

# Game Sense from Dr. Shane Pill

## Skill

- Technique + Game Context = Skill (Game Sense)
- Reading the play is the skill of identifying and understanding patterns of play. Pattern recognition is a skill and as such, it can be taught and conditioned. Elite decision makers recognition and memory of patterns of play is more detailed and therefore recall is quicker (as the detail is more familiar) and more complete (as the pattern has been remembered in more detail). The additional detail and familiarisation means that the elite player can anticipate (read) what teammates and opponents are likely to do.
- Therefore, knowing what to do, knowing how to do it, and being able to do it are not separate but rather coupled components.
- "Skill, in soccer terms, is the ability to be in the right place at the right time and to select the correct technique on demand. Skill is therefore concerned with making judgements and selections [...] Soccer is predominantly a game of judgement".
- Mosston's wisdom, espoused in 1966 in the original text detailing the Spectrum of Teaching Styles, is that an important 'teaching skill' is knowing when to intervene and how to intervene.

## Game Sense

- Game intelligence, tactical decision making, reading the play, game sense - whatever you call it, it doesn't develop by osmosis by simply being 'on the training track', it requires teaching and development like any other 'skill'.
- The term 'Game Sense' was used by Thorpe and West in 1969 as a description of game intelligence and as a games teaching performance measure.
- The Game Sense approach is described as flexible and 'non-linear' (Breed & Spittle, 2011; Pill, 2007; Light, 2013). After an initial game, a period of reflection occurs. This could be coach/teacher lead, or player-led discussion. Following this reflection, the ideas that emerged could be tested in a return to the game. Another option, is a pause in the game to isolate a micro-component of the game for drill practice before a return to the game to test if the practice has improved game behaviour. Individuals, groups of players, or the practice group might pause from the game for practice depending on the need identified during the reflection. A third option after reflection is the progression to development of game 1 with a modification to increase the challenge point of the game to players. In other words, progress the tactical complexity.
- An essential element of Game Sense coaching is to teach players the logic of the game and how to respond individually and collectively to offense, defense and transition phases of the game when a player is in on-the-ball and off-the-ball game moments.

- In the Game Sense approach student learning is driven by refined use of questioning techniques by the teacher, challenging students to think about, and come to ever more sophisticated understanding and use of, the playing dimensions of time, space, application of force, and game flow or tempo.
- This is not to say closed and open drills are avoided in the Game Sense approach. The pedagogical skill of the teacher is knowing when to use pedagogies like drill practice and play practices to improve player game development, just as it is a skill of the teacher to design or select a game purposefully to present concepts and movement models to learn, refine or consolidate. The Game Sense approach is then not about “throwing out the ball and letting students play”. The pedagogical challenge of the Game Sense approach is in the purposeful design or selection, and then shaping of games to focus the play on the concepts and movement responses to be learnt.
- Purposeful design of games as learning contexts, contexts focusing on developing skill performance, with individual, team and class engagement in cognitive, physical and relational “team” game development is a Game Sense approach. The Game Sense approach focus on shaping play and player development through guided inquiry does not detract from physical development or the development of sport “skills”. Teaching through the Game Sense approach recognizes skill as information-in-action. An idealized technique repeated in an open or closed drill is not “skill”. As information-in-action, skill has meaning within the context of the performance environment where the movement occurs – the context is the game.
- Descriptions of the Game Sense approach generally do not rule in or rule out particular instructional strategies but represent a shift in focus from directive “coach centred” instruction to “player and game-centred” guided instruction.
- It is true that Game Sense coaching has an emphasis on practice sessions where contextual “game-like” practice forms the majority of the practice time. This is in contrast to the more common mechanical and directive approach to training that deconstructs the game into discrete elements which are “rote” trained through repetition in drills during practice eventuating (maybe) in a culminating game like activity to finish practice and lead into the warm-down.
- There is more sophistication to Game Sense coaching than game-like practice.
- However, what I find is that Game Sense coaching is most often miss-understood as the SSG approach. The distinctiveness of the Game Sense coaching approach shift of the role of coach from primarily directive or “command” style coaching to the “sport coach as educator” guiding technical and tactical development through problem solving and inquiry instructional strategies is still not well understood. Game Sense coaching is not simply foregrounding designer games, play practices and match simulations at practice; it is about play with purpose.

