Education and Science

Vol 44 (2019) No 200 313-331

The Effect of Tactical Games Approach in Basketball Teaching on Cognitive, Affective and Psychomotor Achievement Levels of High School Students *

Burak Güneş [1], Erdoğan Yılmaz [2]

Abstract

The aim of this study was to examine the effect of basketball unit of physical education lesson that was performed through tactical games approach on the cognitive, affective and psychomotor achievement levels of the students. Pre test-post test model with a control group, that is among semi-experimental models, was used in the study. Experimental group of the study was composed of 30 students (17 females-13 males), and control group was composed of 31 students (17 females-14 males). In the study, a basketball achievement test was used to measure improvement of the students in the cognitive domain, physical education and sports attitude scale was used to measure their improvement in affective domain, observation form and game performance assessment instrument (GPAI) were used to measure their improvement in psychomotor domain. Wilcoxon Signed Rank Test was used to determine the difference between pre-post test scores of study and control groups in cognitive, affective and psychomotor domains. Mann Whitney U test was used to compare cognitive, affective and psychomotor achievement levels of the experimental and control groups. While a significant difference was found in favor of post tests within the cognitive domain and all achievements of psychomotor domain in the experimental and control groups, no significant difference was detected for affective domain. In the experimental group, significant differences were found for post tests in all game performance components. Moreover, significant differences were found in post tests for decision making and skill practices of game performance components in the control group whereas no significant differences were found in post tests for supporting and game participation. No significant differences were found in cognitive, affective domains and skills of psychomotor domain achievement levels in experimental and control groups; however, significant differences were detected in favor of experimental group in decision making, supporting, game participation and game performance components of game performance achivement level. Based on the results of the study, it may be suggested that tactical games approach may be more appropriate compared to conventional approach in improving game performance.

Keywords

Physical Education
Cognitive learning
Affective learning
Psychomotor learning
Teaching models
Basketball

Article Info

Received: 09.13.2018
Accepted: 05.06.2019
Online Published: 10.30.2019

DOI: 10.15390/EB.2019.8163

* This article is derived from Burak Güneş's PhD dissertation entitled "The effect of tactical game approach on the cognitive, affective, psychomotor achievement levels in high school students", conducted under the supervision of Erdoğan Yılmaz.

[1] Nevşehir Hacı Bektaş Veli University, School of Sports Science and Technology, Department of Coaching Education, Turkey, gunesburak82@gmail.com

[2] Gazi University, Sport Sciences Faculty, Department of Coaching Eeducation, Turkey, erdogan.volleyball@hotmail.com

Introduction

Physical education is an important learning area that supports multi-directional development of the students in the creation of human characteristics expected from education in our age. This expected development does not occur spontaneously; effective teaching provided by the teacher determines the sports experience that students will have (Carpenter, 2010 and may provide multi-directional development of the students. Many studies have reported that teaching conducted by using student-centered teaching approaches might be more effective (Broek, Boen, Claessens, Feys, & Ceux, 2011; Güneş & Çoknaz, 2010; Lee, Rengasamy, Hooi, Varatharajoo, & Azeez, 2015; Mirzeoğlu, Munusturlar, & Çelen, 2014; Uzunöz & Demirhan, 2017). Multi-directional development of the students (cognitive, affective and psychomotor development domains) who attend physical education lessons is mostly provided by teaching sportive games (basketball, volleyball, handball, football, etc.)

Broek et al. (2011) and Mitchell, Oslin, and Griffin (2013) have reported that game teaching constitutes a significant part of teaching programs in physical education). In this context, teaching games through technical courses that were structured by conventional approach causes some problems (Bunker & Thorpe, 1986). Intensive technical content of the program may limit the times for playing games, and some problems may be experienced while transferring isolated techniques to game environment (Mitchell et al., 2013). Yet, ability to play games requires players to make appropriate decisions as consistent with the basic rules of the game. This is defined as functional tactics (Holt, Strean, & Bengoechea, 2002). From this point, Bunker and Thorpe (1982) suggested Teaching Games for Understanding (TGFU) as a student-centered approach that connects tactics and skills as an alternative to conventional approach. In the later years, learning tactics has become the focus of game teaching (Holt et al., 2002), several innovator approaches have gained reliability in the scientific literature and many derivatives of game-based approaches have been generated (Almond, 2015).

In general, interpretations about game-based approaches cited game understanding model which was developed by Bunker and Thorpe (1982). In contrary to technical approach in which skills are practiced as isolated, tactical games approach (Mitchell, Oslin, & Griffin, 2006) aims to teach students forms of action within the game and to improve their game performances by encouraging them within a real game and by leading them to think more strategically with better decision-making and tactical awareness (Gubacs Collins & Olsen, 2010; Mitchell et al., 2013; Pearson & Webb, 2008; Stolz & Pill, 2014). During the lessons using tactical games approach, a procedure is followed including phases such as adapted game, question-answer sessions, skill practices and return game (Gubacs Collins & Olsen, 2010). The approach describes mostly game performance rather than the conduction of motor skills. Drills by the players without ball such as decision making by the players without ball, supporting the teammates with ball, defensing competitors, protecting teammates and positioning as game progressed are important; and they need to be taken into consideration in tactical game teaching (Mitchell et al., 2013). In this way, students are provided to improve their performances and to learn game within the relationship between skills and tactics (Mitchell et al., 2013).

As relevant with tactical games approach, there are many studies performed to examine the effects of the approach in the cognitive, affective, psychomotor domains (skill development, game performance). Psychomotor domain findings of some studies relevant with the topic showed that traditional and game-based approaches had similar positive effects in the development of skills (Austin, Haynes, & Miller, 2004; French, Werner, & Rink, 1996a; French, Werner, Taylor, Hussey, & Jones, 1996b; Harrison, Blakemore, Richards, Oliver, Wilkinson ve Fellingham 2004; Şahin, 2007; Turner, 1996; Turner & Martinek, 1999; Tuzcuoğlu, 2006; Zeng, Liu, Zhang, Tao, & Dong, 2016).

In the studies evaluating the effect of tactical games approach on game performance, game-based approaches were found to be more effective compared to conventional approach (Alarcon et al., 2009; Balakrishnan, Rengasamy, & Aman, 2011; French et al., 1996a; Gray & Sproule, 2011; Harvey, 2003; Lee ve Ward (2009), Lee et al., 2015; Light, 2004; Şahin, 2007; Tallir, Musch, Lenoir, & Valcke, 2003; Turner, 1996; Turner & Martinek, 1999; Tuzcuoğlu, 2006; Zeng et al., 2016) ; but, there are also some

studies creating comparable effects on game performance through conventional approach (French et al., 1996b; Harrison ve et al. 2004; Žuffová & Zapletalová, 2015) In addition, some studies revealed that tactical awareness in a game may be transferred to another similar game (Jones & Farrow, 1999; Martin, 2004; Mitchell & Oslin, 1999).

When studies regarding affective domain were examined, some evidence were found indicating that game-based approaches positively affected affective domain (Chen & Light, 2006; Fry, Tan, McNeill, & Wright, 2010; Harvey & Pill, 2016; Harvey et al., 2009; Jones, Marshall, & Peters, 2010; Lee et al., 2015; Light, 2004; Townsend, Jenkins, & Wallhead, 2009; Turner, 1996; Wallhead & Deglan, 2004; Zeng et al., 2016).

