ÁGORA para la educación física y el deporte

recibido el 30 de octubre 2014
aceptado el 9 de enero 2015

APPLYING THE EXPERTISE FROM PLAY PRACTICE AND COMPLEXITY PERSPECTIVES TO TRANSFORM COACHING AND TEACHING PRACTICE

APLICACIÓN DEL CONOCIMIENTO EXPERTO DEL «PLAY PRACTICE» Y LAS PERSPECTIVAS COMPLEJAS PARA TRANSFORMAR LA EDUCACIÓN FÍSICA Y EL ENTRENAMIENTO DEPORTIVO

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ABSTRACT

If learning can only be done by the learner, what can the teacher or coach do to facilitate and accelerate this process? This paper presents the ideas and frameworks associated with Play Practice (Launder & Piltz 2013) as a guide to inform and reflect on professional practice in teaching physical education and coaching sport. The insights associated with this innovation have emerged from experts in the field accumulating tens of thousands of hours in the rigors of real world practice. The paper explores the ways in which teachers and coaches can facilitate learning by applying the processes of shaping, focusing and enhancing the play as they design relevant contexts for engagement and learning. Connections are identified between this practical innovation and the contemporary ideas associated with complexity thinking in sport and physical education applied in non-linear pedagogy (Davids, Hristovski, Araújo, Balague Serre, Button & Passos 2014; Ovens, Hopper & Butler 2013). Complexity perspectives recognise teaching and learning as emergent processes taking place within dynamic and complex contexts, where agents adapt and self-organise in relation to a variety of enabling constraints within the individual, task and environment. Practical implications will be investigated in order to provide sport educators with ideas to adopt in order to transform their professional practice.

RESUMEN

Si el aprendizaje solo puede ser realizado por el aprendiz, ¿qué puede hacer el docente o el entrenador para facilitar y acelerar este proceso? El presente trabajo presenta las ideas y marco teórico de *Play Practice* (Launder & Piltz, 2011) como una guía para informar y reflexionar sobre la práctica profesional en la enseñanza de la Educación Física y el entrenamiento deportivo. Las ideas asociadas con esta innovación han surgido de expertos en el campo, los cuales han acumulado miles de horas en los

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rigores del mundo real de la práctica. El artículo explora las formas en que los profesores y entrenadores pueden facilitar el aprendizaje mediante la aplicación de los procesos de modelación, enfoque y mejora del juego mediante el diseño de contextos de aprendizaje relevantes para la involucración y el aprendizaje. Se han identificado las conexiones entre esta innovación en la práctica y las teorías contemporáneas de pensamiento complejo en el deporte y la Educación Física aplicadas en la pedagogía no lineal (Davids, Hristovski, Araújo, Balague Serre, Button & Passos 2014; Ovens, Hopper & Butler 2013). Las teorías de la complejidad reconocen la enseñanza y el aprendizaje como un proceso emergente que tiene lugar dentro de contextos complejos y dinámicos, donde los agentes se adaptan y auto-organizan en relación a una variedad de restricciones facilitadoras asociadas al individuo, la tarea y el ambiente. En el artículo se exponen principios y aplicaciones prácticas para que los educadores deportivos puedan utilizarlos para transformar su práctica profesional.

KEYWORDS. Teaching and coaching; play practice; facilitating and accelerating learning; applying complexity thinking.
PALABRAS CLAVE. Enseñanza y entrenamiento; *play practice*; facilitación y aceleración del aprendizaje; aplicación del pensamiento complejo.

1. INTRODUCTION

'Play Practice' provides a framework to inform professional practice in teaching physical education and coaching sport (Launder & Piltz, 2013). The framework can be used to facilitate learning by applying the processes of *shaping*, *focusing* and *enhancing* to design challenging learning environments for novices or elite participants across a broad range of physical activities and sports. The approach provides insight into the inherent complexities of teaching physical education and coaching sport. It outlines working strategies for sport educators to explore in order to influence levels of engagement, to foster success and to help facilitate learning and enjoyment.

The purpose of this paper is to share the innovation of Play Practice through a discussion of the key concepts, principles and operating frameworks. Key concepts include *alignment*, *engaging positive learning states* and *maximising learning opportunities*. The principles include the processes of *shaping*, *focusing* and *enhancing* the play. The operating frameworks include the model of '*skilled performance*' used to assist coaches and teachers to understand the complexity of skilful play and the '*P's of pedagogy*' a guide to make sense of the complexities of professional practice. Examples will be included to illustrate how concepts apply in practice and to demonstrate how these frameworks have been implemented in Health and Physical Education (HPE) teacher education at the University of South Australia. The paper will briefly report on the efficacy of Play Practice for enhancing professional practice and illustrate its synergy with complexity thinking and non-linear pedagogy (Davids, Button & Bennett, 2008; Davis, Sumara & Luce-Kapler, 2008). These perspectives recognise teaching and learning as emergent processes taking place within dynamic and complex contexts, where agents adapt and self-organise in relation to a variety of

enabling constraints within the individual, task and environment (Ovens, Hopper & Butler, 2013).

