Investigating games-centred pedagogies to enhance athlete decision making in elite coaching contexts

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Abstract

The purpose of this investigation was to explore how elite coaches used a games-based approach to develop decision making in their performers. The aim of the study was to examine coaches' beliefs surrounding game-based approaches, to explore the mechanisms coaches used to facilitate enhanced athlete decision making and to investigate the nature of athletes' contribution to these mechanisms. Three multi-method case studies were employed comprising semi-structured interviews with the coaches, focus groups with the players and both structured and unstructured observations of multiple sessions. Through the data analysis process two major themes emerged that identified the specific approaches elite coaches were using to develop decision making within their performers i) questioning and group discussions; ii) game play and scenarios. The findings identified that elite coaches who are committed to games-based approaches use similar strategies to develop decision making but often in different ways with varying impact. All coaches attempted to encourage discussions from the performers through questions and developing group debate but there is a balance to establish between coach and performer input to ensure everyone is involved and the players feel the benefit, and value this approach. There was evidence of a lack of understanding from some performers of this approach so coaches must educate the players on their chosen approach to ensure success. Scenarios and small-sided game play were also utilised and used as vehicles for reflective group discussion; however, mediating factors such as time pressure may hinder the deployment of such techniques. Future research should explore more elite contexts to better understand support that both the players and coaches may need to develop this approach successfully and consistently.

Keywords: games-based approaches, questioning, scenarios, game sense, multiple methods

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Introduction

Discourse surrounding the sports coaching process is commonly unfocused, sparse and rarely theory-based (Cushion, 2007a; LeUnes, 2007). Such research over-simplifies the discipline and can be misleading when trying to grasp the sophisticated nature of coaching practice especially in high performance contexts (Cushion, 2007a, 2007b; Occhino, et al. 2014; Voight, 2007). Numerous coaching policy frameworks across the world are suggesting that coaching practice should be based on pedagogically driven knowledge; therefore, it is important to explore the pedagogy of elite coaching (Duffy, et al. 2011). Research surrounding the development of games and team sport pedagogy, has gained significant momentum and enthusiasm with a growth in discourse surrounding an alternative pedagogy with a more holistic focus compared to the predominant 'traditional' skill-based approach (Light & Evans, 2010). Most of the research exploring and challenging the skills-based (or linear) approach to coaching has been drawn from recent developments within physical education which incorporates the application of contemporary learning theory and this innovative pedagogy provides great promise for the development of coaching at all levels (Cassidy, et al. 2009; Evans, 2006; Jones, 2009; Light, 2006; Light & Evans, 2010).

Non-linear pedagogic models and elite coaching practice

Traditional skills-led approaches models the coach directly 'passing on' their knowledge to performers and is predicated on the belief that athletes need to first learn technique in unopposed environments and features carefully structured progressions to increase complexity before these techniques are ultimately being applied to a game; such approaches could be considered to be coach-centred in terms of learning objectives and practice design (Evans, 2006; Ho, 2004). The traditional skills-led approach is thus based on a belief in learning as a linear process; however, the overwhelming consensus of contemporary research (e.g. Evans, 2012; Harvey, et al. 2010; Light,

2013) conceives sports performance to be more than an accumulation of discrete skills and techniques and is more than a simple process of transmission of knowledge from coach to players as passive receptors (Butler & Griffin, 2010; Cassidy, et al. 2009; Jones 2009; Kidman, 2005; Light, 2004; Vinson, et al. 2016). Performers should be seen as more than just a sponge soaking up knowledge and should be coached in a way to encourage their cognitive, affective and psychomotor abilities enhancing decision making aspects, providing them with the ability to recognize cues and produce the desired skill response which can be seen as an essential element of elite level performance (Evans, 2006; Evans, 2012; Light, 2013; Light, 2004).

Contemporary research recommends alternatives to the linear, skills-based, conception of coaching such as the numerous game-based approaches, with four of the most prominent being: Teaching Games for Understanding (TGfU) (Bunker & Thorpe, 1982), Play Practice (Launder, 2001), the Tactical Games model (Mitchell, et al. 2006) and the coaching equivalent; Game Sense (Den Duyn, 1997). These approaches are strongly aligned with constructivist learning theory and conceive the coach more as a partner in learning and as part of an ecological process inseparable from the environment (Light & Fawns, 2003). These approaches make a contribution to the development of tactical understanding, decision-making and the ability to read the game through the use of context-rich environments. For the purpose of this investigation, decision making is considered to be the process where players both individually and collectively attempt to manage disorder whilst facing opposition (Light, et al. 2014). Contextualizing learning within games or game–like scenarios in which players can constantly make decisions by interpreting and adapting to a dynamic physical environment is an important consideration for elite performers (Ho, 2004; Light & Evans, 2010). However, although there appears to be many benefits and positive impacts that can be provided by game-based approaches, there is a lack of research to support their application in a coaching setting at the elite level (Light & Evans, 2010). The shift towards more non-linear forms of coaching

practice is being driven from educational principles and research; however, it is important to realise that most pedagogues are currently continuing to use the traditional skills-based approach and often show a resistance to change the way they deliver as they may perceive the model to be difficult to implement or may not want to move out of their comfort zone (Cushion, 2013; Griffin & Patton, 2005; Harvey, et al. 2010; Light & Butler, 2005; Randall, 2005, 2003). Therefore, considerable work will be required to embed the process of an alternative pedagogy into coaching as definitive plans on how to better educate coaches has not emerged and subsequently many coaches appear reluctant to embrace the athlete-centred style (Evans, 2006; Jones & Turner, 2007; Nelson, et al. 2013).

