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Undergraduate Sports Students' Perceptions of a Change To Game Sense Pedagogy

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Abstract: This paper contributes to research in the scholarship of teaching by reporting on undergraduate sports students' perceptions of their own learning when exposed to a Game Sense learning approach and reflections on my experience of teaching it. A multiple methods approach was utilised to gather data from a four-week "games" component of a 10-week unit of study with all participants (n = 20; aged 18-21) in their first year of a three-year sports-related undergraduate degree. The games classification system was used to plan session content over the four weeks with each week focusing on a different games classification. Data were organised and coded via inductive coding procedures with analysis conducted concurrently to identify three prominent themes: 1) positive experiences of competition and game play, 2) the range of cognitive and emotional learning opportunities provided by Game Sense pedagogy facilitated improved student engagement and learning, and 3) the challenge of effective teacher questioning to stimulate game play knowledge construction.

Keywords: *Game Sense, physical education pedagogy, pre-service physical education*

Introduction

This paper contributes to research on scholarly teaching by reporting on undergraduate sports students' perceptions of their own learning when exposed to a Game Sense learning approach as well as my own perceptions of using the pedagogy as an effective approach to learning. It focuses on participant perceptions of learning when taught using a Game Sense approach in a higher education setting. The research undertaken builds on the work of Light and colleagues (Light, 2002a; Light & Fawns, 2003; Light & Georgakis, 2006; Light & Georgakis, 2008) published over the past decade on learner responses to, and experiences of, being taught Game Sense pedagogy and their perceptions of their learning. This work

has primarily been conducted in school-based physical education/sport contexts and in higher education-based Physical Education Teacher Education (PETE) programmes. In addition, the analysis of data addresses perceptions of traditional learning experiences and compares them to experiences of a Game Sense approach in a higher education setting.

The aims of this research project were to (a) inquire into learner experiences of “understanding” approaches to teaching and, (b) assist me, as the teacher and researcher, in developing my own teaching in a higher education setting. I set out to achieve these aims by implementing a teaching intervention and gathering data on my students’ responses and experiences of it and their views on its efficacy in developing game sense skills. The intervention was the use of a student-centred, inquiry-based approach to games teaching, called Game Sense, adopted to enhance student learning and enjoyment within and across games classifications.

The investigation of my own teaching practice through a change in pedagogy offers a contribution to the growing “communal discourse” surrounding the improvement of teaching practice (Bass, 1999; Kirk, 2005; Butler, 2009) and recognises Fincher & Work’s (2006) support for the value of scholarly teaching and its potential to advance the practice of teaching. Since the publication of *Boyer’s Scholarship Reconsidered* in 1990, the recognition of critically reviewed teaching excellence and its public availability has developed worldwide. In light of this increased spotlight on teaching and learning, I had a two-fold rationale for undertaking the research: (a) the analysis of practice with a focus on the improved attainment of student learning outcomes, and (b) engagement in the research process as a new researcher in the field of sports pedagogy.

Game Sense

The Game Sense approach is one of a number of pedagogical variations derived from Teaching Games for Understanding (TGfU). The main premise of TGfU (and Game Sense) is that learning should take place “within the context of games modified to suit the learner” (Light, 2002a, p. 289). The development and use of Game Sense, a “slightly less structured” Australian version of TGfU (Light, 2004, p116), began in the mid-1990s as a tactical or games-based approach for sports coaching (Georgakis & Light, 2009). The absence of a structured model facilitated incorporating the different coaching approaches already in use in Australia (Light, 2004). Of primary importance to the approach was the contextualisation of learning within games or game-like situations as well as an emphasis on collaborative problem solving through social interaction (Light, 2004; Light & Georgakis, 2006; Georgakis & Light, 2009). Furthermore, with its emphasis on question asking to inform decision making and problem solving, it promotes intelligent play. Game Sense has been suggested to enhance deeper learning when building on students’ prior experiences (Light & Georgakis, 2008). In addition, Webb & Pearson (2008) state that the use of its predominantly constructivist approach can facilitate a “deep understanding of games within and across categories” (p. 3) thus promoting a greater understanding of all aspects of games through higher order thinking and a more holistic learning experience (Light & Fawns, 2003; Webb, Pearson, & Forrest, 2006; Webb & Pearson, 2008; Memmert & Harvey, 2010).

