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# EFFECTS OF THE SPORT EDUCATION MODEL ON UNIVERSITY STUDENTS GAME PERFORMANCE AND CONTENT KNOWLEDGE IN BASKETBALL

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## ABSTRACT

*Many universities offer an abundant amount of physical activity courses designed to improve student knowledge and performance which may lead to increased fitness involvement. This study examined the effect of Sport Education model on university students' (N = 25, 22 males, 3 females) basketball game performance and content knowledge of a physical activity course. Students were taught using either the Sport Education instructional model or a traditional method of teaching basketball. Data were collected to determine game efficiency through the examination of game statistics, offensive game performance measured by the basketball offensive game performance instrument, and content knowledge through the completion of a pre-and-post examination. Results revealed that students in the Sport Education group improved significantly in their offensive game performance and content knowledge compared to a traditional teaching model. In addition, the game efficiency of the Sport Education group did slightly improve while the students in the traditional group did experience a decrease. These findings suggest that the Sport Education model is an effective pedagogical approach for improving game performance and sport content knowledge of university students. Based on the limited amount of research on the impact of the Sport Education model with university physical activity courses, future studies should continue to examine the effectiveness of the model.*

**Keywords:** Sport education, Basketball, Skill performance, Content knowledge.

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## Contribution/ Originality

This study is one of very few studies which have investigated the impact of the Sport Education model on a university physical activity course. Findings suggest that the model can have a positive effect on game performance and sport content knowledge.



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## 1. INTRODUCTION

Basketball is a sport played by people of varying ages for the enjoyment and the associated health benefits that come from playing. Basketball is unique in that it can be played inside or outside as well as individually or on a team. Although few people will receive the chance to play basketball collegiately or professionally, it is one that can be played well into adulthood. In a survey of university students, non-student athletes stated that they missed being a player and the playing time that they had while in high school (Chen *et al*., 2010). With the popularity of the sport, some coaches and programs have established "fantasy" camps to provide people with the opportunity to fulfill their sport dreams (Mitchell *et al*., 2013). Many of these camps offer participants, for a large fee, the opportunity to have an actual player experience. Participants get to be drafted, become part of a team with an actual coach, compete in a regular season, as wells as contests, tournaments, and championships games. Through the instructional model known as Sport Education, students in university physical activity courses can experience many aspects of such fantasy camps during their higher education studies. More importantly, students have the opportunity to learn about the overall aspects of basketball instead of only learning the skills necessary for playing. Therefore, there is the potential for increased involvement due to the development of playing ability and an enhanced understanding of the game of basketball. Siedentop (1998) introduced Sport Education with the idea of creating an authentic sport experience for the learner. Through the introduction of developmentally appropriate sport experiences, the goal is for students to develop as competent, literate, and enthusiastic sportspersons (Siedentop *et al*., 2011). Siedentop *et al*. (2011) believe that the features of Sport Education offer students the potential to achieve learning goals through seasons of greater length. Students are placed on a team and remain with that team for the duration of a season devoted to the learning of a specific skill or sport. After a devoted time of practice, teams participate in a season of competition ending with a culminating event that would be similar to events of today, such as the Super Bowl. Also unique to the model is the designation of duty roles for players. Each team member will take on roles such as coach, captain, manager, uniform designer, or awards director for the end of season festivity. During competitions that their team does not participate as players, team members will fulfill roles such as referee, statistician, clock or video operator. The intent of Sport Education is to provide students with an opportunity to learn about the overall game of basketball, compared to the isolation of only learning the skills necessary to play. Basketball, by nature, is an invasion game. In order to play the game, one must be able to dribble, pass, and shoot. In addition to playing skills, one must exhibit tactical awareness to be an effective player. Research on Sport Education has produced some promising results on the development of skill and game performance (Hastie, 1998; Browne *et al*., 2004; Pritchard *et al*., 2008; Hastie *et al*., 2009; Richards *et al*., 2012; Hastie *et al*., 2013). Hastie (1998) discovered that sixth grade students participating in a Sport Education season of ultimate frisbee improved their skill competence. Across the season students achieved higher success in receiving passes and the percentage of completed passes. Students also made gains in tactical awareness

