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# Teaching team invasion games and motivational climate

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## Abstract

Team invasion games (TIG) make up a large part of the PE curriculum in Scottish schools. It is important, therefore, to understand the environmental conditions that contribute to pupils' motivation to learn to play TIG. Consequently, this study aimed to identify the teaching behaviours exhibited when teaching TIG using a game-based approach and a skill-focused approach to teach secondary 1 (S1) basketball. Additionally, this study investigated pupils' and teachers' thoughts about their experiences during each basketball lesson. We found a change to more mastery behaviours during the game-based lessons and very similar percentages of mastery and ego behaviours during the skill-focused lessons. The game-based teacher discussed the pupils' performance in terms of game performance and understanding, and the skills-focused teacher discussed the pupils' ability to execute game skills. The pupils in the game-based class discussed game understanding, teamwork, enjoyment and involvement. The skill-focused class valued skill learning and evaluated their performance based on the successful execution of game skills. The findings from this study suggest that game-focused teaching strategies appear to promote a mastery oriented motivational climate and, therefore, have the potential to increase pupils' motivation in PE and TIG.

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**Key-words:** motivational climate • teaching strategies • team invasion games

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## Introduction

One of the main aims of PE in Scotland is to provide young people with experiences, skills and knowledge that will encourage them to take part in physical activity outside of school and into adulthood (Scottish Executive, 2004). A key construct in facilitating this kind of self-determined behaviour towards PE and physical activity is intrinsic motivation (Deci and Ryan, 2000; Papaioannou et al., 2006). Everyone is capable of being intrinsically motivated, however, this can be influenced by the environmental conditions the individual is exposed to, and the individual's goal orientations (Deci and Ryan, 2000; Morgan et al., 2005a). In terms of goal orientation,

Achievement Goal Theory (Ames, 1992; Dweck and Leggett, 1988) suggests that individuals approach learning tasks in two different ways, and that this depends on their view about the concept of ability. An undifferentiated conception of ability (task-oriented) is when the individual does not distinguish effort from ability, and success or competence is defined in self-referenced terms. In contrast, a differentiated conception of ability (ego-oriented) is when individuals view ability as capacity and success is defined in norm-referenced terms. Importantly, these two types of goal involvement are not fixed and can be influenced by environmental factors such as motivational climate.

Recent research has demonstrated that a mastery motivational climate, where the teacher defines success in relation to self-referenced effort and improvement, thus promoting task-oriented behaviours, can positively influence intrinsic motivation. This in turn promotes higher levels of enjoyment, perceptions of competence and a positive attitude towards PE (Morgan et al., 2005a, 2006; Ommundsen and Kvalø, 2007). In contrast, when a performance motivational climate is prevalent, and ego-involvement is supported, pupils reported higher levels of boredom, lack of enjoyment, a belief that ability, not effort, leads to success and lack of interest in PE (Morgan et al., 2005a).

Based on the work of Epstein (1989), Ames (1992) identified the teacher behaviours that were more likely to promote a mastery motivational climate and placed them within structures that related to the task, authority, recognition, grouping, evaluation and time (TARGET) (see Table 1). To facilitate the creation of a mastery motivational climate while adopting Ames' (1992) TARGET structures, teachers should set differentiated tasks and encourage pupils to set self-referenced goals for improvement, allow pupils to make decisions and take on leadership roles, recognize effort and improvement privately, organize cooperative heterogeneous groups, encourage pupils to self-evaluate and allow flexible time on tasks. Morgan et al. (2005b) developed a computer-based observational measure of the TARGET behaviours using the Behavioural Evaluation Strategy and Taxonomy software (BEST) (Sharpe and Koperwas, 1999). This allows researchers to film practical sessions and code the teacher's TARGET behaviours as mastery, ego or neither, thus facilitating the objective measurement of the teaching structures that influence motivational climate. It is a reliable means of measuring the motivational climate on a group (or team) level (Smith et al., 2007), which makes it a useful tool for gathering information about teaching and learning in PE lessons.

It is important to understand the impact teaching behaviours have on the learning environment because they can either positively or negatively influence pupils' affective responses towards PE. From a Scottish perspective, it is particularly important to understand the way teachers teach team invasion games (TIG) such as soccer and rugby since they make up a large part of the Scottish PE curriculum. Traditionally, TIG have been taught using teacher-centred, skill-focused approaches. These approaches are applied to develop and refine specific game skills before providing pupils with opportunities to apply the skills in a game situation. The teaching

**Table 1** TARGET behaviours that influence motivational climate

TARGET Behaviour	Mastery Climate	Ego Climate
Task	Self-referenced goals, multi-dimensional, varied & differentiated	Comparative goals, uni-dimensional & undifferentiated
Authority	Participants given leadership roles & involved in decision-making	Teacher makes all the decisions
Recognition	Private recognition of improvement, effort and accomplishments	Public recognition of normative ability and comparative performances
Grouping	Small mixed ability & cooperative groups	Ability groups, whole-class activities
Evaluation	Self-referenced. Private consultations with teacher based on improvement & effort	Normative & public
Time	Flexible time for task completion and maximum time to learn	Inflexible time for task completion

Source: Epstein, 1989; Ames, 1992.

behaviours adopted when using this teaching approach are reflective of the reproductive teaching styles from Mosston's Spectrum of Teaching Styles, where the teachers make most of the decisions during the teaching and learning process (Mosston and Ashworth, 2002). However, one of the contentions with this approach is that it fails to take into account the positive influence the more pupil-centred, productive teaching styles can have on pupils' affective responses and cognitive engagement (Rink, 2001). A high level of cognitive engagement is important in learning because it increases pupils' critical thinking and problem-solving skills. Furthermore, in an investigation into the relationship between teaching styles, TARGET teaching behaviours, and pupils' cognitive and affective responses in PE, Morgan et al. (2005a) found that pupil-centred teaching styles (reciprocal and guided discovery) resulted in more mastery and less performance-focused teaching behaviours compared to teacher-centred styles (command and practice). Morgan et al. (2005a) also found that pupils exhibited more adaptive cognitive and affective responses when pupil-centred styles were used compared to teacher-centred styles