Adopting a non-linear, games-based approach, involves a considerable change in the position of the coach as it requires a more equal power relationship between the coach and players (Light, 2004; Light & Evans, 2010). This approach requires the coach to devolve responsibility and decision making to players in training resulting in the coach becoming more of a learning facilitator than autocratic director (Evans, 2006; Harvey, et al. 2010; Light, 2013; Light, 2008). However, what this process will look like in an elite setting and how this impacts on the structure of sessions is unclear.

Developing athlete decision making within the elite coaching process

Light (2004) explored the process of non-linear games-based pedagogies in a range of coaching environments, including elite settings, and highlighted the importance of developing players' decision. At the elite level, Light (2004) proposed that decisions made off the ball are equally, if not more important, for the team's success. Decision making skills cannot be taught autocratically by the coach but must be developed by guiding athletes through well planned questions and utilizing context-rich environments (Light, 2004; Light & Fawns, 2003). Light's (2004) study identified that good coaching should produce players who produce 'enacted game knowledge' which is learnt at a subconscious level and embodied over time. The pressure on elite coaches to be the 'all-seeing, all-

knowing' power holder was also evident within research conducted by Evans (2006) who used a case study approach to inquire into the ways elite coaches interpret the term Game Sense and the influence it had on their approaches to training. Evans (2006) concluded that games are used within some elite level contexts but not specifically following the game sense pedagogy reporting that games were used by the coaches to develop match fitness or to test skills in a game environment - having worked on them out of context. Furthermore, questioning is seen as central to the learning process in Game Sense; however, Evans (2006) reported that all coaches in his investigation only utilized questions at the completion of a task. Another study exploring the content of coaching at an elite level involved collaborative action research over an eight week period with one elite level rugby coach in Australia to support the coach in adopting a Game Sense approach and to evaluate the impact a change in pedagogy would have on the players and coach (Evans & Light, 2008). Evans and Light (2008) highlighted that the players had an increased motivation through the adoption of more game scenarios and games in training which raised enjoyment and relevance to the players. Evans and Light (2008) also highlighted improvements in the relationship between the players and coach through an increased interaction which is common from a move to an athlete centred approach as communication moves to a more meaningful dialogue (Light & Fawn, 2003). The players identified an increased sense of decision making through individual feedback and through the coach meeting with players more often which allowed the players to feel involved in the decision making process providing a deeper understanding (Evans & Light, 2008). The change in level of player decision making was outlined by both players and the coach to be important as they now felt like they were allowed input into the session and discussions so the players were allowed to develop a deeper understanding especially towards the aims of different activities and drills (Evans & Light, 2008). However, it was suggested that the coach had some difficulty with the area of questioning which is an important factor of game-based approaches and is suggested to be a common issue for coaches but it is an important aspect as

it allows the coaches to adopt the facilitating role allowing the players to develop decision making skills further (Light, 2004, 2006).

Evans (2012) explored four elite rugby union coaches in New Zealand and their interpretation and use of Game Sense. In comparison to some of the earlier studies all participants in this study had an understanding of Game Sense and actively used small sided games to create learning opportunities and develop physical skills alongside developing players understanding and communication required in a competitive game (Evans, 2012). However, some coaches highlighted that they did not believe all players learn through Game Sense and at times felt the need to push on in training to ensure all areas were covered sometimes neglecting the time for questioning (Evans, 2012); however, the coaches did acknowledge the use of game play to encourage players to find solutions to problems generated by the game (Evans, 2012). Studies to date that have reviewed coaches understanding and implementation of game-based approaches in elite settings have suggested some coaches value the process of game-based approaches but are not always utilising it effectively to develop players with improved decision making (Cushion, 2013; Evans and Light, 2013). Coaches at an elite level raised the concern of how they are perceived within their coaching role if they encourage decision making from the players and a number of the studies identified issues and a lack of understanding of how to utilise questioning to develop decision making further (Cope, et al. 2016; Harvey and Light, 2015). However, when used correctly in elite settings, players can have increased motivation and enjoyment as well as an improved relationship with the coach (Groom, et al. 2012). There are only a few studies in this setting and evaluation of how and if decision making is generated effectively in elite players is still unclear. Therefore, the aims of the present study were to examine coaches' beliefs surrounding game-based approaches, to explore the mechanisms coaches used to facilitate enhanced athlete decision making and to investigate the nature of athletes' contribution to these mechanisms.

Method

This investigation comprised three multi-method case studies featuring experienced coaches working in elite environments. Ethical approval for this study was granted by the University of Gloucestershire Research Ethics committee. This involved two coaches working with senior international teams and the third within a top-tier national league domestic club. All three elite coaches were purposefully sampled through the professional networks of the researchers because they demonstrated a strong commitment to game-based approaches.

