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Teaching Games for Understanding and Situated Learning: Rethinking the Bunker-Thorpe Model

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Bunker and Thorpe first proposed Teaching Games for Understanding (TGfU) in 1982 as an alternative to traditional, technique-led approaches to games teaching and learning. Despite interest from teachers and researchers, there has been no attempt to review the TGfU model. This is an oversight, given the important advances in educational learning theory and ecological approaches to motor control since the early 1980s. The purpose of this paper is to present a new version of the TGfU model that draws on a situated learning perspective. The paper describes the TGfU approach, overviews recent research on TGfU, and outlines a situated learning perspective. This perspective is then applied to rethinking the TGfU model. The intended outcome of the paper is the provision a more robust and sophisticated version of the TGfU model that can inform future directions in the practice of and research on TGfU.

Key Words: tactical approaches, instructional model

Bunker and Thorpe (1982) first proposed Teaching Games for Understanding (TGfU) in 1982 as an alternative to traditional, technique-led approaches to games teaching and learning. Since then, TGfU has attracted widespread attention from teachers, coaches, and researchers (Rink, French, & Tjeerdsma, 1996). While there have been developments of the Bunker-Thorpe approach in the work of researchers such as Griffin, Oslin, and Mitchell (1997), and Gréhaigne and Godbout (1995), there have been no attempts to revise the Bunker-Thorpe model itself.

We believe there have been important advances in educational learning theory since the model first appeared that could be beneficial to the development of TGfU. There has also been a recent resurgence of interest in learning among physical education researchers. Metzler (2000) and Rink (1999) have argued that instructional strategies should be based on learning theory, since without a clear understanding of how learning takes place, teachers cannot expect to achieve intended learning outcomes. As Metzler notes, TGfU is an instructional model focused on developing learners' abilities to play games. As such, a perspective on learning underpins the model. Yet this perspective has not been developed and made explicit, even though there was some early published work on the psychological and philosophical dimensions of TGfU (Kirk, 1983; Piggot, 1982).

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We wish to stress at the outset that we do not intend in this paper to provide a model of learning in games, valuable though this may be. We wish to retain, examine, and modify the original TGfU model, with its emphasis on instruction, for a number of reasons. First, the model is well known to researchers and teachers and has been widely used as a developmental tool for teachers and coaches (Australian Sports Commission, 1997a; Butler, 1997; Chandler & Mitchell, 1991; Doolittle, 1995; Griffin et al., 1997). Second, Metzler (2000) provides a sound argument for TGfU to be considered one of a number of instructional models in physical education. Among other things, instructional models provide guidelines to teachers on how to put into practice particular approaches to physical education. Third, as we will argue in this paper, we need to know more from research about how teachers and coaches use the model, as compared to the TGfU approach in general, to structure experiences for learners in games.

Physical education researchers have suggested that approaches to learning to play games such as the TGfU approach may be broadly consistent with cognitive, constructivist, and situated theories of learning (Dodds, Griffin, & Placek, 2001; Griffin, Dodds, Placek, et al., 1999; Kirk & Macdonald, 1998; Rovegno, Nevett, & Babiarz, 2001). These theoretical perspectives emphasize the social, cultural, and physical learning that physical education activities such as games can promote. They also show that learning to play games involves the development of skills such as strategic thinking and problem solving—two important but often understated higher-order cognitive skills that game play can foster (Aspin, 1976). Given traditional resistance in education systems to the idea that physical education can make such a contribution to cognitive development (Kirk & Tinning, 1990), TGfU provides a valuable example of what is possible.

The paper begins with a description of the TGfU approach and overviews recent research on TGfU. A situated learning perspective is then introduced and applied in examining the Bunker-Thorpe TGfU model. The intended outcome of this paper is to produce a revised form of the TGfU model that can inform future directions in the practice of and research on TGfU.

A Description of Teaching Games for Understanding

The Teaching Games for Understanding (TGfU) approach developed from the work of Rod Thorpe and David Bunker at Loughborough University during the 1970s and early 1980s (Bunker & Thorpe, 1982; Thorpe & Bunker, 1989). Other terms that describe developments of this approach include the Tactical Games Model (Griffin et al., 1997) and Game Sense (Australian Sports Commission, 1997a). Thorpe and Bunker observed that much games teaching and coaching was dominated by the development of techniques within highly structured lessons. They also observed that in school physical education, the development of techniques took up the majority of lesson time with little time left to actually play the game. Even when game play was included in lessons, teachers and coaches rarely made connections between the technique practices and how and when these techniques should be applied in game play.

