

The effectiveness of the TGFU approach in increasing student engagement in physical education lessons

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Abstract

Background and Study Aim Physical education contributes to students' physical, social, and emotional development. Traditional teaching approaches, however, often emphasize repetitive drills that fail to sustain students' interest and participation. Although innovative models such as the Teaching Games for Understanding (TGFU) approach are increasingly applied in schools, their relative effectiveness in enhancing motivation and engagement remains of practical interest. The present study aimed to evaluate the effectiveness of the TGFU approach in increasing student participation, motivation, and engagement in physical education.

Material and Methods The study followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol. The process consisted of four stages: database search, screening, eligibility assessment, and inclusion. Relevant publications were identified through searches in Taylor & Francis, Scopus, and the Multidisciplinary Digital Publishing Institute using predefined keywords related to the Teaching Games for Understanding (TGFU) approach. The initial search yielded 187 papers. After screening 162 titles and abstracts, 98 papers were excluded for not meeting the inclusion criteria. Fifty-seven full texts were reviewed, and 15 studies were finally included in the analysis. Data from these studies were summarized to identify trends and evaluate the effectiveness of TGFU-based learning strategies.

Results The analysis showed that both the TGFU approach and hybrid models such as TGFU/SE and TGFU/TPSR contributed to improvements in students' physical fitness, sport-specific skills, and participation levels. The reviewed studies also indicated positive effects on motivation, decision-making, and enjoyment in physical education settings.

Conclusions The findings suggest that the TGFU approach supports students' physical, cognitive, and affective development. Nevertheless, its successful implementation depends on careful planning, adequate teacher preparation, and ongoing support. Broader and longer-term studies are recommended to confirm the consistency and generalizability of these results.

Keywords: teaching games for understanding, physical education, student participation, motivation

Introduction

Physical education contributes to the development of students' physical competence, social interaction, and lifelong attitudes toward physical activity. In school settings, the effectiveness of learning largely depends on students' engagement and the quality of instructional methods used by teachers. However, maintaining high levels of participation in physical education lessons is often challenging, as students' motivation can fluctuate due to repetitive activities, limited contextual understanding, and varying individual interests. These factors make the development of dynamic and inclusive teaching approaches a necessary part of improving learning outcomes and overall student experience.

In this regard, understanding the role of student participation in the broader educational process provides a foundation for examining teaching effectiveness. In education, particularly

in elementary schools, student participation in learning is an important part of educational success [1]. When students are engaged, they improve their understanding and retention of the material and show greater motivation to continue learning and developing [2]. Teachers recognize the challenge of creating an engaging and effective learning environment, especially in physical education. However, their focus on self-development sometimes becomes a barrier, leading them to apply teaching strategies limited to what they learned during training.

In this context, physical education contributes to students' physical, social, and emotional development [3]. Traditional teaching methods, however, often fail to address the diverse needs of students and demand active participation without providing sufficient understanding of the learning purpose. Students are frequently asked to repeat exercises without recognizing their meaning or relevance, which can reduce their interest and make the process monotonous. Excessive repetition and

an emphasis on discipline may cause fatigue and discourage students who do not perceive direct benefits from such activities [4]. As a result, some students may become passive or lose motivation toward physical education, indicating the need for a more contextual and engaging approach.

The Teaching Games for Understanding (TGFU) model offers a possible way to address this issue. It focuses on helping students understand games through tactical and strategic principles rather than through isolated technical drills [5]. This approach encourages students to think, collaborate, and make decisions in real game situations, thereby supporting the development of both cognitive and social skills [6].

The TGFU approach aligns with the natural curiosity and activity of elementary school students [7]. By offering a structured yet interactive learning environment, it encourages learners to participate more actively in lessons and sustain their interest. Strategically designed games support motivation and engagement, making physical education a more coherent and purposeful experience for students [8]. In this context, the literature review provides an overview of key aspects of the TGFU model [9], including implementation strategies, effects on student motivation, and comparisons with traditional instructional methods. Moreover, the analysis of available studies helps identify common challenges in applying TGFU and outlines practical solutions that teachers may consider [10].

