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### EFFECTS OF TEACHING GAMES FOR UNDERSTANDING INTEGRATED SPORT EDUCATION MODEL ON COLLEGE STUDENTS' FOOTBALL COGNITIVE PERFORMANCE AND MOTOR SKILLS

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# Effects of Teaching Games for Understanding Integrated Sport Education Model on College Students' Football Cognitive Performance and Motor Skills

Zhen-Rong JIA<sup>1</sup>

## Abstract

Football is internationally popular. It does not need particularly tall and large figures for playing football that it is extremely suitable for the figure of oriental people. For this reason, football is suitable for being promoted domestically. In the football teaching in PE curricula, it is discovered that most students are lack of interests in football. The effect of Teaching Method of Physical Education is an important issue concerned by physical education related people. PE workers should absorb innovative thinking and concepts with multiple methods to match the time trend, and teachers should understand the complementary relationship among teaching methods. Applying experimental design to the quasi-experimental study, 224 students at a university in Hainan Province are selected as the experimental research subjects for the 16-week (3 hours per week for total 48 hours) experimental teaching study. An experimental class (112 students) is taught with Teaching Games for Understanding integrated sport education model, and the control class (112 students) remains general traditional instruction. Suggestions are proposed according to the results, expecting to help students' adaptive development and allow students acquiring sense of achievement through inspiration, creation, fun, and gamification teaching methods to enjoy learning fun and achieve the idea of learning with fun in football education.

*Keywords:* Teaching Games for Understanding, sport education model, football education, cognitive performance, motor skills, social interaction, social skills.

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## Introduction

A lot of sports population in the world engage in football or participate in football related affairs. It reveals the international popularity of football. Nevertheless, with limited teaching space, formal football field is often used for the practice of school teams. However, football could be preceded in any flat and safe places, unlike basketball requiring hoops and swimming requiring pools, that it is the sports without being restricted to space. Besides, tall and large figures are not necessary for engaging in football that it is extremely suitable for the figure of oriental people and being promoted domestically. Furthermore, teachers inspire good physical education concepts in students and cultivate the correct exercise could cultivate the lifelong passion and habit of exercise. In this case, it conforms to the relevant departments' practice and efforts on Sport for All. Football contains running, jumping, kicking, throwing, and sprinting in humans' traditional activities; it also requires the activity of major muscle group of human body to have an individual perceive the winning fun in group competition. It would strengthen physiques and enhance healthy personality development. From the aspect of education, football presents the absolute necessity and value of existence and is an exercise suitable learning for all.

In the football teaching in physical curricula, it is discovered that most students are lack of interests in football. The effect of Teaching Method of Physical Education is an issue concerned by all PE related people; however, any teaching methods present the advantages and disadvantages to cope with the time change and curriculum revision. Physical education workers should absorb innovative thinking and concepts with multiple methods to match the time trend. Physical education is generally considered as the learning stressing on motor skills, but ignores students' active learning and comprehension of contests as well as individual differences of students. By observing the teaching site, PE teachers emphasize the repeated operation and accuracy of motor skills to isolate students from contest situations so that students lose the physical achievement and fun. It should be realized that Teaching Games for Understanding does not aim at traditional teaching. Traditional skill-oriented teaching method also shows the value; however, the development of different teaching methods to cope with the time trend aims to enhance students' learning effect. Teachers should understand the complementary relationship among teaching methods. Moreover, PE teachers are used to arrange contests or games in 1 hour before the end of the course to cause students not easily comprehending the connection between motor skills and contests. The promotion of guiding tactics and then teaching skills and the application of games or simple contests allow students comprehending contest tactics. Students could reinforce the skills after understanding the tactics to combine skills and contest situations. In this case, the learning fun would be enhanced, and students could realize the objectives or importance of tactics in motor skill practice. It is considered as the spirit of Teaching Games for Understanding. The effect of Teaching Games for

Understanding integrated sport education model on college students' football cognitive performance and motor skills is therefore discussed in this study. It is expected to help students' adaptive development and allow students acquiring sense of achievement through inspiration, creation, fun, and gamification teaching methods, so as to enjoy the learning fun and achieve the idea of having learners be full of fun in the football learning.