Consistent with constructivist informed approaches to learning (Light, 2002a), Game Sense has been aligned with situated learning theory (Pope, 2005) and social constructivist learning theory (Curry & Light, 2006) due to its alignment with Vygotsky’s (1978) ideas on the importance of knowledge construction within a social context. The increased use of Game Sense (and similar constructivist informed pedagogies) as a pedagogical approach

to learning represents a noticeable shift in professional practice away from skills-based content learning. This shift or change in teacher practice is not without its tensions. For example, Rossi et al. (2007, p. 93) note issues arising from a mandated national curriculum innovation in Singapore aimed at “changing the nature of games pedagogy within the physical education curriculum.” The new Games Concept Approach was mandated to replace existing practice and inform teaching practice. Here, teacher tensions included confusion caused by multiple interpretations of pedagogy implementation, unease with the changing nature of the role of teacher, and the disruption caused by having to rethink entire approaches to teaching games. A change in pedagogy is not without its disruptions, however, can be of significant benefit to student learning.

Change in Pedagogy

Amande-Escot and O’Sullivan’s (2007, p. 186) belief that “constructivist theories are at the core of education thinking” is a timely indicator of the growing prevalence of research led pedagogical change. Dow’s (2006) suggestion that the promotion of authentic learning experiences requires a paradigm shift regarding pedagogy is supported by over a decade of research literature which reports on the potential benefits of a change to constructivist informed pedagogy such as the improvement of student motivation and better preparation of future practitioners (Collier & O’Sullivan, 1997; Spittle & Byrne, 2009). In the field of physical education and sport pedagogy, similar benefits have been suggested in physical education (Gubacs-Collins, 2007) but this “change” may often be difficult to facilitate due to the limitations of traditional, formal curricula (Light, 2002a) and resistance from communities of practice that embrace traditional technique-based instruction protocols (Forrest, Webb, & Pearson, 2006; Nash, 2010).

Methods

Context

The study was conducted at a UK-based higher education institution. Data were gathered from the four-week “games” component of a 10-week module (unit of study). The other components of the module included a four-week “aquatics” component and a one-week outdoor activities residential camp. The module was one of four compulsory modules students complete in the first semester of a sports-related undergraduate course. The course itself is comprised of both compulsory and elective modules with main foci on the science of sports performance and the benefits/challenges of lifelong sport participation. Although not a teacher education course, a minority of students traditionally go on to complete post-graduate study to become physical education teachers and/or sports coaches. The aim of the module was to expose students to fundamental principles of game play, and to include emphasis on the importance of body preparation, skill learning progressions, communication and safe practice. The team-based nature and early semester timing of the module is also used to promote social interaction of students and manage expectations of cooperation in a new (tertiary) environment.

Use of Games Classification

Thorpe, Bunker, and Almond’s (1984) games classification system (invasion, strike/field, net/wall, target) was used to structure learning within the four sessions. Each session

consisted of participants' practical involvement in a different game categorised within the system (see Table 1). Adherence to this structure supports the use of a Game Sense approach to learning as modified and/or conditioned games within a classification often share common tactical problems, thus enhancing strategic understanding and tactical awareness (Hopper & Bell, 2001; Griffin, Brooker, & Patton, 2005). Each practical session ran for approximately 80 minutes out of a 90-minute timeslot.

Table 1

Structure of Learning-based on Thorpe, Bunker, & Almond's (1984) Games Classification System

Week	Games Classification	Game Played
1	Net/Wall	Badminton <ul style="list-style-type: none"> • Singles and doubles played
2	Striking/Fielding	Matball* <ul style="list-style-type: none"> • An inclusive, indoor hybrid game combining elements of softball and rounders, allowing multiple numbers of team mates on a base at any one time and a "friendly feeder"
3	Invasion	Poloball* <ul style="list-style-type: none"> • Hybrid indoor game combining elements of indoor hockey and lacrosse played six-a-side with foam polo sticks and a dense foam ball
4	Target	Varied <ul style="list-style-type: none"> • Participants developed, played, and demonstrated their own game based on Mandigo, Butler, & Hopper's (2007) fundamental principles of target games

* The relatively unknown games of matball and poloball were deliberately chosen to negate participants' previous experiences of pedagogy associated with more common games played within that classification.

