



## IMPROVEMENT OF HOTS METHOD IN BASKETBALL GAME THROUGH TGFU LEARNING

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### Abstract

**The study's purpose** was to improve students' Higher Order Thinking Skills (HOTS) through learning using the Teaching Game For Understanding (TGfU) as a medium. This study uses purposive sampling with the provision of classes that have a low average value of physical education.

**Materials and methods.** This research is classroom action research (CAR). The sample used in this study consisted of one class totaling 32 students.

**Results.** The results of the study were that in the first cycle there were two assessments carried out, namely when playing the first game and the second game. In the first game students got a pretty good score, namely for the average SEI (Skill Execution Index) value of 0.72 from the highest score of 1 with a percentage of 72%. In the second cycle, the treatment given to students was still the same as the treatment in 1st cycle. In the second cycle, this time in the 1st game the average SEI value increased to 0.79 with a percentage of 79% then DMI increased to 0.81 with a percentage of 81% and the SI value increased to 0.81 with a presentation of 81%.

**Conclusions.** The learning process using TGfU can improve students' HOTS skills. Learning TGfU with attacking and defending games, can improve decision making, execution skills, and player support which can be seen from each indicator that is determined to have increased from each cycle carried out by students. Hopefully, this research can be a support for Physical Education to grow more advanced.

**Keywords:** teaching game, thinking skill, classroom action research, physical education.

### Introduction

In teaching Physical Education (P.E.) and sporting activities, a directed engineering concept should be used (a technique-led approach) (Nasrulloh et al., 2021). The main purpose of using this approach is to help learners to be aware of the kinds of techniques required to play various sports activities. Students may be able to develop good techniques at various sporting abilities but have very little knowledge of the game. Giving learning experiences is done with multi-purpose, multi-method, multi-source and media by making students the subject of learning (Kristiyanto et al. 2020).

P.E. is one of the subjects in the 2013 curriculum. P.E. is an integral part of the national education program, aims to develop aspects of physical fitness, movement skills, critical thinking skills, social skills, reasoning, emotional stability, moral action, a healthy lifestyle and the introduction of a clean environment through the provision of learning experiences and carried out systematically based on the values of faith and devotion to God Almighty (Sutapa et al., 2020).

Creativity or the application of a knowledge of the ability to exercise to an alternative learning approach that can be applied. A response to claims that teaching games for understanding was not developed as a theoretically based pedagogical framework (Harvey et al., 2018). TGfU attracted the attention of all sports teachers. TGfU is an instruction model that focuses on developing the abilities of students (Wang, M., & Wang, L. 2018). Recent studies have tended to com-

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pare or concentrate on the knowledge, psychological and affective outcomes of this approach (Gil-Arias et al., 2020). Research shows that tactics are more useful than approaches and their results support the development of new teaching theories in game-game teaching (Fani & Sukoco, 2019).

Low student achievement is not caused by a lack of abilities, but a lack of motivation to learn so that students do not direct all their abilities (Mandigo et al., 2019). For this reason, teachers are required to be more creative in the learning process starting from determining learning objectives, learning design, using learning media, and applying appropriate learning models, so that the expected learning objectives can be achieved properly. One of the strategies that teachers can do to achieve the desired learning objectives is to determine the learning media that suits their needs (Lodewyk & Bracco, 2018).

The learning model "tactical approach is a learning model that is often applied to sports games that emphasize understanding play tactics" (Barba-Martín et al., 2020). Learning sports games through a tactical approach can help students in making tactical and strategic decisions when playing games (Abad Robles et al., 2020). Learning games using a tactical approach model is an effective method of decision making in sports games, and should be used as the main goal in learning sports games (Gambles et al., 2018). Therefore, games are included as an important component in the physical education curriculum because it is better if 65% of physical education learning is more in the form of games (Gambles et al., 2018). More than 50% of the time spent in physical education programs at the School of Alberta is more directed towards learning games (Salimin et al., 2018).

The early recognition of this tactical approach was based on the findings of Bunker and Thorpe in 1982, through the concept of Teaching Game for Understanding (TGfU) (Memmert et al., 2015). In TGfU students learn a game that is directed to awareness of playing tactics and problems when tactical actions are taken. TGfU is designed to focus on developing tactical awareness and decision making with a framework of play or an appropriate form of play." Thus, when we apply a tactical approach to game learning, the TGfU concept must be embedded in the thinking of a physical education teacher. This pattern is illustrated in the sequence of learning games in the TGfU frame, namely (1) play, (2) game appreciation, (3) tactical awareness, (4) decision making, (5) skill implementation, (6) performance (Listyarini et al., 2021).

