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Review Article

Game-Centered Approaches in Primary Physical Education: A Systematic Review of Implementation and Learning Outcomes

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Abstract

Background. Game-centered approaches (GCAs) have arisen as innovative pedagogical frameworks in physical education (PE), providing an alternative to conventional technique-focused instruction. GCAs seek to foster comprehensive student growth in physical, cognitive, emotional, and social areas by prioritizing tactical comprehension, adjusted gameplay, and reflective inquiry.

Objectives. This systematic review aimed to consolidate empirical evidence regarding the implementation and educational outcomes of Game-Centered Approaches (GCAs) in elementary physical education. It focused on delineating the scope, patterns, and pedagogical effects of diverse models.

Materials and Methods. Following PRISMA standards, an extensive search was performed across five databases (Scopus, Web of Science, EBSCOHost, Google Scholar, and PubMed) for peer-reviewed experimental papers published till April 2025. The inclusion criteria emphasized elementary-level therapies using GCAs with quantifiable outcomes in motor, cognitive, psychosocial, or affective domains. Thirty-four studies were incorporated and examined utilizing a qualitative synthesis framework based on the PICO model.

Results. Teaching Games for Understanding (TGfU), Tactical Games Model (TGM) were the most commonly used models, typically integrated into invasion games and organized curriculum. GCAs exhibited substantial advantages in enhancing core movement abilities, gaming performance, decision-making, motivation, creativity, and emotional engagement. Hybrid models and socio-motor modifications improved the application of GCA, while large-scale initiatives expanded their influence on social development and well-being. Nonetheless, no singular model adequately addressed all four learning areas, highlighting the necessity for strategic model integration.

Conclusions. The findings confirm that GCAs are a robust pedagogical framework for elementary physical education, promoting multifaceted student outcomes and aligning with 21st-century educational objectives. Further research should emphasize longitudinal, comparative, and context-sensitive methodologies, while teacher professional development must facilitate these models' practical, inclusive, and sustainable implementation.

Keywords: game-centered approach, physical education, primary school, tactical pedagogy, student outcomes.

Introduction

The implementation of GCAs was considered important for shifting the paradigm of physical education teaching from traditional approaches towards more inclusive and relevant experiential learning. As stated by Garcia-Puchades and Chiva-Bartoll (2020) that GCAs were recognized as a leading method in modern PE, as they focused on games as the primary medium of learning. This approach provided a strong framework for designing learning that prioritized students' social, physical, and cognitive learning outcomes (Metzler, 2017) and in line with the demands of 21st-century education (Gubacs-Collins, 2015). In the context of modern education, GCAs became an effective tool for bridging the gap between pedagogical theory and practice in the field (Light et al., 2014). In GCAs, students learned by playing, a process that strengthened their emotional and social engagement in learning. This was relevant for preparing students to face global challenges while encouraging lifelong active living (Harvey & Jarrett, 2014). Additionally, this approach offered long-term benefits for students, including enhancing their physical activity levels and promoting the adoption of sustainable healthy lifestyles (Mercan & Varol Selçuk, 2024). In other words, the implementation of GCAs was crucial not only for supporting curriculum achievement

but also for ensuring that physical education had a lasting positive impact on students' lives.

Despite the many advantages of GCAs, their implementation in the field still faced various challenges. Teachers often struggled to translate the concepts of GCAs into effective teaching practices due to a lack of adequate pedagogical understanding (Goodyear, 2017). Additionally, traditional curricula that focused on technical skills and sports-based approaches often limited room for innovation in physical education (Kirk et al., 2018). These obstacles were exacerbated by teachers' resistance to changing teaching methods and the difficulty of abandoning old habits (Casey & MacPhail, 2018). The limitations of professional training were also one of the factors hindering the successful implementation of GCAs. Teachers required deeper pedagogical skill development through Continuing Professional Development (CPD) programs, which had proven effective in enhancing teachers' pedagogical knowledge and the quality of learning (Morgan et al., 2019; Bodsworth, 2017). Additionally, the development of peer collaboration was necessary to address teachers' limitations in utilizing new technologies and teaching methods (Hordvik et al., 2021).