A Game Sense approach to learning was utilised in each session (Light, 2006; Webb, Pearson, & Forrest, 2006) with Metzler's (2005) benchmarks for tactical games teaching used to verify implementation. All four sessions followed the same format (see Table 2) with regular opportunities provided for students to engage in peer-led discussion, teacher-led discussion (through individual and group question asking), observation, and individual/group reflection.

Table 2

Format Adopted for All Sessions

Small-sided Games

- Gradual introduction of rules
- Key concepts of space and time integral to game emphasised with each new game progression
- Use of “observation” group—one group of participants (i.e., one team out of three) would consistently be rotated out of play to observe and comment on aspects of game play
- Constant challenge of students through individual and group question asking
- Signposting of opportunities for group discussion/reflection
- Peer coaching responsibilities introduced

Full-sided Game

- Three teams selected—two teams would play the other would observe/discuss game play
- Use of “Freeze” command to stop game play and address cohort on specific occurrences/developments

Group Debrief

- Questions posed regarding perceived and actual development of individual and group, challenges faced, enjoyment of session, confidence in personal game play, and transfer of tactical confidence to another game in the same classification
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Participants

All participants (n = 20) were in their first year of a three-year sports-related undergraduate degree (aged 18–21). From the seven tutorial groups that completed the four-week games component of the module a single tutorial group with 21 students was randomly selected. Twenty out of 21 students agreed to participate in the study. All participants identified having a positive association with physical education at secondary school, a key component in their desire to enroll in the course. All participants' names used in this paper are pseudonyms chosen to protect anonymity.

Data Generation

With institutional ethics approval, data was gathered from all 20 participants via a multiple methods (two-phase) approach. Thus, findings could be accepted with greater confidence (Brewer & Hunter, 1989). Open-ended questionnaires were completed by all 20 participants (100% response rate) prior to involvement in the first scheduled practical

session. Participants were also invited to complete a reflective log after each session with a 50% response rate. Field notes detailing researcher reflections and observations were recorded during and after each session.

Phase 1: Open-ended questionnaire. Four main themes were prioritised in the questionnaire to establish an overall understanding of participants:

- Physical education and/or sports club experiences of different teaching pedagogies (including information on structure of class (i.e., gender segregation, ability grouping)
- Reaction to those pedagogies (i.e., preference)
- Level of game awareness (i.e., tactical and technical skill execution confidence) when playing games of different classification
- Understanding of a Game Sense approach to learning

The data included in the participants' questionnaires were used to support the analysis of information included in their reflective log.

Phase 2(a): Reflective log. Participants were provided with a reflective log, which they were asked to complete after each session detailing their perceptions of the following:

- The session
- The pedagogy (learning approach) used
- Its suitability to the games classification
- Comparisons with previous experiences of learning that game (or similarly classified games)

Each reflective log contained a list of thought-provoking "seed" questions designed to stimulate and guide reflection. Participants were advised that they were not obliged to use these questions and that reflections could be made at any time after relevant sessions. According to MacFarlane (2001) and Jasper (2005), the completion of a reflective log is synonymous with the desired development of critical thinking protocols through promoted connectivity of past and current experience. This notion of connecting past and current experience through reflection to instigate meaningful learning is an extension of Dewey's (1916/1997) work and, significantly, forms the basis of constructivist-based pedagogies such as Game Sense (Light, 2006).

Phase 2(b): Researcher field notes. Individual and group behaviour was observed throughout each practical session with a field log completed to record individual, group, and my own affective responses to the learning environment and prevalence of tactical discussion (including constructive feedback) (Thomas, Nelson, & Silverman, 2005). My combined role of teacher and researcher, supported by the ideals associated with a participatory action research approach (Reason & Bradbury, 2001), was seen to minimise researcher obtrusiveness with participants conditioned to teacher movement and communication as representative of a "usual" physical education/sport training episode (Thomas, Nelson, & Silverman, 2005).

Data Analysis

The qualitative data gathered from questionnaires, participant reflective logs, and researcher field notes were organised and coded via inductive coding procedures outlined by Thomas (2006). Multiple levels of analysis were conducted concurrently whilst data was gathered to identify prominent themes and to discover underlying meanings (Light & Georgakis, 2008; Creswell, 2009). The use of inductive procedures was chosen to allow significant themes to emerge from two separate data sources (from participants and myself as primary researcher) and to reduce raw data gathered into dominant, representative summaries of information (Thomas, 2006).