A common complaint voiced by teachers and coaches was that the techniques learned laboriously in lessons and training sessions broke down in game play. Bunker and Thorpe's response to this problem was to develop an alternative

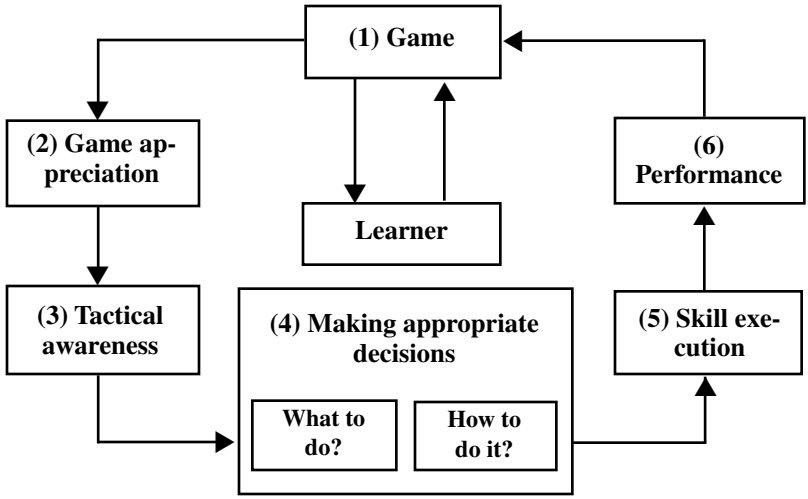

Figure 1 — The Teaching Games for Understanding model (from Bunker & Thorpe, 1982).

approach to games teaching and coaching that helped players to learn the tactics and strategies of game play in tandem with technique development. The Bunker-Thorpe TGfU model can be seen in Figure 1.

At the heart of their approach was the use of modified games to suit the developmental level of the learners (Thorpe, 1990). All TGfU teaching and coaching takes place within the framework of game play and the modified game form. Modifications are made to rules, playing area, and equipment. Techniques are developed using drills and other training practices common to the traditional approach. A technique is only introduced when the players reach a level of game play that requires them to learn the technique. As the players' expertise develops, the game form is changed to continue to challenge the players in terms of game appreciation, tactical awareness, decision-making, and execution of technique.

In conjunction with the development of the TGfU model, Bunker and Thorpe (1982) argued that some groups of games share key characteristics determined by their rules and tactics. For example, they suggested games such as the following:

1. Soccer, rugby union, and rugby league, as well as basketball, netball, and hockey, can be categorized as invasion games since they share:

- the common tactical features of invading territory to make space in attack;
- the containment of space in defense;
- the use of a goal or similar target for scoring.

2. Net/wall games such as tennis, table tennis, and volleyball share:

- the concept of playing the shot so opponents cannot return it;
- all players must serve and receive the ball;
- the target for scoring is on the playing surface.

3. Striking/fielding games such as cricket, baseball, and rounders share:

- the concept of scoring by striking a ball into open spaces;
- fielders being placed strategically to prevent runs from being scored.

Bunker and Thorpe suggested that simplified, modified, and generic versions of games could be used to teach the main tactics required by each game in the above categories. An example would be a court-based game with a small number of simple rules for traveling, contact, re-starts, and scoring that serves as a generic lead-up to games such as basketball, korfball, and netball. This is a particularly important consideration for physical education teachers working within severe time constraints in a school setting. This suggestion does raise questions, however, about the extent to which generic game forms can allow players to learn tactics and techniques in tandem, since the techniques of most games are highly specialized.

The terminology of TGfU has had an impact on policy in several countries. In England and Wales, the terminology of invasion, net/wall, and striking/fielding games is enshrined within the statutory National Curriculum for Physical Education (Qualifications Curriculum Authority, 1999). In Australia the same terminology is used to structure the Aussie Sport Program of modified games produced by the Australian Sports Commission (1997b).

While some studies have examined the possibility of transferring tactical understanding among game forms within the same category (Jones & Farrow, 1999; Oslin & Mitchell, 1999), it is the potential of a TGfU approach to facilitate tactical understanding in games that has attracted the most attention from researchers.

Research on TGfU

TGfU began to be scrutinized empirically by researchers around the late 1980s. Much of this research has taken the form of experimental studies that have compared TGfU with the forms of games teaching it is assumed to replace, traditional technique-led approaches (Griffin, Oslin, & Mitchell, 1995; Lawton, 1989; Oslin, Mitchell, & Griffin, 1998; Turner & Martinek, 1992). Rink et al. (1996) noted that research on TGfU has reported positive learning outcomes for students. The most powerful finding across the studies reviewed by Rink et al. was that students who were taught from a TGfU perspective tend to perform better on tests of tactical knowledge than those taught from a technique-led perspective. Some studies (e.g., Griffin et al., 1995; Lawton, 1989) have suggested that a TGfU approach may be perceived by students as more enjoyable than the technique-led approach, thus they may be more highly motivated to participate.

Rink et al. (1996) also noted that, despite some positive findings, the studies reviewed could not provide conclusive support for TGfU over technique-led approaches. They argued that this was due to different research designs, making comparison difficult because studies varied according to the game chosen, the age of participants, the length and nature of the intervention, the variable chosen for investigation, and the ways in which these variables were measured.

Adding to Rink et al.'s point, we propose that the equivocal nature of these findings may also be due to their treatment of TGfU and technique-based approaches as alternative forms of practice. The difficulty here is not that the researchers themselves accept as valid the notion that cognition and physical performance

are independent processes, or even that these can be studied as if they were independent. Indeed, most appear to accept Bunker and Thorpe's (1982) insistent claim that teaching for understanding must also include technique development. The difficulty instead may be located in the traditional dualistic divide in physical education between cognition and physical performance, and in the constructs used to theorize this relationship.