An improved understanding of the implementation of GCAs in PE teaching required a more in-depth review through systematic investigation of previous study results. Systematic reviews were essential as they helped compile existing research findings into a more integrated picture, providing clearer guidance for practice and policy development (Barba-Martín et al., 2020; Camacho-Sánchez et al., 2023). Moreover, systematic reviews could identify research gaps and areas needing further attention. By uniting key theories and previous empirical evidence, this approach provided a strong foundation for future research (Ortiz Gómez et al., 2023). This review was pertinent for enhancing teaching methodologies and fostering creativity in game-based physical education.

Most reviews on the implementation of GCAs presented systematic reviews. For example, Miller (2015) conducted a review of 15 articles focusing on student outcomes from the implementation of GCAs. Elumalai et al. (2022) reviewed PE learning approaches in improving physical fitness, academic performance, and enjoyment among students. Ortiz Gómez et al. (2023) examined pedagogical approaches applicable to PE teachers at various levels. Camacho-Sánchez et al. (2023) reviewed the impact of game-based learning (GBL) and gamification on variables studied in each investigation. Fernandez-Rio & Iglesias (2024) conducted a general review of the implementation of pedagogical models. These studies highlighted important content related to implementation, key theories adopted, and gaps for further research. Subsequently, Manninen et al. (2024) reviewed twenty-eight articles comparing the effects of game-based approaches (GBAs) and traditional skill-based approaches on decision-making, knowledge, and motor skills in PE students and athletes. However, this study had limitations as it only covered motor and cognitive skills components but did not include play and psychosocial skills components. Additionally, the target subjects were still general, encompassing all school levels and athletes.

In relation to the weaknesses of the previous study, a systematic literature review was needed to uncover the impact of GCA implementation on Primary school students' development, including motor, cognitive, play, and psychosocial aspects. The systematic literature review aimed to report findings from systematic reviews on the implementation of GCAs on physical, cognitive, emotional, and psychosocial skills. Specifically, this study aimed to answer the questions what forms of GCAs had been implemented to facilitate the development of Primary school students? By synthesizing findings from various studies, this research could provide a clearer understanding of best practices and explain broader implications of GCA implementation as an approach in physical education.

Materials and Methods

Search Strategy

A Systematic Literature Review emphasizes the systematic search process supported by three main steps: identification, screening, and eligibility, which aid researchers in conducting comprehensive article searches (Page et al., 2021). A systematic review was conducted to search for studies discussing the application of soccer-based programs for social development. The study search process was conducted using the Scopus, Web of Science (WoS), EBSCOHost, Google Scholar, and PubMed databases, employing Boolean search strings to identify relevant studies from these databases.

The study search incorporated a combination of keywords (game-based approach OR game-centered approach OR game-based learning OR teaching games for understanding OR tactical games OR step-game approach OR invasion game competence OR game sense OR play practice) AND ("physical education" OR "movement education") AND ("primary school" OR "primary education" OR "Primary school" OR "Primary education") AND ("experiment*" OR "trial" OR "comparison" OR "effect") AND ("decision making" OR "knowledge" OR "critical thinking" OR "creative thinking" OR "problem-solving" OR "enjoyment" OR "motivation" OR "self-control" OR "self-confident" OR "self-esteem" OR "well-being" OR "motor skill" OR "physical activity" OR "physical fitness" OR "health" OR "game performance" OR "gameplay" OR "game understanding" OR "game competence" OR "tactical understanding" OR "skill execution" OR "emotion*") AND NOT ("computer game" OR "augmented reality" OR "virtual reality" OR "digital game" OR "internet" OR "online")) with a search scope of article titles, abstracts, and keywords conducted on April 8, 2025. The reference lists of the included articles were searched to identify additional studies to find relevant articles.

Study Selection and Data Synthesis

The systematic review included articles that: (a) focus primarily on the implementation of GCAs in PE teaching for students' development, including motor, cognitive, play, and psychosocial aspects. The games referred to in this study are those that emphasize active physical engagement by students, rather than online or digital games, (b) provide measurable outcomes of Primary student achievement, and (c) utilize an experimental design with both experimental and compare groups. The exclusion criteria applied during

the search process were: (a) articles not written in English, (b) manuscripts that are not peer-reviewed, not in their final stage, or not sourced from journals.

