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Evaluating game performance from external experts in sport education:

A case study of handball.

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KEY WORDS:

Handball. Sport Education. Tactical development. Evaluation.

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ABSTRACT

The purpose of this paper was to examine the efficacy of using experts' evaluations of game play as a method of examining the development of skills and tactics by a group of novice players as they learned to play handball. Twenty-one male students from a high school in the southern United States participated in series of lessons in physical education that followed the principles of the Sport Education pedagogical model. Video clips of game play from various phases of the season were evaluated by three expert handball coaches who were asked to place these in order from worst to best, and also to identify strengths and weaknesses in both skill and tactical components of students' performance. The results showed that these experts were able to place the video clips in their correct chronological order which they believe would demonstrate a continuum from beginning to more advanced performance aligned with the order that they were taught in the unit. Moreover their changing commentary suggested that student game performance did indeed make significant improvements. Further, it was determined that some skills and tactics were developed through simply playing the game, while others needed to be specifically taught.

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Avaliando a *performance* no jogo por peritos externos no modelo de educação desportiva: Estudo de caso no andebol.

RESUMO

O objetivo deste trabalho foi examinar a eficácia da avaliação de ações do jogo por especialistas, enquanto método para avaliar o desenvolvimento de habilidades técnicas e táticas de jogadores principiantes na capacitação para jogar Andebol. Vinte e um alunos, do sexo masculino, de uma escola no sul dos Estados Unidos participaram numa unidade didática de Andebol onde foi aplicado o Modelo de Educação Desportiva. Três treinadores desta modalidade desportiva analisaram vídeo *clips* de jogos, criteriosamente selecionados em referência a diferentes momentos da unidade didática, no sentido de avaliarem a *performance* no jogo (classificação do pior para o melhor) bem como identificarem os pontos fortes e fracos no desempenho das habilidades técnicas e táticas dos alunos. Os resultados evidenciaram que os especialistas colocaram os vídeo *clips* na sua ordem cronológica correta, em alinhamento com a sequência de ensino estabelecida na unidade didática, relatando que os mesmos comportavam um *continuum* desde um nível de *performance* elementar até a um nível mais avançado. Apesar de referirem que os alunos evoluíram na *performance* no jogo ao longo da unidade didática, sublinharam que enquanto algumas habilidades técnicas e táticas desenvolveram-se simplesmente pelo jogo, outras evidenciaram a necessidade de ser especificamente ensinadas.

PALAVRAS CHAVE:

Andebol. Modelo de Educação Desportiva.
Desenvolvimento tático. Avaliação.

One of the goals of physical education is the development in students of the ability to play good games. By a “well played game” Siedentop, Hastie and van der Mars⁽¹⁵⁾ refer to games where a student “understands the flow of a game, knows the tactics the team is trying to execute, gets in the right position, makes good decisions, and has the techniques to execute the decisions.”

Despite this goal, it is important to remember the assertion of Rink, French and Graham⁽¹⁴⁾ that skillful game play takes time, particularly when we consider that players must first have control of the objects used in a sport before they can use tactics. Both these ideas were supported in the study of Hastie, Sinelnikov and Guarino⁽⁵⁾ in which during a badminton unit, there was a lack of skill improvement from pre-test though the initial lessons of the season, and it was only after lesson seven that a significant improvement was demonstrated to allow tactical parts of the game to be included.

This idea of allocating an extended period of time to one particular content area in physical education is quite uncommon. Teachers cite restrictions forced upon them by national curriculum demands, or fears that students will become bored as their most common reasons for not extending time in one specific activity. However, there is one pedagogical model that has shown that with a commitment to longer than normal units, students do exhibit strong motivation and can indeed produce quality game performances in physical education.

In Sport Education, students become members of teams and remain on the same team throughout the competition. They participate in games that count towards a ranking system in which teams are categorized according to their performance not only in matches, but by their achievement of fair play goals. In addition, these competitions are typically interspersed with practices, most often led by student coaches. Finally, there is a culminating event which serves to create the opportunity for festivity and a celebration of accomplishments; a significant characteristic of play and sport.

The Sport Education model has as its goals to produce competent, literate and enthusiastic sports players. By “competent” we mean a student has sufficient skill to participate in games satisfactorily, understands and can execute strategies appropriate to the complexity of the game, and is a knowledgeable games player. By “literate”, we mean a student understands and values the rules, rituals and traditions of sport and can distinguish between good and bad sport practices as either participant or spectator. Finally, by “enthusiastic” we mean a student participates and behaves in ways that preserve, protect and enhance the sport culture within the class, school, and community⁽¹⁵⁾.