realizing that turnovers could be reduced by completing shorter passes. Similar improvements have been shown in eight grade students' badminton skills, as well as their quality of game play and tactical understanding following a season of learning (Hastie *et al*., 2009). According to the competence motivation theory, an increase in overall competence has the potential to lead to an increase in skill mastery attempts (Roberts *et al*., 1981). It is a goal of Sport Education for students to become competent in an activity and "thus increasing the chances that they will seek opportunities to participate in their discretionary time" (Siedentop *et al*., 2011). Studies have also revealed the effectiveness of Sport Education compared to a more traditional model of teaching. The study of Pritchard *et al*. (2008) found that Sport Education student's (n=47) volleyball game performance to improve over time compared to those being taught with the traditional method of teaching. The features of affiliation and modified game play provided students with the opportunity to improve their skills over an extended time of learning. However, results did not show a significant improvement in volleyball content knowledge in either group from the beginning to the end of the season. In a more recent study, Hastie *et al*. (2013) suggested that an extended period of time engaged in a unit of instruction can lead to positive improvements. In that study, involving participants from three different high schools (n=119), students' skill and technical performance, as well as content knowledge of three different track and field events improved following a season of Sport Education. In a recent review of Sport Education, Hastie *et al*. (2011) believed that evidence supporting the models goal of developing competent sportspersons was "burgeoning and developing" (p.129). Even with the favorable results of previous research, limited research exists which examines the effectiveness of the Sport Education model on the development of sport skill and knowledge for university students. In an early investigation of the key features of Sport Education, university students found the method to be attractive. Students believed that their engagement levels were higher and suggested that they would take other courses implementing the same model (Bennett and Hastie, 1997). In a more recent study, student evaluation of Sport Education courses were favorable revealing that students made progress with regards to important course objectives (Mohr *et al*., 2012). In addition, the authors believed that Sport Education is a workable model for facilitating the improvement of sport skill and knowledge for university students participating in physical activity courses. Nonetheless, limited research is available on the impact of the Sport Education model on the development of university student's game performance and content knowledge.

Therefore, the purpose of this research study was to examine the impact of the Sport Education methodology, compared to a traditional form of teaching, on university students participating in a basketball activity course. Specifically, the aim of this study was to examine the effect of Sport Education on (1) overall efficiency based on game statistics, (2) offensive game performance as measured by the Basketball Offensive Game Performance Instrument (BOGPI) (Chen *et al*., 2013), and (3) content knowledge from the beginning to the end of the season. Based on the findings of previous studies (Hastie, 1998; Pritchard *et al*., 2008; Hastie *et al*., 2009; Hastie *et al*., 2013), it was hypothesized that students participating in a Sport Education-based basketball

intervention unit would exhibit greater increase in (1) game efficiency, (2) offensive game performance, and (3) content knowledge compared to their counterparts in a traditional approach basketball unit.

## 2. METHODS

### 2.1. Participants and Procedures

The participants in the study were 36 students from a university in the southeastern part of the United States. Participants were enrolled in one of two university physical activity courses for Basketball. One class was taught using the Sport Education instructional model, while the other was taught with a more traditional approach. Each class met a total of 28 times for one hour and 25 minutes during the spring semester. To help endorse experimental control, two factors were used to eliminate participants from the final analysis. These included: (1) had to attend 90% of classes; and (2) completed both cognitive exams on the game of basketball. In the end, 25 students (22 males, 3 females) participated in the study. The teacher for the Sport Education class had significant experience with Sport Education, both in terms of planning and teaching a number of seasons. At the university level, the teacher had taught a variety of courses (basketball, bowling, flag football, swimming for fitness, volleyball) and incorporated a variety of competition formats and culminating events. The teacher also had experience teaching elementary students using the Sport Education model. The teacher for the traditional class had previous experience teaching basketball to university students using a traditional model. The students participating in the study had no previous experience with Sport Education. Each game was video recorded for the purpose of obtaining data relative to the game of basketball. A video recording device was set up in an optimal viewing area so that all playing footage could be obtained. Informed consent was obtained from all participants prior to the beginning of data collection, and the research protocol was approved by the university's Institutional Review Board for Human Subjects Research. The following data were collected for this study: (1) game statistics to help calculate the game efficiency index, (2) observation of game play to determine the BOGPI, and (3) scores from cognitive exams to evaluate content knowledge.