Analysis of research findings has shown that innovative pedagogical models, particularly those emphasizing understanding and decision-making, can enhance students' motivation and learning effectiveness in physical education. Researchers emphasize that game-based instructional methods contribute to a more meaningful learning experience by connecting physical activity with cognitive and social development. Despite these positive outcomes, practical implementation in school settings still involves various contextual and methodological challenges that require careful consideration. Therefore, examining how the Teaching Games for Understanding (TGFU) approach influences student participation and engagement provides a logical basis for further exploration within this study.

Based on this rationale, the present study aimed to evaluate the effectiveness of the TGFU approach in increasing student participation, motivation, and engagement in physical education.

Materials and Methods

Sources of Information

The initial database search yielded 187 papers from three databases: Taylor & Francis, Scopus, and the Multidisciplinary Digital Publishing Institute (MDPI). After screening 162 titles and abstracts, 98

papers were excluded for not meeting the inclusion criteria. Fifty-seven studies underwent full-text evaluation, and 15 publications were ultimately included in the final analysis. The overall process of selection and inclusion is illustrated in *Figure 1. PRISMA Research Method Flowchart*.

The study followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol to ensure transparency and systematic organization of the literature review process. These three electronic databases were chosen as the primary sources of information. Relevant publications were identified using predetermined keywords related to learning strategies and the Teaching Games for Understanding (TGFU) approach. The search was conducted in May 2024 and covered the period from 2017 to 2024.

Study Design

The PRISMA procedure consisted of four main stages:

1. Identification – Searching databases using selected keywords and topics related to the TGFU approach.
2. Screening – Reviewing titles and abstracts to exclude irrelevant studies.
3. Eligibility – Evaluating full-text articles based on inclusion and exclusion criteria.
4. Inclusion – Selecting studies that met all criteria for final analysis.

The inclusion criteria comprised: (a) research focused on the Teaching Games for Understanding (TGFU) method; (b) open-access articles; and (c) publications written in English. Studies were excluded if they focused on fields outside of sports or were reviews, book chapters, or conference materials. Bibliographic references of selected publications were manually checked to identify additional relevant studies that might have been missed during database searches.

Statistical Analysis

Data extracted from the eligible studies were organized and analyzed descriptively. Quantitative indicators such as the number of studies, publication years, and thematic trends were compiled in an electronic spreadsheet. The analysis focused on identifying patterns in how the TGFU method affects student participation, motivation, and learning outcomes.

Results

The analysis of the selected studies revealed a variety of approaches used to implement the Teaching Games for Understanding (TGFU) method in physical education. The reviewed works demonstrated its adaptability across different educational contexts and sports disciplines. The main characteristics and outcomes of the included studies are summarized in *Table 1. Differentiated Learning in Physical Education*.