- The role of the coach as a designer of games that will be an educative experience facilitated by the coach through inquiry processes such as “tactical timeouts” where the players discuss what is working and what needs to change, and the coach shaping and focusing the play through well considered use of questions to individuals and groups of players begins with the coach having a clear understanding of the “logic” of the game. By understanding the logic of the game the coach can begin to teach players appropriate positioning relative to other team-mates and the opposition. It is my experience that it is coach knowledge of the concept of the game that limits ability to assume a guiding and facilitating rather than directing role.
- When well understood, Game Sense coaching has the advantage of grouping ball watching, player watching and space watching skills together through game-oriented play with purpose to form players understanding of “principles of play”.
- One of the misconceptions of game-based approaches is that technique is not developed. It is the case that movement techniques are initially contextualised as solutions to game problems and players are encouraged to explore movement solutions in games. However, there will be times when a player may require isolation from the game to a drill to help accelerate their movement development. The mastery of the coach/teacher is knowing when, why and with which players the use of a reproductive and/or directive teaching moment is necessary - thereby using drills deliberately to focus attention through rehearsal, and not using drills as a form of 'learning by rote'.
- In summary, play with purpose involves beginning the practice design by choosing a tactical concept for the training session, and then designing a game form to begin the game development (junior or novice players) or match simulation (adult or advanced players) engagement with this concept and to be the organising focus of the practice session.
- The player-centred and game-centred pedagogical nature of the Game Sense approach introduced me to a non-linear example of sport teaching that treated the physical technical movement models and cognitive tactical aspect of play as complementary and integrated - developing thinking players
- Developed to explain how to balance physical development of motor skill and fitness with the development of game understanding. The aim is the development of ‘thinking players’.
- In order to facilitate play with purpose, the teacher/coach becomes a game designer seeking to use a game to purposefully shape player thinking and action. Rushall & Siedentop's (1972) Shaping strategy offers a useful way of thinking about this coaching/teaching action:
  - Know the desired game behaviour
  - Sequence the game progression from simple representation to more complex representation

- Use primes such as questions to focus players thinking and action
- Reinforce learning through volume of engagement - in other words, repetition of exposure to the desired game behaviour
- The Game Sense approach therefore positions the game centrally in the teaching/coaching session by coordinating the activities of the session through an element of game play (eg. maintaining possession of the ball) and by making a game the first engagement of the practice session. The judicious use of questioning is central to the instructional emphasis of the Game Sense approach (den Duyn, 1996, 1997; Thorpe, 1997).
- The Game Sense approach has evolved to comprise three stages of game development. Firstly, fundamental sport skill teaching is initiated through ‘game sense games’. The Australian Sports Commission (ASC) produced the Game Sense Cards resource kit (1999) to assist junior sport coaches use the Game Sense approach with beginning players. The games in this kit were further developed as the Playing for Life Kit (ASC, 2005). Once players have consistency and control of fundamental sport skills the second stage of the Game Sense approach is game development and involves the use of modified ‘small-sided’ and ‘mid-sized’ games. According to Bhaskaran (2000), the small-sided approach involves building through (for example) 1v1, 2v1, 2v2 and 3v3 games. Small-sided games are particularly useful for developing the principles of play related to basic offensive and defensive tactical understanding (Lauder, 2001; Pill, 2007; Wein, 2007). The mid-sized approach involves modifying a sport to the minimum number of players required to play a version of the game, with limited rules and specific rule modifications to emphasise a game understanding and/or a specific component of play (for examples, see: Bhaskaran, 2000; Lauder, 2001; Pill, 2010; Schembri, 2005; Wein, 2007). Where players are ready for more refined game development, the use of ‘designer games’ to “chunk” (Charlesworth, 1994, p. 30) tactical, technical, psychological, competitive and physical skills into an economical package simulating match conditions while honing skills and specific fitness requirements (Charlesworth, 1994) can be implemented. A designer game is then game play deliberately planned to extend game sense skill development through a competitive environment simulating match conditions. The ‘match’ is constructed (or constrained) to achieve a specific game understanding (Charlesworth, 1993). For example: in conclusion, an assumption of the Game Sense approach can be summarised by this quote from Rick Charlesworth: *Any number of training drills can emphasise skills and/or provide physically taxing tasks. However, few offer the continuity of the designer game and none provide the competitive, strategic, distracted and “decision-laden” environment in which to do it* (Charlesworth, 1994, p. 33)
- Three pedagogical tools are integral to the GS approach’s focus on game-based learning:
  - Adapting game structures (such as game rules and play space) to promote, exaggerate, control or eliminate game behaviours;

- Focused use of representative modified game forms suited to the age and/or stage of game development, understanding and physical readiness of the players while retaining the essential tactical structure of the game; and,
- The sport teacher guides player skill learning by guided discovery with questioning.
- In the early mid-2000's I started to use the term Play with Purpose to describe an alternative pedagogical stance to the often common prescriptive and directive instructional style that I observed dominating coaching at junior and senior levels, and physical education teaching. The concept behind Play with Purpose was the deliberate use of game forms and open drills/play practices as learning contexts where the explicit teaching goal is to improve an identified aspect of players tactical and technical game performance. In other words, deliberately improve players 'game sense'
- Game-based coaching literature emphasises the main difference between it and directive practice is the deliberate manipulation of games for a purpose using the pedagogy of game modification. The essential characteristics of games are retained, while aspects of the game are exaggerated, eliminated or reduced (den Duyn, 1997).