In TGfU, it is necessary to consider the need for knowledge and tactical understanding of a game, but many teachers prohibit the use of this model, especially in terms of providing material game and physical limitations. Consequently, the original TGfU was simplified into a three-level tactical approach (Tactical Games Approach / TGA) which focused on the three basic components in physical education lessons. The three components are: (1) modifying and simplifying the game, (2) developing awareness of tactics and solving problems through questions, and (3) developing skills such as individual motion using the ball and without the ball. Game modifications are designed or conditioned towards tactics in various game situations, such as defending the area or directing the ball to the target. All game conditions are always related to the rules, scoring methods, and objectives of the game, as well as providing the structure and purpose of the game. Learning the game through a tactical approach will get joy, excitement and motivation.

After studying several TGfU concepts described by several experts, and based on the opinion of Metzler and Housner (2009: 9) in Chapter I, it is known that the TGfU which was developed in England in the 1980s according to Griffin, Mitchell, and Oslin, the term is "Tactical Games Model (TGM)" (Armour et al. 2009). The Tactical Games Model (TGM) is the same as the Teaching Game Approach (TGA) which in the implementation of learning tends to refer to the relationship and the overall learning plan which includes: (1) theoretical basics, (2) statement of learning outcomes, (3) teacher knowledge skills, (4) develop adjustment and grouping of learning activities, (5) expect teacher and student behavior, (6) unique task structures, (7) assess learning outcomes, and (8) provide direction the model itself. There are three main assumptions in-game learning with a tactical approach, namely: (1) the game is modified in a representative manner to facilitate the form and conditions of the game (such as changes in game rules) which lead to tactical problems found in the game; (2) the game makes assessment easier; and (3) the game generally has a tactical problem, its basic form includes a classification system and a play tactic model structure. The classification system includes four main categories, namely (a) target play, (b) running / field games, (c) net games, and (d) invasion games.

The coaching process is a decision-making process in which the trainer is tasked with implementing the decisions that define practice. Training requires versatility because of the multitude of decision-making, including how to plan training sessions and training assignments. Training sessions, especially training assignments, mean developing abilities, or innate skills of players. Various studies have been conducted to assess how teaching and training of team sports are carried out through task analysis, with a major focus on the stages of sports initiation. From a non-linear pedagogical perspective, the analysis of the tasks for teaching and training sports designed by the coach is essential. This allows us to examine the context in which athletes learn (i.e. learning situations) and adapt to them sporting dynamics. Non-linear pedagogy characterizes the learning process in team sports as an unstable (non-linear) process, in which students must respond to the limitations and changes presented in learning situations with dynamic behavior and change according to the situation.

From a non-linear pedagogical perspective, there are proposals for the design of practice situations, based on ideas from Teaching Bunkers and Thorpe Games for Understanding (TGfU) in 1986, which were further developed by Mitchell and Oslin (2005). TGfU is highlighted as a teaching model for team sports from an alternative perspective. This model proposes the teaching of sports from the structure and understanding of the game itself, in which the development of athletes regarding tactics and decision making is given special importance. In line with this, during the exercise initiation stage, developing the athlete's cognitive skills is very important. Games with limitations and small games are the training tools and game situations proposed to teach team sports by the TGfU Model in the sports initiation stage. From the background above, this research has the aim of improving higher-order thinking skills or in other words, the High Order Thinking Skills (HOTS) of students through learning using the Teaching Games For Understanding (TGfU) method.

## Materials and methods

### Study participants

This research is a classroom action research (CAR). Data collection in this research was conducted at SMP Negeri 2 Godean, Sleman, Yogyakarta in November 2019. The participants in this study were students of class VII D at SMP Negeri 2 Godean. The sample used in this study consisted of one class totaling 32 students. Consisting of 20 female students and 12 male students. Sampling using purposive sampling with the provisions of the class that has a low average P.E. value.