The study search was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. This choice is based on the fact that PRISMA is a protocol that does not require ethical review and is reliable due to its foundation in high-quality, reputable journals (Kapadia et al., 2016). The studies included in this investigation were synthesized qualitatively. The qualitative analysis is assisted by using mnemonics like PICO (Population, Intervention, Comparator, and Outcome) to systematically develop research questions (Martinez et al., 2023; Schiavenato & Chu, 2021).

Results

Study Selection Result

From the keyword searches across the five databases, a total of 180 articles were initially found: Scopus (n = 31), EBSCOHost (n = 32), WOS (n = 74), Google Scholar (n=35), PubMed (n=8). Following a duplicate check, 6 duplicate studies were excluded. After a full-text screening, another 139 studies were excluded for not meeting the inclusion criteria, each lacking at least one criterion. In the end, 35 studies fulfilled the criteria and were included in the systematic review. However, upon further examination, one article was found to be unavailable full paper and was therefore excluded. Consequently, only 34 studies were included for investigation according to the PICO criteria. The selection process for the included studies is illustrated in Figure 1.

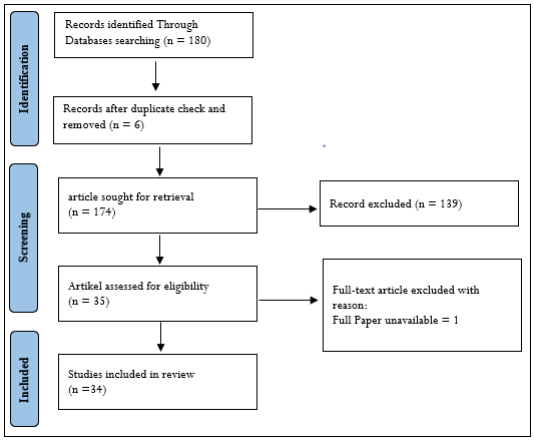

Fig. 1. Flowchart study searching

Overview of Investigation Results

The study results should be presented in tables and described in a logical sequence. The results of the investigation of the 34 studies included are summarized in Table 1. The findings are then elaborated according to the PICO criteria used.

The examined papers provide various GCAs applications in elementatry physical education summarised in Figure 2. This is due to their varied teaching approaches, differing durations, diverse game types, and distinct instructional settings. Teaching Games for Understanding (TGfU), the Tactical Games Model (TGM), Sports Education (SE), and hybrid methodologies were among the most significant approaches. These modifications were implemented to enhance students' performance in gameplay and tactical thinking, motivation, self-perception, and physical fitness.

Most studies (n=21) used TGfU or TGM inside the regular physical education curriculum or structured intervention programs. These strategies include small-sided games, tactical problem-solving, and inquiry to enhance students' existing knowledge. Harvey et al. (2016) used a

Table 1. Summary Included studies

Study (Year)	Participants	Intervention	Comparison	Outcome
(Miller et al., 2015)	168 students	PLUNGE program	No intervention	Improved object control and in-class physical activity
(Harvey et al., 2016)	96 students	TGM unit (basketball)	Traditional unit	Higher MVPA, gender/ school differences in VPA
(Miller, 2016)	107 students	6-week PLUNGE program	No intervention	Improved FMS, PA, decision making
(Petros et al., 2016)	215 students	IAAF Kids' Athletics	No intervention	Increased self-determination and perceived effort
(Telford et al., 2016)	853 children	Specialist PE	Generalist PE	No difference in daily physical activity
(McFarlane et al., 2017)	1,752 grade-6 students	Right to Play program (2 years)	Delayed intervention	Reduced victimization, improved gender attitudes
(Viciana et al., 2017)	66 pupils	TGM	Teacher-centered approach	Positive trend in enjoyment
(Farias et al., 2018)	26 students	3 SE seasons (invasion games)	–	Improved game performance and involvement

Table 1 (continued)