Rink et al (1996) point out that researchers use a range of constructs to describe knowledge and learning in TGfU. The most common constructs are the notions of declarative knowledge, procedural knowledge, strategic knowledge, and technique or movement execution. Before we advance with our examination of the Bunker-Thorpe model, it is important that we clarify our understanding and use of these key constructs.

Constructs for Conceptualizing Learning in Games

In their discussion of expertise in sport, Thomas and Thomas (1994) explain that declarative knowledge is concerned with facts such as game rules, aims, terminology, and etiquette. They define procedural knowledge as knowledge "used to generate action" (p. 299), such as knowing how to get past an opponent in a one-on-one situation in soccer. Thomas and Thomas claim that some measure of declarative knowledge is a precursor to the development of procedural knowledge and that both are present in activities in which it is possible to develop expertise, such as playing chess, programming a computer, or writing an essay.

According to Alexander and Judy (1988), strategic knowledge is a subset of procedural knowledge. Strategies are employed intentionally before, during, and after a performance and are goal-directed. In sport, strategic knowledge is typically dependent on what Alexander and Judy call domain-specific knowledge, which includes declarative and procedural knowledge. The various strategies that may be employed for getting past an opponent in soccer would require some knowledge of the rules and techniques of this game. Dodds et al. (2001) note that although expert/novice studies have investigated aspects of the interaction between domain-specific and strategic knowledge, this is an underdeveloped area of research. They also note that, of the existing studies, few have included children.

The execution of specific movement techniques adds a further dimension to game play that is, according to Thomas and Thomas, a source of error unique to sport. The relationship between each of these elements of knowledgeable performance in games can be summarized as "if-then-do": "declarative knowledge becomes represented as a series of conditions (if statements) linked to action selection (then statements) and then to actions (do statements)" (Thomas & Thomas, 1994, p. 305).

Thomas and Thomas note that the if-then-do relationship is not nearly as straightforward as it sounds. They provide an example of the impact on procedural knowledge of a learner's level of physical and skill development:

> The 5 year old tee-ball player who knows his throwing is not the best and the first baseman's catching is even poorer, often opts to run the ball to first, rather than throwing the runner out. The decision, based on previous experience, is to make the safest attempt at the goal. These players apparently

know that throwing is what they should do, but based on skill they decide not to throw. (1994, p. 305)

What this example demonstrates is that the knowledge dimensions of game play are interdependent. In contrast to this point, some of the experimental studies of TGfU seem to have built into their design the notion that TGfU is primarily concerned with developing declarative, procedural, and strategic knowledge, while the traditional, technique-based approaches are primarily concerned with the effectiveness of movement execution.

It appears that such dualistic thinking about cognition and physical performance remains pervasive. A case in point is McMorris' (1998) critique of TGfU from the perspective of motor behavior. McMorris starts with the view that TGfU is a cognition-to-technique approach. Motor behaviorists in contrast recommend a technique-to-cognition approach. On the basis of this view, McMorris claims that criticisms made by proponents of TGfU about traditional technique-based methods of teaching games are criticisms of poor practice rather than of the technique-to-cognition approach itself. He concludes that TGfU research has provided very little new knowledge for motor behaviorists.

Such a conclusion may indeed be warranted on the basis of the evidence produced by experimental studies of TGfU, since their findings demonstrate that cognition and physical performance are both of key importance in learning to play games. However, as we have noted, the design of research studies that have sought to contrast TGfU with technique-led approaches may have inadvertently supported some of McMorris' criticisms.

An ecological version of information processing illustrates the importance of viewing knowledge and technique dimensions of game play as interdependent. According to Abernethy (1996), the information processing approach emphasizes the importance of perception and decision-making as two of the three sequential phases of information processing, with the third being movement execution or acting.

Abernethy argues that during the perceiving phase, an individual is trying to determine what is happening and to identify what information is relevant in a particular set of circumstances. An example is a basketball player who has just received the ball and must identify the position of teammates and opponents, her or his own position on the field or court, distance from the goal, stage of the game and the score, and so on. Abernethy notes that the ability to sift the important information from all the other information available in the environment, and to do this quickly and accurately, is a key characteristic of expert players.

The decision-making phase involves the player deciding the best course of action—in basketball whether to pass, dribble, or shoot, and which is the most appropriate kind of pass or shot. Typically, expert players are much more efficient and faster decision-makers than novices are because they have learned through experience to link their actions to circumstances in the game.

During the movement execution or acting phase, a series of neural impulses recruit muscles to execute the selected movements with appropriate timing, coordination, and force. Movement execution is a vital part of game play. But it is not necessarily the most important part, as the emphasis in traditional technique-led approaches would suggest.

A Situated Learning Perspective

The importance placed by information processing theorists such as Abernethy, Thomas, and Thomas (1993) on the active engagement of the learner with the environment through perception and decision-making is a key assumption that underpins most situated cognition research (Kirshner & Whitson, 1997). A situated perspective assumes that learning involves the active engagement of individuals with their environment (Rovengo, 1999; Rovegno & Kirk, 1995). Rather than merely receiving information transmitted from another source and internalizing that information, as some versions of a cognitive perspective would suggest, individuals actively appropriate information (Kirshner & Whitson, 1998). In so doing, they adapt new knowledge in order to fit it to what they already know (Prawat, 1999).