CASE 1 - David

Case 1 was an elite ladies hockey team in the English midlands playing in the England Hockey Premier League. The team trained two evenings a week playing a competitive fixture each weekend. Between 16-20 squad members attended training featuring two goalkeepers; the remaining participants were field players. Each training session lasted approximately two hours. The lead coach, David, was an England Hockey Board Level 3 coach with 14 years coaching experience. David's case was selected for the study due to his stated commitment to a games-based pedagogic approach focussing on deep questioning, developing opportunities for collaborative evaluation and 'flipping' the traditional coach/athlete hierarchies. David believed in the use of modified games and re-creating match-related phases of play to create authentic learning opportunities.

CASE 2 - Stewart

Case 2 was an international volleyball team. The lead coach, Stewart, had been a professional coach in a variety of sports before commencing his current role a year prior to the start of the investigation. Alongside his coaching role, Stewart designed and delivered coach education

programmes. Stewart coached the team once a week and had training camps every second week in addition to competitions. Stewarts' case was selected for the study as he highlighted a commitment to games-based approaches. Stewart stated he was also committed to developing an autonomy supportive environment for his performers.

CASE 3 - Mary

Case 3 was an international netball team. The lead coach, Mary, was an ex-international player and worked directly with a team of 14-18 players on two evenings a week with a number of competitive fixtures throughout the season. Mary was selected for the study because she had extensive experience working with all the different age categories in high performance settings. Mary had only worked with her current team for three years but during this time they have seen a considerable improvement in their international ranking. Mary also expressed commitment to game-based approaches within the structure of her sessions.

Research Overview

In order to extrapolate rich data from a variety of perspectives this study used a multi-method case study as this was perceived to offer more depth of understanding and explanation than a single method approach; quantitative data were used to support the findings in the qualitative data (Cresswell, 2003; Partington, et al. 2015). This approach was used as the study attempted to understand connections between both the coach and player's experiences and the structure of the coaching sessions. The range of methods including a semi-structured interview with the lead coach and a focus group with some of the players. This is a method supported by Occhino, et al. (2014) who identified that in order to capture important contextual information, data should be collected from as many perspectives as possible including coach and players. In addition to the interview and focus

group, both structured and unstructured observations were used. Webster, et al. (2013) highlighted no studies exploring the development of decision making in players have used systematic observations to collect descriptive-analytic data before their study even though it is a widely accepted research technique for objectively recording, quantifying and evaluating coaching.

Instrumentation and procedures

The systematic observational tool used was the 14 category version of the Arizona State University Observation Instrument (ASUOI) including the use of first name, uncodeable behaviours and silence, utilising the time sampling element, this tool was utilised for between two to four hours per case study (Lacy & Darst, 1984). Although the development of the observation system MPOWER (Webster, et al. 2013) allows aspects of silence to be categorised as 'demonstrating patience' to sufficiently encompass time to develop player decision making, due to the number of perspectives utilised for this study, information was deemed to not have been missed using the code 'silence' from the ASUOI. The selection of the ASUOI enabled the collection of data on the coach behaviour. The frequency of each of the behaviours was marked with a tally on the recording sheet, and behaviours lasting more than five seconds were marked with a dash to represent a continued behaviour, rather than a new behaviour, allowing the time interval to be recorded. Intra-observer reliability was ensured by the researcher observing the same 20 minute video-recorded coaching episode two weeks apart. The episode was recorded for the reliability process and was not otherwise part of this investigation. Data from the observations were compiled and kappa >0.90 was calculated across both instruments with agreement above 94%. Minor differences in coding were examined by both named researchers and discussed in order to further minimise any future discrepancies. The observer operated for 15 minutes at a time and then rested for five minutes before resuming which continued for two-four hours across one to two visits. In addition to the structured observations the study utilised

unstructured qualitative observations which were recorded as field notes to encapsulate the rich data that was not incorporated by the tool adopted for the structured observations. The unstructured observations were conducted on two to four hours of a coaching session per case study again over one or two visits. The goal of the observations was to ascertain the typical structure of a session, the input from both the coach and the players throughout the session and to observe how the coaches used questions to encourage refection from players. The observations helped to identify the way the coach facilitated discussions and encouraged the level of player decision making.

In addition to the observations, further data were generated by individual semi-structured interviews with each lead coach from the case studies. Interview questions were open ended to encourage greater depth and discussion in response without being leading. An interview guide was constructed, the main areas covered included their coaching background, key characteristics that underpin their coaching, their approach to coaching, structure of sessions, input they encourage from the players as well as some questions generated from the observations. Interviews were conducted either before or directly after training on location over duration of 50 to 75 minutes. One or two focus groups were also conducted with performers in each of the three cases to establish their perceptions of the coaching content and environment. In total, 21 performers participated over four group interviews ranging from 19-36 minutes. Again an interview guide was constructed covering areas such as exploring the players development into their sport and the amount of time they have worked with the current lead coach before progressing onto what they thought about the content of sessions including what they felt they learnt the most from and what if any situations they felt they did not enjoy and were not developing in, and the approach the coach took when coaching. The information gathered was compared with the data from the observations and the interviews.