## 3. INTERVENTION

***Sport Education Unit.*** 13 students (12 males, 1 female) participated in a season following typical Sport Education protocol. Following standard sport education protocol, students participated in a series of lessons devoted to the practicing of skills, followed by placement on heterogeneous, mixed-sex teams. Determination of teams was based on teacher observation and the completion of a skills test used to determine student ability on basic basketball skills. Students stayed with their respective teams for the duration of the season, participating in pre-season games, formal competition, and a culminating event. In addition, each team member took on team roles such as captain, coach, statistician, designer, manager or awards director. During game play, students also accepted roles such as statistician, referee, videographer, and clock manager. Each

team consisted of five to six students. In order to create an accountability system for completing roles, team points were deducted for failing to complete any task for which a team member was responsible. The Sport Education approach consisted of three phases of seasons. In the first phase which lasted from lessons 1-15, students were introduced to Sport Education, practiced basketball skills, participated in drills designed to prepare the student for game play, and were placed onto teams. In addition, it was during this phase that students were given team roles and introduced to their role requirements. Finally, after becoming acclimated to their team, and having time to practice together, teams transitioned into the pre-season. This provided each team with the opportunity to compete against other teams as well as learning how to complete game playing roles (statistician, referee, videographer, and clock manager). In the second phase (formal competition) which lasted from lessons 16-24, students were involved in games against other teams from the class. During each lesson of this phase, teams would play at least two 10 minute quarters, and depending on the schedule, would complete game playing roles. In some instances, teams would play four quarters and would have no game playing role responsibility.

In the third phase which took place during lessons 25-28, saw the students participating in a culminating event. A bracket was completed based on the final standings from the formal competition season. After the completion of the culminating event, an awards ceremony was held to celebrate the accomplishments of the class.

***Traditional Approach Unit.*** 12 students (10 males, 2 females) participated in a season of learning following a traditional approach to learning. The traditional approach consisted of two phases; the first phase consisted of the practicing of basketball skills, with occasional game play, while the second phase consisted primarily of game play. For game play, teams would be randomly selected with no team remaining the same for multiple days. Game play in the traditional approach was absent of students receiving any instruction during the time of competition. No records of results or individual statistics were maintained throughout the season. Table 1 provides a comparison of the instructional approach that was implemented for this study.

### 3.1. Instruments

***Game Efficiency.*** Video of each game was observed so that statistics could be calculated for each game that was played in both the Sport Education and traditional classes. A game efficiency index was calculated using the following formula [(Points + Rebounds + Assists + Steals +Blocks) - ((Field Goals Att. - Field Goals Made) + (Free Throws Att. - Free Throws Made) + Turnovers)]. Although previous research has examined other approaches to measuring basketball efficiency (Trninic and Dizdar, 2000; Sampaio and Janeira, 2003; Ibanez *et al.*, 2008; Yesilyurt, 2014), this approach was selected for this study due to the feedback provided on basic basketball skills. Although game efficiency does not take into account all variables for measuring basketball performance (charges taken, effort, etc.), it does provide data on individual performance and the change that occurs over time. Reliability for game efficiency was measured through a two-step process. First, two observers discussed the statistical definitions for the game of basketball.

Secondly, after these terms were agreed upon, observation of a 10-minute five versus five game took place with each observer recording the following statistics for each player and team; points, rebounds, assists, steals, blocks, turnovers, field goals attempted and made, and free throws attempted and made. After statistics were recorded, observers compared their findings to determine reliability. Reliability was calculated by dividing the agreements by the agreements plus the disagreements. That number was then multiplied by 100. An inter-rater reliability check game efficiency was .89 exceeding the recommended levels of .85 agreement suggested by Van Der Mars (1989).

***Offensive Game Performance.*** The BOGPI was found to be an effective measure for evaluating each student's offensive game performance (Chen *et al*., 2013). A rating scale was used to objectively assess the sub-game components of skill execution (SEI), decision making (DMI), and support (SI) for each student during two 10-minute quarters at the beginning and end of their respective seasons of play. Using the BOGPI assessment sheet (Table 2), two players were selected (one from each team) to be observed. During team possession each sub-game component was marked as either observed or absent. The observation continued until a turnover of possession occurred. The player from the other team would then be observed. This continued until the end of the 10-minute quarter. At that point, two new students were selected to be observed. The procedure continued until all participants had been observed.