A defining feature of Play Practice as an innovative framework for influencing practice is its emergence from professional expertise grounded in the rigors of real world contexts. Expertise built on tens of thousands of hours of reflective experience in teaching and coaching has provided the foundation for the scaffolding of ideas and insights presented in the innovation of Play Practice (Launder & Piltz, 2013). Ericsson (2006) suggests expertise is embodied by emersion in specific and purposeful practice in the relevant field over an extended period of time. Experts develop a refined set of capabilities, they acquire deeper levels of understanding of their specific domain and build rich stores of personal knowledge, all of which can be drawn on seamlessly to respond flexibly to solve problems (Berliner 2001; Côté, Baker and Abernethy 2007; Ericsson, 2006; Syed, 2010). The depth and accumulation of expertise as illustrated in the history and evolution of Play Practice has afforded the creative insight and authentic ideas outlined in this approach (Launder & Piltz, 2013).

> *…to find a method of instruction by which teachers may teach less but learners may learn more…* (Comenius*, Didacta Magna*)

One of the advantages of using the Play Practice processes and frameworks is that they are easy to understand and relatively easy to employ in practice. This is important because teachers and coaches are more likely to commit to transforming their practice if new ideas make sense to them and if they can clearly see how they connect to their own experience.

From the perspective of a teacher or a coach it is important to understand how to facilitate leaning by identifying various strategies of influence and to know why these strategies are applied. The points below illustrate how this processes unfolds.

- Start by analyzing the activity by identifying which elements of skilled play are important in the activity or sport being presented.
- Concurrently consider the nature of the group of students or players you are working with and determine which aspects of skilled performance require emphasis with the specific group especially if they are beginners.
- Next *simplify* the activity to engage learners and ensure that they experience early success.
- Then *shape* the play by manipulating key variables to create specific learning environments in which players can adapt and ensure there is a progressive challenge to accommodate different experience levels. This is termed '*teaching **through** the game*'.
- Consider a *focus* for the game to re-emphasize key concepts, movement outcomes, cues or particular behaviours relating to fair play or resilience. The focus can emphasize any of a broad range of student learning outcomes and it can be implemented using a variety of teaching approaches ranging from an

indirect inquiry, cooperative or a more directed method. This is known as '*teaching **in** the game*'.

- Think about ways to *enhance* the practice by employing various 'tools' to captivate the learner. Enhancing the play influences student engagement and it helps to maintain learner commitment by fostering positive emotional states to maximize enjoyment and improvement.

The initial two processes appear relatively straightforward however they can be the most demanding for teachers and coaches particularly if there is a lack of clarity about the complexities of 'skilled performance'. A lack of knowledge about skilled performance, or a misunderstanding of skilled play can generate a significant barrier for professional practice. An individual's paradigms and thinking has a direct impact on actions and a misunderstanding of the complexity of skilled play by sport educators can severely limit the quality of the learning environments provided to their players. Limitations in individual perceptions influences one's attunement to information sources, the decision making process and the quality of feedback loops operating within the system. Nobel prizewinner, Daniel Kahneman (2011, p. 86) identifies flaws in thinking and the impact of cognitive bias on decision making and actions. He uses the phrase '*what you see is all there is*' to illustrate a particular limitation in individual thinking associated with 'not knowing what you don't know' and how this can seriously influence decision making and actions. Sport educators must be aware of potential limitations in the scope of their paradigms and strive to constantly expand their professional understanding and actions.

Play Practice presents a working framework to assist sport educators to increase their understanding of the complexity of *skilled performance*. By defining key terms and clarifying meaning it encourages a broader perspective of the complexities of skilled play and concurrently expands one's thinking about how to help others to become more skilful. This framework is an 'in house' construct with key elements defined and clarified to assist sport educators to make sense of the complex phenomena of sporting performance. Whilst the various elements of skill appear to be represented as separate entities it is important to remember that all elements of skilled play are dynamic, inter-related and operate in complex ways within specific contexts of any game.

The framework begins by using the term technical ability to describe the actions of players as they 'control and redirect the ball' or object in the game. The term ***technique*** is deliberately used instead of the traditional term skill to describe movement patterns such as the throwing, catching and kicking. This is to eliminate the confusion created when the term skill is used to describe both the specific actions of players and also the overall ability of a player such as someone with 'great skill'. The clarification of the term technique makes it easier for sport educators to recognise the *technical ability* of players and to understand that whilst this is an important element in many ball games, it is only one aspect of skilled performance. In order to play most games skilfully players requires a range of additional capabilities depending on the specific nature of the sport. The framework model of skilled performance suggests consideration be given to the following capabilities.

Agility is what it takes for players to get into the right positions, at the right time in the game. It is often referred to as quickness or 'athleticism' or the 'fundamentals' required for players to get into space efficiently to receive the ball, or to cover the opponent in defense, or to evade defenders. It also allows players more time to attune to the information sources presented in the environment and influence decision making.

Endurance is about a player's ability to 'keep on keeping on'. This element allows players to constantly get into good positions, to maintain high levels of concentration and to consistently maintain technical ability throughout the entire game. Fitness demands vary according to the nature of the sport and sport educators must be considerate of this when designing practice environments to ensure they are aligned with these demands.