The benefits derived from using pupil-centred teaching styles could also explain why research that has investigated game-based approaches to games teaching has found that they are more effective than traditional approaches in developing pupils' tactical knowledge, decision-making and game-playing performance (Allison and Thorpe, 1997; Jones and Farrow, 1999; Rovegno et al., 2001; Turner and Martinek,

1999). With approaches like Teaching Games for Understanding (TGfU) (Thorpe and Bunker, 1982) and the Tactical approach (Griffin et al., 1997) the pupil is at the heart of the learning process. Pupils are encouraged to develop and apply problem-solving skills in order to understand and appreciate the game. Given such similarities between pupil-centred teaching styles and game-based teaching approaches in PE, an analysis of the TARGET teaching behaviours that are exhibited whilst adopting a game-based approach could provide more detail with regard to why pupil performance seems to be enhanced when a game-based teaching approach is employed. Furthermore, in order to develop an even deeper understanding of game-based teaching, it may also be pertinent to investigate both teachers' and pupils' thoughts about their experiences during TIG lessons. This information would provide valuable information about the perceived effectiveness of the teaching and learning environment. Consequently, the purposes of this study were twofold. First, this study aimed to identify the teaching behaviours exhibited when teaching both a game-based approach and a skill-focused approach in a five-week block of basketball using the TARGET structures developed by Ames (1992). Secondly, this study investigated pupils' and teachers' thoughts about both teaching approaches based on their experiences during each lesson of the five-week block.

## Methods

### Participants

Fifty-two S1 pupils (24 female; 28 male; age =  $12.5 \pm 0.3$  yrs) from a Scottish urban state secondary school participated in this study. This school was selected because 96 percent of pupils in Scotland attend state schools and the largest proportion of those pupils (37 percent) attends urban state schools (Scottish Executive, 2007). Moreover, the pupils in this school were representative of all socioeconomic levels and ethnicity (Scottish Executive, 2007). The PE content covered in these schools followed the 5–14 Expressive Arts Guidelines and the Standard Grade curricula for Scottish primary and secondary schools (Scottish Examination Board, 1988; Scottish Office Education Department, 1992) and comprised dance, gymnastics and games, including the TIG soccer, rugby, hockey and basketball.

Twenty-seven pupils took part in the 'game-based' lessons (11 female, 16 male; age =  $12.5 \pm 0.3$  yrs) and twenty-five pupils took part in the 'skill-focused' lessons (12 female, 13 male; age =  $12.5 \pm 0.2$  yrs). A stratified random sample (Cohen et al., 2000) of eight pupils from each class (8 female, 8 male) took part in focus group interviews conducted immediately after each lesson. Permission to survey the pupils was obtained from the head teacher, and all of the pupils provided informed parent/guardian consent and informed assent to take part in the study.

Two teachers, Lisa and Anthony, took part in this study. Both Lisa (age 23) and Anthony (age 27) had taught in the urban state secondary school for one year. This was Lisa's second year and Anthony's first year teaching. Both teachers had a

background in coaching and playing soccer and attended the same Edinburgh-based initial teacher education institution. Informed consent to take part in the study was obtained from both of the teachers. All of the participants were told that their involvement in the study was voluntary, that they were free to withdraw at any time and were assured that their responses would remain confidential. For the purpose of teacher confidentiality, the names used in this study are pseudonyms. The study protocols were approved by the Ethics Committee of the University of Edinburgh, Scotland.

## **Procedures**

### *TARGET structures*

In order to analyse the teaching behaviours that influenced the motivational climate in accordance with Ames' (1992) TARGET structures, both teachers were filmed during the first and the final lessons of the five-week basketball block. The camera was positioned in an area of the gym that did not interfere with the lesson. The focus of the camera was on the teacher at all times during the lesson. Each teacher wore a wireless microphone.

### *Post-lesson teacher interviews*

In order to investigate their thoughts about each lesson, both of the PE teachers took part in semi-structured interviews. The aim of the interviews was to gain a greater understanding of the teaching and learning processes taking place when different approaches were applied to teach TIG. The questions posed by the researcher were designed to identify the strategies the teachers used when teaching TIG and investigate their views on pupil learning. At the end of each question, the researcher summarized the teachers' comments to check for understanding and accuracy, and asked for any additional comments. This part of the process allowed the researcher to take notes that highlighted the key issues raised. The interviews lasted approximately 30 minutes and were conducted on the same day the lessons were taught. All interviews were recorded using an audiocassette recorder and transcribed verbatim.

### *Post-lesson pupil interviews*

Immediately after every lesson, half of each sample group ( $n = 4$ ; 2 female, 2 male) took part in a focus group interview. Focus group interviews were conducted to gather qualitative data from the pupils in relation to learning experiences during each lesson. Moreover, previous research has found only a modest interclass correlation between pupils' perception of the motivational climate and behavioural measures of the motivational climate when self-report pupil questionnaires were administered (Smith et al., 2008).

The number of participants that were interviewed was limited due to the time restrictions placed on the pupils by the school. The pupils had permission to be ten minutes late for their next lesson. This left approximately fifteen minutes to conduct

each interview. It was determined that conducting a focus group interview with eight pupils in fifteen minutes would have left little time to discuss the key issues in any depth. Therefore, half of the group was interviewed in one week and the other half was interviewed in the following week. This pattern continued until the end of the block. As a consequence, information from all of the pupils in the sample from at least two of the five basketball lessons was gathered. The questions posed to the pupils encouraged them to discuss what they learnt (or areas of improvement), what they believed the focus of the lesson to be and what they enjoyed or did not enjoy about the lesson. At the end of each question, the researcher summarized the pupils' comments to check for understanding and accuracy. Once again this allowed the researcher to take notes that highlighted the key issues raised. The interviews were recorded using an audiocassette recorder and transcribed verbatim.