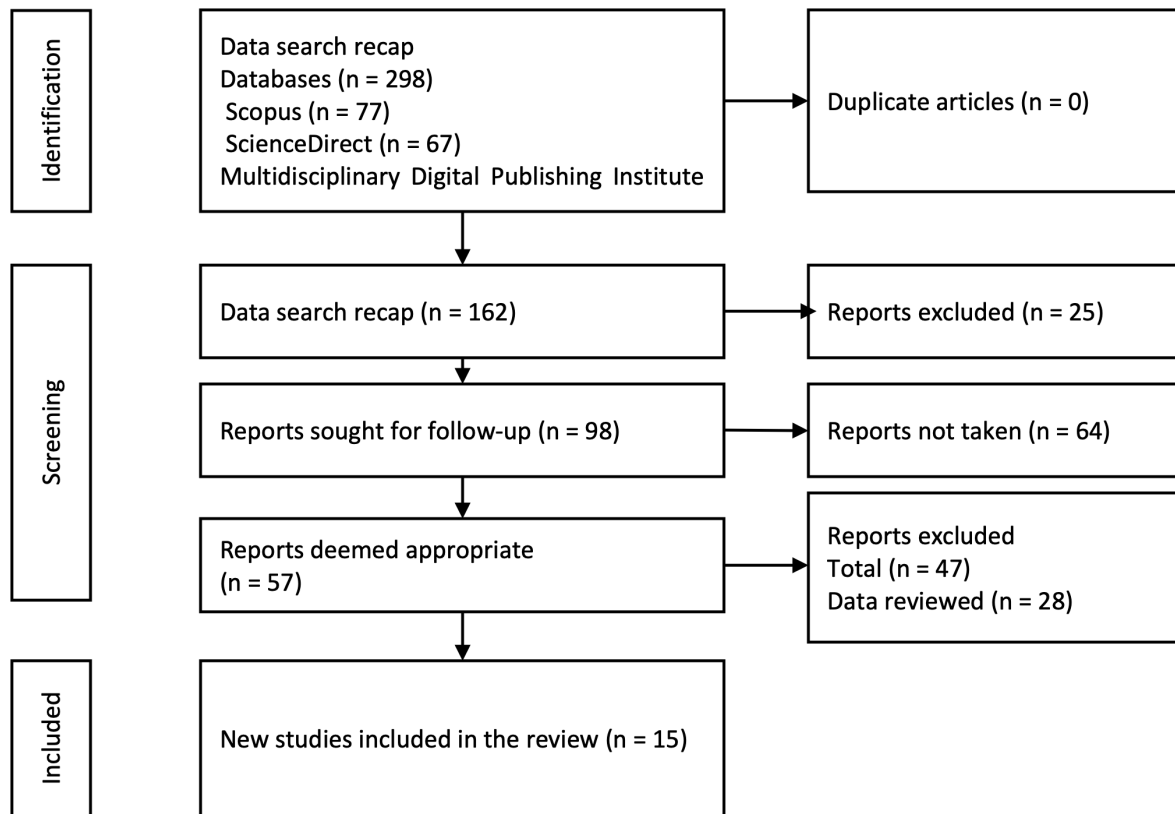


Figure 1. PRISMA Research Method Flowchart

Table 1. Differentiated Learning in Physical Education

No	Author	Title	Research result
1	Stojanović et al., 2023 [22]	School-Based TGFU Volleyball Intervention Improves Physical Fitness and Body Composition in Primary School Students: A Cluster-Randomized Trial	Incorporating a TGFU volleyball intervention into the physical education curriculum improved elementary school students' physical fitness and body composition. The intervention demonstrated potential to reduce obesity and enhance fitness through a contextual and engaging game-based learning approach. Identifying and addressing potential barriers is important to ensure the program's effectiveness.
2	Gil-Arias et al., 2017 [11]	Impact of a Hybrid TGFU–Sport Education Unit on Student Motivation in Physical Education	The study showed that a hybrid TGFU/SE model in physical education classes increased students' self-motivation, perceived competence, and enjoyment. This pedagogical approach combining elements of TGFU and Sport Education supports the development of cognitive, emotional, and psychomotor skills. Addressing implementation barriers is essential for sustaining student motivation and participation.
3	López-Lemus et al., 2023 [15]	Could the Hybridization of the SE/TGFU Pedagogical Models Be an Alternative for Learning Sports and Promoting Health? A School Context Study	Implementing a hybrid SE/TGFU model in physical education classes enhanced student motivation, perceived competence, enjoyment, and participation. The model provides a more comprehensive and meaningful learning experience. Overcoming implementation barriers remains important for improving learning outcomes in physical education.
4	Ortiz et al., 2023 [17]	Teaching Games for Understanding in Game Performance and Psychosocial Variables: Systematic Review and Meta-Analysis of Randomized Controlled Trials	The study found that the TGFU approach positively influenced students' decision-making and tactical performance in game contexts. It also improved the motivational environment and task orientation, though its effects on perceived ability, enjoyment, and intention to engage in physical activity remain inconclusive. Further well-controlled research is recommended to clarify the effectiveness of the TGFU approach in physical education.