When the observation period ended, each sub-game component was transformed into an index score using the following example. Skill Execution Index (SEI) = [the number of efficient game responses/ (the number of efficient game responses + the number of inefficient game responses)] X the total number of times the player gained possession of the ball. The overall BOGPI was calculated as: (SEI + DMI + SI) / 3. BOGPI reliability was measured in a similar fashion to game efficiency. First, two observers discussed their understanding of the sub-game components and the rating system to be used. Secondly, after these terms were agreed upon, observation of a 10-minute five versus five game took place with each observer assessing the offensive game performance of the same two players. This process occurred until the recommended level of agreement was met between the two observers. Inter-rater reliability test was performed indicating acceptable levels of reliability (Van Der Mars, 1989).

***Content knowledge.*** Students from both classes completed a test of content related to the game of basketball at the beginning and end of the semester to determine their overall understanding of the game of basketball. All test questions were developed using suggestions from a book focused on learning the game of basketball (Wilkes, 1998). The test included questions on the following categories: history of basketball (5 questions), rules (10 questions), game performance (10 questions) and basketball vocabulary (15 questions). Sport Education has shown to improve the content knowledge of students during a season of participation (Pritchard *et al*., 2008; Hastie *et al*., 2009; Hastie *et al*., 2013). In the current study, the traditional class devoted the majority of their time to the development of basketball skills and participating in game play. The Sport Education class devoted time at the beginning of class to discuss topics considered important components of

the game of basketball. In addition, the Sport Education teams were expected to work together to complete periodic quizzes. The two teams with the highest scores would earn points for their team while the remaining teams would earn no points. The belief was that this method would better prepare students for the final exam.

### 3.2. Fidelity of Implementation

Teachers' adherence to instruction and content, that is fidelity of implementation (Mowbray *et al.*, 2003), was measured using a 10-item checklist by Pritchard *et al.* (2008), with benchmarks highlighting the instructional features of each model. The trained observers made decisions as to whether an item was representative of the lesson (see Table 3). Four randomly selected lessons were selected for observation with 100% agreement being met by observers with regard to the instructional approach used in each lesson.

### 3.3. Statistical Analysis

Descriptive statistics were analyzed to determine areas of significance related to the outcomes of game play by both classes. A series of analysis of covariance (ANCOVA) tests were conducted to compare the impact of the Sport Education model in contrast to the traditional model on the following dependent variables: (1) game efficiency index, (2) BOGPI scores, and (3) content knowledge. For this analysis, the post-score for each variable was set as the dependent variable, the baseline score as the covariate, and the teaching approach (dummy variable: 0 for traditional teaching style and 1 for Sport Education model) as the independent variable. Within group analyses were also performed through a one-way ANOVA to determine if there was any change over time.

## 4. RESULTS

A Bonferroni corrected *t*-test analysis showed that students in both groups were similar in game efficiency ($t(23) = -.121$, $p = .078$), BOGPI scores ($t(23) = -.964$, $p = .826$), and content knowledge ($t(23) = .071$, $p = .135$) in the beginning of the study. As shown in Table 4 (Figure 1 provides a graphical representation of the student outcomes), ANCOVA test results showed that there was a significant intervention effect on BOGPI ($F$ (Hastie, 1996; Chen *et al.*, 2010) $= 26.21$, $P < .001$, $\eta^2 = .19$) and content knowledge ($F$ (Hastie, 1996; Chen *et al.*, 2010) $= 25.23$, $P < .001$, $\eta^2 = .50$) but not on game efficiency ($F$ (Hastie, 1996; Chen et al., 2010) $= 2.65$, $P = .118$, $\eta^2 = .05$). In regards to game efficiency, mean level results showed an increasing trend for the Sport Education group (0.71) and declining trend for the traditional group (-2.20). However, within group analysis revealed no statistical difference from the beginning to the end of the season for both the Sport Education ($F = .075$, $P = .786$) and traditional ($F = .436$, $P = .516$) groups. From the beginning to the end of the season, the Sport Education group saw an increase of 2.78 in their overall BOGPI. In contrast, the performance of the traditional group remained relatively stable (0.10). Results from the ANOVA did reveal a statistical difference for the Sport Education group

($F$ = 6.770, $P$ = .016), but no difference was found for the traditional group ($F$ = .012, $P$ = .915). Finally, the results from the content knowledge exam indicated that both the traditional (4.90) and the Sport Education (22.6) groups improved in scores from the beginning to the end of the season. However, ANOVA tests revealed that only the Sport Education group ($F$ = 26.210, $P$ < .000) produced a significant change in knowledge.