Study (Year)	Participants	Intervention	Comparison	Outcome
(Alcaraz-Muñoz et al., 2020)	152 students	Social-structured games (win/lose/neutral)	Condition comparisons	Winning ↑ positive emotions, losing ↑ negative emotions
(Cocca, Verdugo, et al., 2020)	229 students	Game-based PE vs traditional	Traditional PE	No significant group difference; both improved
(Cocca, Carbajal Baca, et al., 2020)	188 students	TGfU	Traditional PE	Significant fitness improvements
(Coppola et al., 2020)	66 students	TGM (student-centered)	Skills-based group	Higher enjoyment in TGM group
(García-Ceberino et al., 2020a)	35 students	TGAS	Direct instruction	Both improved tactical/technical outcomes
(García-Ceberino et al., 2020b)	41 students	TGAS	Direct instruction	No significant differences
(Rodríguez-Negro & Yanci, 2020)	256 students	TGM	Direct instruction	Higher PA and perceived exertion
(Gaspar et al., 2021)	111 students	TGfU with questioning	TGfU without questioning	Higher autonomy, satisfaction, engagement
(Gamero et al., 2021a)	55 students	TGA	DI and teacher-led	Greater knowledge acquisition
(Gamero et al., 2021b)	49 students	TGA	DI and teacher-led	Higher internal and external training load
(Gil-Arias et al., 2021)	292 students	TGfU–SE hybrid	Direct instruction	Strong motivational effects
(Schembri et al., 2021)	63 children	TGM cycle	Traditional PE	Increased enjoyment
(Sgrò et al., 2021)	34 students	TGM	High vs low skill groups	Low-skill group improved more
(Farias et al., 2022)	26 students	SE + action research	Pre/post	Improved game-play and context participation
(Murtagh et al., 2022)	859 students	Play-based learning	Traditional practices	Higher academic scores
(Rodríguez-Negro & Yanci, 2022)	168 students	8-week TGM	Direct instruction	Enhanced creativity and attention
(Lorente Sanz et al., 2023)	47 students	Three socio-motor games	Game-type comparison	Stronger positive emotional responses
(Stoddart et al., 2023)	131 students	PLitPE	Traditional PE	Improved motor competence and movement vocabulary
(Stojanović et al., 2023)	88 students	TGfU (volleyball, 16 weeks)	Traditional PE	Improved body comp and cardiorespiratory fitness
(Vallejo et al., 2023)	42 students	Active breaks (game-based, 8 weeks)	Free recess	Increased physical fitness
(Wang et al., 2023)	2,032 students	2-hour GCA-based after-school PA	Free-choice time	No reduction in academic time
(Bartolo et al., 2024)	77 students	Divergent Discovery & Practical styles	Free play	Improved motor performance
(Breed, Kay, et al., 2024)	67 students	Game-based invasion unit	Traditional sport unit	Higher activity levels
(Ritonga et al., 2024)	36 students	TGfU	Traditional PE	Improved throwing and catching