Analysis

All interviews and focus groups were recorded and transcribed verbatim. The analysis of the transcripts and the unstructured observation notes followed Robson and McCartan's (2016) five stage model which resulted in initial familiarisation of the data, generating initial codes based on the text which were then grouped to represent prominent themes (Robson & McCartan, 2016). This process resulted in the following key themes to be discussed i) questioning and group discussion and ii) game play and scenarios. Descriptive statistics were used to develop a contextual framework of the coaching environment explored. Rate per minute (RPM) was calculated with ASUOI data by dividing frequency by the session length in minutes although, following common precedent within the literature, the 'use of first name' category was considered separately and did not contribute to this calculation. To ensure credibility of the data analysis processes, a number of key features were implemented. Regular discussions on design, data collection and analysis were had between the two members of the research team. Both members of the team have experience of coaching and working with elite performers and coaches. This enabled the authors to more dependably understand the culture, language and competing pressures within the elite environment (Robson & McCartan, 2016).

Results

The thematic analysis revealed two core themes which can help explore the importance of the balance and development of player decision making in an elite games environment. These themes are i) questioning and group discussion and ii) game play and scenarios. All three coaches in this study highlighted that they valued the need to encourage independent performers that were able to make their own decisions and adapt to a changing game environment:

I want them to feel as if they're making good decisions all the time, the right decision and if they get it wrong technically, they should still have the right decision that they made [Stewart (coach) volleyball]

No netball game is ever the same; you need to be the one that makes the decision, you can't rely on me screaming from the side line like a banshee saying do this, do this… so it's about them making   the decisions themselves when they need to but also communicating with the team' [Mary (coach) netball]

Lots of the decisions about how to solve particular tactical problems were left to the players [David (coach) field hockey, Field Notes]

These themes will be discussed using both the qualitative and quantitative data in order to identify how the elite coaches develop decision making in performers.

Questioning and Group Discussions

Questioning has been identified as "one of the central learning intervention tools" for games-based approaches and for developing decision making (Harvey, et al. 2016: 30). However, when compared to previous studies (Cushion & Jones 2001; Potrac, et al. 2007; Potrac, et al. 2002; Smith & Cushion 2006; Vinson, et al. 2016) the ASUOI data for the present study (see table 1.0) revealed amongst the lowest percentage counts recorded for the use of questioning (David n=4, 0.89%, Stewart n=21, 2.21% and Mary n=2, 1.29%). These findings support the concerns of Cope, et al. (2016) that frequency of questioning alone is not a good indicator of quality as it fails to consider the discursive nature of effective questioning approaches. It is suggested that effective questioning should encourage reflection on action through a discussion and critique of performance attempting to cognitively engage performers in debate and refection (Harvey, et al. 2016) which is evident in findings from David:

Table 1. ASUOI coach behaviour frequency, RPM and percentage for David, Stewart and Mary

Categories	Case 1 – David			Case 2 – Stewart			Case 3 - Mary		
	Frequency	RPM	Percentage	Frequency	RPM	Percentage	Frequency	RPM	Percentage
Use of first name	38	0.42	8.46	226	2.51	23.76	16	0.17	10.32
Pre-instruction	19	0.21	4.23	25	0.27	2.63	10	0.11	6.45
Concurrent instruction	23	0.25	5.12	267	2.96	28.08	36	0.40	23.23
Post instruction	8	0.08	1.78	16	0.17	1.68	1	0.01	0.65
Praise	99	1.1	22.05	224	2.48	23.55	23	0.25	14.84
Scold	1	0.01	0.22	8	0.08	0.84	7	0.07	4.52
Hustle	101	1.12	22.49	181	2.01	19.03	18	0.20	11.61
Model +ive	0	0	0.00	9	0.10	0.95	8	0.08	5.16
Model –ve	0	0	0.00	0	0.00	0.00	2	0.02	1.29
Questioning	4	0.04	0.89	21	0.23	2.21	2	0.02	1.29
Management	98	1.08	21.83	49	0.54	5.15	19	0.21	12.26
Physical assistance	0	0	0.00	1	0.01	0.11	3	0.03	1.94
Uncodable	5	0.05	1.11	35	0.38	3.68	10	0.11	6.45
Silence	91	1.01	20.27	115	1.27	12.09	16	0.17	10.32
TOTAL	449	4.98		1177	13.07		171	1.9	

'I will bring everyone around and I will ask individuals for comment or everyone for comment or target individuals for comment and then I will hope to ask some questions that will start conversations between people'. [David (coach) field hockey]

Opportunities were provided for review sessions following activities featuring discussions with players and open forums. Discussions were initiated by the players and support by the coach. [David (coach) field hockey, Field Notes]

