Implementation of Teaching Games for Understanding to Stimulate Game Understanding of Elementary School Students

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Article Info

Abstract

Traditional physical education approaches, which often focus on decontextualized sports techniques, may affect the student engagement leading to learning difficulties. The Teaching Games for Understanding (TGfU) model, which emphasizes game understanding and skill development through actual plays, offers a pedagogical alternative. This study aimed to assess the effectiveness of using TGfU with modified traditional games, specifically the Kasti game, to improve the game understanding of primary school students. The pre-experimental design, specifically the One Group Pretest-Posttest Design, was used. This study involved 24 Grade 5 students from a public primary school in West Kalimantan, Indonesia. The TGfU model was implemented using a modified version of the Kasti game adapted to the school curriculum. The game comprehension was measured using the Game Performance Assessment Instrument (GPAI), focusing on decision-making, skill execution, and covering ability. Data were analyzed using descriptive statistics and t-tests to compare pretest and posttest results. Results of this study found a significant improvement in the student game comprehension after the intervention. The mean scores for skill execution, decision-making, and covering ability increased the overall game understanding from the pretest mean of 0.61 to the posttest mean of 0.67. The number of students categorized in the Effective Performance category increased, indicating improved cognitive and tactical understanding. The study concludes that TGfU, which incorporates modified traditional games, could effectively improve game understanding of primary school students. This approach could enhance student cognitive abilities and increase their enjoyment and engagement in sports. These findings suggest that TGfU is a viable model for teaching physical education.

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INTRODUCTION

Physical education (PE) has traditionally been taught using a command-based style that focuses on sport-specific content. However, there has been a shift towards a more decontextualized approach to teaching sports techniques (Kirk, 2016). Consequently, many learners experience difficulties performing learning, and students also struggle to play during the game (Harvey et al., 2018). In response to these issues, an alternative model for teaching team games in PE was introduced: Teaching Games for Understanding (TGfU). This approach emphasizes understanding how to play games, developing skills, and fostering a deeper grasp of game concepts (Papagiannopoulos et al., 2023). TGfU is considered an alternative to traditional content-oriented learning, as it utilizes an actual gameplay approach (Memmert et al., 2015). While pedagogically challenging, TGfU is a game-based learning model recommended for promoting motor skills (Dania & Harvey, 2020). In this regard, TGFU can increase students' low motivation to participate in physical education lessons (García-González et al., 2020). This makes TGfU a model that can be used in the teaching and learning process of physical education (Ab Rahman et al., 2020).

One of TGfU's strengths is its ability to develop students across multiple learning domains—psychomotor, cognitive, and affective—simultaneously (Harvey et al., 2016). Additionally, TGfU has been shown to enhance students' cognitive abilities and tactical thinking by encouraging them to evaluate game situations (Harvey et al., 2020), thus fostering critical thinking skills (Barnabè et al., 2023). Beyond cognitive development, TGfU also helps students understand game rules, the essence of the game, and the necessary skills and tactics to improve their gameplay (Papagiannopoulos et al., 2023). Moreover, TGfU has been found to be more effective than direct instruction in increasing students' physical activity levels during sessions (Sierra-Ríos et al., 2020). A key aspect of TGfU is its focus on creating enjoyment through gameplay (Batez et al., 2021), while also emphasizing the fundamentals of the game to improve students' ability to identify tactical problems and respond appropriately (Mitchell et al., 2020).

The TGfU model is particularly effective when applied in elementary schools (García-López et al., 2019), as younger students are in the developmental stage of acquiring fundamental movement skills. Playing games is an engaging way for them to learn (Goodway et al., 2019). Studies that have implemented TGfU in elementary PE settings have demonstrated that it promotes enjoyment, helps teachers introduce skill variations, and improves students' motor skills (Wang & Wang, 2018). Additionally, the use of TGfU has been shown to enhance decision-making, skill execution, game performance, and students' intent to be physically active (Barquero-Ruiz et al., 2021). However, despite these benefits, PE teachers still face challenges when implementing the model (Harvey, 2016). The practice of TGfU remains limited and must be adapted to fit the PE curriculum in each school (Harvey, 2016). It should also be tailored to the specific context, student characteristics, and school environment (Morales-Belando et al., 2022).

Addressing the challenges related to TGfU implementation is crucial. One possible solution is to incorporate games that are familiar to students or similar to their environment, such as modified traditional games. This approach is effective because ball games are a simple and affordable method for fostering communication and engagement (Ibrahim et al., 2021). Research on the use of TGfU with traditional games has primarily focused on improving motor skills and has not fully explored its potential to enhance game understanding (Gipit Charles et al., 2017; Martínez-Santos et al., 2020; O'Leary, 2016; Ribas et al., 2023). Modified traditional games have been shown to effectively stimulate elementary school students' problem-solving abilities (Gustian et al., 2022).

This study aims to apply TGfU using modified traditional games in PE lessons for primary school students, with a focus on improving their understanding of games. The game used in this study is Kasti (a field game), which has been modified and adapted to align with the school curriculum. The purpose of this research is to examine the effectiveness of TGfU with a modified Kasti game in enhancing elementary students' game understanding. The results of this study are expected to provide valuable insights for PE teachers, especially those working with upper elementary students who are still developing their fundamental motor skills (Goodway et al., 2019).