Dodds et al. (2001) summarize research in science education showing that this prior knowledge varies among individuals and results in learners approaching new learning episodes with alternative conceptions of a topic. For example, Brooker, Kirk, Braiuka, and Bransgrove (2000) reported that for children whose prior knowledge of basketball was formed through their viewing of professional adult sport on television, any modification in school physical education lessons to the "real" media sport was considered as disappointing and unsatisfying. For them, playing basketball was playing the media's version of the game.

Greeno (1997) argues that learning is situated in the sense that it is socially organized. This is particularly the case when learning is constructed and constituted by the institutional requirements of the school. For example, Bereiter (1990) coined the term "schoolwork module" to account for the ways in which individuals respond to the institutional requirements of the school in much the way Jackson (1968) first reported under the rubric of the hidden curriculum. The rules and procedures of the school, and the forms of social interaction they produce, permeate what and how children learn. For example, in the course of learning to play soccer, a child may also be learning about getting along with other children, pleasing the teacher, and her or his own personal abilities and qualities.

Even when a child is working alone, perhaps completing a homework task, learning remains situated because it is socially organized (Greeno, 1997). The student's use of textbooks and computer, access to the Internet, and the study of a task set by the teacher in accordance with school and state curriculum requirements illustrates the layers of social organization of learning, even when it takes place in isolation from others.

Lave and Wenger's (1991) theory of situated learning suggests is necessary to investigate relationships among the various physical, social, and cultural dimensions of the context for learning. This is because the substance of what is learned cannot be disconnected from the communities of practice that generate and sustain knowledge. A key task for schools is to provide young people with opportunities to become what Lave and Wenger describe as legitimate peripheral participants in these communities of practice, whereby they have authentic learning experiences that are valued by themselves and other members of the community of practice. Kirk and Macdonald (1998) suggest that sport education may have the potential to make this connection for young people since it reorganizes most features of competitive sport into an educational form.

A number of key points emerge from this discussion of a situated learning perspective. Learning is an active process of engagement with socially organized forms of subject matter, through perceptual and decision-making processes and the

execution of appropriate movement responses. Individuals bring prior knowledge to learning episodes that contain a (sometimes wide) range of alternative conceptions of a topic. The learner's active engagement with subject matter is embedded within and constituted by layers of physical, sociocultural, and institutional contexts. These contexts include the immediate physical environment of the classroom, gym, or playing field, social interaction between class members, the institutional form of the school, and aspects of culture such as media sport.

Rethinking the Bunker-Thorpe Model From a Situated Learning Perspective

Next we will examine each of component of the Bunker-Thorpe model in light of this situated learning perspective. The revised model is presented in Figure 2.

The Game Form/Learner Relationship

The first category in the Bunker-Thorpe model is the game and its relationship to the learner's developmental level. In most situations, consideration of the learner requires the game to be modified, and for this reason Bunker and Thorpe refer to the "game form." For example, modifications to tennis for beginners might involve a "throw-catch" game without racquets, or the use of padder bats and foam balls, lowering the net, and with a corresponding simplification of the rules.

The model requires the teacher or coach to consider the learner and to be knowledgeable about the game form best suited to learner's capabilities. The most obvious consideration is the physical developmental levels of the learners. Consideration of this factor has led to NASPE's advice on developmentally appropriate physical education in the United States (National Association for Sport and Physical Education, 2000), and programs such as Aussie Sport in Australia (Australian Sports Commission, 1997b) and TOPS in Britain (Youth Sport Trust, 2000). These initiatives share the features of modified equipment, resizing of playing surfaces, and simplified game rules. From a situated learning perspective, a number of additional factors need to be considered.

Given the role of prior knowledge and alternative conceptions of domain-specific knowledge in learning, the teacher needs to have some sense of what the learner already understands about the game (Dodds et al., 2001; Rovegno, 1999). This includes, for the learner, direct experience as a participant as well as experience of the game as a spectator. Since the game form is a context in itself, it is also important from a situated learning perspective that the teacher know something about the learner's conceptions of learning in physical education classes (Kirk, Brooker, & Braiuka, 2000).

The tasks set by the teacher that constitute the game form need to make sense to the learner in terms of his or her emerging understanding of the game (Rovegno, 1999). Such connections, between the game form and the learner's understanding of the game, need to be made explicitly in order to overcome the school work module (Bereiter, 1990). The school work form of a task tends to be remote and abstract from the learner's everyday experience outside the school. A good example of this is where children complete a prolonged period of learning isolated parts of a skill before being offered an opportunity to experience how the skills relate to playing