### Study organization

In this study, using 2 cycles to describe the improvement in the HOTS skills of students through TGfU learning. The research data collection technique used an observation sheet with the following criteria: 1). Decision making (decision making), the criteria for making decisions are: when doing offense students can make the right decisions when passing. Shoot when unable to pass a motion. Performs a layup when not guarded by the enemy. Meanwhile, when in defense, students can decide when to steal or grab the ball. 2). Skill execution (skill execution). The standard criteria used as criteria are: when students commit violations accurately, they reach the appropriate friend/recipient. Can print numbers. Meanwhile, when students can do intercepts appropriately. 3). Support (support). With the criteria when committing violations Students try to change positions to accept surgery from friends / open space to get surgery or perform screening. Meanwhile, when doing defense students are Keeping/ marking opponents who do not carry the ball.

### Statistical analysis

The data analysis technique used in this study used descriptive analysis. Data analysis in this study was carried out by researchers and collaborators reflecting on the results of observations on the learning process carried out by the teacher and students in the classroom. The qualitative data in the field notes were processed into meaningful sentences

and analyzed quantitatively. The data analysis technique is used sequentially, namely data reduction, data presentation, and conclusion drawing. Data reduction in this study includes selecting data through a summary or brief description and processing the data into a more targeted pattern. Thus data reduction is a form of analysis that sharpens, classifies, directs so that a verifiable conclusion can be drawn. In addition, this study also compares the suitability of the learning plan together with the collaborator that has been adjusted to the ongoing learning.

## Results

### Cycle 1

In the first cycle, learning was carried out using the TGfU learning model through attack and defense games. Initially, the teacher divided students into groups consisting of groups of women and groups of men, each group consisting of 3-5 people according to the number of students. Learning is quite conducive and the teacher has also conveyed the stages of learning well, as evidenced by enthusiastic students during learning and experiencing progress in learning.

In this first cycle, two assessments were carried out, namely when working on the first game and the second game. In the first game, students get a pretty good score, namely for the average SEI score (skill implementation index) of 0.72 from the highest value of 1 with a percentage of 72%, then the average DMI (decision-making index) was 0.74 with a percentage of 74%, and the SI (support index) value was 0.76 with a percentage of 76%.

After doing the first game the teacher evaluates and takes the second measurement. From the second game, the increase in the increase of each of the following criteria: SEI reaches 0.75 with a percentage of 75% then DMI increases to 0.79 with a percentage of 79%, and the SI value increases to 0.79 with a percentage of 79%.

Thus the average student gets a good score for the meeting in this first cycle. However, because there are still some students who have unsatisfactory scores or below the desired KKM, which is 75 of the total scores. Then there will be evaluation and improvement in the second cycle.

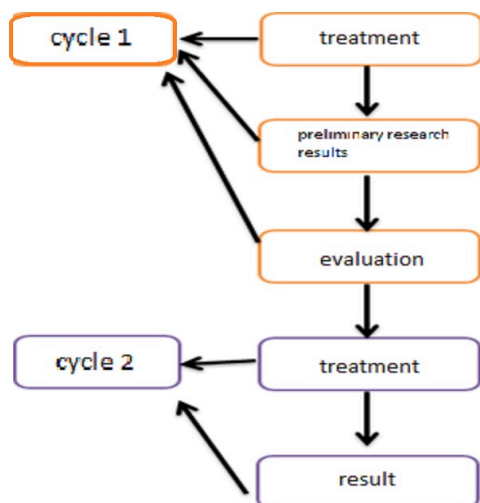


Figure 1. Research flow

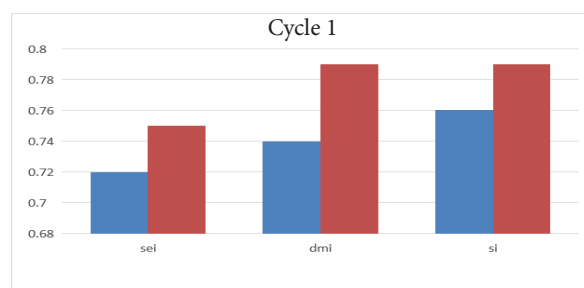


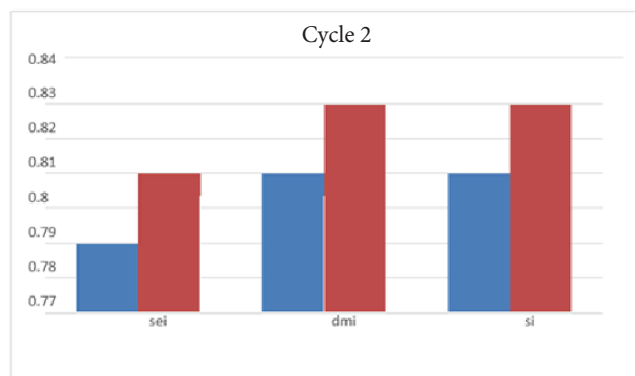
Figure 2. Diagram of games 1 and 2 in Cycle 1