In the study by Broek et al. (2011) questioning its contribution to cognitive domain (Broek et al., 2011), game-based approaches were found to be more effective than conventional approach. Other than this, some studies on cognitive domain showed that methods affected cognitive domain at a similar level (French et al., 1996a; Harrison et al. 2004; Şahin, 2007; Turner & Martinek, 1999; Žuffová & Zapletalová, 2015). Besides, in the study by Olosová and Zapletalová (2015), methods resulted in an improvement at a comparable level but general knowledge about basketball was found to be higher in tactical games approach group when declarative and procedural knowledge were analyzed separately. Moreover, some studies questioning cognitive domain reported that students who were taught by game-based approaches responded to tactical tables, discussed distinct game principles in games, but students who were taught by conventional approach responded mostly to the tables about the execution of the skills and discussed mostly technical components (French et al., 1996b; Gray & Sproule, 2011).

It is observed that there are many studies in this field in which game-based approaches have gained importance. However, variability in the results of these studies showed the necessity of more research in order to determine the efficiency of distinct game teaching methods on cognitive, affective, psychomotor domain outputs (skill development and game performance). It is obvious that there is a need for more comprehensive studies examining game-based approaches and conventional approaches in order to provide information to physical education teachers about making conscious choices on game teaching approaches. In addition, main aim of the students, who take a game education during physical education lessons, is playing games and making matches. The goal of the teacher is to teach the games. However, it is thought that a physical education lesson, that is structured by conventional approach, can not meet this purpose and can not adequately contribute to multi-directional development of the students. From this point, the aim of this study was to examine the effect of Tactical Games Approach on the skills belonging to cognitive, affective, psychomotor domains (ball handling, dribbling, pass, shoots) and game performance (decision making, skill practice, supporting, game participation and game performance) within a real life experience among the students in the basketball unit of a physical education lesson at secondary class level. The following sub-problems were sought to accomplish this goal:

1- Is there a significant difference between cognitive domain pre-test and post-test scores of the students who are studying basketball performed through the Tactical Games Approach (experimental group) and the Conventional Approach (control group)?

2- Is there a significant difference between the Tactical Games Approach (experimental group) and the Conventional Approach (control group) in the cognitive domain achievement levels of the students who are studying basketball?

3- Is there a significant difference between affective domain pre-test and post-test scores of the students who are studying basketball performed through the Tactical Games Approach (experimental group) and the Conventional Approach (control group)?

4- Is there a significant difference between the Tactical Games Approach (experimental group) and the Conventional Approach (control group) in the affective domain achievement levels of the students who are studying basketball?

5- Is there a significant difference between psychomotor domain skill performance pre-test and post-test scores of students who are studying basketball performed through the Tactical Games Approach (experimental group) and the Conventional Approach (control group)?

6- Is there a significant difference between the Tactical Game Approach (experimental group) and the Conventional Approach (control group) in the psychomotor domain achievement levels of of the skill performance of the students who are studying basketball?

7- Is there a significant difference between psychomotor domain game performance and components pre-test and post-test scores who are studying basketball performed through the Tactical Game Approach (experimental group) and the Conventional Approach (control group)?

8- Is there a significant difference between the Tactical Game Approach (experimental group) and the Conventional Approach (control group) in the psychomotor domain achievement levels of the game performance and components of the students who are studying basketball?

Method

Participants

The research group was named as the "Study Group". The study group of the study included two classes among six 9th year classes in the same high school by using unbiased assignment method Experimental (17 females-12 males) and control groups (17 females-14 males) were composed of 14-year old students. Two classes chosen for the study group were measured by pretest treatment using scales that were developed for all skills belonging to cognitive, affective and psychomotor domains and game performance, and found to be comparable ($p>0.05$). Based on these results, one of the classes was determined to be experimental group on which tactical games approach would be used, and other class was determined to be control group on which conventional approach would be used. An institutional authorization was obtained from Ministry of National Education for the implementation of the study in 01.13.2016. Besides, ethics committee approval was taken from Ethics Committee of Gazi University in 02.01.2016 and all participants provided written informed consent.

Design and Procedures

This was a semi-experimental study, and performed by using pre-posttest model using a control group. Data were retrieved as quantitatively. Groups were chosen as experimental and control groups by unbiased assignment. Independent variable of the study was basketball teaching programs within physical education lesson which were prepared by tactical games approach and conventional approach; and dependent variables were cognitive learning levels of the students (cognitive domain), their attitudes towards physical education and sports course (affective domain), their performances in basketball skills and game performances (psychomotor domain). Basketball lessons of experimental and control groups were given by an experienced physical education teacher who had an 11-year experience on basketball teaching and coaching and who have conducted scientific studies on this field and had a master degree.

Intervention

An annual plan for physical education lesson for 9th class was prepared by the researcher in the beginning of academic term by considering that physical education lesson is given for two hours a week among 9th classes within the curriculum and teaching program of National Ministry of Education. According to the annual plan, annual determinant table and unit determinant table were generated in order to determine the duration allocated for all units in the physical education lesson (basketball, athletism, volleyball, handball, etc.) and the topics they covered. A 6-week time period was allocated for basketball unit following this study. Before starting to lessons, students in experimental and control groups were provided general information about tactical games approach and conventional approach, and they were made explanations about the course of the lessons.

Conventional Approach Lessons (Control Group)

Conventional approach-based lessons in control group included topics of ball handling, low and high dribbling, passes and shoots including 2 lesson periods (80 minutes) for 6 weeks. Students in the control group were provided rules of the game by the teacher through instruction method. The instruction of all skills that would be covered in basketball unit was given by the teacher through instruction and showing technique. Warming-up exercises were instructed by the teacher during the lessons; the teacher also told and showed exercises about the topic, and then gave students the opportunity to practice. During the practices, teacher watched each student, introduced necessary hints and feedbacks and used reinforcers. The teacher provided feedbacks to the students individually or totally when required. Practicing times and formats regarding exercises were decided by the teacher. A summary of the lesson was provided by the teacher at the end. Instruction method, command approach, question-answer technique and showing technique were used by the teacher during teaching tactical part of basketball.

Tactical Games Approach Lessons (Experimental Group)

Lessons of tactical games approach in experimental group covered topics as touching ball, low and high dribbling, passes and shoots which were adapted from basketball module level 1 which was developed by Mitchell et al. (2013) and included 2 lesson periods (80 minutes) for 6 weeks. Tactical games approach lessons covered a plan including phases of game, question answer session, skill practice and return game; and activities that make students see where and why they use their basketball skills within the game, what they need to do in technical terms and how they can achieve result during the match. In addition, feedbacks, feinforcers and hints were used in the lessons.