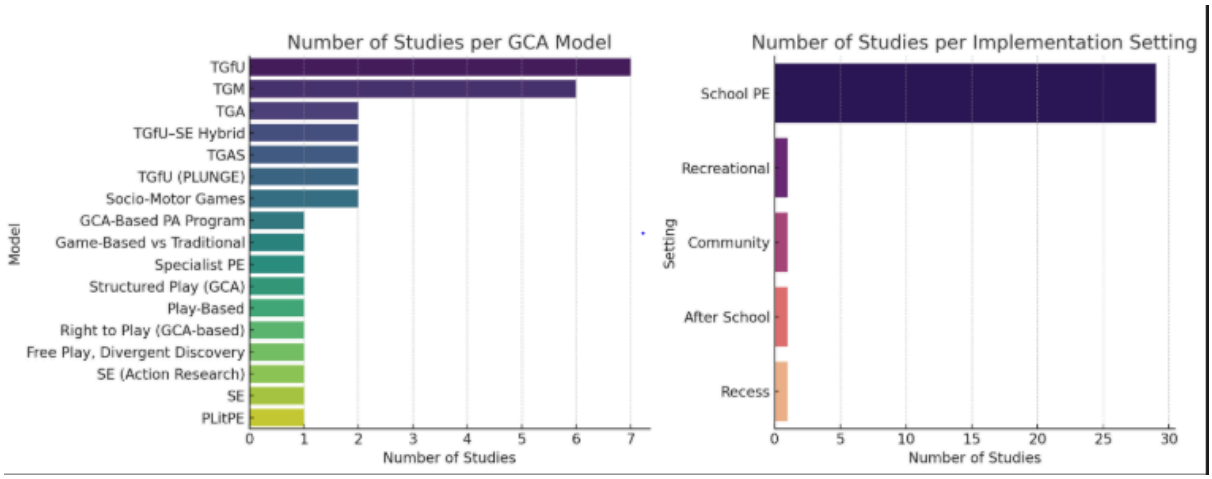

Fig. 2. Summarizing by model and setting application of GCAs

TGfU unit in basketball to encourage children to engage in greater moderate to vigorous physical activity. The PLUNGE curriculum, implemented by Miller et al. (2015) and Miller (2016), integrated TGfU principles over six weeks to facilitate children's acquisition of fundamental movement skills (FMS) and decision-making abilities. Viciana et al. (2017) and Coppola et al. (2020) used the Tactical Games Model with small-sided games to enhance engagement and concentrate on student learning. Rodríguez-Negro & Yanci (2020) & (Rodríguez-Negro & Yanci (2022) used TGM in eight-week courses to foster creativity and tactical engagement, comparing the outcomes to those of direct instructional methods. Additional instances include Cocca, Carbajal Baca, et al (2020) TGfU initiatives aimed at enhancing fitness; Stojanović et al. (2023) use of volleyball to foster health; and Ritonga et al. (2024) implementation of the model to advance object manipulation skills. Gaspar et al. (2021) examined the impact of instructor questioning on TGfU and found that it fosters student independence and engagement. Gamero et al. (2021a; 2021b) conducted two studies on a tactical approach in basketball that enhanced decision-making and training intensity. Gil-Arias et al. (2021) used a TGfU–SE hybrid to assess motivation, while Schembri et al. (2021) and Sgrò et al. (2021) discussed the model's potential to assist less proficient students and enhance enjoyment. García-Ceberino et al. (2020a; 2020b) developed the Tactical Games Approach Soccer (TGAS), enhancing students' comprehension of tactics and approaches. Breed, Kay, et al. (2024) used a themed TGfU unit across several invasion sports, increasing player activity and enhancing tactical comprehension.

A limited body of research (n=3) examined SE models, either alone or in conjunction with TGfU and TGM. Farias et al. (2018; 2022) used SE throughout many seasons of invasion games via iterative action research, finding improvements in tactical performance and situational understanding. Simultaneously, Gil-Arias et al. (2021) integrated SE concepts with a TGfU–SE hybrid model emphasizing an encouraging environment, accountability roles, and inclusive game structures. Although this research indicated that social-emotional learning might be beneficial, most focused on individuals rather than teams. It failed to include defenders' roles in the tactical analysis systematically.

Alongside formal game models, four studies used play-based or socio-motor methodologies that, although not explicitly designated as TGfU or TGM, nonetheless adhered to the core GCA principles of situational decision-making and dynamic gaming. Murtagh et al. (2022) discovered that a play-based curriculum enhanced student engagement and academic performance. Lorente Sanz et al. (2023) used three types of socio-motor games to examine emotional experiences. Alcaraz-Muñoz et al. (2020) examined emotional intensities in cooperative and competitive contexts. Bartolo et al.(2024) examined several types of outdoor play, including divergent exploration and teacher-directed play, and found that they enhanced motor abilities. However, these studies demonstrate the emotional and expressive benefits of GCAs; several instruments were either unvalidated or modified in a manner inconsistent with the educational context.

Finally, four studies demonstrated that GCAs may be implemented in large-scale or non-academic environments, indicating that these strategies may extend beyond conventional physical education contexts. McFarlane et al. (2017) implemented the Right to Play initiative in Pakistan for two years. They used structured activities to address peer victimization, gender norms, and psychological competencies. Wang et al. (2023) initiated an after-school program centered on tactical play, demonstrating that children may increase physical activity without sacrificing classroom instruction. Vallejo et al. (2023) modified school recess using structured GCA workouts to enhance children's fitness. Bartolo et al. (2024) used GCA in outdoor free play to facilitate physical and expressive development.

The Figure 3 illustrates the impact of several GCA models used in primary physical education on learning outcomes across four domains: physical, cognitive, emotional, and social. The TGfU model is the most prevalent, significantly contributing to physical and cognitive development by emphasizing motor skills and tactical awareness. GM and TGfU–SE hybrids provide several benefits, particularly in cognitive and emotional domains. This indicates that they may include students via reflective inquiry and role-based learning. The SE and TGAS models show a stronger correlation with cognitive and social outcomes but a weaker association with emotional development.