Resilience is a critical element of skilled performance as it underpins the player's ability to respond positively to setbacks and to regain focus on the task at hand. For novice participants this element is especially important because making mistakes is integral in learning and participants must be helped to recognize this and respond in a positive manner.

Courage and physical toughness are key elements evidenced in specific sports requiring demands in body contact however courage is required in most sporting endeavour as players cope with the unique challenges presented in the activity. It is important for sport educators to recognise the courage demonstrated by players as they contest for the ball, take a risk to intercept, take on a particular opponent or extend themselves to attain a personal best.

Communication is an element which is particular significant in partner and team games. It is critical for developing team work as defenders and attackers learn to combine to collectively overcome the problems presented by the opponents in the game. Specific communication patterns in interactive team games such as 'help on your left', 'I've got the ball', 'switch' enable defenders to collaborate, to combine their forces in defence. Attackers can be helped to work more efficiently together using calls or signals for specific play patterns or by communicating messages such as 'player on' or 'time' to convey information to their teammates.

A willingness to play fairly. Whilst fair play may not be considered a part skilled performance at a professional level, within this framework it is view as an important platform underlying all participation in sport. The values and actions associated with fair play are perceived as the foundation upon which enjoyment and a sense of achievement are scaffolded.

Game Sense is needed to play skilfully and this aspect of skilled performance it *defined as* '*the ability to use an understanding of the rules, tactics, strategy and of oneself (and of one's teammates) to overcome the problems posed by the sport or by one's opponents*' (Launder & Piltz 2013, p. 16).

Game sense is what players do in the game to demonstrate their understanding as they *read the play* and make decisions in the context of the game. This is facilitated as players read and attune to the affordances, such as the positioning of team mates, the

game context, or specific rules presented in the environment and adapt their behaviours accordingly (Renshaw, Davids, Chow & Hammond, 2010).

By defining game sense in this way and clearly identifying the constituent elements it becomes easier for sport educations to understand the concept and to teach for this by designing game-like contextual learning environments. It is also essential for sport educators to recognise the specific tactical principles of play applicable to specific sports and to recognise how tactics apply at every level of play including beginners. For example, in many interactive team sports player positioning and decision making can be improved by applying the principles of play (Wade, 1997). The attacking principles include knowing the choices of what to do when you have the ball in attack and the choices of what to do when you are in attack without the ball. The defensive principles such as goal side positioning, delaying the ball, support and cover also need to be understood and applied in game like contexts. In addition sport educators must be clear on the differences between strategy and tactics as the terms are often used synonomously. Tactics are applied in every instance in the game where as a strategy determines what specific tactics will be applied within a particular context of the game (Launder & Piltz 2013). For example a team leading by a goal with 1 min to go is likely to apply a different tactic than if they were the team trailing in their endeavours to secure a win in the game.

As mentioned previously there is a continual interaction among all aspects of skilled performance in both individual and teams sports. For example in tennis, the serve and volley tactic can only be used effectively by a player with technical ability to make this happen. In basketball, a team with players who are limited in their outside shooting ability will find defenders sagging off them to clog up the key to stop inside scoring. This interdependence is expressed in the Play Practice mantra '*what is tactically desirable must be technically possible*' (Launder & Piltz 2013, p. 59). It is important for sport educators to recognise how skilled performance involves the melding of game sense and technical ability with other elements of effective play. All of the elements become inextricably bound together, such that deficiencies in one area will influence others. This can be illustrated by considering how an individual plays defence skilfully in basketball. The defender uses game sense to apply the rules and read the attack opponent who is dribbling the ball. They use agility and good footwork to maintain goal side body position and demonstrate effort and resilience to regain position if the attacker makes a break. Finally they use game sense by applying strategy to either play with patience and restraint or risk stealing the ball depending on the specific state of the game.

Sport educators who wish to teach and coach effectively must engage in deepening their understanding of the complex, dynamic interaction associated with effective performance as a vital aspect of their professional knowledge. Novice coaches and teachers can begin by clarifying the elements of skilled performance as this provides a template for analyzing the demands of the sport and it enables similarities and differences to be recognized across sports. The ability to analyze the activity is significant for sport educators as it informs how they facilitate learning by designing relevant environments to improve any component of skilled play.

Pre-service teachers at the University of South Australia learning about the framework of skilled performance reported an improved ability to analyse sports and improvements in their practice (Piltz 2006, 2008a,b). They described how the framework helped them to observe players with a clearer focus and allowed them to analyse what learners were are able to do as a starting point for progressing their learning. Working with the framework influenced their confidence and their ability to plan, progress learning, observe in the game and to provide authentic feedback. It also enabled them to be clearer on the focus for learning, therefore reducing the cognitive stress often experienced by novice teachers and allowing them more time to interact with the students. Additional course evaluation data indicated how the framework improved student understanding of the complexities and interactions of the components of skilled performance across a diversity of sports (Piltz, 2012). Some data from students indicated an increased awareness of fair play and resilience as foundations in skilled performance. This enabled them to transform their practice by emphasizing the importance of these elements when introducing activities to beginning players. Students also reported a better understanding of the differences between beginner and elite performers and were able to provide examples of how to shape the learning environment differently to accommodate the specific needs of the learners. For example, the reasoning for a different configuration of weighted number games. A 3v1 go for goal in basketball designed for beginners to provide a simplified contextual learning environment compared with a 4v5 (defenders) go for goal challenge designed for experienced players looking to extend their ability to manage pressure.