## 5. DISCUSSION

Findings from this study provide evidence that the Sport Education model can be an effective methodology for improving the basketball offensive game performance and content knowledge of university students. Although this study was designed for university students, it adds to the existing literature supporting the use of Sport Education for the improvement of game performance and content knowledge.

### 5.1. Game Efficiency

Results from the current study did not support our hypothesis that game efficiency would significantly improve over the course of the Sport Education season. However, there were some results of interest. Data revealed that the Sport Education class attempted more shots and averaged more possessions compared to the traditional class. Although the intent of this study was not focused on physical activity, observation of game play suggests that the Sport Education group played at a pace which provided more opportunities to perform. This increase in opportunity has the potential to lead to a higher quantity of successful practice (Hastie, 1996). From beginning investigations (Hastie, 1998; Hastie *et al*., 2011), students have found enjoyment in Sport Education due to the increased opportunity to practice. In order for skill competence to occur, students must be given time to play and develop as skillful players (Rink *et al*., 1996; Stodden *et al*., 2008). Although there was no statistical difference in game efficiency between the two models, students in the Sport Education class did improve slightly (0.71) while the traditional class decreased in efficiency (-2.20). These results suggest that when given time, students participating in a Sport Education season of basketball can develop some competency.

### 5.2. Offensive Game Performance

Findings from this study revealed that over time, students in the Sport Education class made moderate (size of effect .19) gains in their overall BOGPI. These findings support our hypothesis and the findings of Pritchard *et al.* (2008) who discovered that the Sport Education model was more effective in improving student's offensive performance. This increase in performance may be contributed to the instructional features of Sport Education. For instance, Hastie *et al.* (2013) believed that the features of affiliation and formal competition promote the benefits of Sport Education compared to a traditional method of teaching. Indeed, due to the embedded features of the model students are held accountable for their actions over a season of learning. Teams can be deducted points for failing to complete a task, exhibiting poor sportsmanship or scoring fewer

points than their opponent during competition. Compared to the traditional method of teaching, this increased accountability can potentially lead a player to seek better game play performance and a better understanding of teammates which can promote team cohesiveness, which ultimately may lead to greater team outcomes.

### 5.3. Content Knowledge

Findings from this study revealed that over time the Sport Education group improved in their content knowledge by more than 22% while the traditional group only improved by approximately 5%. The large effect size (.50) suggests that the Sport Education model was more effective in improving student content knowledge than the traditional approach. One important feature to consider when examining these results was the length of class time. While the length of time for both Hastie *et al.* (2013) and Pritchard *et al.* (2008) were similar (900 & 1000 minutes), the current study was almost three times that amount (2380). Nonetheless, the traditional group in all three studies did not produce a significant change in content knowledge over time. However, results do support our hypothesis and match the outcome of the Hastie *et al.* (2013) study where only the Sport Education group showed significant improvement in their content knowledge. The Sport Education model provides students with a "deeper coverage of content and an expanded set of goals" (Siedentop *et al.*, 2011) (p. 13). In the current study, the availability of time allowed the Sport Education teacher to devote a portion of class to the examination of a variety of content related to basketball knowledge. The embedded accountability of quiz scores contributing toward their overall team score also influenced the learning of material with the desire of earning points for their team. Although the traditional group discussed aspects of basketball knowledge, the majority of time was devoted to skill practice and game play. The current study provides favorable results regarding the adoption of the Sport Education model within university physical activity courses. However, there are a few limitations to consider when examining the data. The sample size included a greater percentage of male participants (88%) therefore limiting our understanding of how females would respond to the model. Another limitation of the study was the small sample size. The incorporation of a nonhierarchical cluster analysis produced some promising findings, but due to the limited statistical power these data were omitted from the paper.