## Literature review

Garcia-Ceberino *et al.* (2020) proposed the concept of Teaching Games for Understanding as contest or game centered Teaching Method of Physical Education. In the beginning of teaching, students were first induced the learning interests and then considered tactics to win in contests to inspire the motor skill learning. Kinnerk *et al.* (2018) thought about what kind of teaching method is suitable for ball games, and that's how they came up with the idea of teaching through games and matches. The concept of Teaching Games for Understanding is believed that a teaching method with tactical understanding has much more pleasure, and therefore, is replacing the traditional way to teach motor skills gradually. From past research on Teaching Games for Understanding, it was discovered that the teaching method could enhance students' learning effectiveness in various PE teaching applications. Fleischman *et al.* (2019) mentioned that Teaching Games for Understanding no longer focused on skill practice in PE class. Instead, the tactical understanding becomes their priority. Because students are fond of games and matches, teachers can simplify and improve the games. Once it's students oriented, it could not only stimulate their learning interests but also integrate them with tactical understanding. Aiming at learners' age, figure, and motor skills, teachers modified exercise situations, e.g. simplification of rules and change in field size, to have the contest conform to learners' abilities. Learners, on the other hand, independently thought of the lacked motor skills or tactic strategies applied in contest, through the modification of designed contest, and more importantly acquired contest fun from the situation. Buisic & Dordic (2018) believed that Teaching Games for Understanding centered on students. Instead of traditional skills, it modifies the games so that they're more personalized for every student. Regardless of rules and equipment, they meet with students' needs. That way, it won't matter which level students are at, they can understand the whole concept and enjoy the games as much as everyone else. They can also activate learning motivation and reinforce the sense of need for skill learning. Dinham & Williams (2019) indicated that physical education curricula in sport education model were formed based on Sport for All and gamification to cultivate students being effective sport participants. It emphasized that PE teachers were not simply coaches, but the deliverers of sport culture. Choi *et al.* (2020) said Teaching Games for understanding told a concept of letting students learn of their own will, and

then initiate their tactical understanding. With that being said, teachers need to design a game that fits the actual situation and the rules are simple yet delightful. It's how students enjoy the challenge and learn from them profoundly (Lasanthi *et al.*, 2019).

Liu *et al.* (2017) indicated that past researchers concluded the promotion of students' cognitive performance on sport rules, sport facilities, basic ball knowledge, sport etiquette, and sport safety with Teaching Games for Understanding. Filiz (2017) stated that Teaching Games for Understanding stressed on students' thinking and comprehension process to develop the presentation of motor skills; after comprehending tactics, students would accumulate sports related knowledge through discussions and actual experiences in contests. Apparently, Teaching Games for Understanding could help students' cognitive performance. Wu *et al.* (2020) thought that Teaching Games for Understanding is beneficial for students when improving their cognitive performance about rules, equipment, basic knowledge, and sports safety. The practice of sport education model was contest centered; students preceded learning of various roles in the sport season designed by teachers; along with the contests, the competition among teams and the cooperation among team members allowed students acquiring more fun in the class learning and learning interaction and responsibility in the contests. Calabria-Lopes, Greco, & Perez-Morales (2019) believed that Teaching Games for Understanding plays an important role in improving students' performance. After obtaining the relevant information, students will understand the tactics and reinforce their skills, and ultimately show their learning outcome in the field. The guide with Teaching Games for Understanding could induce students thinking and comprehending various tactics used in contests. Mohamed, Othman, & Noordin (2018) mentioned that it required longer time for thinking and comprehension in the practice of Teaching Games for Understanding; the sport season in sport education model provided assistance in Teaching Games for Understanding, as the prolonged teaching hours allowed students thinking, discussing, and comprehending contest tactics with more time. Teaching Games for Understanding integrated sport education model therefore could help students' cognitive performance (Wu *et al.*, 2019). Regardless Teaching Games for Understanding or sport education model, Knowlden *et al.* (2018) pointed out the promotion of students' cognitive performance in past research. Teaching Games for Understanding integrated sport education model provided sport seasons for students' longer thinking and comprehension. Besides, with the mutual help in teams, sufficient prerequisite cognition and skills were required for playing various roles in the contests; otherwise, the roles of referees or players could not be competent. Under the role play, students would promote the cognitive performance. For this reason, the following hypothesis is proposed in this study.