Play Practice provides a detailed analysis of skilled performance in sport foregrounding the inter-relatedness of all elements and highlighting the complexity of skilled play. This is one of the major advantages of the approach because it enables teachers and coaches to determine which elements of skilled play to emphasise as they plan learning experiences for a specific group of players in a particular activity. The framework also makes it easier for teachers and coaches to understand the relationships among different sports and to appreciate the way in which good ideas and methods can be transferred from one to another. For example recognizing the similarities in tactical principles of play in basketball and lacrosse when generating a fast break or applying a settled play. In both of these games it is possible to apply either attack or defense 'transition go for goal' games as key learning experience with slight adjustments made to accommodate the space behind goal and the scoring in lacrosse. Finally, the application of the framework of skilled performance enables critical evaluation of professional practice. It exposes the limitations of out-dated methods that focus almost exclusively on the development of technical ability leaving novice players completely unprepared for the complexities of game play. It also raises questions about the value of approaches that emphasise tactics over technical ability when teaching games.

When teachers and coaches determine which elements of skilled play to emphasize with the specific group of students in their care they must also assess the complexities inherent in the ecology of the class. This is not an easy task as it involves interpreting the dynamic relationships within the class, appraising the diversity of individual experience

and interest levels, plus negotiating the array of social, emotional and cultural factors all of which impact on teaching and learning. This capability is acquired and refined through practical experience in appropriate settings, where knowledge is contextual and the reflective cycle is used continuously to consolidate improvement. Once teachers and coaches have determined the key elements of skilled play to emphasise with their group they can then apply the process of shaping the play to accommodate the diversity of learners in the class. This may include *simplifying the activity* for beginners to engage them in success orientated learning environments or shaping a challenge for participants with broader experience levels.

2. SIMPLIFYING

The process of simplifying the activity starts as the teacher introduces the activity in a safe and engaging way, emphasizing the sheer joy of playing the game or meeting a challenge in order to build self-confidence, resilience and foster the desire to continue (Launder & Piltz, 2013). It involves the concept of *alignment* to ensure a pertinent or contextual learning environment is created to maximise transfer from the practice to what happens in the game (Launder & Piltz, 2013). Representative learning is a key feature in non-linear pedagogy where the essential information is present in order to guide actions and support adaption (Pinder, Renshaw, Headrick & Davids, 2014).

Simplification can be achieved by minimising or eliminating various aspects of skilled play which may generate an overload for beginners. For example agility is often a limiting factor in the performance of beginners in a variety of sports and so by initially minimising the agility demands a more success orientated learning environment can be created. For example, a starting game of target table tennis where a 'block' is located at each end of the table and players score by hitting the target. This simplified game promotes the successful improvement of technique and reading the path of the ball off the opponents bat. This game can be extended to increase the challenge on the players agility by locating two blocks as targets. Adjustments to the space dimensions and/or numbers in games can also enable players to get to the ball more easily. The technical demands can be minimized in activities by altering the equipment, modifying rules or introducing 'working models' in order to allow players to start playing as soon as possible. Tactical demands can be minimised by playing with smaller sized teams and ample play space. Large goals can be used to make scoring easier and an emphasis on the primary rules or conditions of play can also be applied to reduce the tactical complexity. Both the technical and tactical demands of a game can be minimised by giving attackers a numerical advantage for example in 3v1or 5v2 game play (Launder & Piltz, 2013, p. 40).

The same activity may be simplified in different ways in order to engage participants, foster enjoyment and success. An example of this is introducing the game of lacrosse to novices. It can be introduced using a simplified end zone game context where the lacrosse stick is replaced by a grip ball pad and ball. With the technical demands reduced players are able to experience the joy of playing in a game, demonstrating

game sense as they apply the rules and basic tactics of lacrosse. It is also possible to introduce the game through a series of individual challenges using the lacrosse stick and ball. The lacrosse stick is a novel item of equipment and the individual challenge tasks associated with improving technical ability can be fun and engaging as a start point. In both introductions the 'joy of playing' is emphasized through engagement in success orientated learning activities. If the sport educator is clear on the framework of skilled play it is possible to progress the learning environment from either introduction to enable players to adapt and improve all aspects of skilled play in lacrosse. This is significant because it legitimises a variety of possible starting points for learning depending on the activity, the group of learners and the context.

3. SHAPING THE PLAY

A key process in facilitating learning is the ability of the sport educator to shape the play (Launder & Piltz 2013). Games can be shaped by manipulating a large number of variables to develop an array of learning situations that are suitable for every performance level. With beginners, the shaping process is used to simplify games and challenges, whilst at the elite level, thoughtful shaping can be used to replicate real game pressures in practice situations. The idea is to retain the essential feel of the sport by retaining its contextual features and to shape it to improve specific elements of skilled play for specific groups of players (Launder & Piltz 2013). This is supported by the work from ecological perspectives and constraints based, non linear pedagogy where the significance of creating representative learning tasks is highlighted as a key challenge for practitioners. It is important that practice task constraints mimic the actual performance environment adequately in order for the learners to be able to adjust to the relevant demands and decision making in context (Pinder, Davids, Renshaw & Araujo, 2011). An example a shaped game in Netball for more experienced players is a half-court contest with five or even six defenders against four attackers. This game provides the opportunity for players to improve their agility and game sense as they work on successful passing and receiving under increased pressure. A similar half-court game shaped slightly differently with 4 attackers and 3 defenders and a 5 sec possession limit provides a beginning group with similar opportunities but with more time and space to successfully improve their performance.