Results and Discussion

The results are presented here under the three main themes to emerge from the data analysis in regard to student perceptions and my reflections upon the experience as teacher/researcher.

Positive Experiences of Game Play

Data collected from Phase 1 open-ended questionnaires indicated an overwhelming majority of participants having positive experiences of competition and game play throughout their primary and secondary schooling. The participants felt that such positive experiences were the main factors contributing toward prolonged sporting involvement with common reference made to “inclusion,” “fun,” and “friendship.” This lends support to similar studies completed by Light & Georgakis (2006) and Harvey (2009) drawing attention to the importance of the affective aspects of participation in games.

There was, however, also some support for what Thorpe & Bunker (1986) describe as a traditional, technical, teaching approach, although the presence of game-based engagement in each of the examples provided below still exists and strengthens the relationship between engagement in game play and positive experience:

The type of lesson I enjoyed most was when you did skill drills then put them in a game situation... (Rachel, questionnaire)

(I enjoyed) when at the start you worked on skills, then played games/matches at the end. (Harry, questionnaire)

According to Yukelson (1997), participation in an environment that facilitates a positive, cohesive, and supportive group atmosphere more often than not is the basis for a successful team. The development of teamwork is often a central learning outcome and/or key assessment component of most physical education/sport team programmes. However, the use of pedagogies that limit communication and social interaction often fail to provide the necessary learning environment required for effective development of teamwork and ultimately successful skill execution. Research conducted by Harvey (2009) describes how soccer players using Game Sense pedagogy reported a perceived development of communication and teamwork through their involvement in game/match situations. Similar perceptions were documented in reflective logs highlighting numerous opportunities for personal and team-orientated development:

I also enjoyed the games that we played previous to the final that showed the progressions, building confidence and communication in our smaller teams. Meaning when you eventually got to matball you had good communication and teamwork. (Ian, reflective log, session 2)

The session progressed, starting with a warm up which involved working with pairs then switching so I got to work with many people. This was a good way of socializing in the session and developing teamwork skills. Starting to do some games... these increased my confidence within the group. We picked up tactics such as sticking together so we could pass the ball faster, running as soon as the ball was hit, getting space awareness. (Olivia, reflective log, session 2)

Opportunities Provided Through Use of Game Sense

Cognitive engagement. The classification of games by Bunker and Thorpe (1982) was designed to allow the transfer of tactical ideas and relationships across games to improve decision making capabilities (Butler & McCahn, 2005; Webb, Pearson, & Forrest, 2006). It is the sharing of similar tactical problems to be solved that allows for this transfer of tactical understanding between games (Webb, Pearson, & Forrest, 2006). Participant comments below from Olivia and Ian reflect these sentiments and suggest that their exposure to Game Sense pedagogy promoted cognitive engagement through tactical understanding transfer within a games category:

I believe I would be able to transfer my skills I have learnt from poloball, with tactical spacing and transfer it into a game like netball and get the players to stick to separate zones to spread the defense out and greater chance of getting it to the D. (Olivia, reflective log, session 3)

I may take some of the things learnt in poloball, like spacing, into consideration when next playing hockey. (Ian, reflective log, session 3)

Research suggests that deeper learning of Game Sense pedagogy occurs through actual first hand experience of Game Sense pedagogy and reflection upon it (see Light, 2002b; Light, 2002a; Light, 2003; Light & Georgakis, 2008). The incorporation of an “observation” group during small-sided and full games provided participants in this study with a “structured” opportunity to stop, observe, and discuss game play to enhance understanding. This was designed to prevent the occurrence of what Brooker et al. (2000) described as students’ desire to give answers they believed the teacher wanted to hear in order to continue playing. Comments made by Gary and Dave below suggest that appropriate opportunities to engage in deeper cognitive reflection were available, further suggesting the occurrence of what Light (2002a; 2002b) suggests as “higher order thinking.” This heightened cognitive engagement was also demonstrated through their articulation of game specific, contextualised skill execution to advantage personal game play:

I realized when observing that I need a lot more tactical awareness on a badminton court because when playing an experienced player you need to make more of an effort to work the opponent so that they make mistakes. (Gary, reflective log, session 1)