*H1: Teaching Games for Understanding integrated sport education model would affect cognitive performance.*

Li *et al.* (2017) indicated that Teaching Games for Understanding integrated sport education model could promote students' skill performance; besides, sport education model provided teams and role play to enhance peer interaction and create fun for students with low motor skill performance enhancing the learning effect. Shimoga, Erlyana, & Rebello (2019) stated that sport education model provided authentic sport experiences and created pleasant learning environment in the entire sport season, allowing students being enjoyable and happy in the sport season, acquire self-confidence in the activity performance, and induce the continuous learning and improvement. In this case, Teaching Games for Understanding integrated sport education model presented certain assistance in motor skills. Nezelek *et al.* (2019) mentioned that sport education model was presented with sport season, i.e. sport contests as the major teaching content, and Teaching Games for Understanding focused on tactics. As a result, applying comprehension strategies in sport season with Teaching Games for Understanding integrated sport education model would help students' learning. The GPAI assessment could be used for understanding students' comprehension of tactics. Past research discovered that Teaching Games for Understanding integrated sport education model could promote motor skills and contest performance. Watkins, McLaughlin, & Parker (2019) indicated that, with Teaching Games for Understanding integrated sport education model, teachers combining physical education activities with tactic based physical education was meaningful to enhance critical thinking and social interaction in small groups in real games and to significantly promote students' motor skills and contest performance. Gabana *et al.* (2019) stated that the contest property of sport education model would not change the setting of major rules; even the contest was modified, the contest performance could still be inquired by mastering the major rules. Sport education model could remarkably enhance contest performance; apparently, sport education model could notably improve students' cognition, skill, affection, and contest performance. Especially it provided a better environment for students with low skills being brave of practice. In Teaching Games for Understanding integrated sport education model, teamwork in the sport season allowed good interaction among team members and teachers empowering students, as team coaches and leaders, to cultivate personal and social skills and responsibilities. Moodley, Naidoo, & van Wyk (2018) considered that Teaching Games for Understanding integrated sport education model provided authentic contest situations, allowing students applying the learned motor skills to contests as well as promoting the tactic comprehension and performance. Giel & Breuer (2020) indicated that the sport season in Teaching Games for Understanding integrated sport education model extended the unit learning, allowing students with more time practicing motor skills. Since the participation opportunity and peer support were increased, Teaching Games for Understanding integrated sport education model improved the learning result of students with low motor skills. Teaching Games for Understanding integrated sport education model covered sport season, formal competitions, and final contests, which required certain motor

skill practice. In this case, Teaching Games for Understanding integrated sport education model would largely enhance the learning of motor skills. The following hypothesis is therefore proposed in this study.

*H2: Teaching Games for Understanding integrated sport education model would affect motor skills.*

Liu *et al.* (2018) indicated that Teaching Games for Understanding integrated sport education model could promote students' learning effectiveness on basketball contests. After receiving Teaching Games for Understanding integrated sport education model, students appeared learning growth on cognition, affection, skill, and contest performance. Sum *et al.* (2018) proposed that Teaching Games for Understanding integrated sport education model could enhance students' learning effectiveness on football contests, and students showed learning growth on cognition, affection, skill, and contest performance after receiving Teaching Games for Understanding integrated sport education model. Lu *et al.* (2019) indicated that Teaching Games for Understanding integrated sport education model could promote the learning motivation of the entire class, presented positive effects on students' cognitive learning, and effectively promoted students' objective motor skill learning and contest performance. Sam (2018) proposed notable differences in the cognitive performance and contest performance of the entire class, males, and females as well as the objective skill learning of the entire class and females after applying Teaching Games for Understanding integrated sport education model to basketball teaching in elementary schools. The application of Teaching Games for Understanding integrated sport education model to basketball teaching in elementary schools was affirmative to assist in the cognition and further promote motor skills. Baluch *et al.* (2017) mentioned that Teaching Games for Understanding integrated sport education model allowed the progressive development of students in the learning process to obviously make progress in team identity and tactic thinking as well as improve the attitude towards regular exercise. All students revealed significant differences in contest performance pretest/posttest. Students considered that the teaching method could help cognitive performance to further promote the cultivation of motor skills so that the learning was full of fun and expectation. In regard to sport cognition, Sierra *et al.* (2019) indicated that most studies found out the assistance of Teaching Games for Understanding integrated sport education model in sport cognition. Teaching Games for Understanding integrated sport education model mainly helped students think about tactics, use motor skills, and learn rules to appear positive effects on cognitive learning and further promote the application of motor skills. Accordingly, the following hypothesis is proposed in this study.