Shaping the play is an essential capability for teachers and coaches to understand as it is the foundation for designing relevant learning contexts to enable players to adapt, self-organise and for skilfulness to emerge. The process is referred to as 'teaching through the game' and it is seen as the basis for continued improvement for all levels of participation (Launder & Piltz 2013, pp. 41-45). Once teachers and coaches engage in thinking about the shape of the learning games and challenges provided for the diversity of participants in the group they are better able to consider options for differentiating tasks and strategies for increasing student choice and decision making in the shaping process. Renshaw, Oldham & Bawden (2012) also highlight the significance of carefully matching the task constraints to the ability level of the individuals in order to facilitate engagement and success.

Complexity thinking provides a relevant framework for interpreting complex phenomena as exists in teaching physical education and coaching sport. From this perspective learning is recognised as a dynamic process of adaption and self-organisation that emerges for individuals and groups in relation to affordances or opportunities presented within representative contexts (Davids, Button & Bennett, 2008; Bernstein, 1967, as cited in Chow *et al.,* 2007; Davis, Sumara & Luce-Kapler, 2008). Play Practice highlights the importance of alignment in the process of simplifying and shaping the play in order to provide a realistic context for learning (Launder & Piltz, 2013, p.4). It also acknowledges the significance of learner engagement and learner commitment to the adaptive process drawing on Bugelski's (1956) perceptive statement 'learning can only be done by the learner, not by some kind of transmission process from the teacher' (as cited in Launder & Piltz, 2013, p. 7). Finally it recognizes the dynamic influence of socio-cultural factors, group processes, learner interactions and collaboration in the complex learning system. Ovens, Hopper & Butler (2013) suggest individual components exist as independent self-organising agents within complex systems whilst also demonstrating interdependent patterns and relationship with other constituent agents.

From an ecological dynamics perspective learning is perceived as process of self-organisation emerging as interacting constraints within the system are accommodated resulting in transformation from one stable movement pattern to another (Chow, Davids, Button, Shuttleworth, Renshaw & Araujo, 2007). The boundaries or features of the learning settings termed 'constraints' include factors associated with the performer, the environment and the task which act as control parameters or affordances in the system. They have the potential to perturb the system and enable opportunities for the individual to adapt and self organise as new functional movement behaviours emerge. Non-linear pedagogy applies key principles from the constraints-led approach highlighting the importance of designing contextual learning settings where perceptual information and movement couplings are maintained. The dynamic interaction among key constraints provide the platform for self-organisation of functional movement behaviours and consideration of individual differences can be accommodated through variations in the manipulation of task constraints (Chow, Renshaw, Button, Davids & Tan Wee Keat, 2013; Davids, Button & Bennett, 2008; Chow et al., 2007). There are many similarities between the constraints led approach and the concepts and processes outlined in Play Practice (Launder & Piltz, 2013). The concept of alignment outlined in Play Practice is captured in the design of representative learning settings in nonlinear pedagogy. The management of individual needs is accommodated by the manipulation of task contraints in nonlinear pedagogy. In Play Practice it is addressed through 'personalising' the play which is implemented by differentiating the shape and focus of the learning task. Both approaches recognize the significance of catering for a diversity of players by designing success orientated learning environments.

The process of shaping the play in Play Practice or teaching 'through' the game corresponds to the concept of designing learning settings by adjusting the constraints within the task or environment to enable movement behaviours to emerge through self-organisation as espoused in constraint-led perspectives.

When shaping the learning environment in interactive court and field games such as football, hockey or basketball, it is possible for the teacher to manipulate a range of task constraints such as the number of players, the dimensions of the playing area and importantly the ratio of attackers to defenders to create a challenging context to facilitate learning. The design process can be differentiated according to the experience base of the learners by varying the task constraints, in order to trigger the self-organising, adaptive process for a diversity of participants. For example more experienced players can be challenged to adapt to play in limited space such as in a half court Netball game with the task constraint of the number of players adjusted to six defenders vs 4 attackers. The constraints of the number attackers and defenders and the space act as control parameters to enable the system to self-organise and adapt the aspects of skilled play within this context. With novice participants it is important to create a representative task where the parameters of time and space are increased to provide an achievable challenge for the players to adapt to. This can be facilitated by weighting the attacker to defender ratio (4v2) in the same half court space. This enables beginners more time and space to adapt and function in this context and improve game sense and passing the ball. The technical complexity of different sports must also be considered when designing learning environments in order to accurately adjust the constraints to enable the adaptive learning process to emerge. For example in games like basketball, netball or handball, where the technical demands of throwing and catching a large ball using the hands is relatively easy, it is possible to shape the play by providing just a single player advantage for beginners in 2v1 or 3v2 contexts. However in games such as soccer, hockey and lacrosse, where the technical demands are more challenging because the extended stick, smaller ball or the feet being used to control and redirect the ball, the attacker defender number ratio must be adjusted in order to provide more space and time to be skilful. For beginners a 4v1, 3v1 or 5v2 possession games or go for goal games are more suited because the number ratio enables the learners to experience success as the adaptive response is triggered.