The session has made me realize how games are often a lot more tactical than they appear and time is spent focusing on taking advantage of the opponent's weaknesses as well as on your own play. (Dave, reflective log, session 1)

Gary and Dave's comments also allude to a growing awareness of the need to consider opponents weaknesses as a major influence on the adoption of a particular tactical approach. This supports Harvey's (2009) findings that suggest through the use of Game Sense participants are able to familiarize themselves with opponents strengths and weaknesses in game like scenarios for personal/team advantage. For a minority of participants, however, there were perceptions that limited cognitive development of relevant game play requirements:

Some negative transfer from other sports knocked my confidence slightly... I did not improve my tactical awareness. (Liam, reflective log, session 4)

Of significance, here is the length of time participants were exposed to a Game Sense approach to learning, and in effect, if Game Sense can address issues of negative transfer reported by participants. It is certainly conceivable that participants' perceptions of learning opportunities afforded to them were somewhat limited by the constraints of module delivery, specifically the short four week data capture period. In contrast, Harvey's (2009) study of soccer players' perceptions of learning with Game Sense occurred over a sporting season. This limited exposure to Game Sense and previously attained lack of confidence in playing games from a particular category suggests a longer period of induction is required for participants to begin challenging prior conceptions:

In poloball I didn't think that enough time was given to practice with the stick. Therefore, I wasn't very confident at using the stick and in the big games I didn't participate in them as I normally would, as I didn't want to let the team down because my skills were not very good. Also, as I wasn't confident I didn't enjoy my learning experience, and now would probably not want to play poloball again. (Natalie, reflective log, session 2)

In addition to issues of length of exposure to pedagogy and prior confidence of play within a games category, when referring to the use of a Games Sense approach, Brooker et al. (2000, p. 20) stated that "this new practice was competing for the ground already occupied by the existing curricular practices fashioned over time by tradition." Thus supporting Light's (2002a) comments on the difficulties associated with pedagogical change caused by limitations of traditional curricula and the importance of adherence to a longer term induction regime.

Emotional engagement. As Pope (2005) surmises, it is often the cognitive aspects of understanding in games that enjoy a greater research profile than our pursuit of understanding of the emotional or affective dimensions of game play. From an education perspective, Hargreaves (2003) highlights the positive and negative effect emotion can have on teaching and learning—a central theme in Light's (2003) study into emotion and teaching in games which links positive emotional experience (facilitated by a TGfU approach) to improved understanding of game play. Suggestions of positive emotional engagement and

links to improved game play understanding were also found within participant reflections within this study:

I have never played this sport before...but seemed to always do well (thus) my confidence has increased. (Kevin, reflective log, session 2)

I think the whole games module was well delivered and fun, and it gave me more respect for games players as it made me appreciate how much skill and tactical awareness is needed in a games situation. My confidence has improved... the sessions have increased my desire to participate in games on a more regular basis. (Alexandra, reflective log, session 4)

Alexandra's comment above was also made after initially articulating in the questionnaire an aversion to team games due to "having to depend on others" and "not being one of the group," thus, having a preference for playing individual sports such as "gymnastics or swimming." Her recount of a positive change in experience after only four weeks of exposure to Game Sense pedagogy was also reflected by preservice, primary school teachers in Light's (2002) study over a similar time period. This "sense of belonging, worth and self esteem" that Light & Georgakis (2006, p. 7) describe as being central to learning via a Game Sense approach was evident not only for Alexandra during collective problem solving opportunities, but also as a result of individual interactions between myself and the students.

I am amazed at the domino effect caused by individual engagement throughout the session. It seemed as though every time I instigated one-on-one discussion with a student others would appear with their own questions about their learning. Their viewing of one-on-one attention being provided seemed to provide them with the confidence to take ownership of their learning, which on occasion seemed to be reflected in greater animation and outward reaction to experiences. (Researcher field notes recorded after session 1 conclusion)

These animated responses, resulting from a developing appreciation of the game, were also reported by Light's (2003) study on preservice primary teachers' first experiences of TGfU. Also of significance were the numerous opportunities created by the pedagogy (Light & Georgakis, 2006) to engage in personal and team-based learning without reliance on instruction from the teacher. This sense of learner empowerment is a core justification for the use of Game Sense or other constructivist approaches for learning (Gréhaigne, & Godbout, 1998; Light, 2003; Light & Georgakis, 2006).