### Cycle 2

In the second cycle, the treatment given to students was still the same as the treatment in cycle 1. In the second cycle, this time in the first games, the average SEI score increased to 0.79 with a percentage of 79% then the DMI increased to

0.81 with a percentage 81%, and the SI value increased to 0.81 with a presentation of 81%.

In the second game, the teacher again gave evaluations to students and the result was an increase in all the assessment criteria. For the average SEI value increased to 0.82 with a percentage of 82%, then the IDM value increased to 0.83 or 83% and the SI value increased to 0.83 with a percentage of 83%. In this second cycle, the results can be seen and we can compare where from the first cycle to the second cycle there is a high enough difference from each of the predetermined criteria which we can see in the following graph:



**Figure 3.** Diagram of games 1 and 2 in cycle 2

Based on these results, it can be compared to the results of cycle 1 and cycle 2, there is an increase in each learning carried out, thus learning using TGfU through an effective attack and defense games to improve children's cognitive abilities, especially the HOTS ability of the child.

## Discussion

Based on the comparison of the results of cycle 1 and cycle 2, there was an increase in each lesson carried out, thus learning using TGfU through attacking and defending games was effective to improve students' cognitive abilities, especially the HOTS abilities possessed by these students. These results are in accordance with the research of Gil-Arias et al. (2021) that significant differences in student motivation were observed for both boys and girls who participated in the hybrid TGfU/SE unit in both analyses across all motivational outcomes. Furthermore, Batez et al. (2021) denoted that the effectiveness of the TGfU model of short duration (12 lessons) in an educational context to improve volleyball skills.

In addition, a research by Harvey et al. (2020) denoted that the effectiveness of the TGfU unit in developing adaptations to long-term memory that improved the quality of the students' tactical knowledge at all three levels of analysis (conceptual content, sophistication, and structure). the need to use pedagogical models such as TGfU to increase students' capacity to evaluate game situations and develop their tactical reasoning. Meanwhile, the research by Sierra-Ríos et al. (2020) claimed that TGfU seems to be more appropriate than direct instruction to increase the light PA levels during sessions while no significant differences were found between programs in moderate and vigorous intensities. Regarding

the effects of programs in decisions, greater improvements in decisions with the ball were found in TGfU compared to DI.

By the end of the TGfU basketball unit, students modified the conceptual content of their tactical knowledge, as significant increases in their scores in all concepts, goals, conditions and predictions were observed. This increase in all concepts allowed students to have a greater capacity to reflect upon on executed actions and its influence on future actions. Moreover, a significant increase in conditions is important, because this shows that students generated specific advanced conditions to adapt and modify their interpretations of every game action over the course of the TGfU unit. Thus, students displayed a more in-depth tactical approach to the game situations they observed, continuously representing relevant information, which allowed them to explain how the players they observed would choose relevant skills to be executed (i.e. "if he cannot find one, he passes to his teammates or he just passes it off the wall"; "he charges for the ball when he has the chance to") (McPherson & Kernodle, 2007).

Likewise, these changes demonstrate that the students were more competent in modifying their interpretations of the game actions during each game play episode they observed, updating their action plan profiles (tactical action models faced with explicit conditions) and current event profiles (tactical condition prototypes used to take decisions), and referring to these profiles with an increasing level of complexity (McPherson, 2008). These changes in conceptual content lead to greater cognitive flexibility and greater capacity for participants to predict possible game events (i.e. "he knows when passes are going to be made to the other team"; "she anticipates that the other teammates is going to go into the direction towards their goals") that would help them select an effective response during game play (McPherson & Kernodle, 2007).