This indicates that more structured and strategic forms of play are superior. Conversely, socio-motor games and play-based methodologies are primarily associated with emotional and motivational advantages, with some overlap in social learning. This indicates that they effectively promote emotional engagement and participation from all individuals. Models specific to particular contexts, such as Right to Play, after-school GCA programs, and structured recess activities, often concentrate on a singular domain, such as social or physical, by the program's objectives. None of the models fully address all four learning dimensions; nevertheless, TGfU and its derivatives provide the most extensive array of developmental advantages. These findings underscore the need to select models and consider their potential interactions carefully. This will ensure that the design, implementation, and specific physical, cognitive, or psychosocial goals educators desire are aligned..

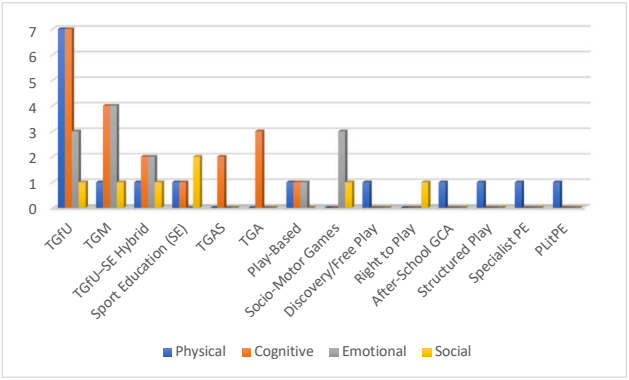

Fig. 3. Summary Learning Outcomes by GCA Model in Primary PE

Discussion

This study examined how GCAs have been implemented in primary PE and the outcomes they have produced across physical, cognitive, emotional, and social domains. These models engage students in meaningful learning experiences that go beyond mere activity, encouraging them to think, feel, move, and relate in authentic and developmentally appropriate ways. The results suggest that these approaches reinforce the idea that PE should go beyond physical activity to foster creativity, tactical awareness, and strategic thinking. Moreover, with physical fitness benefits such as improvements in cardiovascular fitness and body composition, game-centered models can be as effective as, if not more effective than, traditional fitness training methods. This is in line with the statement that game-based approach was recommended as a PE teaching strategy (Barba-Martín et al., 2020) and was part of a PE philosophy oriented towards games as objects (Garcia-Puchades & Chiva-Bartoll, 2020). Teaching PE by Primary school teachers could be effectively enhanced through game-centered pedagogical approaches (Miller et al., 2016).

Most studies (n = 25) were situated within formal school-based PE programs, reflecting growing curricular interest in learner-centered and tactically rich pedagogies. The remainder were conducted in extracurricular (n = 6) and community or free-play settings (n = 3), suggesting broader adaptability of GCAs beyond conventional classrooms. TGfU and TGM were the most widely applied models (n = 21), predominantly structured around invasion games such as soccer, basketball, and volleyball. These implementations emphasized modified games, questioning strategies, and tactical scaffolding to promote decision-making and contextual learning. The findings implied a crucial need for a paradigm shift from traditional teacher-centered methods to innovative, student-centered approaches in PE. Implementing these approaches in Primary schools could foster holistic learning outcomes, encompassing physical, cognitive, and social development. Moreover, GCAs like thematic invasion through game sense effectively promoted physical activity (Breed, Kay, et al., 2024) and had positive impacts on student engagement, academic achievement, and physical fitness (Mahardhika et al., 2024; Mercan & Varol Selçuk, 2024; Molina-Torres et al., 2021). The GCAs provided significant benefits related to understanding the relationship between the concept and reality of playing, the internal structure of games, and the development of motor interventions (Martínez-Santos et al., 2020).

GCAs yielded positive outcomes across all four developmental domains. Physical and motor gains were observed in interventions emphasizing structured gameplay and movement-rich tasks. TGfU programs enhanced fundamental motor skills and physical fitness (e.g., Miller et al., 2015; Cocca, Carbajal Baca, et al., 2020; Ritonga et al., 2024; Stojanović et al., 2023), and hybrid play-based models demonstrated additional utility for supporting diverse motor profiles, including those of lower-skilled students. Cognitive and tactical learning gains were equally robust. Through questioning, reflection, and context-specific play, students developed higher-order thinking, game intelligence, and adaptable problem-solving skills (e.g., Gaspar et al., 2021; Gamero et al., 2021a; Rodríguez-Negro & Yanci, 2022). This cognitive scaffolding not only enriched in-game decision-making but also supported broader academic and executive functioning, as evidenced in interdisciplinary studies.