Research on Sport Education has been prolific since the introduction of the model by Daryl Siedentop in 1994. Reviews by Wallhead and O’Sullivan⁽¹⁸⁾, and Hastie, Martínez, and Calderón⁽⁶⁾ report on over 60 empirically based papers examining various components of the model. As a general summary of findings, it can be confirmed that for students, Sport Education is a more

attractive form of physical education than their previous experiences, as they perceive there is a level of curriculum ownership with roles and responsibilities as part of a persisting team. For teachers, they appreciate the students' greater interest in the subject, and also value the release from a direct instructional role which allows for more individual attention to students and the ability to achieve other pedagogical tasks such as assessment⁽¹⁵⁾.

Research on game competence in Sport Education is still in its early stages. The first studies simply examined students' perceptions of their improvement, without procuring any quantitative data to support those claims^(3, 12, 7). More recent studies have used sophisticated designs to actually measure improvements in skill and game play. These include studies in badminton⁽⁵⁾ and volleyball⁽¹³⁾.

The purpose of this study was to extend the data set on competence development in Sport Education by testing a methodology for examining game play. In particular, the goal was to examine the efficacy of using external experts in making qualitative judgments about game play. While instruments such as the Game Performance Assessment Instrument⁽¹¹⁾ and the analysis of decision making units^(2, 9) provide data concerning individual game performance components such as decisions made, skill execution, and support, by reducing performance to single unit scores, they fail to provide rich qualitative descriptions of the context of game play. In Sport Education, where the challenge is to examine game play from a holistic perspective in order to evaluate student learning, there is a need for an assessment process that will capture a complete picture, rather than reduce it to simple numerical scores.

In this study, the process of using expert evaluators is described. The task of these evaluators is to first describe the quality of play as demonstrated in several videotaped portions of game play. The second task is to place these vignettes of game play in a chronological order which they believe would demonstrate a continuum from beginning to more advanced performance. It should reflect the order that they were taught in the unit. If the evaluators' assessments do indeed match the chronological order and their descriptive accounts describe progression of game quality, it can then be stated that there was indeed improvement in performance.

In this study we examined the extent to which novice students could develop competence during a season of handball using the methodology described above. A secondary objective, which is missing from most of the research on Sport Education, was to describe and analyze the key tactical features of the game that the teacher had to specifically introduce during the season in order that the students could by unit's end, play a good game. This point is relevant given that strategies beyond those that might be considered generic to a type of game are most likely to be sport-specific⁽¹⁴⁾.

It is important to note that handball in the United States is almost an anonymous sport. It is not played in competitive formats in schools or universities, and its only exposure on television is limited to brief highlights of Olympic matches every four years. Even these are relegated to the minor broadcast channels, and certainly are not telecast during prime time hours. By consequence, students in physical education classes who participate in units of handball have almost no background knowledge of the game, and certainly no acquaintance knowledge from previous playing experience.

METHOD

PARTICIPANTS AND SETTING

The participants in this study were 21 male students (mean age of 15.9 years) from a high school in rural Alabama, a southern state in the United States with no history with handball. The school had a total enrollment of over 1100 students in the ninth through twelfth grades with 45.9% of student eligible for free or reduced lunches, which is an indicator of poverty.

The students were members of an elective physical education class that focused on the development of physical conditioning. The class met daily for 90 minutes, with four days a week allocated to strength and conditioning exercises, and one day for conditioning sports. Students and their legal caregivers completed the informed assent/ consent prior to the commencement of the study. The students had no prior experience in team handball, and none of them had any previous experience with Sport Education. Classes met once a week for the entire academic quarter for a total of 12 lessons.

LESSON CONTENT

The students participated in a unit of handball designed and taught according to the key principles of Sport Education. Consistent with the model, the students were divided into teams that remained together throughout the duration of the season. After the initial lessons that developed a foundational level of handball skills and in which the rules of the game were introduced, teams competed in non-consequential practice games. Later, these same teams took part in a formal competition that culminated in play-off matches and an awards ceremony. The students also took on administrative roles including officials, scorekeepers, statisticians, and equipment managers during the course of the season. One student in each team acted as the coach, helping to conduct practices following teacher instruction. The complete outline of the season along with lesson content is presented in Table 1.

TABLE 1 — Handball season plan.