Regarding motor development through TGfU model studies González-Villora et al. (2019), and Wang, M., and Wang, L. (2018), improved physical and physiological performance was shown, as well as levels of physical activity. Moreover, a novel study by García-González et al. (2020) showed that a hybrid Sports Education/TGfU volleyball teaching unit permits designing learning environments where students can make decisions and assume responsibilities, perceive themselves as skilled, and establish positive relationships with teammates. One more study by Broek et al. (2011) confirmed that an instructional model consisting of TGfU, sports education, cooperative learning and peer instruction with a determinant contribution of thoughtful decision-making skills might be key elements to create a powerful learning environment in which students can become self-regulated. The results from the current study by Barba-Martín et al. (2020) showed that the TGfU model improves not only the tactical knowledge but also the technical knowledge, which was confirmed by improved volleyball skills in our students. Therefore, our results and the results of the different studies highlight the TGfU as a positive pedagogical model in PE by promoting learning through understanding and knowledge, thus enjoying the fun of playing, which was confirmed in our study showing better enjoyment than PE classes.

Several limitations and future research directions should be considered. First, the small number of participants limits



the capacity to generalize the results. Consequently, future research can extend the current sample by, for example, increasing the number of students who complete the task in each class, and/or by using more PE classes/PE teachers at the same/different schools. Second, researchers did not include a control group to test the differences between groups. Therefore, it is not possible to guarantee that significant changes in tactical knowledge were a sole consequence of the TGfU unit. Third, only one TGfU unit has been developed in the current study. Consequently, it would be valuable to replicate this study and examine the effect on tactical knowledge over a more longitudinal time frame with the application of consecutive TGfU units in different team sports. Finally, future research could capture game performance data to link these data to student tactical knowledge development.

## Conclusions

Based on the research result above, it can be concluded that learning using TGfU can improve students' HOTS skills. From TGfU learning through attack and defense games, it can improve decision making, skill execution, and player support, which can be seen from each determined indicator that has increased, from each cycle that is carried out.

There are many limitations in this research both in terms of time and existing facilities and infrastructure. Constructive suggestions are needed to build better research. It is hoped that after this research, there will be further researchers that develop Teaching Game for Understanding (TGfU), which will later build and open the gates of progress in the field of education in Indonesia to grow more advanced.

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## Conflict of interest

All the authors of this research declare if there is no conflict of interest for this research.

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## УДОСКОНАЛЕННЯ МЕТОДУ HOTS У БАСКЕТБОЛЬНІЙ ГРІ ЧЕРЕЗ НАВЧАННЯ TGfU

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Авторський вклад: А – дизайн дослідження; В – збір даних; С – статаналіз; D – підготовка рукопису; Е – збір коштів

Реферат. Стаття: 7 с., 3 рис., 27 джерел.

**Мета дослідження** полягала в тому, щоб покращити навички мислення вищого порядку (HOTS) шляхом навчання з використанням навчальної гри для розуміння (TGfU) як засобу. У цьому дослідженні використовується цілеспрямована вибірка з наданням занять, які мають низьке та середнє значення фізичного виховання.

**Матеріали та методи.** Це дослідження є дослідженням дій у класі. Вибірка, використана в цьому дослідженні, складалася з одного класу загальною кількістю 32 учні.

**Результати.** Результати дослідження полягали в тому, що в першому циклі було проведено дві оцінки, а саме під час гри в першу гру та другу гру. У першій грі учні отримали досить хороший бал, а саме за середнє значення IBN (індекс виконання навичок) 0,72 від найвищого бала 1 з відсотком 72%. У другому циклі впливу, яке надавалося учням,

все ще було так само, як і в 1-му циклі впливу. У другому циклі, цього разу в 1-й грі, середнє значення IBN зросло до 0,79 з відсотком 79%, потім індекс прийняття рішень зріс до 0,81 з відсотком 81%, а значення індекса підтримки зросло до 0,81 з відсотком 81%.

**Висновки.** Процес навчання з використанням TGfU може покращити навички HOTS студентів. Вивчення TGfU з атакуючими та захисними іграми може покращити прийняття рішень, навички виконання та підтримку гравців, що можна побачити з кожного показника, який, як визначено, зріс із кожного циклу, який виконували студенти. Сподіваємося, це дослідження може стати підтримкою розвитку фізичного виховання.

**Ключові слова:** навчальна гра, навичка мислення, дослідження дій у класі, фізичне виховання.

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