This evidence explains the low percentage count of questions used due to the approach the coach has taken to generate levels of debate amongst the performers. Hence, whilst the coach may not have been overtly active, the performers had been provided with an inquiry-led environment allowing deep discussion to explore team strategy and to develop decision making. This approach is supported by the evidence gained from the structured observations as David was reported to have the highest percentage of the three accounting for 'silence' (n= 91, 20.27%). Alongside this, David recorded a very low percentage of all forms of instruction (12.02%) (Which accounts for pre-instruction, concurrent instruction, post instruction, Questioning, physical assistance, positive modelling and negative modelling); other studies have reported ranges of instruction from 27.11%-64.35% (Cushion & Jones 2001, Potrac, et al. 2007; Potrac, et al. 2002; Smith & Cushion 2006; Vinson, et al. 2016). This alongside evidence from the unstructured observations highlighted that the coach was allowing the performers time to reflect and solve the problems without the need to demonstrate any controlling behaviours and make the decisions for the players. The low percentage of instruction from the coach may be explained by David's values:

I believe in the Lynn Kidman principle of trying to empower people and groups within the squad...I try and facilitate discussion between players and small units of players [David (coach) field hockey]

A lot of decision making was left to the players with very little input from the coach during game play. Some participants were very outspoken but within game situations they were all

vocal. During small games the majority of players showed leadership and were all confident.
[David (coach) field hockey, Field Notes]

A games-based approach is only considered to be player-centred if it is constructed to empower players and allow them to have an active role in their learning which could include discussion and reflection time during and after game play which would support David's low count for instruction. Group discussion is key to the development of an environment to develop decision making as collaboration in dialogue as a reflective activity that provides performers with the opportunity to take initiative will form a core part of the learning process as they construct a shared understanding (Butler, 2014; Grehaigne, et al. 2005; Magaeu & Vallerand, 2003). David's commitment to an empowering approach resulted in athletes constructing their own learning by developing their understanding of appropriate decision making as David challenged them to repeatedly interpret situations and solve problems. Stewart also identified a similar belief in the importance of questioning and discussion to David:

I like that idea of just trying to tease something out of somebody, not give them an answer but try to get them to find an answer and that goes alongside the coaching side, court side that I don't want to always be the instrument of solution, I want them to find out ways in which they can do it. [Stewart (coach) volleyball]

Evidence from Stewart suggests that he understands the need to develop decision making in his players and his percentage count for questioning falls into a typical amount of coaching behaviour (Cope, et al. 2016); however, there was limited evidence from the field notes and focus group to suggest this approach is used effectively. Research highlights that the area of questioning is an important factor as it allows coaches to adopt a facilitating role to help players develop decision making skills further, it is also identified to be a common issue for coaches to get right (Cope, et al. 2016; Light 2004, 2006). Stewart attempted to use questioning but at times there were insufficient

questions used or a lack of time allowed for the performers to develop discussion and reflection which may hinder athletes' cognitive engagement. For example, Beni (player – volleyball) said:

> Stewart will ask "why did she do that? tactically that was really good, you should have done it this way because of this this and this … You didn't know actually what you were doing, just did it out of complete chance.

Sometimes, Stewart failed to display sufficient patience by offering solutions immediately rather than probing further and so demonstrated a rather limited appreciation of effective approaches to develop decision making (Webster, et al. 2013). Offering solutions too quickly may prevent the development of more complex forms of thinking and echoes similar studies which identify that an ineffective use of questioning retains the coach as the giver of knowledge rather than developing an environment to encourage decision making (Cope, et al. 2016). Stewart's difficulties reinforce that questioning is a complex process and even coaches with good intentions may need additional support to develop this skill effectively. The questioning approach used by Mary was revealed as similarly convergent in nature:

> Following a period of full game play, players are asked 'If this [your fellow defender is holding her player on one side] happens, what side should you stand?' Two Players respond with a suggestion each. Mary agrees with answers and then tells them how she wants them to stand and move to follow the ball. [Mary (coach) netball, Field Notes]

Here, questions were often used to clarify understanding of what the players were being asked to do, either by other players or by the coach, rather than to explore their understanding of scenarios and experiences they have just had which, would allow them to feel involved in the decision making process and provide a deeper understanding (Evans, 2006). Again this highlights that although questions are being used they are not effectively developing decision making in players through reflection as they are still being instructed by the coach. These findings are supported by the

structured observations that identified that although all coaches suggested they want to encourage independent learners, both Stewart (n=267, 28.08%) and Mary (n=36, 23.23%) had a high frequency of concurrent instruction when compared to David (n= 23, 5.12%) but also other studies such as Potrac, et al. (2002) which recorded concurrent instruction at 24% and highlighted it as 'high' and echoed by Potrac, et al. (2007) who recorded concurrent instruction ranging from 18.87% (n=640) to a high of 29.35% (n=1,296). Potrac, et al. (2007) suggested the coaches in their study exhibited high levels of instruction due to their desire to be in control. It is important that the performers are allowed time to discuss and solve the problem presented by the game/scenario as this will allow them to understand how to play the game more effectively (Light, 2013; Renshaw, et al. 2015). If the coach is directing and providing a lot of concurrent input during set games or scenarios the players will not be developing their decision making. This coaching approach is likely to be a result of the pressure to succeed at an elite level as this level sport can produce stress which can lead to controlling behaviours' (Occhino, et al. 2014, Pelletier, et al. 2001).