Instruments

Basketball Achievement Test

Basketball achievement test was developed by the researcher to measure the improvement of experimental and control groups in cognitive domain. Researcher has taken basketball specialty training in the university and had a D-type coaching certificate. An annual determinant table was developed for physical education lesson in order to develop basketball achievement test in cognitive domain and to provide content validity, and a unit determinant table was prepared for basketball unit based on the annual determinant table of physical education. Basketball unit determinant table that was prepared included a total of 13 critical behaviors. 3 of these critical behaviors included knowledge level and 10 of them included the level of engagement. According to basketball unit determinant table, a total of 4 questions were prepared for each critical behavior in knowledge and engagement levels; and a multiple choice trial test was prepared including five options and 52 questions. In order to provide content validity of trial test, questions regarding each topic that would be covered, were included. Clear and understandable words were used in the questions as much as possible. This trial form was shown to four experts including one in program development, two in physical education (having C and D level coaching certificate) and one in Turkish literature. These experts were asked for their opinions regarding understandibility of the questions, relationship between the roots and answers of the questions and the status of distractors. In accordance with their feedbacks, necessary revisions were made on the questions in the trial form and final version was generated. This trial basketball achievement test was applied to 80 students who have taken basketball training. This trial test was applied by the researcher itself and conditions that might decrease the reliability and validity of the test were avoided as much as possible. A 52-item matrix was prepared by giving 0 point to false, incomplete or multiple marked answers and 1 point for each correct answer in the test. Necessary item analyses were carried out on this matrix. Out of item analyses, item difficulty index, item reliability coefficient and item discrimination power were calculated separately for each item. Following the calculation of item difficulty and item discrimination power indexes of trial test, two questions which had the highest item discrimination index among the four questions measuring each critical behavior were enrolled in the final basketball test. Questions with a high item difficulty index ($0.75<p<1$) were chosen for the questions which were believed to distinguish between familir and unfamiliar (item discrimination power index was 0.30 and higher) and that were easy; questions with a moderate item difficulty index ($0.35<p<0.75$) were chosen for the ones having

moderate difficulty and questions with a low item difficulty index ($0<p<0.35$) were chosen for difficult questions. Thus, basketball achievement test compromising 26 questions was established. Kuder Richardson 20 (KR-20) reliability coefficient of the established test was found to be 0.81; and its arithmetic mean was 15.59 and its mean difficulty was 0.59. Based on these data, it can be stated that final version of cognitive basketball test is at a moderate difficulty level and is a reliable test.

Physical Education and Sports Attitude Scale

Physical Education and Sports Attitude Scale, which was developed by Demirhan and Altay (2001) and whose validity and reliability was calculated, was used in order to measure attitudes of the students towards physical education. A permission was taken from the researcher in order to use attitude scale. There were a total of 24 items in this scale, which was developed as Likert-type, including 12 positive and 12 negative attitudes. Cronbach's Alpha reliability coefficient of the scale was 0.93, intraclass correlation coefficient was 0.85 and criteria validity was 0.83 (Demirhan & Altay, 2001). Besides, Cronbach's alpha reliability coefficient was calculated for this study. Cronbach's alpha coefficient was found as 0.89 at the end of calculations made. Based on these findings, it can be stated that Physical Education and Sports Attitude Scale is a reliable scale.

Observation Forms

Observation forms were developed for each of the skills including ball holding, low dribbling, high dribbling, chest pass, bounce pass, overhead pass and shooting in order to evaluate the skills of the students in psychomotor domains. Critical behaviors belonging to each skill were detected while preparing observation forms. After the preparation of observation forms regarding basketball skills, these forms were sent to 5 basketball experts having 10-30 year experience in basketball (three of them were academician, lecturer and basketball coach having an A level coaching certificate; and the other two were physical education teachers having C and D level coaching certificate, respectively) for evaluation. Assessments were analyzed by using Davis technique. Items that were agreed by 70-80% of the experts were included in skill observation forms by making revisions based on the reviews. Intelligibility levels of the items were found between 3.6 and 4 in the content validity analysis performed by using Davis technique. Besides, content validity indexes of critical behaviors were found to be 0.80 and above. In addition, a pilot study was done before the treatment in order to test construct validity of the observation forms. 15 students (mean age was 15 years old) who got basketball training among the ones who were studying in a high school in Cankaya district of Ankara city, who were playing basketball in several clubs and participated in the basketball team of the school, and 15 students (mean age was 16 years old) who were not playing basketball and did not have any training were evaluated by two basketball experts by using these observation forms. The scores of these two groups from the observation forms were assessed by Mann Whitney U test. It was found that the scores of the group which had basketball training (group 2) were significantly different from the group which did not have training (group 1) ($p<0.05$). Visual aids (camera and video) were used for measuring students' performances belonging to the skills in the study groups (experimental and control groups). Performances exhibited by each student in all skills were recorded by camera and then these recordings were scored by observation forms which were developed by 2 basketball experts with 11 and 16-year experience of coaching (having a D and C category coaching license, respectively). Basketball experts evaluated students' performances individually. No significant differences were found in all skills between the observers based on the results of Mann Whitney U test which was carried out to test the consistency of pretest observations ($p>0.05$).

The Game Performance Assessment Instrument (GPAI)

Game Performance assessment instrument, which was developed by Oslin, Mitchell, and Griffin (1998), was used to evaluate game performances of experimental and control groups. Decision making, skill practice and supporting components were chosen from this scale and adapted to basketball. Actions or skills that may be used as a response to a tactical problem were selected for decision making category in the study. Criteria such as player's attempt to pass to his/her teammate and attempt to shoot when appropriate were taken into consideration. Skill practice category was generated

by skills such as ball handling, low and high dribbling, chest pass, bounce pass, overhead pass and shoot. The player got positive (appropriate) scores in all regular skills and negative scores (inappropriate) for all irregular skills. Supporting category was described as getting an appropriate position by the player without ball (to get pass or to shoot) in order to continue having the ball as a team. Criteria such as proper placement of the player in the playground, moving to get pass in appropriate position and providing support to teammate with the ball were considered. In order to determine game performances, practices of the students in the study during the matches were recorded with a camera for 10 minutes during both pretests and posttests; and these recordings were watched independently by two individuals who were specialized in basketball (physical education teachers having a C and D level coaching certificate) by considering "decision making", "skill practice" and "supporting" components; and they were coded by using scorekeeping method. Individual indexes were found for each player, and individual decision making index, skill practice index, supporting index, game performance index and game participation index of each player were determined by using necessary formulas. In order to calculate interobserver reliability, consistency between decision making, supporting, skill practice, game participation and game performance pretest scores was checked by Mann Whitney U test, and no statistically significant difference was found between the scores given to the students by the observers ($p>0.05$).