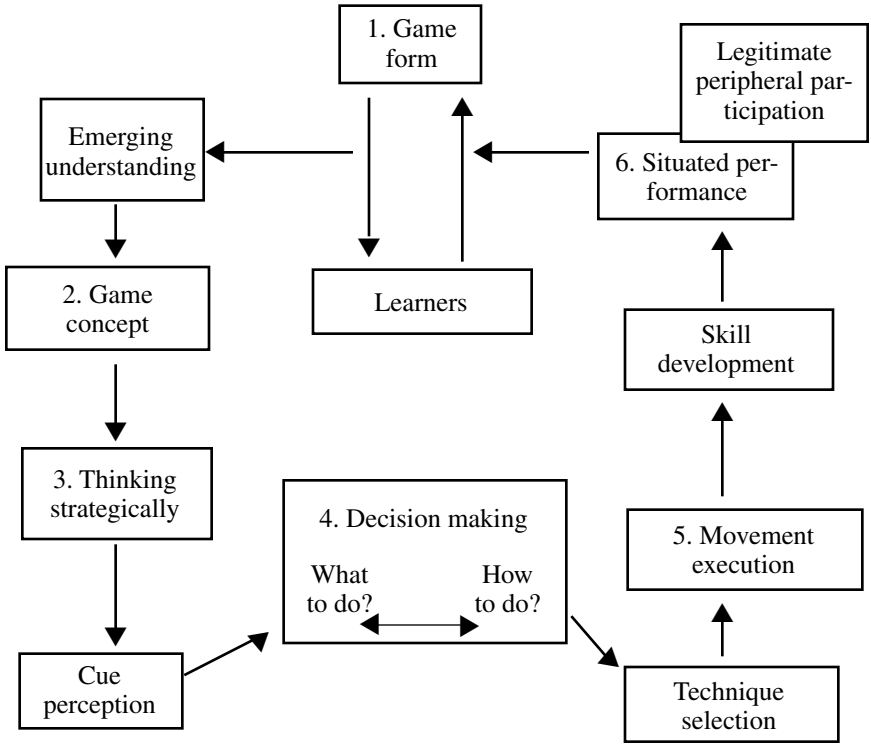

Figure 2 — The revised TGfU Model.

the game (Thorpe & Bunker, 1989). In the case of TGfU, this means that the tasks set by the teacher need to be seen as authentic and connected to the game from the learner's point of view.

These requirements of a situated perspective seem demanding enough when considering the relationship between one learner and the game form. The challenge of modifying the game and setting appropriate tasks becomes even more demanding when a group of learners is considered. Taking into account the sense that each member of the group makes of the game form, the relationship of the game form to the game, and learning within the game form context is extremely complex. Practical issues will undoubtedly direct a teacher's actions. However, some form of graded tasks for groups of students, such as manipulating the width of the play area to challenge different ability levels, or loading the attack or defense, may facilitate understanding and game play. Also, explicit contextualization of the game form in relation to what the teacher knows about the learners' perspectives may be necessary, such as using, say, the Olympics to frame a unit of work in track and field.

Game Appreciation, Tactical Awareness, and Emerging Understanding

In the Bunker-Thorpe model of TGfU, the categories of game appreciation,

tactical awareness, and making appropriate decisions align with domain-specific and strategic knowledge. Game appreciation aligns with declarative knowledge, such as knowing rules, player positions, and scoring systems of a game. Making appropriate decisions aligns with procedural knowledge in terms of knowing what to do in response to a game situation, such as how to defend in a one-on-one situation in soccer. Tactical awareness seems to rest somewhere between these two dimensions of knowledge.

Given Bunker and Thorpe's emphasis on players understanding how to play, it seems likely that game appreciation and tactical awareness are intended to go beyond the mere acquisition of rules and other information about a game. The emphasis on understanding suggests that seeing the relationships among pieces of information may be more important to game performance than merely acquiring information (Aspin, 1976).

From a situated learning perspective, game appreciation might be more accurately represented as a player's concept of a game and the ways in which it might be played. Memorizing the rules, positions, and purposes is not the same thing as developing a concept of a game, although these aspects of declarative knowledge are the substance of concept development. The player's concept of the game plays an organizing role in relation to all aspects of game play.

A good way to test an individual's concept of a game is to imagine taking part in an unfamiliar game, say, Australian Rules football. If an individual is a knowledgeable invasion-game player and already knows that Australian Rules football is an invasion game, concept development might be more rapid for this individual than for someone without this prior knowledge. As learning progresses, the concept of Australian Rules football is likely to become increasingly sophisticated. Without some concept of the game, its central purpose, and the relationship of purpose to game form and the player's role, progress in learning to play the game is likely to be slow.

The ways in which the concept of a game may be conveyed to beginners in particular becomes an issue of key importance to teachers and coaches. The insertion in the revised model (in Figure 2) of the notion of emerging understanding between the categories of game form-learner and game concept is intended to provide teachers with a point of focus for helping learners make the connections between the purpose of the game and the game form.

Tactical awareness both feeds and is fed by a player's emerging concept of the game, based on domain-specific declarative and procedural knowledge. Given its central importance in TGfU, the term "tactical awareness" may be somewhat imprecise in identifying the assumptions about learning embedded in the model. Players don't need to be simply *aware* of tactics. They need to be able to *deploy* them appropriately (Alexander & Judy, 1988; Aspin, 1976).