There are many other possible constraints for the teacher or coach to manipulate when designing representative learning environments or shaping the play using small sided games. Small sided games provide an aligned and authentic context for learning and they maximising the opportunity for individual participation (Launder and Piltz, 2013). Task constraints such as the rules, special conditions of play, the nature of the goal, the choice in equipment and the system for scoring can be considered when designing learning environments to enable players to improve any aspect of skilled play. When learning to play lacrosse, a condition can be applied to game play that forces the ball to go behind the goal before a scoring shot can be attempted. This condition or specific rule draws attention to this part of the space on the field in lacrosse and it challenges players to adapt to use this important space in the game (Launder & Piltz, 2013, p. 107). In Association Football (Soccer) a variety of shaped games including '5v5 long pitch', 'four goal' and 'two touch' games are other examples of this concept (Launder & Piltz, 2013, p. 98). The two touch game is a shaped game designed for experienced players. Players may only have two touches of the ball at any time. This task constraint challenges players to adapt their play. A game shaped in this manner

eliminates dribbling, encourages good ball control, and forces players to become aware of potential receivers even before they get the ball. It also encourages every attacking player to support the ball player intelligently and to use good calling to communicate how much space and time they have to control and redirect the ball. This game prepares players to inter-pass with speed and accurately especially in the limited space near the opponent's goal and it also progresses to the more advanced progression of the one-touch version of the game which can be used to challenge elite players even further (Launder & Piltz, 2013, p. 98). Many other examples illustrating how the process of shaping can be used to facilitate learning and improve performance at every level of play across a variety of sports is included in Part 2 of the Play Practice publication (Launder & Piltz, 2013).

Button, Chow, Travassos, Vilar, Duarte, Passos, Araujo and Davids (2013) suggest a key role of a physical education teacher or coach is to facilitate the opportunity for self-organising behaviour to emerge in relevant learning contexts. This is undertaken by identifying and adjusting the key constraints within the context in order to stimulate the adaptive process. Similarly, Launder & Piltz (2013) suggest that learning environments can be shaped for racquet sports by selecting variables, or task constraints, associated with the equipment, the playing space, the net height, the scoring arrangement (including targets) and the conditions of play such as the techniques or specific patterns to be incorporated. The design of the learning task will provide the opportunity for the players to adapt and improve various dimensions of skilled play. It is particularly important to consider the level of experience and ability of the participants in racquet sports in order to personalise learning and enable the best opportunity for all participants to experience success. Chow, Renshaw, Button, Davids & Tan Wee Keat (2013) also highlight the need to manipulate task constraints based on an assessment of individual needs and differences in order to challenge learners to achieve success. Launder and Piltz (2013, p. 154) describe how target games can be used to accommodate all levels of experience across a variety of racquet sports. In target games, the scoring system is a key control parameter impacting both on the learning task and also on the psychological state of the learner. Points can only be won by hitting the target, but they can never be lost. For example in target table tennis with beginning players a block about the size of a mobile phone, is place on either side of the table and players use a backhand push to rally the ball aiming to hit the target. This game is shaped to enable novice players to maximize their opportunity to successfully hit the ball. The design of the task supports learning as it minimizing the impact of agility and tactics in this game allowing a focus on technical ability. Target games can be easily 'personalised' by allowing players the freedom to choose and change the equipment, adjust the size of their target and alter the play space based on their individual capabilities or as a result of the score (Launder and Piltz 2013, p. 159). The starting score line can be set to minimise the impact of wide score line margins which can impact on student motivation. For example the game could start at 7-7 in a game played to 11 and once a game is concluded the score can be adjusted according to the result of previous game encounters. This is a strategy for enhancing the play and it is important for building the self-efficacy of beginning player. It is possible to allow players

the autonomy to adjust the shape of their games by adjusting the playing space, or size of the target in order to maintain a close encounter and to extend the diversity of the individuals in the group. Hopper (2011) draws attention to this strategy when he suggests game design can be modified by adaption based on the outcome of each game encounter. This enables the game challenge to be differentiated for a diversity of abilities fostering more equitable game play amongst players with a range of abilities. Launder and Piltz (2013, p.173) explore how games can be shaped to cater for the needs of more experienced players through the use of conditions and bonus points. The game shape can be configured to produce a game-like challenge demanding increased levels of tactical and technical ability and simultaneously extending agility and endurance demands. An example of this in tennis is a game where points can only be won by shots played into the service area. This constrained learning environment encourages players to exploit sharp angles, improve racquet control, it also forces players into rapid changes of direction, quick movement into position and decisions about where to play the ball (Launder & Piltz, 2013, p. 173).