All of the coaches in Potrac, et al. (2007) study also provided a high level of 'pre' (ranging from 6.37%-9.85%) and 'post' (ranging from 18.37-26.84%) instruction as well as the high concurrent counts and did not follow an approach designed to develop decision making. Although Stewart had high concurrent instruction there were very low counts of pre (n = 25, 2.63%) and post (n=16, 1.68%) instruction. These pre and post instruction findings are similar to the results of Smith and Cushion (2006) who explored professional coaches who recognised the need for game-based approaches to develop player decision making and recorded 6.29% of pre instruction and 1.95% of post instruction.

> It's like in training he doesn't drill us, we will play 6 on 6 and he will feed balls in from each
> side so it is like game related, and then he will also have balls to throw in so he can give us
> tips on balls and that's when we learn the most from him, when he's standing on the side

coaching us through a game scenario [James (player) volleyball]

James' statement reinforces Stewart's minimal utilization of pre instruction which can allow the players to discover the problem posed by games and scenario's themselves and, there is little post instruction which suggests he guides them to discuss any queries they might have without telling them the answer. The high level of direction and instruction during play however reflects earlier findings and may prevent the players from constructing their own learning and developing fully as independent learners who can make their own decisions, as this requires the coach to devolve responsibility and decision making in training becoming a facilitator through well-structured games that highlight scenarios and game-related problems (Evans 2006; Harvey, et al. 2010; Light, 2013; Light 2008;). This approach appears to be echoed by Mary who also had a higher count of concurrent instruction which was coupled with the lowest count of time recorded as 'silent' (n=16, 10.32%) across the three coaches, which is also low when compared to other studies (Cushion & Jones 2001; Potrac, et al. 2007; Potrac, et al. 2002; Smith & Cushion 2006; Vinson, et al. 2016). This would suggest that Mary was more vocal during the activities; however, the ASUOI data identified this as mainly consisting of both praise (n= 23, 14.84%) and scold (n=7, 11.61%) which are described by Smith and Cushion (2006) to be used as support and encouragement and not input to develop performance. Although Mary had evidence of being vocal during the activities she had an extremely low count of post instruction, 0.65% (n=1), compared to studies such as Potrac, et al. (2002) 26.10%, Cushion and Jones (2001) and even Smith and Cushion (2006) 2.94%. The lack of instruction following activities was noted during the unstructured observations:

> During intervals within scenario play the players were seen discussing tactics and debating
> moves to overcome problem such as; discussing advice with two blue players on how to get
> an interception she missed, players discussing tactics for set moves, defenders discussing the
> best defensive approach to use in this scenario and how to work together. During these

discussions the coach was seen to be walking around the groups and discussions but having no input and not guiding the discussions [Mary (coach) netball, field notes]

The field notes highlighted that the players were heavily involved in group discussion and had opportunities to reflect on their experiences; however, this was not a result of guidance from the coach directly. This is in contrast to literature surrounding game-based approaches which identifies that the coach needs to develop learners' knowledge through questioning (Butler, 1996; Harvey, et al. 2016). The lack of direction and questioning did not prevent discussions amongst the group, it was simply that the discussions were led and developed by the players. It did become evident that the performers didn't always welcome the lack of perceived input to guide reflection from the coach.

I think sometimes she assumes that we all know umm … her saying these simple things and I'm like oh, but I didn't actually know that …, but she assumes that we know it…. but it's just we need to actually practice it with her guidance kind of thing. [Christine (player) netball]

Although this approach demonstrates elements of an environment that will develop decision making as the performers are developing their own strategies and tactics to overcome problems, there is evidence that performers may need to be helped to understand and deal with their newly acquired autonomy (Occhino, et al. 2014, Pelletier, et al. 2001). If a performer is familiar with a directive coaching approach they may need further support to understand the benefits of an autonomy supportive environment and for them to understand the input the coach is having through the process of modifying games and setting certain scenarios. Greater direction through questioning following games/activities may have allowed the players to feel the coach is having greater involvement in their development even if the questions are just a starting point to encourage the discussions. Although David appears to use a more effective questioning approach, there are still a number of challenges that were also evident highlighting the complex nature of effective questioning. For example, Samantha and May said:

I got to the point where I was like 'I can't listen to this anymore' and I need to run around and you just completely switch off and it's not going to benefit us really is it. [Samantha (player) field hockey]

'David maybe lets some people in training forcefully put some of their view more so than others, whereas other people might have something to say that might also be beneficial and it's like you're constantly hearing one voice. [May (player) field hockey]

Samantha's eagerness to return to the (physical) training environment and May's difficulty in being heard revealed some of the challenges of question-based approaches that should be encouraging all to engage cognitively if done correctly. Frustrations with protracted questions and debates may occur because the attempt to develop decision making may be new to many performers and adjustment to this approach can take time thus preventing many from appreciating the learning taking place during discussions in the early stages of exposure to mechanisms such as group discussion. Therefore, as suggested previously a need to educate performers on how to deal with increased autonomy may be required (Occhino, et al. 2014). Although the frequency of questions was low, and there is evidence that not all questioning approaches used were fully enabling of player led decision making, there is evidence that learning conversations were generated through considerable in-depth debate of performers' ideas. These conversations and debates were not wholly dependent on the coaches' questions but were facilitated by alternative coaching strategies and mechanisms such as scenarios.