LESSON	SEASON COMPONENT	LESSON FOCUS
1	Introduction to the season Skills practice	Handball game rules Skills practice: Dribble, pass, shoot
2	Skills practice	Team roles and protocol practice Defensive schemes
3	Skills practice	Sliding defense and screen plays
4-6	Practice competition	Learning officiating roles Team tactical development
7-9	Regular season	Game play and tactical application
11	Semi-finals	Game play and tactical application
12	Finals and festivity	Final game Awards

DATA COLLECTION

Four, seven minute video clips were made of the students' game play at various times during the season, and each was uploaded separately to the YouTube website. The clips were recorded during game play on days 3, 6, 9, and 12 of the season.

Three experts in Handball from the United States, Portugal and Spain were invited to make an analysis of the video clips. These evaluators were either teachers of handball didactics or Olympic levels players and coaches. Each evaluator was asked to complete two tasks. The first task was to "make a comment on each clip that describes what you think is the quality of handball play (listing strengths if any, and weaknesses)." The second task was to "rank the clips with regard to game play quality from worst (score = 1) to best (score = 4), and then give a small summary of why this order was as you selected." The evaluators were blind to the chronological order of the video clips, as the URLs were sent to each of them in a random order.

The answers were firstly read and listened in order to ensure familiarity with the content. After this, they were transcribed verbatim into a transcript for each expert. A content analysis was carried out, applying inductive methods. The analysis began with an coding phase (i.e., creating specific meanings units that contained one idea or piece of information) based on a constant comparison undertaken until no more themes emerged from the data⁽¹⁷⁾. The following phase consisted on re-grouping the units with similar meanings into a more comprehensive categories.

It was hypothesized that if the evaluators were able to place the clips in their correct chronological order, and if their commentaries suggested higher levels of game quality across this correct order of clips, then this would be support for the assertion that the students had indeed made improvement in their game play.

CHRONOLOGICAL ORDER

Each of the three evaluators placed the video clips in the order of lowest quality to highest quality in the chronological order in which the clips were filmed. This supports the first requirement for demonstrating improvement in game play over the season.

COMMENTARY DATA – PHASE 1

Table 2 provides a collection of the comments made about the matches in the first phase. This table includes a general comment about game play, followed by a more complete analysis of on and off the ball skills.

TABLE 2 – Evaluation of game play following lesson 3.

EVALUATION OF GAME PLAY FOLLOWING LESSON 3

General game play:

- * Tactically it is a very confusing game, with several ball possession changes. In comparison with the other clips, the players are very static in the attack; they seem to move with less goal intention. The progression in the goal direction is slow, performed by dribbling, with frequent unsystematic technical and tactical actions.
 - * There is little understanding of handball rules, with the game looking more like basketball with a big goal. The defense is primarily basketball defense, there is lots of dribbling, no use of steps, mostly two-handed passing, and no jump shots into the goal area.
-

Player with the ball: Weaknesses

- * The players struggled to receive the ball in order to shoot while moving.
 - * After reception they commonly dribble the ball without reading the game, without looking for a better throwing line (for example) – *this behavior was quite frequent during the transitions from defense to attack.*
 - * When handling the ball usually they stop in front of the opponent without trying to penetrate in the space between defenders (with some exceptions) and/or performing faking moments.
 - * When there is numerical superiority (two players against one) they opted to stop in front of a player when there are better positioned players to receive the ball and to score a goal.
 - * Frequently they chose distant throwing lines when there are closer throwing lines, with reduced the risk of losing the ball.
-

Players with the ball: Strengths

- * Good arm correction to avoid opposition (such as block).
-

Players without the ball: Weaknesses

- * Playing static, don't move to open space to receive the ball, to create throwing lines, leading to frequent throwing interceptions by the opponent.
-

Players without the ball: Strengths

- * They had no difficulties in pressing the player with the ball.
 - * Good defense position to throwing interception .
-

COMMENTARY DATA – PHASE 2

It was after lesson 3 where the teacher saw it necessary to formally introduce a 6-0 zone defensive pattern of play, whereby there was less intent to make direct interception of the ball at all spaces on the court. The goal was to have the players be more concerned with controlling defensive space between the ball and the goal. Table 3 shows the summary comments following these next three lessons.

TABLE 3 – Evaluation of game play following lesson 6.