Data Analysis

Shapiro Wilk test was used to determine whether study data showed normal distribution or not, and Levene test was used to determine if variances showed a homogenous distribution. Normality test values of the students in control group were found as follows: cognitive domain; ($z=.958$, $p>0.05$), affective domain; ($z=.978$, $p>0.05$), psychomotor domain including ball handling ($z=.946$, $p>0.05$), low dribbling ($z= .677$, $p<0.05$), high dribbling ($z=.744$, $p<0.05$), chest pass ($z=.949$, $p>0.05$), bounce pass ($z=.897$, $p>0.05$), overhead pass ($z=.965$ $p>0.05$), shoot ($z=.676$, $p<0.05$), game performance including decision making ($z=.845$, $p<0.05$), skill practice ($z=.397$, $p<0.05$), supporting ($z=.940$, $p>0.05$), participation ($z=.855$, $p<0.05$) and game performance ($z=.958$, $p>0.05$). Normality test values of the students in experimental group were the following: cognitive domain; ($z=.908$, $p<0.05$), affective domain; ($z=.900$, $p<0.05$), psychomotor domain including ball handling ($z=.905$, $p<0.05$), low dribbling ($z=.916$, $p<0.05$), high dribbling ($z=.934$, $p>0.05$), chest pass ($z=.939$, $p>0.05$), bounce pass ($z=.971$, $p>0.05$), overhead pass ($z=.761$, $p<0.05$),shoot ($z=.885$, $p<0.05$), game performance including decision making ($z=.432$, $p<0.05$), skill practice ($z=.180$, $p<0.05$), supporting ($z=.955$, $p>0.05$), participation ($z=.801$, $p<0.05$), game performance ($z=.908$, $p<0.05$). No significant differences were found in the homogenicity of the variances of the pre test scores in experimental and control groups in cognitive, affective domains and skills of psychomotor domain and game performance. Variance homogenicity test values of the students in experimental and control groups were as follows: cognitive domain ($F=.196$, $p>0.05$), affective domain ($F=.036$, $p>0.05$), psychomotor domain including ball handling ($F=.079$, $p>0.05$), low dribbling ($F=.012$, $p>0.05$), high dribbling ($F=1.029$, $p>0.05$), chest pass ($F=.242$, $p>0.05$), bounce pass ($F=.061$, $p>0.05$), overhead pass ($F=.268$, $p>0.05$), shoot ($F=.116$, $p>0.05$), and game performance including decision making ($F=.945$, $p>0.05$), skill practice ($F=.996$, $p>0.05$), supporting ($F=1.564$, $p>0.05$), participation ($F=.364$, $p>0.05$), and game performance ($F=.076$ $p>0.05$). At the end of normality and variance homogenicity tests, data were not found to be homogenously distributed. Therefore, nonparametric tests were used in the study.

While developing basketball achievement test, item difficulty index, item discriminating power index, arithmetic mean, standard deviation, mean difficulty of the test and KR-20 reliability coefficient were used. Mann Whitney U test was used to determine consistency between pretest scores given by the observers for skills belonging to psychomotor domain and game performance. Davis technique was used for the content validity of observation forms which were developed to observe skills belonging to psychomotor domain. In the study, Mann Whitney U test was used to compare pretest scores of behavioral domains of experimental and control groups. Wilcoxon Signed Rank Test was used to compare the difference between pretest and posttest scores of the students in experimental and control groups from behavioral domain. In order to compare the difference between behavioral domain gain

scores of experimental and control groups, Mann Whitney U test was used. Statistical procedures that would be performed for data from the study were analyzed by using SPSS package program. Significance level in statistical procedures was considered as 0.05.

Results

In this part, results obtained from experimental and control groups were provided for basketball achievement test, physical education and sports attitude scale, basketball observation forms and game performance assessment scale.

First Sub-Problem Results

Is there a significant difference between cognitive domain pre-test and post-test scores of the students who are studying basketball performed through the Tactical Games Approach (experimental group) and the Conventional Approach (control group)?

The results of the study revealed a statistically significant difference between basketball achievement pretest and posttest scores of experimental and control groups in cognitive domain in favor of posttests (Table 1 and Table 2.). Based on these results, it can be said that there was a significant increase in favor of exit behaviors when entry and exit behaviors of the students in experimental and control groups were compared.

Table 1. Comparison of Pre Test-Post Test Scores of Experimental Group from Cognitive Domain

Cognitive domain	Post-pre test	n	Mean rank	Total rank	Z	p
Experimental group	Negative rank	1	1.50	1.50	-4.680	0.000*
	Positive rank	28	15.48	433.50		
	Equal	1				

Table 2. Comparison of Pre Test-Post Test Scores of Control Group from Cognitive Domain

Cognitive domain	Post-pre test	n	Mean rank	Total rank	Z	p
Control group	Negative rank	0	0.00	0.00	-4.866	0.000*
	Positive rank	31	16.00	496.00		
	Equal	0				

Second Sub-Problem Result

Is there a significant difference between the Tactical Games Approach (experimental group) and the Conventional Approach (control group) in the cognitive domain achievement levels of the students who are studying basketball?

According to study results, no statistically significant differences were found between cognitive, domain achievement scores of experimental and control groups (Table 3). Basketball lessons, that were taught by using tactical games approach and conventional approach had comparable effects on students' development in cognitive domain.

Table 3. Comparison of Cognitive Domain Achievement Scores of Experimental and Control Groups

	Group	n	Mean rank	Total rank	U	p
Cognitive domain	Control	31	33.84	1049.00	377.000	0.202
	Experimental	30	28.07	842.00		

Third Sub-Problem Results

Is there a significant difference between affective domain pre-test and post-test scores of the students who are studying basketball performed through the Tactical Games Approach (experimental group) and the Conventional Approach (control group)?

The results of the study showed that the differences between affective domain pre test and post test scores of experimental and control groups were not statistically significant (Table 4. and Table 5.). Based on this result, it can be said that affective domain entry and exit behaviors of the students in tactical games approach and conventional approach groups were comparable.

Table 4. Comparison of Pre Test-Post Test Scores of Experimental Group from Affective Domain

Affective domain	Post-pre test	n	Mean rank	Total rank	Z	P
Experimental group	Negative rank	12	13.08	157.00	-0.472	0.637
	Positive rank	14	13.86	194.00		
	Equal	4				

Table 5. Comparison of Pre Test-Post Test Scores of Control Group from Affective Domain

Affective domain	Post-pre test	n	Mean rank	Total rank	Z	P
Control group	Negative rank	18	14.14	254.50	-0.802	0.423
	Positive rank	11	16.41	180.50		
	Equal	2				

Fourth Sub-Problem Results

Is there a significant difference between the Tactical Games Approach (experimental group) and the Conventional Approach (control group) in the affective domain achievement levels of the students who are studying basketball?

According to study results, no statistically significant differences were found between affective domain achievement scores of experimental and control groups (Table 6). Basketball lessons, that were taught by using tactical games approach and conventional approach had comparable effects on students' development affective domain.

Table 6. Comparison of Affective Domain Achievement Scores of Experimental and Control Groups

	Group	N	Mean rank	Total rank	U	p
Affective domain	Control	31	28.95	897.50	401.500	0.358
	Experimental	30	33.12	993.50		

Fifth Sub-Problem Results

Is there a significant difference between psychomotor domain skill performance pre-test and post-test scores of students who are studying basketball performed through the Tactical Games Approach (experimental group) and the Conventional Approach (control group)?

The results of the study revealed that there were statistically significant differences between pretest and posttest scores of experimental and control groups from all basketball skills (ball handling, high dribbling, low dribbling, chest pass, bounce pass, overhead pass and shoot) among the skills in psychomotor domain in favor of posttests (Table 7. and Table 8.). A similar effect was observed in skill development in both methods.