*H3: Cognitive performance would notably and positively affect motor skills.*

## Methodology

### *Measurement of research variable*

The ball games cognitive performance measurement from Prat *et al.* (2020) is used to measure students' football cognitive performance.

Motor skills: According to the motor skill evaluation proposed by Wang & Wang (2018) brought up the benchmark of motor skills and use it as a measurement of students' football moves.

### *Research subject and sampling data*

With experimental design, 224 students at a university in Hainan Province are selected for the quasi-experimental study. The experimental class (112 students) is taught with Teaching Games for Understanding integrated sport education model, and the control class (112 students) remains general traditional instruction for the 16-week (3 hour per week for total 48 hours) experimental study. The retrieved research data are analyzed with SPSS, and regression analysis and analysis of variance are applied to test various hypotheses.

### *Analysis method*

Analysis of variance is used in this study for comparing the difference of Teaching Games for Understanding integrated sport education model in cognitive performance and motor skills, and regression analysis is further utilized for understanding the relationship between cognitive performance and motor skills.

## Results

### *Effects of Teaching Games for Understanding integrated sport education model on cognitive performance and motor skills*

*Comparative analysis of Teaching Games for Understanding integrated sport education model to cognitive performance.* According to analysis of variance, the difference of Teaching Games for Understanding integrated sport education model in cognitive performance is discussed in this study, i.e. analyses and explanations of cognitive performance. From *Table 1*, Teaching Games for Understanding integrated sport education model shows significant effects on cognitive performance ( $P=0.000^*$ ) that H1 is supported.



Table 1. Comparative analysis of Teaching Games for Understanding integrated sport education model on cognitive performance

variable	F	P	Scheffe post hoc
cognitive performance	33.751	0.000*	understanding>general

\* stands for  $p < 0.05$

Comparative analysis of Teaching Games for Understanding integrated sport education model on motor skills. Analysis of variance is applied to discuss the difference of Teaching Games for Understanding integrated sport education model in motor skills in this study, i.e. analyses and explanations of motor skills. From Table 2, Teaching Games for Understanding integrated sport education model reveals remarkable effects on motor skills ( $P=0.000^*$ ) that H2 is supported.

Table 2. Comparative analysis of Teaching Games for Understanding integrated sport education model on motor skills

variable	F	P	Scheffe post hoc
motor skills	42.168	0.000*	understanding>general

\* stands for  $p < 0.05$

### Correlation analysis of cognitive performance and motor skills

The analysis results, Table 3, appear notable effects of cognitive performance ( $t=2.275^{**}$ ) on motor skills that H3 is supported.

Table 3. Analysis of cognitive performance to motor skills

dependent variable→	motor skills	
independent variable↓		
	Beta	t
cognitive performance	0.213	2.275**
F	43.786	
significance	0.000***	
R2	0.397	
adjusted R2	0.366	

Note: \* stands for  $p < 0.05$ , \*\* for  $p < 0.01$ .

Data source: Self-organized in this study.

## Discussion

Current physical education still applies traditional teaching methods. The dull practice could not enhance students' participation in physical education, and students with low skills might lose the learning willingness. Teaching Games for Understanding provides students different physical education curricula, in which games and situations allow students learning skills in contest situations and enhancing the learning motivation. Moreover, the integration into sport education model allows students with low skills learning knowledge beyond motor skills to enhance the motivation for physical education. Sport education model could enhance teamwork for students learning communication as well as mutual respect and assistance. When students crave for contests, the practice of sport season provides students with more contest experiences and enhances the willingness to promote motor skills.