Affective and motivational dimensions also benefited from GCA implementation. Programs incorporating socio-motor games and emotionally rich activities fostered high levels of student enjoyment, autonomy, and emotional safety (e.g., Schembri et al., 2021; Sgrò et al., 2021; Lorente Sanz et al., 2023). These outcomes are particularly significant in inclusive education contexts, where emotional security and engagement are prerequisites for sustained participation. Furthermore, the social and interpersonal benefits of GCAs were strongly evidenced in studies focusing on community-based initiatives. Programs like Right to Play (McFarlane et al., 2017) and SE models (Farias et al., 2018; 2022) supported the development of prosocial behavior, gender equity, and collective responsibility, demonstrating the broader potential of GCAs to contribute to character education and citizenship development.

This study's outcomes align with the statement that GCAs significantly benefit physical education, particularly improving students' learning competencies. Research showed that this approach supported the development of decision-making skills, tactical awareness, and enjoyment during learning (Morales-Belando et al., 2022). Additionally, GCAs allowed students to learn holistically, encompassing physical, cognitive, social, and affective aspects (Kim, 2024). This integration aligned with the goals of modern physical education, which emphasized the comprehensive development of learners.

GCAs were also one of the models effectively implemented in Primary schools (García-López et al., 2019). Additionally, this approach supported active learning and provided realistic playing experiences, which were relevant to students' real-life contexts (Breed et al., 2024; Mercan & Varol Selçuk, 2024). Therefore, GCAs became an effective learning strategy to enhance student engagement and achievement in PE classes.

Primary educators should have integrated these approaches into their teaching to create more dynamic and inclusive PE programs. Developing techniques, understanding, tactical knowledge, and decision-making could be done through a tactical approach (Robles et al., 2020). Games applications could be done by modifying rules and equipment to manipulate player behavior, thus forming the expected skills (Ashford et al., 2020). On the other hand, games could be implemented to identify talented players and assess perceptual-cognitive-motor skills (Piggott et al., 2019). Furthermore, a study by Lucia et al. (2022) revealed that games had clear efficacy in cognitive-motor training protocols (CMT) on sports performance and increased anticipatory brain processing in the prefrontal cortex.

Moreover, the use of gamification and question-based techniques in this model emphasized the importance of encouraging student autonomy and active participation, making PE more relevant to 21st-century learning needs. 21st-century education has shifted to emphasize the ability to find knowledge and information from various sources, formulate problems, think analytically, collaborate in problem-solving, and optimize the formation of life skills, social skills, and lifelong learners (Alawiah et al., 2022; Joynes et al., 2019). Professional development programs for PE teachers should have focused on equipping them with the knowledge and skills to effectively implement these innovative methods. By adopting such practices, Primary schools could have positioned PE as a holistic platform that nurtured physical, cognitive, and emotional growth, ultimately contributing to the overall development and well-being of young learners.

Implications for Practice and Future Research

The findings from this review carry several implications for both educators and researchers. For practitioners, GCAs offer a viable framework for promoting multidimensional learning that integrates physical literacy, tactical thinking, emotional resilience, and social cooperation. Their adaptability across formal and informal settings makes them particularly useful in diverse educational contexts, including under-resourced schools and culturally varied environments. However, to realize their full potential, teachers must be equipped with professional development that emphasizes tactical pedagogy, questioning strategies, inclusive game design, and context-appropriate assessment.

Future research on GCAs in physical education should focus on several key areas to enhance their understanding and effectiveness. Direct comparative studies between different GCA models, such as TGfU and TGM, are essential to identify the most effective approach for improving outcomes like motor skills, cognitive development, and social competencies, providing clearer insights into their impact on student learning and engagement across various contexts. As has been stated by Lee & Lee (2021) that experimental studies were required to conduct quantitative comparisons and validations through comparative studies of traditional PE programs that did not incorporate these methods. Additionally, exploring hybrid models, such as combining TGfU with SE, could offer valuable perspectives on long-term student motivation, physical activity, and academic outcomes.