Table 7. Comparison of Pretest-Post Test Scores of Experimental Group from the Skills in Psychomotor Domain

Psychomotor domain	Post-pre test	n	Mean rank	Total rank	Z	p
Ball handling	Negative rank	0	0.00	0.00	-4.787	0.000*
	Positive rank	30	15.50	465.00		
	Equal	0				
High Dribbling	Negative rank	0	0.00	0.00	-4.791	0.000*
	Positive rank	30	15.50	465.00		
	Equal	0				
Low dribbling	Negative rank	0	0.00	0.00	-4.786	0.000*
	Positive rank	30	15.50	465.00		
	Equal	0				
Chest pass	Negative rank	0	0.00	0.00	-4.787	0.000*
	Positive rank	30	15.50	465.00		
	Equal	0				
Bounce pass	Negative rank	0	0.00	0.00	-4.792	0.000*
	Positive rank	30	15.50	465.00		
	Equal	0				
Overhead pass	Negative rank	0	0.00	0.00	-4.786	0.000*
	Positive rankl	30	15.50	465.00		
	Equal	0				
Shoot	Negative rank	0	0.00	0.00	-4.785	0.000*
	Positive rank	30	15.50	465.00		
	Equal	0				

Table 8. Comparison of Pre Test-Post Test Scores of Control Group from the Skills in Psychomotor Domain

Psychomotor domain	Post-pre test	n	Mean rank	Total rank	Z	p
Ball handling	Negative rank	0	0.00	0.00	-4.866	0.000*
	Positive rank	31	16.00	496.00		
	Equal	0				
High Dribbling	Negative rank	0	0.00	0.00	-4.867	0.000*
	Positive rank	31	16.00	496.00		
	Equal	0				
Low dribbling	Negative rank	0	0.00	0.00	-4.865	0.000*
	Positive rank	31	16.00	496.00		
	Equal	0				
Chest pass	Negative rank	0	0.00	0.00	-4.865	0.000*
	Positive rank	31	16.00	496.00		
	Equal	0				
Bounce pass	Negative rank	0	0.00	0.00	-4.863	0.000*
	Positive rank	31	16.00	496.00		
	Equal	0				
Overhead pass	Negative rank	0	0.00	0.00	-4.866	0.000*
	Positive rankl	31	16.00	496.00		
	Equal	0				
Shoot	Negative rank	0	0.00	0.00	-4.864	0.000*
	Positive rank	31	16.00	496.00		
	Equal	0				

Sixth Sub-Problem Results

Is there a significant difference between the Tactical Game Approach (experimental group) and the Conventional Approach (control group) in the psychomotor domain achievement levels of of the skill performance of the students who are studying basketball?

According to study results, no statistically significant differences were found between psychomotor domain achievement scores of experimental and control groups (Table 9). Basketball lessons, that were taught by using tactical games approach and conventional approach had comparable effects on students' development psychomotor domain.

Table 9. Comparison of Psychomotor Domain Achievement Scores of Experimental and Control Groups

Psychomotor domain	Group	N	Mean rank	Total rank	U	P
Ball handling	Control	31	30.56	947.50	451.500	0.845
	Experimental	30	31.45	943.50		
High dribbling	Control	31	28.10	871.00	375.000	0.192
	Experimental	30	34.00	1020.00		
Low dribbling	Control	31	31.95	990.50	435.500	0.670
	Experimental	30	30.02	900.50		
Chest pass	Control	31	31.98	991.50	434.500	0.659
	Experimental	30	29.98	899.50		
Bounce pass	Control	31	31.68	982.00	444.000	0.761
	Experimental	30	30.30	909.00		
Overhead pass	Control	31	28.13	872.00	376.000	0.198
	Experimental	30	33.97	1019.00		
Shoot	Control	31	27.73	859.50	363.500	0.142
	Experimental	30	34.38	1031.50		

Seventh Sub-Problem Results

Is there a significant difference between psychomotor domain game performance and components pre-test and post-test scores who are studying basketball performed through the Tactical Game Approach (experimental group) and the Conventional Approach (control group)?

Study results revealed statistically significant differences between pretest and posttest scores in all game performance components of experimental group in favor of post tests (Table 10). Moreover, no statistically significant differences were found between pre test and post test scores of control group in supporting and game participation components of game performance (Table 11).

Table 10. Comparison of Pre-Post Test Scores of Experimental Group from Game Performance

Game performance	Post-pre test	n	Mean rank	Total rank	Z	p
Decision making	Negative rank	3	5.00	15.00	-4.100	0.000*
	Positive rank	23	14.61	336.00		
	Equal	4				
Skill practice	Negative rank	4	9.88	39.50	-3.724	0.000*
	Positive rank	24	15.27	366.50		
	Equal	2				

Table 10. Continued

Game performance	Post-pre test	n	Mean rank	Total rank	Z	p
	Negative rank	0	0.00	0.00		
Supporting	Positive rank	26	13.50	351.00	-4.488	0.000*
	Equal	4				
	Negative rank	4	4.00	16.00		
Participation	Positive rankl	25	16.76	419.00	-4.360	0.000*
	Equal	1				
	Negative rank	0	0.00	0.00		
Game performance	Positive rank	29	15.00	435.00	-4.703	0.000*
	Equal	1				

Table 11. Comparison of Pre-Post Test Scores of Control Group from Game Performance

Game performance	Post-pre test	n	Mean rank	Total rank	Z	p
	Negative rank	7	9.43	66.00		
Decision making	Positive rank	19	15.00	285.00	-2.826	0.005*
	Equal	5				
	Negative rank	3	2.83	8.50		
Skill practice	Positive rank	22	14.39	316.50	-4.151	0.000*
	Equal	6				
	Negative rank	3	3.50	10.50		
Supporting	Positive rank	3	3.50	10.50	0.000	1.000
	Equal	25				
	Negative rank	16	15.88	254.00		
Participation	Positive rankl	11	11.27	124.00	-1.584	0.113
	Equal	4				
	Negative rank	6	9.50	57.00		
Game performance	Positive rank	25	17.50	439.00	-3.747	0.000*
	Equal	0				

Eightth Sub-Problem Results

Is there a significant difference between the Tactical Game Approach (experimental group) and the Conventional Approach (control group) in the psychomotor domain achievement levels of the game performance and components of the students who are studying basketball?

The results of the study reported statistically significant differences between game performance achievement scores of experimental and control groups in decision making, supporting, game participation and game performance components in favor of experimental group (Table 12.). In skill practice component, there was not a statistically significant difference between experimental and control groups. Tactical games approach improved game performance better than conventional approach.

Table 12. Comparison of Achievement Scores of Experimental and Control Groups from Game Performance and its Components

Game Performance	Group	N	Mean Rank	Sum of Ranks	U	p
Decision making	Control	31	25.58	793.00	297.000	0.014*
	Experimental	30	36.60	1098.00		
Skill practice	Control	31	29.31	908.00	412.500	0.448
	Experimental	30	32.75	982.00		
Supporting	Control	31	18.44	571.00	75.500	0.000*
	Experimental	30	43.98	1319.00		
Participation	Control	31	19.74	612.00	116.000	0.000*
	Experimental	30	42.63	1279.00		
Game performance	Control	31	21.94	680.00	184.000	0.000*
	Experimental	30	40.37	1211.00		

In this context, the results of this study showed that post test scores were higher in all skills belonging to cognitive and psychomotor domains among experimental and control groups; but there was no significant increase in affective domain. Significant differences were found in pre-post test scores of experimental from the components of game performance including decision making, skill practice, supporting, participation and game performance. In control group, a significant difference was found in favor of post tests in the components of decision making, skill practice and game performance whereas no significant differences were observed in supporting and participation components. When achievement scores of experimental and control groups were compared for cognitive, affective and psychomotor domains, no significant differences were found between the groups. While a significant difference was observed in favor of experimental group in decision making, supporting, participation and game performance, there was not a significant difference in skill practice component.