## **Intervention**

### *Game-based approach*

Lisa taught a five-week block of basketball based on the 'tactical approach' to teaching games (Griffin et al., 1997; Hopper and Kruisselbrink, 2002). The tactical approach to teaching TIG emphasizes tactical understanding and the development of motor skills as a means of solving tactical problems. The teacher decides on the tactical problem that has to be addressed and a game (conditioned to highlight a specific tactical problem) is presented to the learners. Once the learner understands the problem, and has worked out the skills required to solve the problem, he/she has the opportunity to explore and examine the skills in more detail before returning to the game. In terms of skill development, Lisa adopted a more hands-off approach and gave the pupils opportunities to explore the practice environment, and search for the most appropriate movements that fulfilled the demands of the task (Williams and Hodges, 2005). Lisa's role was to monitor and guide this search, rather than to give specific information about what to do and how to do it.

Lisa had some previous experience of teaching in this way as an undergraduate PE student, where she completed an eleven-hour module that focused on games-based approaches to teaching games. However, as this was Lisa's only experience, she was guided through the planning stage of each lesson by the lead researcher who had seven years experience teaching and researching such 'alternative' approaches to games teaching. The overall aim of the five weeks was to develop the pupils' performance in a game of 4v4 basketball. More specifically, the aim was to develop the pupils' ability to understand ways in which they could create space in order to move towards the target and score. Thus, the tactical elements Lisa focused on when teaching were: creating space on and off the ball to keep possession and to reach the target, regaining possession and counterattack, and denying space in the key area. A summary of the first lesson of the five-week block can be seen in Table 2.

**Table 2** An outline of the lesson from week one of the game-based class

Focus	Content	Content Objective
Keep the ball and reach the target.	1. 3v3 basketball	Work out <b>AS A TEAM</b> – how do you reach the target <b>AS QUICKLY AS POSSIBLE?</b> Why is this important?
	2. Pass and move in grid, on the whistle, move to the grid opposite as quickly as possible and shoot.	To develop the players' ability to get the ball to the shooting zone and target as a team as quickly as possible. To encourage scanning, showing for the pass, receiving on the move and sending a catchable pass.
	3. As in 2, defender can move into grid on the whistle.	To encourage each team to determine effectiveness of working as a team, looking for team-mates, show for the pass, moving away from defenders – toward the target.
	4. As in 2 and 3, 3v1. Second defender introduced on whistle.	
	5. 3v3 basketball	

### *Skill-focused approach*

This group was taught by Anthony, who delivered a five-week block of basketball that followed the PE department's programme for teaching basketball. His overall aim was the same as Lisa's, namely, to develop the pupils' performance in 4v4 games. Anthony intended to reach this aim by teaching the chest pass, the bounce pass, dribbling, the set shot, the jump shot and the lay-up. Anthony was not guided in any way by the researcher. His objective was to use his own knowledge and beliefs about teaching to deliver the programme set out by the PE department. A summary of the first lesson of this five-week block can be seen in Table 3.

Both the 'game-based' lessons and the 'skill-focused' lessons took place once a week and lasted one hour and twenty minutes. The time available for on-task activity was reduced to approximately 60 minutes to allow time for changing and administrative duties. The S1 basketball blocks took place during the term from January to March.

## **Data analysis**

### **TARGET structures**

The TARGET (Ames, 1992) configuration modification of the Behavioural Evaluation Strategies and Taxonomies (BEST) (Sharpe and Koperwas, 1999) software developed by Morgan et al. (2005b) was used to analyse the video data. For each of Ames' (1992) TARGET areas and motivational strategies, mastery, performance and neither behaviours were identified and assigned a computer keyboard number or letter for coding. The computer keyboard was configured to permit the recording of



**Table 3** An outline of the lesson from week one of the skill-focused class

Focus	Content	Content Objective
To introduce and develop dribbling and passing skills.	1. With a ball each, find a space and begin to dribble anywhere in the hall.	To move with ball while looking up to move into a space.
	2. Same task, use left hand and then the right hand.	To develop stopping ability –
	3. Move around the hall and when you hear the whistle, do a jump stop.	two feet, wide base, flex ankles and knees, ball in two hands.
	4. Right hand then left hand dribbling only.	To understand how and why you protect the ball when you are dribbling.
	5. Dribble the ball and protect it with arm and body, change on the whistle.	
	6. Ball handling skills.	
	7. Passing in pairs.	No dribbling, pass to score.
	8. 4v4 Benchball	

multiple and overlapping frequency behaviours (task, recognition and evaluation) and duration behaviours (authority, grouping and time structures). Validity and acceptable intra and inter-observer reliability (greater than .80) was established during the development of the measure (Morgan et al., 2005b) in line with Sharpe and Koperwas's (1999) recommendations to ensure reliability and accuracy of data records and the use of recognized agreement tests and reliability procedures (Kazdin, 1982). Three researchers, instrumental in the development of the measure of teacher behaviours that influence motivational climate and trained in its use, undertook video analysis simultaneously on the observed teacher behaviours. The flexibility of the BEST system allowed the researchers to pause both the video and the software system and to replay the video for discussion until complete and unambiguous 100 percent agreement was reached on the coding of the mastery, performance and neither categories of teaching behaviours.

### Post-lesson pupil and teacher interviews

For both the pupil and teacher post-lesson interviews, the first stage of analysis involved reading and rereading the transcripts in order to become familiar with the participants' responses. The pupils' responses were then grouped according to the questions asked, thus providing a context-specific and more focused framework for analysis (Taylor-Powell and Renner, 2003). The third phase of the analysis involved the identification of the key issues. This process was also carried out independently by a second researcher. Subsequently, both researchers discussed the issues they had identified and agreed on the main issues raised by the pupils (Morgan et al., 2005b; Sproule et al., 2002).

