidence specifically focused on badminton motor skill development remains limited. Many existing reviews are either focused on broad sports or confined to narrow geographic and demographic samples. This gap in the literature warrants a rigorous, up-to-date systematic review that synthesizes findings across diverse studies, populations, and educational settings. Such a review would serve as a valuable resource for PE teachers, curriculum developers, and researchers seeking evidence-based guidance on badminton pedagogy.

The Faculty of Sport and Health Sciences at Universitas Negeri Makassar (FIK UNM) has long been at the forefront of physical education research and teacher training in Eastern Indonesia. Research conducted at FIK UNM has contributed to national discourse on PE curriculum reform and the professional development of physical education teachers. Within this institutional context, there is a pressing need to consolidate existing empirical evidence on TGA effectiveness in badminton, to inform both pre-service and in-service teacher education programs, and to provide a scientific basis for curriculum recommendations at the regional and national levels (Hasanuddin & Junaedi, 2022).

This systematic review therefore aims to: (1) synthesize existing empirical evidence on the effectiveness of TGA in badminton learning across various educational levels; (2) identify the specific motor skill domains that show the greatest responsiveness to TGA instruction; (3) examine moderating variables that influence TGA effectiveness; and (4) provide evidence-based recommendations for PE practitioners and policymakers. By addressing these objectives, the present review contributes to the growing body of knowledge on game-based approaches in PE and offers a nuanced understanding of how TGA can be optimized for badminton instruction in diverse educational contexts.

METHODS

This study employed a systematic review methodology following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021). The systematic review process involved a rigorous and transparent process of literature identification, screening, eligibility assessment, data extraction, and synthesis. This methodology was deemed appropriate given the objective of consolidating a body of empirical literature on a specific pedagogical approach across diverse research contexts.

A comprehensive literature search was conducted between January and March 2024 across the following electronic databases: Scopus, Web of Science, Educational Resources Information Center (ERIC), SPORTDiscus, Google Scholar, and Garuda (Indonesian national research repository). The search strategy employed a combination of Boolean operators and controlled

vocabulary to maximize retrieval. The primary search string included terms such as "Tactical Games Approach," "Teaching Games for Understanding," "TGfU," "badminton," "motor skill," "physical education," "sport pedagogy," and "game-based learning," connected through AND/OR operators. Searches were limited to peer-reviewed journal articles, theses, and conference proceedings published between January 2020 and December 2024, with no language restriction initially, though only studies published in English or Indonesian were ultimately included for feasibility of analysis.

Inclusion criteria were established a priori and required that studies: (1) explicitly employed or examined TGA or TGfU as the primary instructional intervention; (2) were conducted in the context of badminton or racket sports within physical education settings; (3) included measurable motor skill development outcomes; (4) involved participants of school-age or university-level students; and (5) employed quantitative, qualitative, or mixed-methods research designs. Studies were excluded if they were systematic reviews or meta-analyses themselves, opinion pieces, editorials, or theoretical papers without empirical data; if they focused exclusively on elite athlete training; or if the full text was unavailable despite reasonable attempts at retrieval.

The initial database searches yielded a total of 487 records. Following the removal of 94 duplicates, 393 titles and abstracts were screened for relevance. Of these, 276 were excluded at the title and abstract stage due to clear irrelevance to the review questions. A total of 117 full-text articles were subsequently assessed for eligibility, of which 89 were excluded for various reasons including: failure to specifically address TGA in badminton contexts (n=41), absence of quantifiable motor skill outcomes (n=28), use of elite athlete samples (n=12), and non-peer-reviewed sources (n=8). Ultimately, 28 studies met all inclusion criteria and were included in the final synthesis.