4. FOCUSING PLAY

Teachers and coaches facilitate learning by shaping contextual learning environments to challenge participants and to provide them with opportunities to adapt their movement behaviours to become more skilled performers. This is referred to as teaching through the game. Sport educators can influence this process further and help to accelerate learning using the process of f*ocusing* the play or '*teaching in the game*' (Launder & Piltz, 2013, p. 45). Once an aligned learning task has been designed by shaping the play the teacher can then focus the play by using a variety of strategies to further facilitate learning. From a non-linear perspective it is important that learning tasks are representative of the task constraints of the performance environment (Chow, Renshaw, Button, Davids & Tan Wee Keat, 2013). Similar to the concept of focusing the play, Chow, et.al. (2013) suggest it is possible to further guide students in their search for possible movement solutions by varying the instructional constraints and by using movement- outcome based instructions to prompt an external focus of attention. An example is asking students to loft the ball over an obstacle onto a green when undertaking a chipping challenge in golf. This focus is a source of feedback however it is presented in a way that encourages the learner to focus on the external movement outcome rather than on a prescribed movement form. This enables the learner to draw on, explore and adapt their individual movement patterns accordingly (Peh, Chow & Davids, 2011).

Launder and Piltz (2013) suggest there are a variety of strategies to accelerate learning when focusing the play. The purpose of the focusing process is to support the learner to attain a variety of possible outcomes including improving movement behaviours associated with skilled performance such as increased understanding, a refinement of techniques etc. Broader dimensions of individual development including expanding collaborative capabilities, improving personal responsibility, maintaining commitment or becoming more resilient can also be supported when focusing the play. One way to

focus the play is to provide feedback built into the task. An example of this is asking a player to direct a net kill shot in badminton downward into a hoop target in order to increase the trajectory of the shuttle (Launder and Piltz, 2013, p. 168). This supports the strategy presented in non-linear pedagogy where the instructional constraint of focus of attention is directed to an external movement outcome.

The 'freeze re-play' is an important teaching method to initiate the process of focusing the play. It requires the teacher to analyse the game and identify relevant moments within it where the play can be stopped and paused to reflect on specific contextual situations. A signal can be used to freeze the play. Once players have stopped in the situational context, there is an opportunity to engage in a reflective dialogue of an 'action replay' of the scenario. It is possible for the teacher to focus on the use of space or a specific game concept, or on any aspect of skilled play or to focus on another dimension of participation. Launder and Piltz (2013) suggests the teacher can choose a variety of methods to focus and facilitate learning advocating an eclectic approach (Launder & Piltz, 2013, p. 71). For example, clarifying or probing questioning may be used to draw attention to tactical possibilities and decision making options during the instance of play prior to the freeze replay. The teacher may present data they have gathered whilst observing the game, for example the possession and turnover rate which can then be presented as a problem for the team to attempt to solve in the next play interval. From observations of the game the teacher may suggest individuals focus on changing the outcome of their technique for example flattening out the pass or directing it away from defenders. The game shape might be adjusted by manipulating the environmental constraints adding in a condition that challenges players to adapt their play. For example adding a condition of changing hands with the stick in lacrosse before passing it will increase the opportunity for this behaviour to emerge through self – organisation within the learning setting. Another way of influencing learning is for the teacher to provide 'bare bones' prompts drawn from their analysis of the game. For example, players in the role of the ball carrier in the 3v2 go for goal must work on 'look out of your ears' to improve scanning and reading the play.

Launder and Piltz (2013) suggest when carefully handled, the freeze replay can capture the great teaching moments to re-engage and accelerate student learning. Freezing the play or using short play time intervals or time outs are examples of how constraints of a learning task can be manipulated to facilitate adaption. This is a very effective way of fast tracking the chaotic scramble that is inevitable when beginners play in games where rules or concepts require early clarification within the context of the game. When working with elite players it is possible to create additional feedback loops into the system when applying these methods. These players bring a rich personal experience to informe freeze replay and mini game debriefs. This adds value to the interactions, establishes collaborative feedback and enables individual autonomy. From a complexity perspective, learning systems are characterised by interdependent agents operating with enabling constraints and a variety of feedback loops to influence the actions of the system and impact on emergence (Davis, Sumara & Luce-Kapler, 2008). The process of focusing the play is significant as it provides the opportunity for a variety of feedback loops to be included into the system to support

student learning. Debriefing time during time outs or at the end of short play time intervals fosters the interdependence of learners and the teacher within the system and it increases the opportunity for dynamic interaction which in turn influences the adaptive and self-organising processes.

5. ENHANCING THE PLAY

In addition to shaping and focusing the play, teachers and coaches can also influence learning by applying the process of *enhancing the play* (Launder & Piltz, 2013, p. 46). This is an important process because it relates to engaging and maintaining positive learning states for all participants. Enhancing the play is about individual motivation, and identifying strategies to maximize enjoyment, to maintainin learner commitment and to promote improvement. Individual motivation can be influenced by a range of factors within a complex system comprised of the learner, the learning environment and the teacher. The personality of the teacher (or coach), their ability to design relevant and challenging learning experiences and the relationship they establish with their students are significant. Other strategies can be adopted by the teacher or coach in order to enhance or lift the level of engagement and commitment of the learners in the class. Pre-service HPE teachers at the University of South Australia who implemented a variety of strategies to enhance the play reported fewer management issues in their classes and observed higher levels of engagement, participation and enjoyment (Piltz, 2008b).