Lisa and Anthony's interview transcripts were analysed separately. However, the data from each script were grouped according to the main areas of questioning, namely 'teaching strategy' and 'pupil learning' (Taylor-Powell and Renner, 2003). The key issues that emerged from each group were identified and the second researcher subsequently reviewed these issues. Both researchers then agreed on the most salient issues that emerged from each area of questioning. The next phase of analysis involved the identification of sub-groups by both researchers using the constant comparison method of analysis (Glaser, 1964; Podlog and Eklund, 2006). For the 'teaching strategies' group, this resulted in the emergence of two subgroups, namely, 'pupil-centred' strategies and 'teacher-centred' strategies. For the responses linked to the teachers' thoughts on pupils learning, the categories, 'game performance', 'game understanding' and 'affective development (enjoyment)' emerged. The final phase of analysis, for both the pupil and the teacher interviews involved the identification of the TARGET structures (Ames, 1992). This was completed in order to consider the congruence between teacher behaviours and the interview responses.

## Results

### TARGET structures

The percentage of 'mastery' 'performance' and 'neither' coded teaching behaviours was calculated for each of the individual (Table 4) and the combined (Table 5) TARGET structures for both teaching approaches. Observational computer-based behavioural analysis of the TARGET behaviours revealed that both Lisa and Anthony applied more ego-orientated behaviours during the first lesson of the block. However, results also indicated that, as Lisa gained more experience teaching using a game-based approach, her behaviours changed from ego-orientated to more mastery-focused (Table 5). Specifically, Lisa focused more on self-referenced learning goals in multi-dimensional tasks. In addition, she also gave pupils more autonomy and decision-making opportunities, reduced comparative feedback, facilitated more mixed ability cooperative grouping and increased activity time. In contrast, overall analysis of the TARGET structures for skill-focused (Anthony) teaching revealed very similar percentages of mastery and ego behaviours in the pre- to post-intervention lessons.

### Post-lesson teacher interviews: game-based teaching (Lisa)

#### *Teaching strategies: pupil-centred teaching strategies*

When asked to discuss the teaching strategies she used, Lisa talked predominately about pupil-centred, game-based and problem-solving tasks. The practices that she used throughout each lesson were directly linked to the tactical problem. The individuals within each team had to work together to solve the tactical problem through discussion and exploration of all the possible solutions in the practice and game settings. For example, in week four Lisa explained that the pupils had to work out

**Table 4** Percentage of 'mastery' (M), 'performance' (P) and 'neither' (N) coded teaching behaviours for individual TARGET structures

% ages	Games Lesson 1			Games Lesson 5			Skill Lesson 1			Skill Lesson 5		
	M	P	N	M	P	N	M	P	N	M	P	N
Task goals multi/uni diff	.50 .50 .0	.50 .50 .100		.75 .50 .25	.25 .50 .75		.90 .0 .20	.10 .100 .80		.75 .0 .0	.25 .100 .100	
Authority	20.9	79.1		71.7	28.3		6.9	93.1		41.7	58.3	
Recognition and evaluation	0	63	37	0	57.4	42.6	13.8	77.6	8.6	0	86.2	13.8
Grouping	45.2	54.8		76.4	23.6		16.2	83.8		53	47	
Timing	0	44.4	Inactive 55.6	<1	69.6	Inactive 29.6	0	32.1	Inactive 67.9	0	51	Inactive 49

**Table 5** Percentage of combined 'mastery' (M) and 'performance' (P) TARGET structures

Games Lesson 1		Games Lesson 5		Skill Lesson 1		Skill Lesson 5	
M	P	M	P	M	P	M	P
23.7	63.0	42.6	46.9	20.9	68.1	24.2	66.8

the best formation to adopt in order to defend the space under the basket. This is consistent with a mastery cooperative grouping structure (Ames, 1992). She believed that this was successful because the pupils were able to share their ideas and because they all produced appropriate solutions to the problem.

The player that led each discussion, and presented the teacher with the solutions to each problem, was a peer-nominated captain (a new captain was peer nominated each week). This is congruent with a mastery authority structure which encourages pupils' decisions and leadership roles (Ames, 1992). Lisa kept the pupils in the same teams each week of the five-week basketball block. She described how the pupils requested to change teams for the first two weeks, but subsequently seemed very happy to stay in their team. She believed that they became accustomed to working with each other and that it gave them a stronger feeling of being part of a team. She understood that this was particularly important because of the fact that the teams were mixed ability:

It was good that the teams were mixed. The good players mixed with the not so able players and they really did help bring them on as part of the team.

(Lesson 5)

Mixed ability grouping and differentiation is consistent with Ames's (1992) TARGET guidelines. However remaining in the same group is contrary to a mastery climate which encourages a variety of grouping within and between lessons.

In addition, Lisa also believed that the pupils enjoyed taking on board the responsibility she gave them. She explained that, by the end of the block, the pupils were making nearly all of the decisions in the lesson. This emphasizes mastery authority (Ames, 1992):

I think almost every single one of them were enjoying it, probably again because it's very games based, but again they had that little bit of responsibility.

(Lesson 5)

## Pupil learning

### *Game understanding*

When asked to discuss the pupils' performance during each lesson, the focus of Lisa's response was often linked to her perception of the pupils' improved game

understanding. This is indicative of a self-referenced learning focus for evaluating pupils (Ames, 1992). Lisa also believed that the pupils had a much better understanding of the game in terms of its shape and player roles within the game:

Their team play seems to be better, they seem to have more shape, more understanding of where they should be on court, what they should do, how to get into the best position, how to move the defenders from under the basket.

(Lesson 5)

### *Game performance*

In addition to examining the pupils' improved game understanding, Lisa also discussed their enhanced game performance. While she never talked about their performance improvements with regard to developed skills or techniques, consideration was given to how games play was progressed. She highlighted pupils' improved teamwork, decision-making, movement on and off the ball and their application of the tactical solutions to the practices and to the games.

### *Pupil enjoyment*

When Lisa discussed the pupils' enjoyment of each lesson, her main focus was on their enjoyment while playing the game. They enjoyed starting each lesson with the game, they enjoyed the practices because they were directly linked to the game and they enjoyed the fact that so much of the lesson time was devoted to game play. However, she also stated that they enjoyed each lesson because they were able to recognize their own, and their team's, success. This is in agreement with mastery evaluation (Ames, 1992).