The teaching game for understanding has been broadly popular in the world as a new trend in ball teaching. The physical education method using competition or games as the main method will arouse students' interest in learning at the beginning of teaching, and then let students think about how to play in the game. The winning tactics will in turn inspire students in the learning of a certain sport skill. In terms of theoretical implications, we have extended that physical education should not only focus on technology and skills, but also the fun of learning by doing. Although the traditional skill-oriented teaching method has certain benefits, the students will play better in learning if the comprehensive teaching method can be added. In terms of practical implications, we suggest that teachers pay more attention to courses that can arouse students' learning fun in the course arrangement. They can also use games or simple competitions to make students understand the tactics of the game. After students understand the tactics, they can strengthen their skills in practice. It not only can increase the joy of learning, but also encourage students to understand the purpose or importance of motor skills through the understanding of tactics.

## Conclusion

The research results reveal that Teaching Games for Understanding integrated sport education model could help college students' football cognitive learning, including the understanding of contest rules, the acquisition of basic football knowledge, the cultivation of sport etiquette, and the perception of tactic application. Besides, college students favor the learning integrated into contest situations to receive sense of achievement in the process, find out personal difficulties for overcoming, are glad to participate in class activities, and enjoy the fun in contests. In terms motor skills, college students could perform proper basic motor skills in contests, use time for active practice, achieve learning objectives through

observation, and make progress on the learning through discussions. College students therefore could make decisions in contest situations, try to succeed in the motor skills, and comprehend the target tactic of support in the contest situations through teaching design. In this case, teachers have to pay attention to the activities in curriculum design being effectively connected with learning goals. Easier target tactics could reduce teaching time to reinforce other comparatively difficult goals. Contest rules should be timely adjusted for achieving the target tactic. Timely proposing key questions in the discussion to guide students and facilitate the success in target tactics. During the process, teachers have to ensure that students could accurately connect target tactics with formal contest situations.

### *Recommendations*

Aiming at above research results, the following suggestions are proposed in this study:

- 1) Current physical education still applies traditional teaching methods. The dull practice could not enhance students' participation in physical education, and students with low skills might lose the learning willingness. Teaching Games for Understanding provides students different physical education curricula, in which games and situations allow students learning skills in contest situations and enhancing the learning motivation. Moreover, the integration into sport education model allows students with low skills learning knowledge beyond motor skills to enhance the motivation for physical education. Sport education model could enhance teamwork for students learning communication as well as mutual respect and assistance. When students crave for contests, the practice of sport season provides students with more contest experiences and enhances the willingness to promote motor skills.
- 2) Teachers applying Teaching Games for Understanding integrated sport education model to football curricula could actually result in good learning effect that it could be properly used in physical education. However, teachers have to mater the spirit of the teaching method so as to design suitable goals and teaching contents. Teachers are suggested to join in relevant seminars or workshops to enhance the professional knowledge. Teacher seminars or workshops for PE teachers could be conducted in schools to enhance teachers' understanding of Teaching Games for Understanding integrated sport education model and further discuss the practice in schools. The model therefore requires longer period for the practice. Teachers' mutual coordination and the distribution of space should be discussed before the practice. With the exchange in teachers' seminars or workshops, it is expected to promote students' football learning effect, enhance students' participation motivation in football course, and cultivate the lifelong learning habit.

- 3) Teachers could first collect relevant books or research data for the curriculum design in order to complete the planning. The connection of activity contents with teaching goals, the sequential arrangement of activities, the planning of time, and the establishment of contest rules could refer to existing data. Complete considerations in the initial phase to avoid spending time on modification in the process could enhance students' learning efficiency.
- 4) To promote Teaching Games for Understanding integrated sport education model, PE teacher enhancement seminars, integrating relevant knowledge into PE teacher training channels, and even writing teaching materials and methods and practice classes to include different teaching methods in teacher training could assist in the promotion of Teaching Games for Understanding integrated sport education model.

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