Table 1. Continued

No	Author	Title	Research result
5	Batez et al., 2021 [4]	Effects of a Teaching Program Based on the Teaching Games for Understanding Model on Volleyball Skills and Enjoyment in Secondary School Students	The study indicated that the TGFU model effectively improved volleyball-specific skills (overhead and underhand passes, serve accuracy) and increased students' enjoyment of physical education. While some limitations in skill development were noted, the model appears to provide a balanced and engaging instructional framework for physical education.
6	García-Castejón et al., 2021 [7]	Implementation of a Hybrid Educational Program between the Model of Personal and Social Responsibility (TPSR) and the Teaching Games for Understanding (TGFU) in Physical Education and Its Effects on Health: A Mixed-Methods Approach	The study demonstrated that combining the TPSR and TGFU models offered an effective alternative for promoting students' motivation, responsibility, and enjoyment in physical education. Teachers reported favorable experiences with the program and emphasized the importance of adequate training to support successful implementation.
7	García-González et al., 2020 [8]	Can a Hybrid Sport Education/Teaching Games for Understanding Volleyball Unit Be More Effective for Less Motivated Students? An Examination of Motivation-Related Variables	The study found that a hybrid SE/TGFU model in volleyball instruction improved self-determination theory (SDT)-related variables, particularly for students with moderate or low initial motivation. The approach also increased satisfaction with instructional novelty and variety, as well as motivation to engage in physical activity. Effective implementation of this hybrid model requires careful planning to ensure benefits for all students.
8	Sierra-Ríos et al., 2020 [21]	Effects of Six Weeks of Direct Instruction and Teaching Games for Understanding Programs on Physical Activity and Tactical Behavior in U-12 Soccer Players	The TGFU program was more effective than direct instruction in improving decision-making and ball-play execution among U-12 soccer players. It also increased participation in light physical activity and had a positive influence on motivation and satisfaction during training. However, no significant differences were observed for moderate and vigorous activity levels. The findings suggest that TGFU may provide a more suitable approach to enhancing student engagement and performance in sports.
9	Arias-Estero et al., 2020 [1]	Effects of Two TGFU Lesson Periods on Game Performance, Knowledge, and Psychosocial Variables in Elementary Physical Education	The implementation of TGFU among fourth-grade students over two instructional periods improved game performance, knowledge, enjoyment, perceived competence, and intention to be physically active. Although no significant differences were found between the two period durations, both showed improvement compared to baseline. This suggests that exercise volume alone is not decisive, and that pedagogical design plays an important role in the effectiveness of TGFU interventions.
10	Robles et al., 2020 [20]	Effects of Teaching Games on Decision Making and Skill Execution: A Systematic Review and Meta-Analysis	The review examined the effectiveness of technical and tactical instructional approaches in games and physical education. Findings indicated that tactical approaches improved decision-making but did not lead to significant gains in skill execution compared with technical approaches. Considerable heterogeneity and limited evidence quality were noted across studies. Tactical approaches are recommended to enhance understanding, strategic thinking, and decision-making in educational and sports settings.

The data presented in Table 1 indicate that the TGFU and hybrid models (TGFU/SE and TGFU/TPSR) contribute to improved student motivation, engagement, and learning outcomes in physical education. Across studies, consistent positive effects

were observed on physical fitness, sport-specific skills, and participation levels. Additionally, several studies emphasized cognitive and affective benefits, including enhanced decision-making, collaboration, and enjoyment. These findings suggest that the

integration of tactical and reflective elements in TGFU-based instruction can make learning more meaningful and contextually relevant for students.

Discussion

The purpose of this study was to evaluate the effectiveness of the Teaching Games for Understanding (TGFU) approach in enhancing student participation, motivation, and engagement in physical education. The analysis of 15 selected studies demonstrated that the TGFU model, as well as its hybrid applications with Sport Education (SE) and the Teaching Personal and Social Responsibility (TPSR) frameworks, positively influences students' learning experiences. The reviewed evidence indicates consistent improvements in physical fitness, sport-specific skills, and active involvement during lessons. In addition, several studies reported cognitive and affective benefits, including better decision-making, higher intrinsic motivation, and increased enjoyment of physical activity. Overall, the findings confirm that the TGFU approach provides a structured yet flexible framework that supports both physical and psychological dimensions of student development in educational settings.