Learning tasks that are thoughtfully designed, realistic, game like, and where success is achievable are more likely to engage participants. A fair and balanced game contest is also important and this can be facilitated by ensuring a rotation of opponents, a rebalancing of teams or by an adjustment to the shape of the games. Launder & Piltz (2013, p. 47) have discovered a key strategy for enhancing student motivation in games is to limit the game time to short intervals of about 3-5 min. With playing time limited in this way it ensures the score remains close and it captures the sense of urgency and purpose as the quality of play is lifted. It also reduces the impact of fatigue on performance and promotes focused attention over shorter time spans. The use of 'random-time' creates a novel play structure to increase engagement right from the very start of the game. When using random time in games, the length of each game is unpredictable varying between 30 seconds to 5 minutes and this brings excitement and a heightened commitment to playing effort (Launder & Piltz, 2013, p. 47). Varied and well-paced activities help to sustain player engagement, as does the inclusion of novel tasks and allowing student autonomy in the design of their learning environment. Other strategies such as counting down the time remaining, counting out loud the number of repetitions left or recording and emphasizing individual improvement, can also influence individual effort and persistence. Action fantasy games and exciting culminating events are innovative strategies for enhancing the play which have been well received by pre-service HPE teachers at University of South Australia. Student motivation is enhanced as students adopt a 'cameo' identity of a sporting great, a favourite or international team as they play in a noted sporting event

such as the 'World Cup', 'National Championships' or the 'Playoffs'. This concept has sparked creativity in the design of units of work in Physical Education such as the 'Tour de West Lakes' event based on safe cycling and bike maintenance (Launder & Piltz, 2013, p. 47-50).

The process of enhancing the play draws the attention of sport educators to the importance of a providing a pedagogy for engagement when designing learning environments. This adds another dimension to the way in which teachers and coaches can support the learner and facilitate learning in addition to shaping and focusing processes. Csikszentmihalyi (1990) identifies the significance of enjoyment in fostering internal motivation and he suggests the use of novel, playful environments in which challenges are aligned to the performers' abilities to enable a state of flow to be experienced. The feeling of enjoyment is significant as an internal motivation to sustain engagement and a drive for continued participation. Kretchmar (2005), uses the term 'delight' to describe the joyful state generated when players experience a matched level of challenge. Both authors differentiate fun from enjoyment and align enjoyment with competence, fulfilment and achievement as the basis of intrinsic motivation. Ryan and Deci (2000) suggest that intrinsic motivation can be developed through the embodied enjoyment of movement, which can be facilitated by thoughtfully designed learning experiences enabling the psychological needs for competence, autonomy and relatedness to be fulfilled. The Play Practice approach adopts a learner-centred focus and it harnesses the power of play to engage participants in challenging success orientated learning tasks to foster enjoyment and build intrinsic motivation. The importance of relationship is emphasized as sport educators consider strategies for focusing the play in order to influence learner commitment and accelerate the development of competent and confident players. Play Practice also recognises the importance of creating enjoyable learning environments and positively influencing the learner's motivational state through an array of strategies for enhancing the play (Launder & Piltz, 2013).

The final aspect of Play Practice to be addressed in this paper is the '*P's of pedagogy*' which is a working framework to support the development of the complexities associated with quality teaching (Launder, 1989; 2001; Launder & Piltz, 2013, p. 63-71). The P's framework simplifies the complexities of quality teaching by introducing various components in a way that can be more easily recalled, applied, observed and analysed. Each 'P's' represents a concept which can be clarified in relation to the teaching capabilities and how these factors influence student learning. For example some of capabilities covered in the framework are 'planning, preparation of the learner and the learning environment, presentation of the task, pre-test, provide opportunity for practice which is pertinent, purposeful, playful, progressive paced and personalised. Positioning to provide feedback, praise and projecting poise, patience and passion' (Launder & Piltz 2013, pp. 64-68). This framework provides a platform for pre-service teachers to begin to teach and reflect on their teaching during the initial Lab School classes and into their formal placements in school sites. Pre-service teachers (HPE) at the University of South Australia have successfully applied this framework in their 'Lab School' teaching experience as a part of their professional preparation over an

extended period of time and report positive outcomes in personal confidence and improved competence in their teaching (Garrett, Wrench & Piltz, 2007). Pre-service teachers report on the efficacy of the P's framework to facilitate their understanding of quality teaching and to improve their ability to transform their teaching in a self-determined manner (Piltz 2006; 2008b).

6. CONCLUSION

Teachers and coaches are significant influencing agents operating interdependently in physical activity and sporting contexts. This paper has examined the processes associated with facilitating learning drawing on the innovative ideas emerging from the expertise from Play Practice and the perspectives of complexity thinking and constraints-led, non linear pedagogy. The strategies and frameworks outlined in this paper provide a supportive and empowering guide for teachers and coaches to apply as they plan, reflect and transform their own practice. Importantly, it encourages sport educators to experiment within their unique contexts, to create their own exciting innovations, to reflect critically and contribute to their professional practice.

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