The notion of "thinking strategically" may offer a more explicit and focused term for what Bunker and Thorpe intended here. Strategies can of course vary in the level of their generality and specificity. There can be strategies that apply to the whole team or group, and others that are more specific to individual players, strategies for a season, or strategies for specific games. As Alexander and Judy (1988) note, strategies draw on declarative and procedural knowledge. The notion of thinking strategically replaces tactical awareness in the revised model because the notion of strategy conveys a focused, intentional, relational, goal- and action-oriented sense of what the learner does in the process of using declarative and

procedural knowledge.

Cue Perception and Decision-Making

The category of making appropriate decisions is common to both information-processing and situated perspectives on learning. Perception can be located here perhaps, between thinking strategically and Bunker and Thorpe's more substantive and instantiated subcategory of decision-making. With perception highlighted in the model, teachers then have license to facilitate cue recognition. Kirk et al. (2000) argue that even in a TGfU approach, teachers do not teach for cue recognition automatically. An improvement in a player's ability to discern what information is appropriate in any given set of circumstances, as a wealth of research shows, is a function of experience (Abernethy, 1996). Kirk et al. argue that players must be given opportunities to develop the experience of recognizing appropriate cues in a variety of contexts, such as learning that a teammate's outstretched hand is a cue to pass the basketball into his or her path, or when an attacking player is feinting rather than dodging.

Cue perception may be a key factor linking game concept, thinking strategically, and decision-making. Research on TGfU has well established that learners are able to display declarative knowledge of rules and purposes prior to displaying procedural and strategic knowledge (Rink et al., 1996). Kirk et al. (2000) speculate that a failure to display declarative knowledge in game play when it was previously evident in a question-answer session may be explained by a player's inability to recognize the cues that activate particular strategies, especially those relating to positioning and the timing of actions. Teachers need to make links explicitly between the cues embedded in particular sets of circumstances in a game (such as a defensive formation) and the application of specific strategies to overcome that formation (such as creating an overlap in offense).

Decision-Making, Movement Execution, and Technique Selection

If making appropriate decisions involves perceptual activity interfacing with a stock of declarative knowledge, expressed in the revised model as game concept and thinking strategically, then decisions about how to act interface with the actual execution of movement. Bunker and Thorpe's model locates skill execution within a separate category from decision making. Thomas and Thomas (1994) claim that decision-making in games is strongly influenced by knowledge of one's own and others' movement execution capabilities. If this is the case, it may be appropriate to insert a mediating process between decision-making in terms of how to act and the more specific process of movement execution. In other words, some elements of procedural knowledge and movement execution are understood to interface.

A key mediating category to insert here may be technique selection. Technique selection can be understood to refer to a process of reflection on the appropriate techniques that are actually available to the player and the player's own knowledge of which technique(s) she or he can execute with confidence. By making this process visible within the model, teachers can address explicitly "how to do?" as a process of self-reflection and selection from a range of options.

Skill Development and Situated Performance

The interfaces between skill execution and performance in the original Bunker-Thorpe model, and between performance and the game form/learner relationship, must be reconsidered given the developments to the revised model so far. The final category in Bunker and Thorpe's original model is performance. This category refers to normative criteria, often consisting of an advanced form of a game. This normative category effectively provides a means of judging the relationship between a learner's progress through cycles of modified game forms and conventional adult or advanced versions of a game.

Bunker and Thorpe consistently used the term "skill" to refer to an amalgam of strategic and technique capabilities in game players. The notion of skill development in the revised model offers itself as a useful mediating process between movement execution to performance.

Skill in this context comes close to what Bereiter (1990) describes as a "learning module." A learning module is a cluster of related, rather than discrete or separate, capabilities. Skills as modules represent clusters of cue perception capabilities, strategies, and techniques that are activated together in specific game situations. As players' performances improve, their ability to activate skills as clusters of perception capabilities, strategies, and techniques becomes smoother and more seamless.

The practice of set drills would seem to provide a good example of an intentional attempt to cluster or modularize components of game play. For example, soccer players often practice drills for passing and moving into space in attack. The drill might involve two or three attackers, opposed or unopposed, with the aim of developing in combination passing technique, perception of where space is, anticipation of the movement of teammates, and strategies such as the wall-pass to get around defenders and progress the ball toward the goal.

The second interface to be reconsidered is between performance and the game form/learner relationship. This interface can be understood in terms of a learner's legitimate peripheral participation in a community of practice (Lave & Wenger, 1991). When Bunker and Thorpe were developing their model of TGfU in the late 1970s, the phenomenon of media sport was just beginning to emerge (McKay, 1991). Now more than 20 years later, media sport forms an important community of practice for young people's learning (Kirk, 1999). Young people's everyday experiences are saturated with professional, commercial, high-tech, elite adult versions of sports and games. This cultural phenomenon plays a significant part in shaping young people's concept of particular games and their expectations of what it will be like to participate in that game (Brooker et al., 2000). Rovegno (1999) has suggested that more attention needs to be paid to students' cultural conceptions of learning to play games. She claims,

> We must take students' personal and cultural experiences seriously. Students never come to school sport lessons without personal and cultural knowledge, knowledge of how sport and physical activities are portrayed in the mass media, and, with the exception of very young children, without knowledge of how sports are typically taught in schools. (p. 11)

The notion of "situated performance" in the revised model might better describe this normative category, reaching out as it does to consider the cultural

location of sport and its role in young people's lives as legitimate peripheral participants in this community of practice (Kirk & Macdonald, 1998; Lave & Wenger, 1991). When sport is understood as a complex, multifaceted, and heterogeneous community of practice, it is possible to track players' learning trajectories over time as they begin to understand the broader social, cultural, and institutional practices that constitute games.