Discussion

In this study, the effects of tactical games approach in basketball teaching on the basketball skills belonging to cognitive, affective and psychomotor domains (ball handling, high dribbling, low dribbling, chest pass, bounce pass, overhead pass and shoot) and game performance (decision making, skill practice, supporting, participation, game performance) of the students were examined. Data regarding this purpose, were obtained by basketball achievement test which was developed by the researcher, physical education and sports attitude scale which was developed by Demirhan and Altay (2001), basketball skills observation forms which were developed by the researcher and game performance assessment instrument which was developed by Oslin et al. (1998).

In this study, it was determined that tactical games approach and conventional approach improved cognitive domain behaviors of the students. However, when experimental and control groups were compared, it was determined that approaches created similar positive effects. French et al. (1996a), Turner and Martinek (1999), Harrison et al. (2004), Şahin (2007), Žuffová and Zapletalová (2015), Olosová and Zapletalová (2015) reported similar results in their studies. In these studies which were performed with distinct branches of sports, improvement in cognitive domain was tested by using knowledge test as in our study, and students showed similar improvements in cognitive domain. In addition to this, the studies conducted by Butler (1996), Turner (1996), and Broek et al. (2011) have reported different results. In these studies, data were retrieved qualitatively through interviews and/or only tactical knowledge was measured; and these might have resulted in that difference. Besides, methods had similar effects on cognitive domain and less number of questions measuring tactical knowledge were included due to the context of tactical complexity level 1 in our study. Therefore, results of the study should be evaluated by considering tactical complexity level 1. In our study, questions including information regarding the accuracy of the skills, information about game rules and

tactical complexity level 1 (Mitchell et al., 2013) were included. According to Mitchell et al. (2013), the most important thing was the lack of addressing all tactical problems at all levels; because, this would not be appropriate developmentally. For that reason, questions including high level tactical complexity were not included in basketball achievement test used in our study. Cognitive domain can be questioned with different studies through another cognitive test including more tactical information at higher level complexity levels or only tactical information. As a result, a behavioral change may be created in cognitive domain by conventional approach and tactical games approach when a positive learning environment is generated in physical education lessons.

Tactical game approach did not cause a change in physical education and sports attitudes of the students in affective domain. However, the studies by Turner (1996), Light (2004), Wallhead and Deglan (2004) Chen and Light (2006), Moreover when study and control groups comparedi these two approach affected similarly both groups. Hovewer Harvey et al. (2009), Townsend et al. (2009), Jones et al. (2010), Fry et al. (2010), Lee et al. (2015), Zeng et al. (2016) and Harvey and Pill (2016) showed that game-based approaches positively affected affective domain. These studies reported that students enjoyed lessons, they found the lessons entertaining, attended teaching-related activities more and obtained positive improvement in self-confidence, motivation and social relationships when tactical games approach was used. However, Physical Education and Sports Attitude Scale in our study measured general attitude regarding physical education and sports. Studies in the literature did not reflect a general attitude score regarding physical education and sports. In addition to this, more detailed results could be retrieved in these studies due to the retrieval of data through qualitative methods in general and the use of methods such as interview, observation and keeping diaries. The results of our study may present differences with the results of other studies in the literature due to that. Examination of the elements in affective domain separately may reveal the contribution of tactical games approach to affective domain. Besides, our study included 6 weeks (basketball unit was for 6 weeks in the curriculum); and it might have been insufficient to create a change in physical education and sports attitude scores. Implementation of the program for longer times may lead to a change in the attitudes of the students.

In the study, it was found that both tactical games approach and conventional approach improved psychomotor domain skills of the students. When experimental and control groups were compared, it was detected that approaches created similar positive effects. Learning-teaching activities which were conducted by conventional approach (demonstration, command, question-answer, instruction) and learning-teaching activities conducted by tactical games approach (first game, debriefing session, practice implementation, return game) created positive effects on the development of basketball skills at a comparable level. In conventional approach, creation of an improvement in psychomotor domain (implementation of the technique accurately) is an expected outcome due to the format of the lesson. However, the important thing in here was the creation of an effect by tactical games approach in psychomotor domain similar to the conventional approach. This outcome may be derived from skill practice phase that was used within tactical games approach. In the study by Harvey, Cushion, Wegis, and Massa Gonzalez (2010), it was indicated that practice-based approach within tactical games approach supported learning as a suitable framework. This practice used in the lessons was thought to be effective in the improvement of basketball skills. In the literature, studies by French et al. (1996a), French et al. (1996b), Turner and Martinek (1999), Harrison et al. (2004), Austin et al. (2004), Tuzcuoğlu (2006), Şahin (2007) and Zeng et al. (2016) which were about tactical games approach in psychomotor domain support the results of our study. In conclusion; teachers and coaches who will adopt tactical games approach should give importance to skill practice within tactical games approach if they want to teach the technique accurately. Otherwise, students may experience problems in practicing tactics within the game since they do not have sufficient skills although they understand the tactics.

In the study, it was determined that tactical games approach improved game performance and all it's components. Conventional approach improved only decision making, skill implementing and game performance. In game performance, players that have the ball within the game obtained similar results in implementing basketball skills regularly in both approaches. There were no significant difference between groups for skill implementing component. These results show that tactical games approach more effective in improving the game performance and its components than the conventional approach. In the game performance, the players who have the ball in the game in both approaches have achieved similar results in order to properly practice their learned basketball skills. It is an important aspect of the approach to teach the proper implemantation of skills in the conventional approach. Isolated teaching of the skills in conventional approach have improved regular practice of the skills within the game. However, a similar effect was also observed in the groups using tactical games approach. Tactical games approach improved practice of the skills within the game. As relevant with these results, it is thought that practical implementation phase used within tactical games approach met learning outputs of conventional approach. When tactical games approach and conventional approach were compared for decision making and supporting components, a significant difference was observed in favor of tactical games approach. Presence of a significant improvement in these components caused a significant improvement in game participation and game performance scores for tactical games approach. During the lessons using tactical games approach, players without ball generated an area for themselves to get pass from their teammmates with ball; and this created a game having a concept of more attacks. In conventional approach, their inability to create a sufficient area for themselves caused the generation of a game with a concept of less attacks. This difference between both methods was thought to be derived from the use of adapted games that were similar to real games and debriefing periods in tactical games approach lessons. Students played more games in these lessons and found the chance to experience basketball game more. Students could not find the opportunity to play games during the lessons conducted with conventional approach and thus, could not exhibit the skills especially of the players without ball. The results of the studies by Turner (1996), French et al. (1996a), Turner and Martinek (1999), Tallir et al. (2003), Harvey (2003), Light (2004), Tuzcuoğlu (2006), Şahin (2007), Alarcon et al. (2009), Lee and Ward (2009), Gray and Sproule (2011), Balakrishnan et al. (2011), Lee et al. (2015), and Zeng et al. (2016) support our study. In conclusion, students who were taught by tactical games approach exhibited critical tactical behaviors of the game (decision making, skill practice, supporting) and associated game participation and game performance significantly better compared to the students who were taught by conventional approach. This outcome shows that game performance is directly related with the teaching approach used. This is an important evidence for teachers and coaches who aim teaching.

Conclusions

In this part, conclusions made based on the findings of the study were listed.