## 6. CONCLUSION

The results of this study suggest that over time university students participating in a Sport Education season of basketball can develop their offensive game performance and content knowledge. One of the positive features of teaching university physical activity courses is the length of the class. Since most universities follow a semester format, typical classes may meet two to three times a week for a period of four months. Research has revealed that in a Sport Education season, an increased opportunity for practice may potentially lead to gains in performance (Pritchard *et al.*, 2008; Hastie *et al.*, 2009; Hastie *et al.*, 2013). Similar to those studies, the results

from this study may be contributed to the extended period of time for practicing skills and learning content about the sport. Descriptive statistics suggest that the model can produce greater opportunity to perform which may potentially lead to the development of skill. These results are noteworthy for coordinators of university programs as the amount of time available for learning is similar for all classes. In addition, the Sport Education format is set up to establish a developmentally appropriate environment where teams compete against one another to earn points. Because of this, students are concerned with their offensive decision making due to the impact their decisions may have on the outcome of the game. Regardless, more research is needed to confirm the effectiveness of the Sport Education model in the development of skill, game performance, and content knowledge as it pertains to activity courses that are taught to university students. Although this study produced positive results, future investigations need to include a variety of classes that are commonly offered to university students. In addition, with rising health concerns regarding physical activity and obesity, an examination of the continuation of participation needs to occur to provide confirmation of the effectiveness of teaching models being incorporated into university activity courses.

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**Table-1.** Comparison of Instructional Approaches

| Instructional Component | Traditional | Sport Education |
|---|---|---|
| Length of Season | 28 Lessons (85 Minutes) | 28 Lessons (85 Minutes) |
| Team Formation | Teams were randomly selected and each day students were placed on a new team | After an evaluation period students were placed on evenly matched teams (Lesson 8) for the duration of the season. |
| Game Play | The first half of the semester consisted of classes devoted to skill practice and game play (14 Lessons) The second half consisted of only game play (14 Lessons). | In the beginning (Lesson 10), students participated in small sided, modified game play. Students then transitioned into the pre-season (3 Lessons), formal competition (9 Lessons), and culminating event (2 Lessons). |
| Record Keeping | Game scores were maintained for each game but no formal record of results was recorded. | Game statistics were maintained by students and were posted at the completion of each day of competition. Officials and statisticians would decide on fair play points for each game played. |
| Student Roles | No roles other than player. | Students took on team roles (coach, designer, manager, awards director) and required duty roles (statistician, clock manager, official) |

**Table-2.** Definition of Each Sub-Game Component and Rating Scales in the BOGPI.

| Game Decision | Definition of Each Game Component |
|---|---|
| Skill Execution | 1. Dribbling: Dribbles a ball when appropriate while changing pace and directions to maintain control of the ball.<br>2. Passing: Passes accurately when a teammate is open, has a good supporting position, or has the best shooting position.<br>3. Shooting: Shoots when getting open and scores a basket. |
| Decision Making | 1. Attempts to dribble to take on/beat defender, drive to the basket, or read situations.<br>2. Attempts to pass to set up a shot, move the ball, beat defender, or set up offense.<br>3. Attempts to shoot when in good position and wide open. |
| Support | 1. Reads defense and offense situations to effectively and appropriately use cuts or post up.<br>2. Reads defense/offense situations to effectively and appropriately set screens.<br>3. Reads the defender to effectively come off screens by using roll, pop out, curl, and/or fade appropriately.<br>4. Reads defense/offense situations to effectively and appropriately relocate positions. |
| Rating Scale | "+" indicates that an individual player demonstrates the definition of each individual game component.<br>"-" indicates that an individual player does not demonstrate the definition of each individual game component.<br>"/" indicates that the definition of a specific game component is not applicable to an individual player. |

*Taken from Chen *et al.* (2013). Development and validation of the basketball offensive game performance instrument. Journal of Teaching in Physical Education, 32(1), 100-109.

**Table-3.** Instructional Checklist

| | |
|---|---|
| 1 | Groups of students go to a designated home area and begin warming-up with that group. |
| 2 | Students warm-up as a whole class under the direction of the teacher. |
| 3 | Students practice together with their group/team under the direction of a peer leader. |
| 4 | Students practice individually or in small groups under the direction of the teacher. |
| 5 | Students remain a part of easily identifiable groups throughout the lesson and throughout different tasks. |
| 6 | Student grouping throughout the lesson is variable across tasks. |
| 7 | Performance records are kept by students. |
| 8 | Students perform specialized tasks within their group/team. |
| 9 | Student performance scores count towards a formal and public scoring system. |
| 10 | Student performance scores are not recorded or recorded in private. |

**Note.** Items 1, 3, 5, 7, 8, 9 indicate Sport Education while items 2, 4, 6, 10 represent a traditional lesson.
*Taken from Pritchard et al. (2008). Effects of two instructional approaches on skill development, knowledge, and game performance. Measurement in Physical Education and Exercise Science, 12(4), 219–36.