I enjoyed talking to and getting to know my opponents... I thought I would be told off for talking and laughing but all that was OK. (Olivia, reflective log, session 1)

We picked up tactics such as sticking together... we picked them up as a team. (Olivia, reflective log, session 2)

Of equal significance were the participants' perceptions of opportunities for meaningful one-on-one engagement with the teacher especially in a time of increased massification of higher education:

Talking is very important. I found this session I was able to seek clarification from (the teacher) whenever I wanted. (Liam, reflective log, session 2)

By the end of the fourth session, it had become apparent that the opportunities for learning provided by the change to a Game Sense approach relied heavily on two areas of learning management. First, how sessions were structured (in this case a small-sided approach adapted from Webb, Pearson, and Forrest (2006)), and second, my posing of questions as teacher to facilitate engagement in tasks appropriate to game awareness development and participant capabilities (Mandigo, Butler, & Hopper, 2007).

Challenges of Effective Questioning

The role of question asking to facilitate deeper tactical and game understanding is critical to the success of Game Sense. Question asking offers participants an opportunity to challenge existing conceptions through verbalisation of thoughts, discussion, and debate (Light, 2003; Light, 2008; Harvey, 2009). Select field notes highlighted the continual challenge faced when formulating and asking appropriate questions to facilitate students' construction of game awareness knowledge:

Appropriate question asking is a difficult skill to master. I need to learn how to do it better...to facilitate construction of knowledge not just share with students my understanding of the situation. Asking appropriate, relevant questions requires greater preparation prior to session as well as the skill to adjust questions in response to game play. (Researcher field notes recorded after session 4 conclusion)

To develop beyond the elementary phase of question asking alluded to in the field notes above adherence to Webb and Pearson's (2008) four main areas of question asking (strategies of play, technical execution, rules of game, and psychological attributes) may provide the necessary structure for improved question asking preparation. Through a focus of questions on these four areas as well as further use of Game Sense pedagogy with different age and ability groups, it is hoped that more effective phrasing of questions results.

Gubacs-Collins (2007) stated that the asking of relevant questions was dependent on tactical understanding of the game being played. But for me, the limiting issue was less about a lack of understanding of the tactical elements of game play associated with each different classification of game and more about the need to trust what Vygotsky (1978) describes as the process of knowledge acquisition through collaborative interaction and the immediate learning environment. My reluctance to trust the learning environment and the process of collaborative knowledge generation has been reported in other studies (see for example, Roberts, 2011) and is clear in my field notes made prior to the first session:

I have not worked with these students before and have very limited understanding of their general approach to study and practical engagement. I am apprehensive about how the sessions will unfold and if the pedagogy will be "accepted." (Field notes recorded prior to session 1)

Research conducted on similar student-centred pedagogies utilising social interaction as a means for learning has presented specific concerns over student knowledge attainment. For example, Wallhead and O'Sullivan (2007, p. 225) reported in their study of a sport education season that "participants failed to learn higher order content during peer teaching primarily due to deficiencies in the student coach's ability to elaborate content through appropriate demonstration, error diagnosis, and task modification." Thus, although there is flexibility in the choice of knowledge construction processes available to Game Sense users (i.e., availability of different teaching approaches) how the learning environment is structured and the experience of the teacher should be key considerations.

My Experience as Teacher/Researcher

Challenges in teaching Game Sense. Some of the challenges to engagement that participants commented on were linked more to the game being played rather than any pedagogical issue. Participants often negatively compared the key skills required for poloball and matball to key skills obtained in other games:

I found the game and techniques hard to master and the equipment hard to use... this made me become de-motivated. (Alexandra, reflective log, session 3)

As my main sport is hockey it was sometimes frustrating when playing, as there was some negative transfer. (Ian, reflective log, session 3)

These comments on negative transfer between games are supported by field notes completed during each of the poloball and matball sessions:

The influence of rounders on decision making during the full game is obvious. This includes batting technique utilised (i.e., stance at plate and one-hand grip). Two students that were "thrown out" after choosing to run on their first missed attempt at bat were lambasted by team mates, yet defended their actions by stating "that's what we are use[d] to." (Field notes recorded during session 2)

The issue of negative transfer between games and the role of TGfU (and Game Sense) in facilitating both positive skill transfer and principles of game play transfer is still one of contention among physical educators and motor learning theorists (McMorris, 1998; Forrest, Webb, & Pearson, 2006). Further empirical research is required in this area to explore the transfer of game play skills and principles between games of similar classification.