EVALUATION OF GAME PLAY FOLLOWING LESSON 6

General game play:

- * In general the game is still quite disorganized, particularly in attack, but they seem to understand better the game than in the clip 1.
 - * They played with higher game fluidity; still there is no ball circulation between players when attacking the goal, which is more common when playing against individual defense.
 - * Players with ball are moving faster and with higher intention to goal in comparison with the clips 1.
 - * Players are also throwing to open areas and moving forward to receive the ball closer to the goal.
 - * The throwing of the ball has changed, with less two handed passing and curved elevated trajectories.
 - * Players without the ball are still very static or move to unfavorable zones.
-

Player with the ball: Weaknesses

- * The players still shooting the ball without jumping, and from too far from goal (but now there is good amplitude and attempts to throw away from the goalkeeper).
-

Players with the ball: Strengths

- * Some players carrying the ball are now able to fix two opponents when moving to the goal.
 - * In comparison with the clip 1, it seems to exist more goal intention when carrying the ball.
-

Players without the ball: Weaknesses

- * Don't give throwing line to the player with the ball – stayed aligned with the opponents and closer to the restrictive area, they should come back in order to give a secure throwing line and to receive the ball in movement.
 - * Don't move to receive the ball, to create a throwing lines, leading to throwing interceptions of the opponent.
 - * Are not creating spaces in the zone, often with their back to the defense.
-

Players without the ball: Strengths

- * Good defensive pressure near the player with the ball.
 - * Good defense moving when defending the player with the ball.
-

Following the introduction of the zone, which the players seemed to adapt to well (considering their understanding of this type of defense from basketball), it was now more the turn of the attack to struggle. Specific attention was placed on offensive movement without the ball, and for players to be more attacking in their throwing from closer positions. Table 4 shows the summary comments following these next three lessons.

TABLE 4 – Evaluation of game play following lesson 9.

EVALUATION OF GAME PLAY FOLLOWING LESSON 9

General game play:

- * There is an increase use of attack cooperation between two players (throw and reception).
-

Player on the ball: Weaknesses

- * The players still shooting the ball without jumping, and from too far from goal (when there is space to move to a better shooting position).
 - * There is good amplitude and attempts to throw away from the goalkeeper.
-

Players with the ball: Strengths

- * Some players carrying the ball are now able to fix two opponents when moving to the goal.
 - * There is now more purposeful movement. Throws are to open lines and players are moving forward to receive the ball closer to the goal.
-

Players without the ball: Weaknesses

- * Are not creating spaces in the zone, often with their back to the defense.
-

Players without the ball: Strengths

- * In defense, there are more interceptions.
-

COMMENTARY DATA – PHASE 4

During these final lessons, the teacher and student coaches focused on devising ways to improve the offense. In particular, jump shooting was highlighted as a way of penetrating defenses. It was also at this time that the defensive players finally appeared confident in actually adopting a more physical style of play. It was during these lessons that fouling became much more prevalent, but it must be said that at times players had poor conceptions of the intent of the foul rule and the legitimacy of contact between players (Table 5).

TABLE 5 – Evaluation of game play following lesson 12.

EVALUATION OF GAME PLAY FOLLOWING LESSON 12	
General game play:	
* They seem to have a better idea of the game and are reasonably distributed in the space.	
* The elementary technical abilities, particularly the throwing actions, are performed with higher precision.	
* Better ball circulation and transitions from defense to attack.	
* Progression is now more often made using passes and less dribbling.	
* They received more often the ball when moving for the open space and opted to jump for shooting.	
* In attack we could observe some tactical cooperation between two players: moving to the open space after throwing the ball to another player.	
Player on the ball: Weaknesses	
* Some players are still dribbling the ball when there is forward and opened throwing lines.	
* In individual duels with the ball, most players do not try to perform faking movements or penetrate to goal, exploring the 3 steps rule.	
Players with the ball: Strengths	
* Players are throwing the ball to an open throwing line and moving forward to receive again in a better attacking position .	
* Some students are able to receive, pass or shot while moving fast.	
* They are now jumping to increase the goal proximity to shot.	
* Shots on goal have strong velocity.	
Players without the ball: Weaknesses	
* Are not making movements to unfavorable zones to create passing lines, such as near the lateral lines. Even if this movement increases the game amplitude, they should explore more the open space in the central zone.	
Players without the ball: Strengths	
* Movements in order to create throwing lines in favorable attacking zones.	
* In defense, in individual duels they are well positioned, particularly in relation to the player with the ball and relative to the attack position (more close or far the goal).	
* They are also compensating any defensive mistake and helping proximal team mates.	

CONCEPTUALIZING TACTICAL DEVELOPMENT

A qualitative analysis of the series of lessons suggests that the students moved through four phases in which attack and defense alternately dominated play. It is suggested that this development of tactical understanding took place due to specific intervention. That is, without this intervention, these tactics would not have developed by students simply playing games. Indeed, students in a second physical education class who merely played handball games as part of their conditioning lessons did not show any of these progressions.