1. Post test scores of the students, who have taken basketball training through tactical games approach and conventional approach, in cognitive domain development were found to be significantly higher. Both approaches provided an increase in their knowledge about basketball.

2. No statistically significant difference was found in cognitive achievement levels of the students who have taken basketball training through tactical games approach and conventional approach. Both approaches improved knowledge of the students regarding basketball at a comparable level.

3. No significant differences were found in pre test and post test scores of affective domain of among the students who have taken basketball training through tactical games approach and conventional approach. Both approaches did not cause a change in their attitude scores towards physical education and sports lesson.

4. When their affective domain achievement scores were compared, no significant difference was found between the groups. Both approaches affected their attitudes towards physical education and sports lesson at a similar level.

5. A statistically significant difference was found in favor of post tests in psychomotor domain (ball handling, high dribbling, low dribbling, chest pass, bounce pass, overhead pass, shoot) development of the students, who have taken basketball training through tactical games approach and conventional approach. Both approaches improved their basketball skills.

6. No significant differences were found between psychomotor domain achievement levels of the students who have taken basketball training through tactical games approach and conventional approach. Both approaches improved skills in psychomotor domain similarly.

7. A statistically significant difference was found in favor of post tests in decision making, skill practice, supporting, participation and game performance of the students, who have taken basketball training through tactical games approach. Tactical games approach improved basketball game performance components of the students. A statistically significant difference was found in favor of post tests in decision making, skill practice and game performance of the students, who have taken basketball training through conventional approach; but no statistically significant differences were found in supporting and participation.

8. When achievement levels of the students, who have taken basketball training through tactical games approach and conventional approach, from decision making, supporting, participation and game performance components were compared, a statistically significant difference was found in favor of experimental group; but no significant difference was found in skill practice component. Tactical games approach improved decision making, supporting, participation and game performance components of the students more than conventional approach. Tactical games approach and conventional approach improved skill practice component at a comparable level.

Suggestions

In this part, suggestions regarding the results of the study were listed.

1.This study was conducted on 14-year old students. It should be carried out with a different age group

2.The study was performed in basketball unit of physical education lesson. It may be performed in different branches.

3.The study was performed on the classes where 9th class female and male students are taught together. The effects of tactical games approach may be compared on male and female students separately.

4.This study was designed in the first level difficulty of tactical complexity levels. Similar studies may be performed on higher level of complexity.

5. In the study, Physical Education and Sports Attitude Scale were used to measure affective domain. The elements of affective domain (motivation, pleasure, cooperation, self-confidence, participation, etc.) may be measured separately in order to investigate the contribution of tactical games approach to affective domain.

6. The study was performed within a 6-week period. The effects of tactical games approach on physical education development domains may be investigated at longer durations.

7. Tactical games approach is composed of phases such as game, questioning, skill practice, and return game. How the behaviour domains (cognitive, affective and physicomotor domains) are affected by these phases may be measured quantitavely and qualitatively.

References

Alarcon, F., Cardenas, D., Miranda, M. T., Urena, N., Pinar, M. I., & Torre, E. (2009). Effect of a training program on the improvement of basketball players'decision making. *Revista de Psicología del Deporte*, *18*(3), 403-407. Retrieved from http://www.redalyc.org/articulo.oa?id=235116466021

Almond, L. (2015). Rethinking teaching games for understanding. *Agora para la educación física y el deporte, 17*(1), 15-25. Retrieved from http://uvadoc.uva.es/handle/10324/23788

Austin, B., Haynes, J., & Miller, J. (2004*). Using a game sense approach for improving fundamental motor skills.* Paper presented at Australian Association for Research in Education Conference (AARE), Melbourne, Victoria.

Balakrishnan, M., Rengasamy S., & Aman M. S. (2011). Teaching game for understanding in physical education: A theoretical framework and implication. *ATIKAN, 1*(2), 201-214. Retrieved from http://eprints.um.edu.my/id/eprint/14288

Broek, G., Boen, F., Claessens, M., Feys, J., & Ceux, T. (2011). Comparison of three instructional approaches to enhance tactical knowledge in volleyball among university students. *Journal of Teaching in Physical Education, 30*(4), 375-392. doi:10.1123/jtpe.30.4.375

Bunker, D., & Thorpe, R. (1982). A model for the teaching of games in secondary schools. *Bulletin of physical education*, *18*(1), 5-8.

Bunker, B., & Thorpe, R. (1986). The curriculum model. In R. Thorpe, D. Bunker, & L. Almond (Eds.), *Rethinking games teaching* (pp. 7-10). Loughborough: University of Technology, Loughborough.

Butler, J. (1996). Teacher responses to teaching games for understanding. *Journal of Physical Education, Recreation and Dance, 67*(9), 17-20. doi:10.1080/07303084.1996.10604851

Carpenter, E. J. (2010). *The tactical games model sport experience: An examination of student motivation and game performance during an ultimate frisbee unit* (Doctoral dissertation). University of Massachusetts, Amherst.

Chen, S., & Light, R. (2006). I thought I'd hate cricket but I love it! Year 6 students' responses to game sense pedagogy. *Change: Transformations in Education, 9*(1), 49-58. Retrieved from https://ses.library.usyd.edu.au/bitstream/2123/4536/1/Vol9No1Article5.pdf

Demirhan, G., & Altay, F. (2001). Lise birinci sınıf öğrencilerinin beden eğitimi ve spora ilişkin tutum ölçeği II. *Hacettepe Spor Bilimleri Dergisi, 12*(2), 9-20. Retrieved from http://dergipark.gov.tr/download/article-file/151418

French K. E., Werner P. H., & Rink, J. E. (1996a). The effects of a 3-week unit of tactical, skill, or combined tactical and skill instruction on badminton performance of ninth-grade students. *Journal of Teaching in Physica Education, 15*, 418-438 doi:10.1123/jtpe.15.4.418

French, K. E., Werner, P. H., Taylor, K., Hussey, K., & Jones, J. (1996b). The effects of a 6- week unit of tactical, skill, or combined tactical and skill instruction on badminton performance of ninth-grade students. *Journal of Teaching in Physical Education, 15*(4), 439-463. doi:10.1123/jtpe.15.4.418

Fry, J. M., Tan, C. W. K., McNeill, M., & Wright, S. (2010). Children's perspectives on conceptual games teaching: A value-adding experience. *Physical Education and Sport Pedagogy, 15*(2), 139-158. doi:10.1080/17408980902813927

Gray, S., & Sproule, J. (2011). Developing pupils' performance in team invasion games. *Physical Education and Sport Pedagogy, 16*(1), 15-32 doi:10.1080/17408980902813927

Gubacs Collins, K., & Olsen, E. B. (2010). Implementing a tactical games approach with sport education: A chronicle. *Journal of Physical Education, Recreation and Dance, 81*(3), 36-42. doi:10.1080/07303084.2010.10598447

Güneş, B., & Çoknaz, H. (2010). The effects of cooperative learning on the achievements of students in gymnastics unit. *HÜ Journal of Education, 39*, 207-219. Retrieved from http://dergipark.gov.tr/download/article-file/87469

Harrison, J. M., Blakemore, C. L., Richards, R. P., Oliver, J., Wilkinson, C., & Fellingham, G. (2004). The effects of two instructional models-tactical and skill teaching-on skill development & game play, knowledge, self-effıcacy, & student perceptions in volleyball. *Physical Educator, 61*(4), 186.