Challenges associated with data generation. From a data generation perspective, students recorded varying degrees of reflection in a reflective log limiting potential analysis of certain participants' perceptions of Game Sense. For example, in response to seed question 2: Describe how you felt and what you learnt as a result of the identified pedagogy used during the session (which was included in a cover sheet at the beginning of each reflective log), a range of responses were reported, including the following:

I also enjoyed the games that we played previous to the final that showed the progressions, building confidence and communication in our smaller teams. Meaning when you eventually got to matball you had good communication in your teams. (Ian, reflective log, session 2)

Not much, I still don't like badminton. (Mark, reflective log, session 1)

Yet, as Jasper (2005) suggests, the data generated by reflective accounts (from participants and/or researchers) may come in many different forms or complexities, but when considered with other data, may be more insightful. For example, to supplement Mark's comments from his reflective log above, his completed questionnaire highlighted his lack of exposure during secondary school to net/wall and target games. Thus, although the depth of reflection recorded in the reflective log is limited, when combined with additional data further meaning could be assigned.

Implications

For Teaching Practice

An appreciation for the potential benefits of a Game Sense approach to learning was evident throughout the majority of participant reflections and personal field notes used for this study. In the case of this study, this suggests that Game Sense was effective as a primary learning pedagogy for undergraduate sports students to develop and enhance their own learning. The results also endorse my use of Game Sense to enhance the social interaction opportunities that are vitally important to participants' prolonged sporting involvement. Tentatively moving beyond the limits of this study the wider implications for teaching practice include the use of peer teaching initiatives and the sign posting of group reflection opportunities within the pedagogy to promote deeper learning of game awareness skills.

For My Own Teaching

My previous experience of taking a Game Sense approach to teaching was when I was teaching a junior secondary physical education class during a ten-session unit of striking/fielding games. The all-male class responded positively to the context of game-based learning yet their development of game play awareness and knowledge seemed to me to be somewhat restricted. On reflection, I gave limited in-class time to the students to engage in game-related discussions. With the benefit of a lot more reading about Game Sense and thinking about my use of Games Sense pedagogy in this study with included structured observation/discussion segments that incorporated timely access to discussion opportunities with their peers and myself, I feel that I need to pay greater attention to the facilitation of student to teacher and peer discussion opportunities during periods of game play and of game play observation.

Conclusion

Findings from this study reinforce the importance of positive emotional, affective, and cognitive engagement of learners for their learning and realising the potential that the Game Sense approach holds for facilitating learning. These findings are commensurate with those found in similar studies by Light and colleagues (Light, 2002a; Light & Fawns, 2003; Light & Georgakis, 2006; Light & Georgakis, 2008). Positive experiences of game play through the use of Game Sense are also likely to be persuasive factors in encouraging long term participant involvement in games/sport. The combined use of participant reflections and researcher field notes enabled me to identify opportunities provided by a Game Sense

approach for learning and to foster positive results from both student perspectives and my own as teacher/researcher for the use of Game Sense in a higher education setting. The value of this study to me as the researcher through the analysis of personal teaching practice was supported by a range of participant comments on the appropriateness of the pedagogy and its implementation. Challenges associated with the effectiveness of teacher questioning to stimulate game play knowledge construction were apparent throughout my reflections on each session supporting other research that has identified the challenges involved with questioning in TGfU (Roberts, 2011). Thus, further preparation of questioning in line with Webb and Pearson's (2008) four main areas of question asking is required for improved attainment of learning outcomes. Further empirical research is required to ascertain the role Game Sense may have in limiting negative skill transfer between games of similar classification. Finally, the following field note I recorded at the conclusion of the final session can sum up the impact this study will have on my future teaching practice:

...In essence, the axis upon which my entire approach to teaching at higher education level has shifted. The potential of Game Sense to utilise multiple resources to enhance games learning is significant. It will result in the continued adoption of a learning focus in my sessions, rather than a teaching focus.

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