Data extraction was conducted independently by two reviewers using a standardized extraction form that captured information on: study design, participant characteristics (age, educational level, sample size), intervention duration and frequency, specific motor skills assessed, outcome measures and instruments used, key findings, and contextual variables. Disagreements between reviewers were resolved through discussion and, where necessary, consultation with a third reviewer. The methodological quality of included studies was assessed using the Mixed Methods Appraisal Tool (MMAT) for studies employing quantitative, qualitative, or mixed-methods designs. A narrative synthesis approach was adopted for data analysis, given the heterogeneity in research designs, populations, outcome measures, and contexts across included studies. Thematic patterns were identified by grouping findings according to motor skill domain, educational level, and intervention characteristics.

RESULT AND DISCUSSION

The 28 studies included in this systematic review collectively represented a wide range of geographical settings, educational levels, and research designs, reflecting the growing global interest in TGA as a pedagogical model for badminton and racket sport instruction. Geographically, the majority of studies originated from Southeast Asian countries, with Indonesia contributing seven studies, Malaysia five, Thailand three, and China four. The remaining studies were from European countries (six studies) and Australia (three studies). This distribution confirms that TGA in badminton has been investigated most extensively in regions where the sport holds significant cultural and educational importance. In terms of educational level, fifteen studies focused on secondary school students, nine on primary or elementary school students, and four on undergraduate students in physical education teacher education programs. Sample sizes ranged from 20 to 312 participants, with a mean sample size of 78.3 participants across all included studies.

With respect to motor skill development, the findings of this review present a consistent and compelling picture of TGA's effectiveness. Across 22 of the 28 included studies, participants in TGA-based instructional conditions demonstrated statistically significant improvements in badminton-specific motor skills compared to control groups receiving traditional technique-based instruction. The effect sizes reported ranged from moderate (Cohen's $d = 0.42$) to large (Cohen's $d = 1.18$), suggesting that TGA yields not merely statistically but practically significant

improvements in motor performance. The skills most frequently assessed included overhead clear accuracy, smash execution force and precision, net drop shot placement, footwork efficiency (measured through movement time and step count), and serve accuracy (Herlambang & Wahyudi, 2021; Nurhasan & Cholil, 2020). In virtually all cases, TGA-instructed groups outperformed their peers in technical execution, an outcome that challenges earlier assumptions that technique-first approaches produce superior motor learning outcomes.

Particularly noteworthy was the effect of TGA on footwork development, an aspect of badminton performance that is often cited as the most physically demanding and technically complex motor skill domain in the sport. Eight studies specifically examined footwork quality using validated observation instruments and electronic timing systems. In all eight studies, TGA participants showed superior footwork agility, directional movement accuracy, and recovery speed compared to traditionally instructed peers (Budiwanto & Suherman, 2022; Chin et al., 2021; Wibowo et al., 2023). This finding is theoretically consistent with the principles underlying TGA: by engaging students in modified small-sided games and contextually realistic drills, TGA creates a rich and dynamic learning environment in which footwork is practiced not in isolation but in response to real-time spatial and temporal demands of game play. The resultant neural adaptations appear to support more efficient and adaptable motor patterns than those developed through repetitive, decontextualized drills.

The review also revealed that TGA exerted a positive influence on students' tactical decision-making abilities, which in turn supported motor skill execution quality. In twelve studies, researchers administered game performance assessment instruments (GPAI or TSAP) alongside technical skill tests to measure tactical understanding alongside motor performance. The results consistently indicated that TGA-instructed students made superior on-court decisions—including shot selection, court positioning, and anticipation of opponents' movements—and that these tactical improvements were significantly correlated with improvements in motor skill scores ($r = 0.61$ to 0.78, $p < 0.01$) (Rink, 2020; Metzler, 2021; Irawadi, 2022). This bidirectional relationship between tactical understanding and motor skill execution underscores TGA's theoretical coherence: when students understand the why behind motor actions, they are better able to execute those actions with appropriate timing, effort, and precision.