Game Play and Scenarios

David and Stewart demonstrated a commitment to using modified game play, a game-based approach to delivery, and identified that they have learnt through previous experience and observing other coaches that a technical focus may prevent the players from understanding the complex dynamics of the game.

> Everything I do or try to do is game-based or game-focused and try to use modified or mini games for a particular purpose [David (coach) field hockey]

> I've taken a very strong games-based approach with them and that they understand why they are using the techniques or adapting technique... so it's an understanding of that game and how to construct a game [Stewart (coach) volleyball]

Mary also acknowledged that game play can develop game understanding, identifying that the best way to learn to play the game is by playing. However, through observations Mary's games were constructed mainly as full sided games with game play scenarios often attached rather than a smaller sided modified game.

> I feel the best way to teach people how to understand and how to play the game is by playing the game and sometimes I don't think coaches do it enough. [Mary (Coach) netball].

> At this international [level], it drives me insane that they expect us to play (modified) games. [Mary (coach) netball]

The vast majority of research in contemporary coaching pedagogy strongly supports the use of modified games to facilitate the occurrence of specific scenarios more regularly then they would often appear in full sided game play, in order to challenge athletes physically and cognitively (Harvey & Jarrett, 2014; Light, et al. 2014; Meldrum, 2011). Scenario-based learning is described as an empowering and powerful approach where performers are in control of issues raised and for presenting solutions (Meldrum, 2011). All coaches included in this study attempted to use scenario-based learning in their session to present the performers with challenges that they need to overcome/solve through game play. Data in this study highlighted that two types of scenarios were used; i) play-specific scenarios where players were confronted with a situation from a game:

> Just go through so many different scenarios that could happen with what we are doing and what they are doing [Stewart (coach) volleyball]

56

Or ii) match situation scenarios which identify potential game situations to which the team will need to respond:

> Scenarios were placed on the game play at different stages including "Greens, you are now playing as if you are 7 down" and when the assistant coach calls "last minute" and applies a scenario that they are 2 goals down asking them to now turn the ball over. [Mary (coach) netball, Field Notes]

As evident in these examples, scenario-based learning provides a shared learning context where performers will use their situational knowledge to engage with problem-solving, decision making, evaluation and critical analysis to pursue the task and solve the issue (Meldrum, 2011).This is an important factor because it is suggested decisions made off the ball are equally, if not more important for the team's success and that these skills cannot be taught by the coach but developed by guiding them, by placing them in appropriate contexts to allow them to develop decision making (Light, et al. 2014). Mary used scenarios within delivery but was developing these scenarios to ensure the response from the players was guided by what approach she wanted and not what decision the players' made:

> The way I see coaching is you have a team of people that you are sending out on the court, or field or paddock whatever it is, to do a job for you. How you get them to do that job is you're the coach so it doesn't matter what players you have you are sending them out there with your game plan... ultimately it's the coach's head who sends them out there because they're going to play the style that they want. [Mary (coach) netball]

This highlights that although scenarios are used to encourage players to develop decision making skills by overcoming issues presented to them, their decision making process will be developed and shaped by factors around them such as their team mates and the type of coach or the approach the coach favours within game play. This concept of decision-making 'at action' suggests

all players are part of a team and decisions are inseparable from the immediate situation posed and the larger game situations such as time left in the game, opposition and previous agreed strategy (Light, et al. 2014). Mary used scenarios to develop decision making in a convergent sense – heading to a pre-determined (Mary's) outcome. In apparent contrast, David used scenarios that were developed to allow unexpected responses to emerge as players attempt to solve problems.

> You know the next few things we will do will be game-related or scenario-based sessions; I will let them play a little bit until I can start to see something's emerging [David (coach) field hockey]

David's approach could be said to be partly commensurate with a constraints-led approach (CLA) where the correct solution is expected to emerge through participation (Renshaw, et al. 2015; Renshaw, et al. 2010). Therefore, if a quality environment is developed in a scenario-based approach, it will allow emerging skills and performance to develop which at times may be unexpected. Stewart also presented his players with scenarios but at times this was done through a discussion process and a walk through rather than through using game play and problem solving to develop their decision making. For example, Phillipa said:

> He would give us a lot of scenarios so "the ball comes here this person is here, what would be the best idea then?" [Philippa (player) volleyball]

As evident above this was developed through coaching them through a scenario and at times through questioning but due to the issues raised earlier with Stewarts approach to questioning it didn't always ensure a deeper engagement with learning and development of player decision making. Stewart needs to support the performers through self-reflection and discussion following scenarios/walk through to help develop understanding of the solutions they offer so as discussed earlier he needs to remember to allow them time to develop this and reflect without answering for

them (Harvey, et al. 2016).

Contrastingly, Mary did not utilize either supported discussion or questioning following her scenarios which also helps to explain the very low frequency of questioning identified earlier.

> A set play was being used repeatedly with an overload of attackers so the defenders kept trying options to decide how best to approach the scenario. The players were communicating between attempts whilst resetting and use gestures to each other to signal the approach they wanted to try next until they could repeatedly overturn the ball. No interaction from the coach throughout this process [Mary (coach) netball, Field Notes].