The conceptualization of these phases is shown in Figure 1, with the column in that figure representing the relative strength of the offensive or defensive side of play. The phases have been labeled as follows: (1) Un-learning basketball, (2) The zone dominates, (3) Regression to the mean, and (4) A second response by the defense.

PHASE 1. UN-LEARNING BASKETBALL

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In the very first lessons, progression of the ball was primarily through dribbling. Being basketball players, the boys were particularly reluctant to run with the ball, especially in cases where they were defended. It was indeed these situations where the 3-step rule would have allowed them to easily escape pressure.

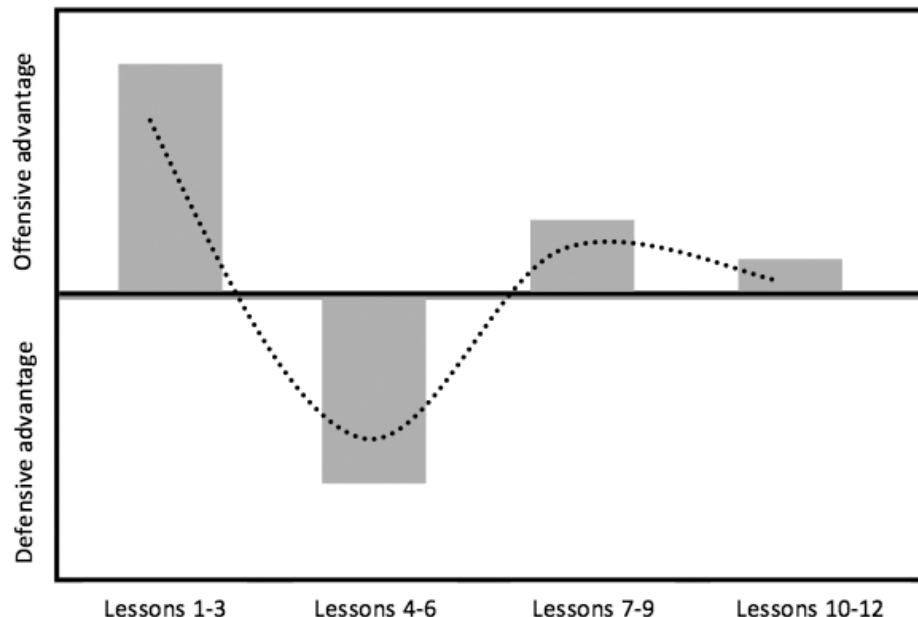


FIGURE 1 — Relative strength of attack and defense throughout the season.

Passing during this phase was mostly with two hands and from a static position. Being unaware of the advantage of running away from the defender, players stopped, looked for an open team mate, and then used a chest pass. As one evaluator commented, there was very little evidence of players actually running through defenders as is allowed in handball but not in basketball.

With these two limitations, the offense actually dominated play. While this might seem strange given the above commentary, the prevalence of one-on-one defense, coupled with the players' athleticism, meant that nearly every possession resulted in a score or an interception and a fast break. It just didn't look like handball.

PHASE 2.THE ZONE DOMINATES

The introduction of the 6-0 zone brought a dramatic change to the state of play. Once the students mastered covering spaces and helping their adjacent defenders, it became very difficult to score. With the introduction of the zone, the players were encouraged to be less concerned with gaining progression up court as well as trying to gain possession. This resulted in less fast break goals. As the players at this stage had not developed the idea of the jump shot, there was very little penetration towards goal. While jumping with the ball was not a foreign concept (consider the lay-up in basketball), the idea of a jump to a horizontal throw did not come naturally.

The physical concept of play was also under-developed at this stage. Consider again the ethic of basketball, where fouling is penalized, particularly the type of foul allowed in handball. In this regard, the players usually defended in a "hands held high" posture, rather than as a way to prevent offensive penetration. In fact, the position may well have further reduced the idea of the jump shot.

PHASE 3. REGRESSION TO THE MEAN

While the players without the ball in the defensive zone made quick adaption to their responsibilities, the same cannot be said for the offense. As noted by one of the evaluators, the players with the ball were shooting too far from goal, while the players without the ball were not moving to create space.