Conclusions

This comprehensive study presents compelling evidence that GCAs, particularly TGfU, TGM, and their hybrids, are very effective for instruction in fundamental physical education. GCAs consistently showed positive impacts on children's physical, mental, emotional, and social development throughout 34 studies. These solutions transcended standard skill-based approaches by promoting meaningful learning via tactical decision-making, reflective questioning, and altering gameplay dynamics. TGfU and TGM significantly enhanced motor abilities, tactical awareness, and student motivation. Conversely, socio-motor and play-based adaptations enable children to articulate themselves and enhance their well-being, aligning with the objectives of inclusive education.

The findings indicate the need for basic physical education to modify its pedagogical approach to include models integrating physical literacy with cognitive involvement and emotional well-being. GCAs were seen to function well in both formal and informal environments, indicating their potential use outside conventional educational institutions. The use of GCAs in diverse manners and the insufficient emphasis on emotional and social learning outcomes in contemporary studies indicate a need for more integrated and multidimensional program designs. Ultimately, GCAs can enhance basic physical education by fostering physical abilities, creativity, social competencies, and a lifelong passion for movement. To maximize these benefits, educators, researchers, and policymakers must collaborate to integrate GCAs into curricular frameworks that prioritize the student's holistic development.

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Conflict of Interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publica-tion of this article.

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Ігроцентричні методи у фізичному вихованні учнів початкової школи: Систематичний огляд впровадження та результатів навчання

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Авторський вклад: A – дизайн дослідження; B – збір даних; C – статаналіз; D – підготовка рукопису; E – збір коштів

Реферат. Стаття: 11 с., 1 табл., 3 рис., 59 джерел.

Історія питання. Ігроцентричні методи (ІЦМ) виникли як інноваційні педагогічні концепції у фізичному вихованні (ФВ), створюючи альтернативу традиційному технічно-орієнтованому навчанню. ІЦМ спрямовані на стимулювання комплексного розвитку учнів у фізичній, когнітивній, емоційній та соціальній сферах шляхом пріоритизації тактичного розуміння, адаптованого ігрового процесу та рефлексивного аналізу.

Цілі. Цей систематичний огляд мав на меті узагальнити емпіричні дані щодо впровадження та освітніх результатів в контексті використання ігроцентричних методів (ІЦМ) у фізичному вихованні початкової школи. Основна увага приділялася визначенню сфери застосування, закономірностей та педагогічного впливу різних моделей.

Матеріали та методи. Відповідно до стандартів PRISMA («Переважні елементи звітування для систематичних оглядів та метааналізів»), було проведено розширений пошук у п'яти наукометричних базах даних (Scopus, Web of Science, EBSCOHost, Google Scholar та PubMed) з метою виявлення рецензованих експериментальних статей, опублікованих у період до квітня 2025 року. У критеріях включення наголошувалося на процедурах, адаптованих для учнів початкової школи з використанням ІЦМ, які мали кількісно вимірювані результати в моторній, когнітивній, психосоціальній або афективній сферах. Було включено та проаналізовано 34 дослідження з використанням концепції якісного синтезу на основі моделі PICO.

Результати. До найбільш поширених моделей належали: навчальні ігри для тренування розуміння (Teaching Games for Understanding, TGfU) та тактична модель ігор (Tactical Games Model, TGM), інтегровані зазвичай в інвазивні ігри та організовану навчальну програму. ІЦМ показали значні переваги в покращенні основних рухових навичок, ігрової результативності, ухваленні рішень, мотивації, креативності та емоційній залученості. Гібридні моделі та соціомоторні модифікації сприяли поліпшенню застосування ІЦМ, тоді як масштабні ініціативи розширили їхній вплив на соціальний розвиток та благополуччя. Проте жодна окрема модель повноцінно не охоплювала всі чотири області навчання, що підкреслило необхідність стратегічної інтеграції моделей.

Висновки. Результати дослідження підтверджують, що ІЦМ представляють собою надійну педагогічну основу для фізичного виховання в початковій школі, забезпечуючи досягнення багатоаспектних результатів у навчанні учнів та відповідаючи освітнім цілям 21 століття. У подальших дослідженнях слід акцентувати увагу на лонгітюдних, порівняльних та контекстно-залежних методологіях, тоді як професійний розвиток викладачів має сприяти практичному, інклюзивному та сталому впровадженню зазначених моделей.

Ключові слова: ігроцентричний метод, фізичне виховання, початкова школа, тактична педагогіка, результати навчання учнів.

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