The intended learning outcomes (linked to a tactical problem) were made explicit at the start of each lesson and then reinforced during every activity the pupils took part in. This appeared to result in an increased awareness and understanding of the tactical problem and the possible solutions. As a consequence, the pupils seemed more aware of when they were successful in applying the tactical solutions and solving the problem during each game:

Everyone is having a little bit of success, even if they are not the ones that are scoring they are realizing that once they are getting towards the target that they are helping their team mates by kind of spreading the court, and whether it's an accurate pass they make or whether they score, they seem to all be quite enjoying it as a team. (Lesson 2)

## **Post-lesson teacher interviews: skill-focused teaching (Anthony)**

### *Teaching strategies: teacher centred teaching strategies*

Most of the teaching strategies Anthony used during his basketball lessons were very direct, teacher-centred and skill-focused. His main objectives were linked to the

development of specific basketball skills and techniques and he gave direct instruction and specific feedback about how the pupils could perform each skill:

I was leading the session and they were following what I was doing basically, just trying to determine what these kind of people were like in the class. It was the first lesson with them so I had to try and keep me being in charge basically and show them what to do. (Lesson 1)

Anthony used question and answer techniques frequently during each lesson. The focus of these was on developing the pupils' understanding of how to perform the skills. During the fourth lesson, he instructed the pupils to observe each other perform the lay-up so that they could help each other improve their technique. Anthony provided the pupils with opportunities to play games, and at times, introduced competition into the practices. He did this in order to challenge the pupils and put their skills under some pressure, thus highlighting the more performance-focused climate (Ames, 1992).

One of the teaching strategies Anthony discussed each week was the division of the class according to ability level. He seemed very concerned that he was not challenging the more able in the class and every week he suggested providing the more able pupils with more game-playing opportunities and the less able with more time to practise the skills. However, congruent with performance involving un-differentiated tasks (Ames, 1992), Anthony never employed this strategy.

## **Pupil learning**

### *Game understanding*

When asked to discuss the pupils' performance after each lesson, most of Anthony's discussion was based upon their ability to perform the skills. Very little of what he said was linked to the pupils' game understanding. However, occasionally he mentioned that he would employ question and answer techniques in order to develop the pupils' understanding of when and how to perform the skills during the game:

It was a bit like guided discovery, they were trying to work out what actually made a good pass . . . two hands, effective, probably looking more at achieving their goal of scoring, so they did a good pass, like a pass that was accurate, was it good weight on it, was it able to create the opportunity to shoot. (Lesson 2)

### *Game performance*

When discussing the pupils' performance during each lesson, once again Anthony focused on their ability to execute the game skills. He believed that the pupils improved in their ability to perform the skills. However, he also recognized that their skills were rather fragile when faced with game pressures such as a defender.

The main aim of the final lesson was to give the pupils a grade based on their game performance, thus highlighting normative ability comparisons, which is a key feature of a performance involving motivational climate (Ames, 1992). Anthony recognized that he had not covered any attacking or defending principles in any detail during this course, yet he still intended to assess the pupils' performance in these areas. In addition, he also intended to assess their ability to execute the skills during the game:

I know we haven't covered defence that often, but to see if they had an understanding where they should stand, where they should be in a defensive situation and then when they go into attack maybe they had a shot, maybe they looked at positive pass, varied kind of pass kind of thing, rather than just run about.

(Lesson 5)

### *Pupil enjoyment*

Anthony believed that the pupils in his class enjoyed his lessons because of the challenges he set, describing competitive practices that put the pupils under pressure. Interestingly, it was not until the last lesson that Anthony discussed the pupils' enjoyment in relation to playing games. This was perhaps because this lesson provided the pupils with the most opportunities to play games.

### **Post-lesson pupil interviews: game-based class.**

#### *What did you learn?*

Despite there being some reference to learning skills during the game-based lessons, the pupils that were interviewed mainly discussed the principles of play that they learnt. This was strongly linked to the notion of cooperative teamwork (Ames, 1992). Importantly, the principles they discussed were closely related to the teacher's objective. For example, the objective of lesson three was to develop the pupils' understanding of ways to create space under the basket to move in close to shoot. One pupil explained what she had learned, stating:

You had to like pass to either one of your team mates on either side of the basket, so the defender under the basket moved and then you could get back in.

(Lesson 3; Pupil 3: Female)

### *Areas of improvement*

One of the main themes to derive from the discussions about the pupils' improvements after each lesson was the notion of enhanced teamwork. Consistent with mastery evaluation, grouping and authority structures (Ames, 1992), they believed that this improvement was as a result of their understanding of the game, their role within the game and the numerous opportunities they were given to play the game. The pupils' knowledge of the game and their perceived improvements in performance during

games play made them feel more involved and encouraged them to work hard for their team-mates during the game:

I think people are interested in playing games because you don't get that involved like if you just do skill work. (Lesson 1 Pupil 1: Female)

### *Focus of learning: games or skills?*

After every lesson, all of the pupils agreed that the main focus of the lesson was on developing their game performance. They concurred that this was achieved through playing games and taking part in activities that they thought resembled the game. In agreement with mastery tasks that focus on variety and interest (Ames, 1992), pupils believed that this was an appropriate way to learn to play games because they were much more interesting and less boring than practising skills:

You are doing loads of like different things, because if you are doing your skill work, and I know you just focus on one thing, if you play games you have to work on your dribbling, your passing, your shooting and teamwork and general things like that. (Lesson 1; Pupil 1: Female)

### *Enjoyment*

In general, the pupils that were interviewed after each lesson stated that they enjoyed their learning experiences. In particular, they enjoyed playing the games, being involved and feeling like they had improved. The discussions that pupils had with regard to the aspects they did not enjoy were focused on the fact that they did not get to choose their teammates and had to remain in the same teams throughout the five-week block. One of the pupils mentioned that he wanted to be in a team with better teammates and play against more able players. In addition, another pupil mentioned that she wanted the opportunity to play with different people. This highlighted the need for variety in the grouping structures both within and between lessons as suggested by Ames (1992):

Yeah, I never liked a couple of games because we weren't playing hard people, we were playing easy people. We want more competition.