Two interventions were introduced at this point, the jump shot and the setting of screens. Neither of these was difficult to execute for the players as they had a prior history of these skills from basketball. While the execution of the screen is different between basketball and handball, the general concept is similar. That is, one player introduces himself into the pathway of a defender thus opening space for the player with the ball. Once players had been introduced to these two concepts, and particularly that of attacking the spaces or lanes creating as a result of losing defenders, the offensive teams became more successful. In addition, though not noted specifically by the evaluators, the players were aiming at spaces less likely to be covered by the goalkeeper.

PHASE 4. A SECOND RESPONSE BY THE DEFENSE

The final phase of play was a refinement of the physical nature of play, particularly by the defense. Due to the incorporation of attacking screens and significantly more movement by offensive players without the ball, the defensive units found it necessary to intentionally foul. Players now not only closed available shooting lanes by better helping their team mates, but they used fouls to further resist scoring efforts when they were faced with one-on-one situations. In addition, the adjustment of the defensive players to a hands-forward, rather than a hands-up posture meant they were also able to physically force the attacking players further from goal.

The results of this study show that with time, a group of novice players can progress from playing a crude game of handball to one resembling the key elements of a well-played contest. The reviews of the experts noted that what looked more like basketball with extensive dribbling and individual defense, moved to a process where players could create and deny spaces with and without the ball. These findings support previous research on the development of game play, and the need for an extended period of concentrated practice. As can be seen from the tables, it was only during the final lessons of the season (that is, after 720 minutes of class time) that well-played handball was truly evident.

It was mentioned earlier in this manuscript that being able to control the ball as well as use appropriate force is critical to tactical development. It should be noted here that the boys in this class had good general ball control skills prior to the season. That is, as skillful basketball players, they could dribble with control, pass effectively (albeit with two hands), and throw with ease, even though this was the first time they had handled a handball. As a result, it was the tactical component that took priority in the teacher's formal instruction, requiring specific training in the "if-then relationships" that apply to handball.

The results of this study also show the value of having experts provide qualitative and discriminatory accounts of game play during Sport Education. They also support the idea of expert assessment as a way of providing rich descriptions of game play that go beyond reducing game performance to less than contextually valuable numeric scores.

In addition, the findings from the experts' analysis tend to contradict the suggestions that physical education teachers can promote the transfer of skills across team sports by highlighting the action rules common to most invasion games ⁽⁸⁾. By action rules, they refer to the general tactical features such as playing in movement, exploiting and creating available space, and defending the target ⁽⁴⁾. Instead, it is suggested that teachers identify the sport-specific components of play that need to be deliberately introduced to students.

Further, while handball, like most invasion games, is a game of spaces, and where much of the tactical reasoning of a team is a response to the effective space occupation of the opponent, the awareness of these sport-specific spaces, and the tools available to penetrate (or deny) these spaces was something that required specific teacher intervention. On the other hand, the tactical and collective behavior of players in this game would appear to be much more important and harder to learn than the individual technical skills (say, of football). Consequently, there would appear to be little value in spending considerable instructional time with technical skill exercises, with a preference to let these develop naturally in the game situations. This idea is supported by studies comparing volleyball in traditional and Sport Education ⁽¹³⁾. In the traditional format, where more time was spent in isolated skill and technique development, students

showed a lower quality of game play than those in Sport Education who were involved in consistent game play in modified games or full version games.

Additional support for the idea that the structure of Sport Education enhanced the positive findings of this study could partly be attributed to the format of delivery. First, it has been reported by many students that they take their participation more seriously when participating in Sport Education seasons ^(1, 16). Part of this "seriousness" is derived from team affiliation. Where students are members of persisting teams and play and practice together to reach team goals, there is an enhanced sense of wanting to improve. This is particularly the case in Sport Education seasons which are strongly grounded in formal competitions. As noted ⁽¹⁰⁾, students in Sport Education have a higher degree of concern with strategy and team unity, whereas students in situations where teams change daily are more concerned with having fun and are less concerned with improving team strategy. So while Lenzen, Theunissen and Cloes ⁽⁸⁾ suggest that players have to be regularly confronted with real game situations before being able to develop efficient strategies regarding risk taking, we take this idea further to suggest that those real game situations need to be taken seriously by the players.

In conclusion, this study has identified that the Sport Education model is an attractive way to promote the development of skills and tactics on sports within physical education, and that expert evaluation of game play provides a rich data set through which such improvement can be explained. Nonetheless, while some skills and tactics were developed through simply playing in meaningful competitions, many of the sport-specific tactics required specific teacher instruction. Consequently, it could be hypothesized that the achievement of "good game play" by students in physical education is significantly influenced by the content knowledge of the instructor.

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