Harvey, S. (2003). Teaching games for understanding: A study of u19 college soccer players improvement in game performance using the game performance assessment instrument. In *Segunda Conferencia Internacional: Enseñanza del deporte y educación física para la comprensión* (pp. 11-25). Australia: Universidad de Melbourne.

Harvey, S., Cushion, C. J., Wegis, H. M., & Massa Gonzalez, A. N. (2010). Teaching games for understanding in American high-school soccer: A quantitative data analysis using the game performance assessment instrument. *Physical Education and Sport Pedagogy, 15*(1), 29-54. doi:10.1080/17408980902729354

Harvey, S., & Pill, S. (2016). Comparison of academic researchers and physical education teachers' perspectives on the utilization of the tactical games model. *Research Quarterly for Exercise and Sport, 87*(S1), S88. doi:10.1123/jtpe.2016-0085

Harvey, S., Wegis, H. M., Beets, M. W., Bryan, R., Massa Gonzalez, A., & Van Der Mars, H. (2009). Changes in student perceptions of their involvement in a multi-week TGfU unit of soccer: A pilot study. In T. F. Hopper, J. Butler, & B. Storey (Eds.), *TGfU... Simple good Pedagogy: Understanding a Complex Challenge* (pp. 101-113). Canada: Physical and Heath Education.

Holt, N., Strean, W., & Bengoechea, E. (2002). Expanding the teaching games for understanding model: New avenues for future research. *Journal of Teaching in Physical Education, 21*, 162-176. doi:10.1123/jtpe.21.2.162

Jones, C., & Farrow, D. (1999). The transfer of strategic knowledge a test of the games classification curriculum model [R]. *Bulletin of Physical Education-Driffield Then Nafferton*, *35*, 103-123.

Jones, R., Marshall, S., & Peters, D. (2010). Can we play games now? The intrinsic benefits of TGfU. *European Journal of Physical and Health Education, 42*(2), 57-63. Retrieved from http://eprints.worc.ac.uk/1009/1/2010_European_Journal_of_Physical__Health_Education.pdf

Lee, W. A., Rengasamy, S., Hooi, L. B., Varatharajoo, C., & Azeez, M. I. K. (2015). The effectiveness of teaching games for the ımprovement of the hockey tactical skills and the state of self-confidence among 16 years old students. World Academy of Science, Engineering and Technology, *International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering, 9*(7), 2296-2302. Retrieved from http://scholar.waset.org/1307-6892/10001801

Lee, M.A., Ward, P. (2009). Generalization of tactics in tag rugby from practice to games in middle school physical education. *Physical Education and Sport Pedagogy*, *14*(2), 189–207. doi:https://doi.org/10.1080/17408980801974937

Light, R. (2004) Coaches' experiences of game sense: Opportunities and challenges. *Physical Education and Sport Pedagogy, 9*(2), 115-131. doi:10.1080/1740898042000294949

Martin, R. (2004). An investigation of tactical transfer in invasion/territorial games. In *Research Quarterly for Exercise and Sport, AAHPERD National Convention and Exposition 75 (1: March Supplement)* (pp. A73-A74). Oxford, PA.

Mirzeoğlu, A. D., Munusturlar, S., & Çelen, A. (2014). Akran öğretimi modelinin akademik öğrenme zamanına ve voleybol becerilerinin öğrenimine etkisi. *Spor Bilimleri Dergisi, 25*(4), 184-202. doi:10.17644/sbd.171672

Mitchell, S., & Oslin, J. (1999). An investigation of tactical transfer in net games. *European Journal of Physical Education, 4*, 162-172. doi:10.1080/1740898990040205

Mitchell, S., Oslin, J., & Griffin, L. (2006). *Teaching sport concepts and skills: A tactical games approach* (2nd ed.). Champaign, IL: Human Kinetics.

Mitchell, S. A., Oslin, J. L., & Griffin, L. L. (2013). *Teaching sport concepts and skills: A tactical games approach for ages 7 to 18.* Champaign, IL: Human Kinetics.

Olosová, G., & Zapletalová, L. (2015). Immediate and retention effects of teaching games for understanding approach on basketball knowledge. *Acta Facultatis Educationis Physicae Universitatis Comenianae, 55*(1), 39-45. doi:10.1515/afepuc-2015-0005

Oslin, J. L., Mitchell, S. A., & Griffin, L. L. (1998). The game performance assessment instrument (GPAI): Development and preliminary validation. *Journal of Teaching in Physical Education, 17*, 231-243. doi:10.1123/jtpe.17.2.231

Pearson, P. J., & Webb, P. (2008). *Developing effective questioning in teaching games for understanding (TGfU).* Paper presented at 1st Asia Pacific Sport in Education Conference: Ngunyawaiendi Yerthoappendi Play to Educate, Adelaide.

Stolz, S., & Pill, S. (2014). Teaching games and sport for understanding: Exploring and reconsidering its relevance in physical education. *European Physical Education Review, 20*(1), 36-37. doi:10.1177/1356336x13496001

Şahin, R. (2007). *Hentbolun öğretiminde taktik oyun yaklaşımının etkisi* (Unpublished doctoral dissertation). Hacettepe University, Faculty of Sport Sciences, Ankara.

Tallir, I., Musch, E., Lenoir, M., & Valcke, M. (2003). *Assessment of play in basketball*. Paper presented at The 2nd International Conference: Teaching Sport and Physical Education for Understanding, University of Melbourne, Melbourne.

Townsend, M., Jenkins, J., & Wallhead, T. (2009). *Teacher progress and fourt graders' learning in the tactical approach.* Paper presented at AAHPERD National Convention and Exposition, Tampa, Florida.

Turner, A. (1996). Teachers' perceptions of technical and tactical models of instruction. *Research Quarterly for Exercise and Sport,* 67(Suppl), A-90.

Turner, A., & Martinek, T. (1999). An investigation into teaching games for understanding: Effectson skill, knowledge and game play. *Research Quarterly for Exercise and Sport, 70*(3), 286-296. doi:10.1080/02701367.1999.10608047

Tuzcuoğlu, S. (2006). *Taktik oyun yaklaşımının tenis öğretimi üzerine etkisi* (Unpublished master's thesis). Abant İzzet Baysal University, Bolu.

Uzunöz, F. S., & Demirhan, G. (2017). The effect of creative drama on critical thinking in preservice physical education teachers. *Thinking Skills and Creativity*, *24*, 164-174. doi:10.1016/j.tsc.2017.02.018

Wallhead, T., & Deglan, D. (2004). Effect of a tactical games approach on student motivation in physical education. *Research Quarterly for Exercise and Sport, 75*(1), A83-A84.

Zeng, H., Liu, A. Q., Zhang, Y., Tao, H., & Dong, Q. Q. (2016). Application of teaching games for understanding (tgfu) in preschool children basketball education. *Research Quarterly for Exercise and Sport, Conference Supplement, 87*(S1), 76.

Žuffová, Z., & Zapletalová, L. (2015). Efficiency of different teaching models in teaching of frisbee ultimate. *Acta Facultatis Educationis Physicae Universitatis Comenianae, 55*(1), 64-73. doi:10.1515/afepuc-2015-0008