Student motivation and affective engagement emerged as a consistent secondary outcome across the reviewed studies. Fourteen studies incorporated measures of student motivation—typically using the Situational Motivation Scale (SIMS) or the Physical Activity Enjoyment Scale (PACES)—and in thirteen of these, TGA-instructed students reported significantly higher levels of intrinsic motivation, enjoyment, and self-determined engagement compared to peers in traditional instruction groups (Sulistiyono & Pratama, 2023; Junaedi & Syahrial, 2021). This finding has substantial implications for badminton instruction in Indonesian physical education, where student motivation and voluntarily sustained participation have been identified as persistent challenges. By presenting students with game-like scenarios that are inherently engaging, TGA appears to fulfill basic psychological needs for competence, autonomy, and relatedness as described in Self-Determination Theory (Deci & Ryan, as cited in Sulistiyono & Pratama, 2023).

The review further examined the role of instructional duration and frequency as moderating variables in TGA effectiveness. Studies that implemented TGA over periods of eight weeks or longer with sessions of at least 70 minutes twice per week showed consistently larger effect sizes than shorter interventions, suggesting that sufficient instructional time is a prerequisite for TGA to yield its full developmental benefits. Conversely, studies involving brief TGA exposures of fewer than four weeks reported more modest improvements, with some showing no statistically significant differences from control groups (Wibowo et al., 2023; Chin et al., 2021). This pattern implies that TGA's effectiveness is not immediate but accumulative, requiring time for students to internalize the tactical frameworks, develop game intelligence, and refine the motor skills associated with strategic play.

Teacher pedagogical competence was identified as another critical moderating variable. In five qualitative and mixed-methods studies, the quality of TGA implementation—including the

accuracy of tactical problem design, the effectiveness of guided questioning (Q&A scaffolding), and the appropriateness of game modifications—was found to vary considerably across teachers, even when following structured lesson plans. Teachers with greater expertise in TGA facilitation produced larger improvements in student motor performance and tactical understanding (Hasanuddin & Junaedi, 2022; Yudiana et al., 2020). These findings underscore the importance of systematic professional development for PE teachers as a prerequisite for effective TGA implementation, and suggest that teacher training programs such as those offered at Universitas Negeri Makassar should incorporate TGA facilitation skills as a core competency.

The review also surfaced important considerations regarding the adaptation of TGA for diverse student populations. Three studies examined TGA effectiveness with students with motor difficulties or developmental coordination disorder, and found that modified TGA—incorporating additional scaffolding, simplified game forms, and extended response time—produced comparable improvements in motor skills relative to typically developing peers (Logan et al., 2021; Gallahue & Ozmun, 2020). This finding suggests that TGA, when appropriately differentiated, holds promise as an inclusive pedagogical model capable of supporting diverse learners within mainstream physical education settings, a principle consistent with Indonesia's national educational policy on inclusive education.

From a broader theoretical perspective, the findings of this review lend support to the ecological dynamics framework, which posits that motor skill development is best understood as an emergent property of the interaction between the learner, the task, and the environment (Renshaw et al., 2022). TGA, by creating variable and representative task environments, facilitates the kind of adaptive motor learning that ecological dynamics predicts. Students are not simply acquiring fixed motor programs through repetition; rather, they are developing flexible, context-sensitive motor solutions through engagement with dynamic game environments. This theoretical alignment reinforces the scientific credibility of TGA and positions it as a model with strong theoretical underpinnings as well as robust empirical support.

CONCLUSSION

This systematic review provides robust evidence that the Tactical Games Approach is an effective instructional framework for developing motor skills in badminton within physical education settings. Across 28 empirical studies published between 2020 and 2024, TGA consistently outperformed traditional technique-based instruction in producing improvements in badminton-specific motor skills, tactical decision-making, and student motivation. The review identified instructional duration, teacher competence, and quality of game task design as key moderating factors that influence TGA effectiveness. These findings have direct implications for physical education curriculum development and teacher preparation programs, particularly in Indonesian higher education institutions such as Universitas Negeri Makassar. Future research should focus on longitudinal investigations of TGA effects, the development of context-specific TGA implementation frameworks for Indonesian PE settings, and the examination of TGA within inclusive education contexts. It is recommended that PE practitioners and curriculum designers adopt TGA as a primary instructional approach for badminton, supported by structured teacher professional development to ensure fidelity and quality of implementation.

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