Building on the reviewed findings that highlight the effectiveness of game-based instructional strategies, the following section elaborates on the pedagogical foundations of the Teaching Games for Understanding (TGFU) approach. The Teaching Games for Understanding (TGFU) approach is a pedagogical method that promotes conceptual understanding and supports the development of "game intelligence" as a learning outcome [11]. Its main contribution to learning lies in contextualizing technical skills within meaningful game situations, which helps students overcome task-related limitations, develop tactical awareness, and enhance problem-solving through active decision-making [12].

Learning effectiveness within this framework can be assessed through cognitive, affective, and psychomotor indicators. Teachers play a central role in guiding this process, as they are responsible for selecting learning content, managing activities, and monitoring the development of students' abilities across all domains [13]. Therefore, the inclusion of game-based models such as mini-volleyball and the TGFU approach in school curricula may improve students' understanding of both technical and tactical aspects of games [14].

The findings of the present review, supported by previously published studies, confirm that the TGFU model positively influences learning outcomes in physical education. Comparative analysis shows that its effectiveness is reflected not only in improved performance but also in enhanced motivation, social interaction, and emotional development. Collectively, the evidence demonstrates that the

TGFU approach contributes to a more integrated learning experience by combining physical practice with reflective understanding. Based on this, an analysis of specific areas of influence of the TGFU model on learning outcomes allows for a more detailed examination of how this approach supports student development across cognitive, affective, and psychomotor domains, beginning with cognitive enhancement.

Based on the collected literature, the Teaching Games for Understanding (TGFU) approach improves several cognitive aspects of learning. Although few studies provide direct measures of cognitive change, the results show that participation in TGFU increases students' understanding of game concepts and strategies [15]. Students who took part in TGFU-based lessons demonstrated better decision-making and game performance than those taught through direct instruction.

The TGFU approach develops cognitive skills by placing learning within real game situations, which enhances analysis and tactical reasoning. It also helps students learn and apply techniques such as overpassing and underpassing, showing progress in understanding. After TGFU interventions, students in sports such as volleyball and floorball showed greater tactical awareness and the ability to make situational decisions.

The use of questioning within the TGFU method increases students' participation and supports active engagement in learning. Discussion of tactical options and problem-solving tasks helps students think more deeply about game situations and strategies. The hybrid TGFU/SE model further contributes to students' autonomy and sense of competence, reflecting higher cognitive involvement in physical education. Overall, the TGFU approach enhances students' ability to analyze, make decisions, and apply knowledge during games, supporting both technical and cognitive development.

According to the reviewed literature, the Teaching Games for Understanding (TGFU) approach has a positive effect on students' emotional well-being. Although not all studies directly measured emotional outcomes, many reported that the use of TGFU increases students' motivation and engagement in physical activity [16]. For instance, the hybrid TGFU/SE model led to higher levels of intrinsic motivation, satisfaction, and positive attitudes toward exercise, contributing to a more engaging learning process.

Greater enjoyment and motivation toward physical activity were linked to better emotional well-being. Students who participated in hybrid SE/TGFU programs reported higher enjoyment, perceived competence, and satisfaction with participation in physical activity [17]. The TGFU approach also improved the motivational environment and task

orientation, supporting intrinsic motivation and a sense of accomplishment in physical education.

Students taught with the TGFU method reported enjoying lessons more than those in control groups, reflecting improved emotional engagement and motivation to participate. Increases in self-directed motivation and enjoyment suggest that students became more interested in physical education activities. The TGFU model also helps students develop a sense of personal and social responsibility, which is an important component of educational development [18].

Students with initially low or moderate motivation experienced higher levels of motivation and psychological satisfaction after participating in SE/TGFU lessons. Greater satisfaction with the variety and novelty of volleyball instruction indicates that this hybrid model makes physical education more engaging for students [19]. The TGFU program also promoted participation in light physical activity, reflecting increased motivation and satisfaction during lessons.

After TGFU interventions, students expressed higher enjoyment of physical activity and a stronger willingness to continue it. Implementation of the model through questioning reduced teacher corrections, encouraged peer interaction, and provided more positive feedback, which improved students' confidence and intrinsic motivation [20]. Teacher support that encouraged teamwork and participation strengthened students' sense of belonging and satisfaction with the learning process.