(Lesson 1; Pupil 6: Male)

## **Post lesson pupil interviews: skill-focused class**

### *What did you learn?*

The main focus of the discussions with regard to what the pupils had learnt during each lesson was on the development of basketball skills:

Just how, how to shoot like to bend your legs and aim.

(Lesson 3; Pupil 7: Female)



They discussed the principles of attack and defence, but only in a vague way. However, one pupil described defending in terms of the technical components of a defensive stance:

Before I would always stand like straight and that. But now I've got my knees bent and that. And I'm ready when people come up I'm easily running to them.  
(Lesson 5; Pupil 3: Male)

### *Areas of improvement*

When asked if they believed that they had improved after each lesson, all of the pupils believed that their basketball skills had improved. They described how they were better at dribbling, passing and shooting, and usually based their success on whether they scored or whether they won their game, which suggests a more performance-focused comparative definition of success (Ames, 1992):

I think I did get a bit better because by the end our team was beating more teams. (Lesson 2; Pupil 4: Female)

### *Focus of learning: games or skills?*

The pupils that were interviewed after each lesson all recognized that the main focus of each lesson was on the development of game-specific basketball skills. They all believed that learning skills was very important and that this had to be done if they wanted to improve their game performance.

Practising the skills . . . well that's good because you can't really just go and shoot (in a game) before you do like practising cause then you won't know what to do. (Lesson 3; Pupil 5: Female)

### *Enjoyment*

Even though there were often limited opportunities to play the game during this five-week block of basketball, particularly in the third week, all of the pupils that were interviewed enjoyed each of the lessons. In agreement with a mastery task structure (Ames, 1992), they enjoyed learning skills, especially when they were presented in a fun and challenging way, often in the form of indirectly competitive practices. Although the pupils seemed to enjoy learning skills, they also enjoyed the times during the lessons when they were provided with more authentic game-playing opportunities:

Because we got to play games and show each other what skills we've learned.  
(Lesson 5; Pupil 7: Female)

## **Discussion**

Observational computer-based behavioural analysis of the TARGET behaviours revealed a change to more mastery-focused teaching behaviours during the game-based teaching approach. In contrast, overall analysis of the TARGET structures for

skill-focused teaching revealed very similar percentages of mastery and ego behaviours in the pre- to post-intervention lessons. Thus, the game-based teaching approach influenced the motivational climate to be more mastery involving for the pupils (Table 5).

Consistent with the behavioural analysis, the teacher interviews indicated that Lisa used more mastery-focused pupil-centred strategies, and discussed the pupils' performance in terms of their game performance and their game understanding. Anthony used more performance involving teacher-centred strategies and discussed the pupils' performance in terms of their ability to execute game skills. The pupils in the game-based class valued learning through the game and discussed game understanding, teamwork and success in solving tactical problems, enjoyment, involvement and interest. The skill-focused class valued skill learning and evaluated their performance based on the successful execution of game skills.

### **Authentic learning environment.**

Research findings have demonstrated that game-based approaches to teaching have a positive effect on pupils' game performance. This is in comparison to more traditional skill-focused teaching styles (Allison and Thorpe, 1997; Jones and Farrow, 1999; Rovigno et al., 2001; Turner and Martinek, 1999). Game-based approaches provide the learner with authentic learning environments that require and facilitate game understanding through active engagement in 'real' game situations. In the present study, the pupils in the game-based class described how they believed that their game understanding and decision-making had improved as a result of the many opportunities they had to play the game. Reflecting this, Lisa used terms linked to improved game knowledge, increased tactical awareness and better decision-making when discussing the pupils' improvements in game performance. In contrast, neither the pupils nor the teacher from the skill-focused class considered improvements in performance in relation to the game or decision-making.

Presenting pupils with authentic, game-based learning environments provides a possible explanation as to why there were differences in the pupils' accounts of their TIG lessons. However, it is unreasonable to suggest that this was the only factor that affected their learning experience. Teaching and learning is a very complex and multi-faceted process. In order to understand more about pupil learning when different TIG teaching approaches are employed it is necessary to go beyond the teaching approach. In-depth investigation into the learning environment is required in order to gain a greater understanding of the factors that influenced the pupils' learning experiences.

### **Task design**

One of the structures the teacher can manipulate in order to create a mastery motivational climate is the task. When tasks are interesting, varied and designed for inclusion, pupils are more engaged in learning and are able to take part at a level more

suiting to their own ability (Morgan et al., 2006). The tasks that were presented in the game-based lessons could have been perceived to be varied, interesting and designed for inclusion as they were all directly linked to playing a game. For example, Lisa commented on the pupils' improved teamwork, highlighting that the tasks she presented could only be resolved if they worked together as a team, thus emphasizing the notion of inclusion.

Furthermore, variation was inherent in the tasks Lisa provided her pupils. Each task presented the pupils with a problem to which there were a number of both movement and tactical solutions. This type of problem-solving approach is reflective of the productive teaching styles identified by Mosston and Ashworth (2002), which are said to increase cognitive engagement in the task (Mawer, 1999), enhance pupil enjoyment of the task (Morgan et al., 2005a) and have a positive influence on pupils' motivation towards PE (Salvara et al., 2006). Certainly, the pupils in this study who were exposed to problem-solving tasks discussed how they enjoyed learning through game-like activities, felt more involved and believed that they learned more. Their learning was reflected in the detailed and relatively sophisticated discussions about the different principles of play. Wright and Forrest (2007) highlighted that pupils should develop a language for games, and that this is achieved when they have opportunities to answer open questions and debate ideas. However, Wright and Forrest (2007) found that teachers who taught games using TGfU, tended to pose closed questions that only required one answer. The authors proposed that this type of questioning does not encourage the pupils to engage in problem-solving activities, which in turn does not increase levels of cognitive engagement. In the present study, the pupils in the game-based class appear to have developed their games language because Lisa provided questions, or problems, to which there were a number of solutions. Importantly, the pupils had to work to find the solutions to the problem as a team by discussing the game and playing the game. In contrast, the skills-focused class were presented with tasks that concentrated on the development of game skills through repetitive, progressive and indirectly competitive practices. These are practices that require low levels of cognitive processing (Lee et al., 1991). However, in line with the TARGET structure for task design (Ames, 1992), the skill-focused class enjoyed the variety of activities that their teacher presented to them, stating that they were 'fun' and 'challenging'.