METHODS

Pre-experimental study using One Group Pretest-Posttest Design was the methodology employed. There was no control group; instead, the study focused on a single experimental group. The TGfU model was implemented using field games that were adapted to align with typical PE instruction in elementary schools. The task for the experimental group was to participate in a game with modified fields, allowing children to engage actively and improve their motor skills. A game understanding assessment was administered to the students both before and after the intervention, based on the study's planned stages.

Partisipants

The participants in this study were fifth-grade students from a public elementary school in the Batu Ampar sub-district, Kubu Raya district, West Kalimantan Province, with a total of 48 students. A stratified random sampling technique was used to select participants. The target population consisted of two fifth-grade classes with 56 students in total. The inclusion criteria for participants were: ideal body weight, no physical or mental disabilities, and good health. These criteria ensured that the students could fully participate in and complete the learning sessions. Ultimately, 24 students were selected for the study, comprising 11 girls (45.83%) and 13 boys (54.17%), with an age range of 10.6 to 11.4 years.

Procedure

The TGfU model used in this study followed six phases, as adapted from Barquero-Ruiz & Kirk, (2024). First, arranging a game for students to play; second, ensuring students understand and appreciate the game; third, encouraging strategic thinking and tactical awareness; fourth, promoting problem-solving and decision-making regarding game strategies; and fifth, carrying out movements based on the decisions made.

The research was divided into four stages over five meetings, totaling eight sessions (see Table 1). Each meeting lasted 80 minutes. The first stage involved an introduction, where the objectives were explained, and the game was introduced in one meeting. The second stage consisted of pretest data collection. The third stage, comprising four sessions over two meetings, involved intervention and was critical for implementing the learning process. The final stage involved posttest data collection after the intervention.

Instruments

Game understanding was assessed using the Games Understanding Assessment Instrument (GPAI), adopted from Barquero-Ruiz & Kirk, (2024). The GPAI component consists of decision-making (DM), skills executing (SE), and the ability to protect the opponent's cover (CV). Of these three components, the criteria used in the assessment are accuracy in making decisions, effectiveness in executing skills, and accuracy in protecting the opponent (covering).

Instrument validation involved two experts in TGfU and GPAI, who quantitatively rated the instrument on a scale of 1 to 5 and provided qualitative feedback on the aspects and assessment criteria, ensuring they aligned with the pedagogical features of TGfU. The experts rated all features as highly appropriate (5). Based on their suggestions, the assessment was refined by improving the objectives, increasing the number of questions, adjusting the language, and reorganizing the order of the questions.

Data Analysis

Data analysis was carried out descriptively using quantitative methods with the SPSS 26 software. To assess students' game understanding, GPAI analysis was conducted by summing the scores for each component and calculating the index value by dividing by the total number of components. The results were classified

Table 1. Course Schedule

Phase	Session	Scope	Stage	Meeting
Game Form Introduction	1	Introduction and explanation of learning objectives	Game Form Introduction	1
	2	Game Introduction	Game Form Introduction	1
Pretest	3	Motor skills test	Performance Test	2
Intervention	4	Games Play	Understanding Game Concept	3
	5	Games Play	Making Decisions	3
	6	Games Play	Skill Execution	4
	7	Games Play	Games Performance	4
Posttest	8	Motor skills test	Performance Test	5

into four categories: very practical, very effective, mod-

erately effective, and less effective. This classification aimed to determine how well students improved their game understanding through gameplay. The difference between pretest and posttest scores on game understanding was analyzed using a t-test. These findings served as the basis for evaluating the effectiveness of the TGfU model in enhancing students' game understanding.

RESULT

The results from measuring game understanding indicate an improvement in the average scores between the posttest and pretest for each variable. As seen in Table 2, Skill Execution (SE) increased from 0.65 to 0.69, Decision Making (DM) from 0.57 to 0.62, Covering (CV) from 0.60 to 0.69, and overall Game Understanding from 0.61 to 0.67. The improvement ranged between 0.04 and 0.09.

Table 3. Student Game Understanding Recap

Games Performance Score	Pre-test (F)	Post-test (F)	Descriptive Ratings
0.80-1.00	0	0	Very Effective Performance
0.60-0.79	15	21	Effective Performance
0.40-0.59	9	3	Moderately Effective
0.20-0.39	0	0	Weak Performance
0.00-0.19	0	0	Very Weak Performance
Total	24	24	

Next, a homogeneity test was conducted . The Levene Statistic showed a significance level of 0.98, indicating homogeneity of variances, as the value was greater than 0.05. Based on this, a paired t-test was conducted.