This notion of situated performance in TGfU provides one way of understanding the relationship between the game form and the player's prior and alternative conceptions of a game. Without analysis of the popular cultural forms of sport, leisure, exercise, and other related phenomena such as fashion, we may be limiting our understanding of the learner's perspective. We agree with Rovegno (1999) that it is important for young people to grasp the meaning of a game.

Conclusion

By modifying and making additions to the Bunker-Thorpe model, we have been concerned with explicating those dimensions of TGfU that seem to be omitted or underdeveloped. We believe that the interfaces between the elements of the model are worth elaborating upon since they may make crucial links for teachers and coaches. In particular, we suggest that explicit attention to the learner's perspective, game concept, thinking strategically, cue recognition, technique selection, and skill development as the clustering of strategies and techniques, and situated performance as legitimate peripheral participation in games, elaborate upon the already existing but implied learning principles of the Bunker-Thorpe model.

The model has the appearance of a linear process. As Rovegno (1999) notes from her reading of the educational learning theory and motor control literature, learning in a complex medium such as games is not linear. We concur with this point and reiterate that the TGfU instructional model contains embedded assumptions about learning, but it does not seek to represent the learning process. Since this is an instructional model for facilitating understanding, we suggest that the structure needs to be presented in a form that will assist teachers. Here we encounter a key issue. We know relatively little about how teachers use the Bunker-Thorpe model and whether it is in fact useful to them as a model of instruction.

A research program centered on the revised TGfU model or some other form of the model immediately suggests itself. What we believe is required is a systematic examination of the revised model in practice and its further modification and development on the basis of this research program. If the model is to be useful as a means of guiding teaching for understanding in games, it must be able to identify for teachers the key moments in learning to play games that require their attention in terms of designing learning experiences.

When learning to play games is understood as a form of situated learning, we suggest that it becomes possible for teachers to explicitly address aspects of learning that have hitherto at best been understood only intuitively. So, for example, through a situated learning perspective, teachers may be able to address explicitly the authenticity and meaningfulness to children of the experience of learning to play games in school settings by developing better understandings of children's prior knowledge and alternative conceptions (Dodds et al., 2001). Whether the model can assist teachers in this process of reflective teaching is a matter for investigation through research.

References

Abernethy, B. (1996). Basic concepts of motor control: Psychological perspectives. In B. Abernethy, V. Kippers, L.T. Mackinnon, R.J. Neal, & S. Hanrahan, *Biophysical foundations of human movement* (pp. 295-311). Melbourne: Macmillan.

Abernethy, B., Thomas, K., & Thomas, J. (1993). Strategies for improving understanding of motor expertise (or mistakes we have made and things we have learned!!). In J. Starkes & F. Allard (Eds.), *Cognitive issues in motor expertise* (pp. 317-356). Amsterdam: Elsevier Science.

Alexander, P.A., & Judy, J.E. (1988). The interaction of domain-specific and strategic knowledge in academic performance. *Review of Educational Research*, **58**, 375-404.

Aspin, D. (1976). 'Knowing how' and 'knowing that' and physical education. *Journal of the Philosophy of Sport*, **3**, 97-117.

Australian Sports Commission. (1997a). *Game sense: Developing thinking players*. Belconnen: Author.

Australian Sports Commission. (1997b). *Modified sport: A quality junior sport approach*. Belconnen: Author.

Bereiter, C. (1990). Aspects of an educational learning theory. *Review of Educational Research*, **60**, 603-624.

Brooker, R., Kirk, D., Braiuka, S., & Bransgrove, A. (2000). Implementing a Game Sense approach to teaching Year 8 basketball. *European Physical Education Review*, **6**, 7-26.

Bunker, D., & Thorpe, R. (1982). A model for the teaching of games in the secondary school. *Bulletin of Physical Education*, **10**, 9-16.

Butler, J. (1997). How would Socrates teach games? A constructivist approach. *Journal of Physical Education, Recreation and Dance*, **68**, 42-47.

Chandler, T.J.L., & Mitchell, S.A. (1991). Reflections on 'models of games education.' *Journal of Physical Education, Recreation and Dance*, **61**, 19-21.

Dodds, P., Griffin, L.L., & Placek, J.L. (2001). Chapter 2. A selected review of the literature on development of learners' domain-specific knowledge. *Journal of Teaching in Physical Education* [Monograph], **20**, 301-313.

Doolittle, S. (1995). Teaching net games to skilled students: A teaching for understanding approach. *Journal of Physical Education, Recreation and Dance*, **66**, 18-23.

Greeno, J.G. (1997). On claims that answer the wrong question. *Educational Researcher*, **26**, 5-17.

Gréhaigne, J-F., & Godbout, P. (1995). Tactical knowledge in team sports from a constructivist and cognitivist perspective. *Quest*, **47**, 490-505.