Participation in TGFU-based lessons has also been linked to more positive attitudes toward physical activity and greater motivation to remain active. Although some studies did not report strong emotional effects or increased enjoyment, they found higher intentions to engage in physical activity. Overall, the TGFU approach improves the emotional aspects of physical education by increasing students' motivation, enjoyment, and participation in learning.

According to the reviewed literature, the Teaching Games for Understanding (TGFU) approach has a positive effect on students' psychomotor development. Several studies reported that participation in TGFU lessons improved physical abilities such as vertical jump, 30-meter sprint, agility, and cardiorespiratory endurance [21]. These findings indicate that the TGFU approach contributes to the development of students' physical fitness and movement efficiency. The hybrid TGFU/SE model that includes practical learning tasks has also been found to enhance motor coordination and the application of movement skills during gameplay [22]. Greater engagement and active participation during play are associated with improvements in motor and practical skills necessary for effective performance [23].

Although some studies did not observe significant differences between TGFU and technical instruction in specific skill execution, improvements were noted in tactical abilities and game performance [24]. Enhanced accuracy in overpassing, underpassing, and serving suggests that the TGFU method supports motor skill development in volleyball. Some abilities may require longer intervention periods or different methods, yet the use of TGFU has been linked to overall gains in speed, flexibility, strength, and coordination. Students in TGFU-based lessons also showed better perceptual abilities compared with control groups, possibly due to learning activities adapted to their developmental level.

Participation in physical education lessons using the TGFU framework led to improved athletic performance, especially in volleyball. Students demonstrated progress in both fine and gross motor skills relevant to sports performance. Although not all studies explicitly examined psychomotor outcomes, the available evidence indicates that the TGFU approach supports the development of motor abilities and enhances performance quality in physical education.

Study Limitations and Implementation Challenges

Based on the reviewed studies, several limitations and challenges related to the implementation of the Teaching Games for Understanding (TGFU) approach have been identified. Although not all papers directly addressed these aspects, a number of recurring issues can be observed. Time constraints are frequently mentioned as a major barrier to integrating the TGFU model into regular school curricula. Differences in student engagement and the level of institutional and teacher support also influence the effectiveness of interventions [25]. Successful implementation of hybrid models such as TGFU/SE requires adequate teacher training, which can be difficult due to additional time and workload demands. Variation in students' motivation and initial reactions to new instructional methods further complicates the process.

Several methodological limitations were also observed. Differences in research design, short intervention periods, and small sample sizes reduce the generalizability of findings. The absence of control groups and the use of quasi-experimental designs may introduce bias related to participant selection and maturation. Moreover, high variability in measuring decision-making outcomes limits the comparability of results. Some studies also reported a decline in long-term exercise motivation, particularly among male students, which suggests difficulties in maintaining engagement over extended periods.

While the TGFU model demonstrates promising outcomes, these limitations highlight the need for more comprehensive and longitudinal studies to

strengthen the evidence base and refine practical implementation strategies in physical education.

Conclusions

Based on the reviewed research, the study summarized evidence on the effectiveness of the Teaching Games for Understanding (TGFU) approach and its hybrid forms, including Sport Education (SE) and Teaching Personal and Social Responsibility (TPSR). The findings indicate that TGFU-based interventions in physical education can improve students' physical fitness, body composition, sport-specific skills in activities such as volleyball and soccer, and overall participation in physical activity. In addition, hybrid TGFU/SE and TGFU/TPSR

models support students' initiative, competence, enjoyment, and engagement in lessons.

The TGFU approach contributes to the development of physical, cognitive, emotional, and psychomotor skills, including decision-making and tactical abilities. However, effective implementation requires systematic planning and appropriate teacher preparation to address practical and methodological challenges. Further studies with larger and more diverse samples, as well as controlled designs, are recommended to validate and expand current evidence on the role of TGFU and its hybrid models in physical education.

Conflict of Interest

The authors declare no conflict of interest.

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