The t-test results (Table 4) showed a t-value of 5.514, which was greater than the t-table value of 1.711, leading to the rejection of the null hypothesis (Ho). This indicates that there was a significant difference between the pretest and posttest scores. The significance value was <0.05, confirming that the improve

Table 2. Student Games Understanding Measurement Results

Measured Items		N	Minimum	Maximum	Mean Statistic	Mean Std. Error	Std. Deviation
Skill Execution	Pretest	24	.55	.80	.65	.01	.07
	Posttest	24	.60	.79	.69	.01	.05
Dicision Making	Pretest	24	.40	.75	.57	.02	.09
	Posttest	24	.40	.71	.62	.01	.07
Covering	Pretest	24	.43	.75	.60	.02	.08
	Posttest	24	.62	.75	.69	.01	.05
Game Understanding	Pretest	24	.51	.69	.61	.02	.04
	Posttest	24	.56	.73	.67	.01	.04

Based on the recapitulation data, the categorization of students' game understanding (Table 3) shows that most students' pretest scores fell within the 0.60-0.79 range, totaling 15 students, while nine students scored between 0.40-0.59. These results show that students predominantly have abilities in the Effective Performance category, followed by the Moderately Effective category. The posttest score also has the same results as the pretest, which shows that students' game understanding is dominant in the score range 0.60-0.79, only there has been an increase in the number of students who succeeded in achieving the score, increasing by six students to 21 students and the score range 0.40-0.59 only leaves three students. Students' game understanding abilities are also still in the Effective Performance category, followed by the Moderately Effective category. No students reached the Very Effective Performance category.

ments in students' game understanding were statistically significant.

Table 4 Game Understanding t-test Results

		Paired Differences Mean	Paired Differences Std. Dev.	t	df	Sig. (2-tailed)
Pair 1	Posttest - Pretest	.06	.05	5.51	23	.000

DISCUSSION

This study aimed to assess the effectiveness of the TGfU model in improving elementary school students' game understanding through modified field games. As a result, it can be used as a reference for teachers in implementing PE learning, especially in elementary schools. The results of the study show that there has been an increase in elementary school students' game-

understanding abilities based on the mean pretest and post-test. The results of this study are in line with the results of previous research which state that there has been a significant increase in students' decision-making and execution capacity with the comprehensive application of the TGfU model (Pizarro et al. (2017; Arias-Estero et al., 2020; Sucipto, 2020; Morales-Belando et al., 2018). The findings are further supported by (Gil-Arias et al., 2017; Abad Robles et al., 2020), who emphasize that the TGfU model, through contextualized and modified games, enhances motivation, decision-making, and tactical understanding.

The significant increase in game understanding after the TGfU intervention suggests that it effectively promotes students' tactical reasoning and evaluation of game situations (Harvey et al., 2020). In addition, the TGfU model develops the technical, cognitive, and problem-solving skills required for gameplay (Abad Robles et al., 2020;Bracco et al., 2019;Castillo et al., 2020;Farias et al., 2015;Xie et al., 2020). The increased understanding of the game is also due to the use of TGFU in enhancing a fun mood for students thus improving the mood state to engage more actively in physical activity (Nugraha et al., 2020).

Based on the results of this study, TGFU is an appropriate learning model to be applied in PE learning, especially in the efforts to improve students' cognitive abilities. The TGfU model is implemented using games through understanding, developing tactical knowledge, and enhancing problem-solving through execution and decision-making skills (Chatzipanteli et al., 2016; Gil et al., 2022; Slater & Butler, 2015; Ortiz et al., 2023)).

The Teaching Games for Understanding (TGfU) model offers an innovative alternative to traditional sports instruction by transforming the teaching-learning process. It prioritizes content that alters both the functional and formal elements of gameplay, fostering creativity and adaptability in students (Puente-Maxera et al., 2020). TGfU places the learner at the center of the experience, encouraging them to become active participants in the game, which enhances their decision-making skills and strategic execution. By focusing on developing game strategies, TGfU boosts young players' tactical intelligence and game awareness (Sierra-Ríos et al., 2020).

Physical education (PE) teachers can leverage TGfU's pedagogical benefits to maximize students' abil-

ities. Through its play-based approach, TGfU encourages students to explore the necessary skills, strategies, and tactics for better understanding and playing games (Ribas et al., 2023). This model shifts attention towards the logical dynamics of gameplay, emphasizing the integration of learning within the context of the game (Sierra-Ríos et al., 2019, Friskawati, 2023). TGfU also enhances decision-making, skill execution, and game performance while increasing student engagement and motivation to be physically active (Barquero-Ruiz et al., 2021). TGFU serves as a positive pedagogical model in PE because it encourages learning to play through effectively stimulating the cognitive aspect of elementary school students (Gustian, 2021). Thus, students are intrinsically motivated (Barba-Martín et al., 2020).

CONCLUSION

This study demonstrated the effectiveness of the TGfU model in improving elementary school students' game understanding through modified field games. The results showed significant improvements in decision-making, skill execution, and overall game performance. TGfU provides an effective framework for PE teachers to develop students' tactical knowledge and cognitive skills, making it a valuable approach for elementary school education. The study's limitations include the use of a single experimental group, a relatively small sample size, and a short intervention period. Future research should involve larger, more diverse populations and longer interventions, and explore TGfU applications to other sports and game types.

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CONFLICT OF INTEREST

The authors declared no conflict of interest.

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