Griffin, L., Dodds, P., Placek, J.H., Carney, M.C., Tremino, F., Lachowetz, T., & Raymond, C. (1999). Middle school students' conceptions of soccer: Their solutions to tactical problems. *Research Quarterly for Exercise and Sport*, **70**(Suppl.), 89.

Griffin, L.L., Oslin, J.L., & Mitchell, S.A. (1995). An analysis of two instructional approaches to teaching net games. *Research Quarterly for Exercise and Sport*, **66** (Suppl.), 65-66.

Griffin, L.L., Oslin, J.L., & Mitchell, S.A. (1997). *Teaching sports concepts and skills: A tactical games approach*. Champaign, IL: Human Kinetics.

Jackson, P.W. (1968). *Life in classrooms*. New York: Holt, Rinehart & Winston.

Jones, C., & Farrow, D. (1999). The transfer of strategic knowledge: A test of the Games Classification Curriculum model. *Bulletin of Physical Education*, **35**, 103-124.

Kirk, D. (1983). Theoretical guidelines for 'Teaching for Understanding.' *Bulletin of Physical*

Education, **9**, 41-45.

Kirk, D. (1999). Physical culture, physical education and relational analysis. *Sport, Education and Society*, **4**, 63-73.

Kirk, D., Brooker, R., & Braiuka, S. (2000, April). *Teaching games for understanding: A situated perspective on student learning*. Paper presented at the American Educational Research Association Annual Meeting, New Orleans.

Kirk, D., & Macdonald, D. (1998). Situated learning in physical education. *Journal of Teaching in Physical Education*, **17**, 376-387.

Kirk, D., & Tinning, R. (1990). Introduction: Physical education, curriculum and culture. D. Kirk & R. Tinning (Eds.), *Physical education, curriculum and culture: Critical issues in the contemporary crisis* (pp. 1-21). Lewes: Falmer.

Kirshner, D., & Whitson, J.A. (Eds.) (1997). *Situated cognition: Social, semiotic and psychological perspectives*. Hillsdale, NJ: Erlbaum.

Kirshner, D., & Whitson, J.A. (1998). Obstacles to understanding cognition as situated. *Educational Researcher*, **27**, 22-28.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. New York: Cambridge University Press.

Lawton, J. (1989). Comparison of two teaching methods in games. *Bulletin of Physical Education*, **25**, 35-38.

McKay, J. (1991). *No pain, no gain: Sport in Australian culture*. Sydney: Prentice Hall.

McMorris, T. (1998). Teaching games for understanding: Its contribution to the knowledge of skill acquisition from a motor learning perspective. *European Journal of Physical Education*, **3**, 65-74.

Metzler, M.W. (2000). *Instructional models for physical education*. Boston: Allyn & Bacon.

National Association for Sport and Physical Education. (2000). Appropriate instructional practice—Developmentally appropriate practice for elementary school physical education. Reston, VA: Author.

Oslin, J.L., & Mitchell, S.A. (1999). An investigation of tactical transfer in net games. *European Journal of Physical Education*, **4**, 162-172.

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.

Piggot, B. (1982). A psychological basis for new trends in games teaching. *Bulletin of Physical Education*, **18**, 17-22.

Prawat, R.S. (1999). Dewey, Pierce and the learning paradox. *American Educational Research Journal*, **36**, 47-76.

Qualifications Curriculum Authority. (1999). *Physical education. The national curriculum for England*. London: Author.

Rink, J.E. (1999, April). *What do students learn in physical activity and how do they learn?* Keynote presentation at the AIESEP Conference, Besancon, France.

Rink, J.E., French, K.E., & Tjeerdsma, B.L. (1996). Foundations for the learning and instruction of sport and games. *Journal of Teaching in Physical Education*, **15**, 399-417.

Rovegno, I. (1999, April). *What is taught and learned in physical activity programs: The role of content*. Keynote presentation at the AIESEP Conference, Besancon, France.

Rovegno, I., & Kirk, D. (1995). Articulations and silences in socially critical work on physical education: Toward a broader agenda. *Quest*, **47**, 447-474.

Rovegno, I., Nevett, M., & Babiarz, M. (2001). Chapter 5. Learning and teaching inva-

sion-game tactics in 4th grade: Introduction and theoretical perspective. *Journal of Teaching in Physical Education* [Monograph], **20**, 341-351.

Thomas, K.T., & Thomas, J.R. (1994). Developing expertise in sport: The relation of knowledge and performance. *International Journal of Sport Psychology*, **25**, 295-312.

Thorpe, R. (1990). New directions in games teaching. In N. Armstrong (Ed.), *New directions in physical education*, Vol. 1 (pp. 79-100). Leeds, UK: Human Kinetics.

Thorpe, R., & Bunker, D. (1989). A changing focus in games education. In L. Almond (Ed.), *The place of physical education in schools* (pp. 42-71). London: Kogan Page.

Turner, A.P., & Martinek, T.J. (1992). A comparative analysis of two models for teaching games: Technique approach and game-centered (tactical focus) approach. *International Journal of Physical Education*, **29**(4), 15-31.

Youth Sport Trust. (2000). *The TOPS programs*. Retrieved Oct. 10, 2000, from the Internet at http://www.youthsport.net

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