### **Recognition and evaluation**

Game knowledge may also have been a key factor in the 'game-based' pupils' ability to determine what they had achieved during each class. Those who were interviewed believed that they had been successful during the lesson, and they linked their success to reaching specific game/team objectives. Determining success in this way is consistent with the TARGET behaviours identified by Ames (1992), where evaluation is linked to self- or group-improvement, effort and mastery of the task. Furthermore, the emphasis during the game-based lessons was placed on solving the problems as a team, and on team improvement. This seemed to promote collaborative learning

where pupils supported each other rather than focusing on individual improvements by comparing, or competing, with another team member. Certainly, there was no evidence from the teacher and pupil interviews that suggested peer comparisons were used to evaluate their success or improvements.

The objective for the pupils during practice in the skill-focused lessons was quite different. The emphasis during each lesson was on how well each individual performed on-the-ball basketball skills. One of the issues with placing such an emphasis on performing skills is that they have to be performed within a socially evaluative environment. This can lead to fear of negative evaluation by peers and/or teachers, avoidance behaviours (Carr, 2006) or self-handicapping behaviours (Standage et al., 2007). The pupil and teacher interviews did not indicate that peer comparisons had been used to measure their success. However, there was some evidence to suggest that they based their success on the outcome of their individual performance in executing specific skills.

## Grouping

For both the game-based and the skill-focused classes, the teams and the practice groups were made up of a mixture of ability levels. However, the main difference was that the groups in the game-based class remained the same in every lesson during the five-week block. The same pupils practised together and played together. This is contrary to Ames's (1992) guidelines for creating a mastery climate. These suggest a variety of heterogeneous grouping arrangements both within and between lessons. This may explain why post-lesson pupil interviews revealed that this was an issue at the outset. Initially, they wanted to change teams and/or play with and against more able pupils. However, towards the end of the block, this did not appear to be a problem anymore. The teacher of the game-based class believed that this was a useful way to organize each lesson for a number of reasons. She believed that it developed the pupils' ability to work as a team, increased pupil involvement and allowed the pupils to recognize that the teams had improved throughout the five-week block. In addition, she felt that the more able pupils helped the less able pupils and she could evaluate how much the teams had improved throughout the block.

Many of the tasks set in the skill-focused lessons involved working in mixed ability groups. However, these groups changed from week to week (and sometimes task to task), and usually the focus of the task was on the pupils' individual performance. The pupils were not given the opportunity to develop 'team skills' such as co-operating, communicating, sharing and problem-solving. Moreover, they did not have time to learn to play as a team and see any improvements as a team.

## Authority

Motivational climate literature proposes that a mastery-oriented motivational climate is created when the teacher hands over responsibility to the pupils for their own learning. During the game-based lessons, the teacher set the problem, provided

conditioned games and encouraged each team to work together in order to come up with their own solutions. Ommundsen and Kvalo (2007) found that a mastery climate and teacher autonomy support positively influenced pupil intrinsic motivation in PE. However, when learners are presented with a more controlling environment where they are not given any responsibility to make decisions about their learning, they are more likely to lose interest in the task and ultimately learn less, especially when the task requires conceptual or creative processing (Deci and Ryan, 2000).

The objectively measured TARGET behaviour data, and the findings from the teacher interview, indicated that the teaching approaches used in the skill-focused lessons were more 'controlling'. This may have negatively affected the pupils' feelings of autonomy, and subsequent, effort and learning. Additionally, the pupil interviews revealed that the pupils from each group acquired different types of knowledge about basketball (conceptual/tactical in the game-based lessons compared to technical in the skill-focused lessons) perhaps evidencing different levels of task engagement depending on whether the content and learning was driven by the teacher or by the pupil.

## Conclusion

The findings from this study indicate that the teacher who adopted a game-based approach to teach basketball exhibited more mastery behaviours than the teacher who taught using a more traditional, skill-focused, approach. When Lisa taught basketball, she set interesting, game-related tasks that encouraged whole group involvement, regardless of ability level. She also promoted the use of problem-solving skills that encouraged the pupils to take responsibility for their own learning. These findings support previous research on productive, or pupil-centred, teaching styles and teaching behaviours that promote a mastery motivational climate (Morgan et al., 2005a). In contrast, the teacher who used a more traditional, skill-focused and teacher-centred approach to teaching games concentrated on the individuals' ability to perform specific basketball skills. He set tasks that demanded limited game understanding or cognitive processing, and organized mixed ability groups and teams. However, he did not emphasize or encourage team skills such as cooperating, sharing or problem-solving.

One of the limitations of this study is that the pupils were not consulted explicitly in relation to how they perceived the motivational climate. This is important because the way in which pupils perceive the motivational climate will influence the way in which they approach the learning task and, ultimately, how they learn (Sproule et al., 2007). However, to date, a reliable group measure of the pupils' perception of the motivational climate linked to all of the TARGET structures has yet to be developed. More importantly, the pupil focus group interviews provided some valuable qualitative data in relation to the ways in which they perceived their learning environment.