**Table-4.** Longitudinal Representation of the Effectiveness of the Intervention

| Variables | Condition | Pre | Post | Raw Change Score | Intervention Effect | |
|---|---|---|---|---|---|---|
| | | M(SD) | M(SD) | | F(df1, df2) | P($\eta^2$) |
| GEI | Traditional<br>Sport<br>Education | 9.87(9.16)<br>10.24(6.03) | 7.67(7.02)<br>10.95 (7.22) | -2.20<br>0.71 | 2.65(1,23) | =.118(.05) |
| BOGPI | Traditional<br>Sport<br>Education | 3.75(2.43)<br>4.68(2.40) | 3.85(2.24)<br>7.46(3.01) | 0.10<br>2.78 | 26.21(1,23) | <.001(.19) |
| COG | Traditional<br>Sport<br>Education | 66.58(8.97)<br>66.25(13.86) | 71.48(10.47)<br>88.85(7.81) | 4.90<br>22.60 | 25.23(1,23) | <.001(.50) |

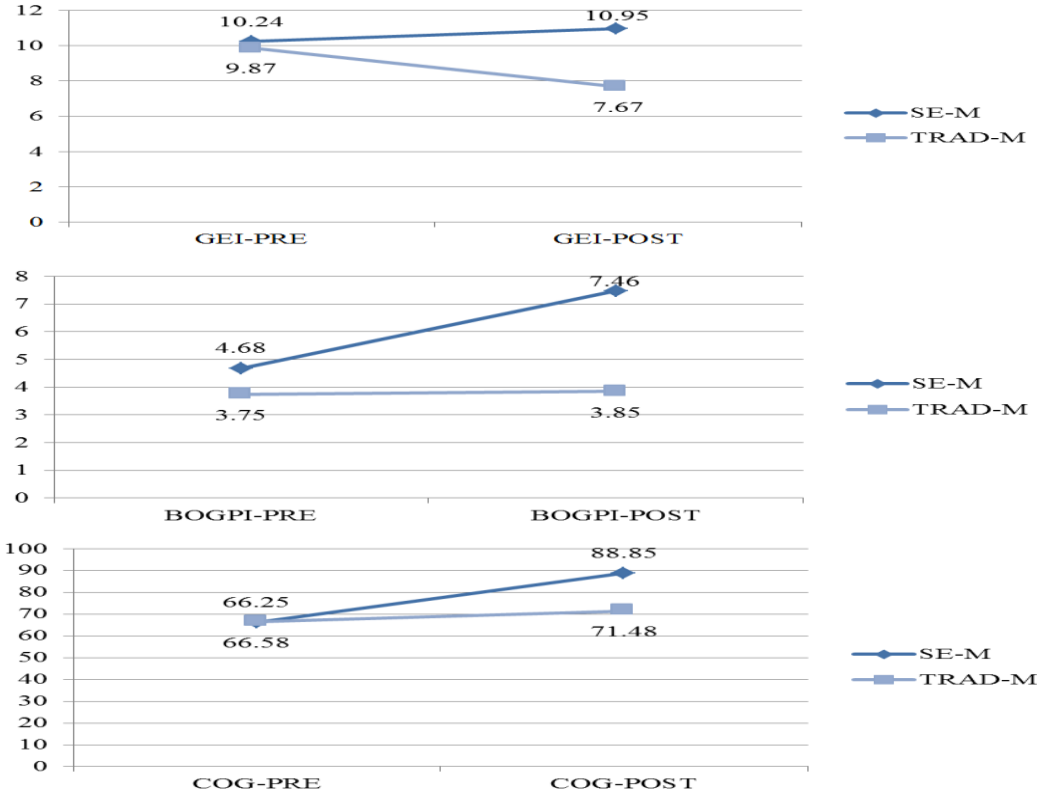


**Figure-1.** Graph for pre/post scores for GEI, BOGPI, and COG