> We just, yeah figured out what we needed to do [Brenda (player) netball]]

This demonstrates that the players developed ideas and solutions themselves either throughout the game play/scenarios or during breaks without the need for guidance from the coach to do this. Meldrum's (2011) study highlighted the importance of the initial explanation as scenarios have been described as potentially confusing and complicated if not developed effectively. Therefore, coaches need to be prepared to allow performers to work through scenarios as this will allow them to construct meaning so they are more likely to develop and learn within the experience (Meldrum, 2011). Therefore, if a scenario is developed well and the players are encouraged to develop potential approaches to solve the problem then they may not need to have direct guidance and support such as questioning to develop discussions although we know from earlier discussions some support for the coach may be useful.

Varying approaches to the use of modified games and scenario based learning at an elite level could be a result of a lack of research into game-based approaches focused on international contexts and a lack of supporting resources for coaches in this area as well as a lack of player-centred pedagogy in coach education programs (Evans, 2006; Light & Evans, 2010). Although David identified that he structures his sessions around game play he does acknowledge that he is still learning and as a result

at times his games can be too complicated; this was echoed by responses in the focus group:

> Sometimes when he thinks about things he makes them [modified games] too complicated, which actually detracts from what he wants as an outcome but he does, he knows when it isn't working...sometimes he kind of just needs to do more basic, yes some of them can be more complicated with bits in but he can build that up as well. [Linda (player) field hockey]

Facilitating the athletes' contribution to the learning environment in order to encourage decision making from the players is complex. All three coaches demonstrated a commitment to developing decision making in the players through a variation of approaches including the use of questions, through group discussion/strategies and through the development of scenarios.

Discussion

This study aimed to; examine coach's beliefs surrounding game-based approaches, explore the mechanisms coaches used to facilitate enhanced athlete decision making and to investigate the nature of the athlete's contribution to these mechanisms. It was clear that all coaches were aware of the benefits of game-based approaches and they all attempted to utilised similar strategies such as questioning and group discussions as well as creating different game play and scenarios to develop decision making but, these approaches varied and some were more impactful then others as all coaches struggled at times to develop a balance between the players and their own contribution.

A key area that emerged through the analysis process was the use of questioning to develop discussion and reflection and although questioning was identified as "one of the central learning intervention tools" for games-based approaches and for developing decision making (Harvey, et al. 2016: 30) it is clear from these case studies that quality of questions rather than quantity was

important. Even coaches that used this process more effectively to generate group discussion, there were still complexities in this process with some players not understanding the value of it, as well as some players finding it difficult to be heard so, additional support and training for coaches to continue to develop this skill is important. There was also evidence to suggest that even coaches that stated they believed in a game-based approach, the pressure for performance at the elite level could result in coaches preferring to maintain control not allow the group time to come to the solution themselves. This again highlights the complex nature of questioning and the difficulty in developing a balance in the learning process between the player and the coach. Questioning is a complex process and even coaches with good intentions may need additional support through coaching resources or coach education programs that include a focus on player-centred pedagogy (Evans, 2006; Light & Evans, 2010) to develop this skill effectively to produce questions that will generate reflection on action through discussion and critique of performance developing cognitive engagement from the performers.

An alternative approach was also discussed where an environment was encouraged giving players time to reflect and discuss any solutions and problems between themselves which was self-directed and not a result of prompts or questions from the coach. This would result in the desired effect of developing reflective discussions but at times the lack of direction or guidance that would come from some initial questions resulted in the players feeling a lack of support and direction. Therefore, further education of the players especially if they are used to a coach lead traditional approach to delivery is required to ensure engagement from all participants and to ensure they value the process of discussions when developing their decision making. Further research into different approaches to questioning and developing group discussions is required at an elite level to identify the balance of input from performers and coach to generate the most effective approach to develop decision making.

In order to generate experiences for the group to reflect upon in their discussions all three coaches in this study utilised game play and scenarios to establish problems to be solved. The use of small sided modified games was suggested as the most effective approach as this will result in a high frequency of certain scenarios and will consequently challenge the players more cognitively (Harvey & Jarrett, 2014; Light, et al. 2014; Meldrum, 2011). The use of scenarios that are either play specific or match play were also impactful for decision making allowing players to develop an understanding of off ball decisions. This is suggested to be skills that cannot be taught but must be developed through the coach guiding them within appropriate contexts allowing decision making to occur (Light, et al. 2014).

The coaches however did have different approaches which resulted in scenarios which the players work through to reach the coaches agreed team strategy or scenarios to allow players to develop sometimes unexpected outcomes. All three coaches are still attempting to develop their chosen approach and at times produced games that were seen as too complicated or they were taking too much control to reach the desired tactic or strategy which prevented the players from developing their own decision making.

The inconsistent approaches demonstrated by the coaches highlights a need for more coaching resources surrounding the development and implementation of game play and scenarios within elite coaching as well as a need for player centred coach education.   A recommendation for further research into different elite contexts will also develop this area of understanding further.

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