Another limitation of this study reveals the difficulties of conducting ecologically valid research that attempts to integrate theory with practice. Although

there were many similarities between the two teachers, it would be wrong to suggest that it was the way they designed and presented the tasks that was the sole influence on the motivational climate and the pupils' learning experiences. Future research in this area could address this issue either by having a larger sample of teachers, or by adopting a crossover design (Hopkins, 2000). However, the integration of theory with practice in a school setting is a major strength of the study from which physical educators might learn valuable lessons.

The findings from this study should provide those responsible for curricular development and innovation in Scotland with information to develop and enhance TIG teaching in Scottish schools. Teaching strategies such as the Tactical approach (Griffin et al., 1997) appear to promote a mastery oriented motivational climate. This enhances the affective responses that are critical to engagement and continued participation in PE and physical activity (Deci and Ryan, 2000; Li et al., 2007; Wigfield and Eccles, 2000). Thus, a game-based teaching approach seems to have the potential to make a positive contribution to the health and well-being of children, and adults, in Scotland.

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## Résumé

### L'enseignement des sports collectifs interpénétrés et le climat motivationnel

Les sports collectifs interpénétrés (SCI) représentent une part importante de l'enseignement de l'Éducation Physique en Écosse. Aussi est-il important de comprendre les conditions environnementales qui favorisent la motivation des élèves à apprendre à jouer aux SCI. Cette étude a donc pour objectif d'identifier les conduites des enseignants engagés dans deux approches de l'enseignement des SCI auprès d'élève du secondaire: a) une approche basée sur le jeu et b) une approche basée sur la maîtrise d'habiletés. Dans le cadre d'un enseignement basé sur le jeu, l'enseignant apprécie les performances des élèves à partir de leur compréhension du jeu et de leur efficacité ; les élèves sont intéressés par la compréhension de jeu, la collaboration, le plaisir et l'engagement. Dans le cadre d'un enseignement basé sur la maîtrise, l'intérêt de l'enseignant porte sur le niveau de maîtrise d'exécution de l'élève ; les élèves ont apprécié leurs performances à partir de leur réussite dans l'exécution des habiletés. Les résultats de cette étude suggèrent que les stratégies d'un enseignement basé



sur le jeu semblent favoriser un climat motivationnel orienté sur la maîtrise et permettent, potentiellement, d'accroître la motivation des élèves en Education Physique et dans les SCI.

## **Resumen**

### **La enseñanza de los juegos de equipo de invasión y el clima motivacional**

Los juegos de equipo de invasión ocupan una amplia parte del currículum de Educación Física en las escuelas escocesas. Por ello, es importante entender las condiciones ambientales que contribuyen a la motivación de los alumnos para aprender los juegos de equipo de invasión. Consecuentemente, este estudio trata de identificar los comportamientos de enseñanza utilizados en la enseñanza de los juegos de invasión utilizando la perspectiva basada en el juego y la perspectiva basada en la habilidad para la enseñanza del baloncesto en el nivel I de secundaria. Complementariamente, este estudio investigó los pensamientos de alumnos y profesores acerca de sus propias experiencias durante las clases de baloncesto realizadas.

Encontramos cambios hacia mayores comportamientos de maestría durante las clases realizadas bajo la perspectiva basada en el juego y porcentajes similares de maestría y comportamientos hacia el ego en las clases realizadas en la perspectiva de la habilidad. El profesor que utilizaba la perspectiva del juego se refería a la ejecución de los alumnos en términos de rendimiento y comprensión del juego, mientras que el profesor que utilizaba la perspectiva de la habilidad refería la capacidad de los alumnos para ejecutar las destrezas del juego. Los alumnos que asistieron a las clases orientadas en la perspectiva del juego hacían referencia a la comprensión del juego, el trabajo en equipo, el divertimento y la implicación. La clase orientada en la perspectiva de la habilidad valoró el aprendizaje de habilidades y evaluó sus rendimientos a partir de las ejecuciones exitosas de las habilidades. Los hallazgos de este estudio sugieren que las estrategias de enseñanza basadas en la perspectiva del juego parecen promover un clima motivacional orientado a la maestría, además de mostrar el potencial necesario para incrementar la motivación de los alumnos en la Educación Física y en los juegos de equipo de invasión.

## **Zusammenfassung**

### **Der Unterricht in Mannschaftssportspielarten und das motivationale Klima**

Mannschaftssportarten bilden einen großen Teil des Sportcurriculums an schottischen Schulen. Deshalb ist es wichtig die Rahmenbedingungen zu verstehen, die zur Motivation der Schüler zum Erlernen von Mannschaftssportspielen beitragen. Mit dieser Studie sollte das gezeigte Lehrerverhalten im Unterricht von Mannschaftssportarten erfasst werden in Abhängigkeit von einem spielzentrierten oder einem fertigkeitzentrierten Ansatz im Basketball an Oberschulen. Weiterhin hat die Studie die Einschätzungen der jeweiligen Erfahrungen von Schülern und Lehrern während jeder Basketballstunde erfasst.

Wir konnten eine Verbesserung des Könnens im spielzentrierten Unterricht feststellen, während sehr ähnliche Prozentzahlen im Können und individuellen Verhalten im fertigkeitszentrierten Unterricht festzustellen waren. Die spielzentriert unterrichtenden Lehrer diskutierten das Schülerverhalten hinsichtlich des Spielverhaltens und des Verständnisses und die fertigkeitsorientiert unterrichtenden Lehrer diskutierten die Schülerfähigkeiten zur Ausführung von Spielfertigkeiten. Die Schüler der spielzentrierten Klassen diskutierten das Spielverständnis, die Zusammenarbeit, den Spass und die Beteiligung. Die fertigkeitsorientierten Klassen bewerteten das Fertigkeitlernen und ihre Leistung, die auf der erfolgreichen Ausführung von Spielfertigkeiten basierte. Die Ergebnisse lassen vermuten, dass spielorientierte Unterrichtsstrategien ein könnensorientiertes, motivationales Klima befördern und deshalb ein Potenzial zur Steigerung der Schülermotivation im Sportunterricht und im Unterricht der Mannschaftssportarten besitzen.

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