## Practice Design

- Role of the teacher or coach as a designer of 'learning spaces'
- **Situational complexity** - develop a model of the situation and the decision making possibilities confronting players. The initial run-throughs may need to be with inactive defense before progressively introducing active defence and more variables to the model depending on the complexity of the model and the stage of development of the players.
- **Option generation** - After the warm-up, move away from having players run in lines and ball movement patterns to the 'marker', to game simulations that use the same strategy but with more than one option available to the on-the-ball player. For example, in an Australian Football game simulation practice the defender peels off their player to take the defensive mark in the left forward pocket, then looks to switch (the strategy) the ball to the opposite side of the ground to the one the ball came in from and is presented with players who 'split' to provide options for the pass laterally to the right side pocket and at 45 degrees to the mark.
- **Make it 'real'** - develop game simulations (designer games or play practices) that incorporate tactical decision making, execution of motor skills under pressure and fitness conditioning rather than treating each component as necessarily separate parts of the training session.
- **Develop 'If-then' thinking** - couple decision making with specific game conditions to create action rules. For example, IF you have the ball and you are accelerating away from

your defender AND your teammate further afield is closely guarded THEN run and carry the ball.

- **Teach cue recognition** - use predetermined cues to help players focus on the information in the environment that is 'important' to enable faster decision making. For example, football players are taught to 'watch the hips' to get early information about opposition players movement intentions and not to 'watch the ball' when moving in to tackle a player.
- In training, we try to replicate both the time and space pressures the game demands so they have the ability to make the right decisions,
- Create practice situations that are representative of the performance context at all levels of game development, described in the literature as information-movement coupling, in order to facilitate transfer of learning from practice to play.
- Involving students in game play is not the end of the story. The play must be purposeful. Students don't learn by osmosis, simply being outside and involved in play. Practice which is structured and deliberately designed to be progressively and coherently complex stimulates learning.
- That is because learning implies improvement and adaptation on behalf of the individual resulting in an improved state of performance. Teachers and coaches therefore have a responsibility to be clear about the target concepts and capabilities that game-play is designed to develop – to structure *play with purpose*. A drill is just a drill – how often in a game of basketball or football do you see players execute a 3-player-weave? When do players run off markers over a set distance to another marker in a game?
- The elements that create the recipe for a “rich” environment where education is the determination of the PE teacher/sport coach that leads to play with purpose are:
  - **Game-centred, but not game only:** Play is the core element of training/lessons, but directive teaching is not excluded. The pedagogical skill is in knowing when and with which students/athletes to use directive teaching methods.
  - **Small-sided game play:** Less players means more game engagement for each player and therefore more opportunity to consolidate movement understanding and capability.
  - **Designer games:** Teachers/coaches can manipulate game constraints (rules and conditions) to focus learning on particular game outcomes.
  - **Teach for transfer:** Transfer from practice to play is facilitated when the practice task is representative of the game context at all levels of game development.
  - **Teach for transfer:** Games from the same game category (Invasion, Target, Net/Court, Striking/Fielding) ask similar “questions” of players from the configurations of play. The tactics and specific strategies developed in response to game “questions” or “problems” learnt in one game/sport can be applied in

another game/sport in the same category, so the PE teacher should deliberately scaffold for this transfer to occur.

- **Guided discovery:** Learning is scaffolded by the deliberate use of questioning to lead players to discover target concepts. When a player discovers a solution they are more likely to retain the new knowledge and understanding than if being told. Being able to shape the play and focus the play on the purpose for play through well designed questioning is an important, but perhaps the most difficult, pedagogical skill.
- **Focus play:** Practice tasks should be purposefully focused on game concepts or tactics.
- The three rules of deep practice to accelerate this process, and the 'code' behind developing talent 'hotbeds' are:
  - 1. Chunk it up - absorb the 'whole thing' first (I see some correlations here to Norman's prototype model - start with a knowledge representation that can be progressively added to), and slow it down to begin with;
  - 2. Repeat it (Coyle connects to Ericsson's research here);
  - 3. Learn to feel it.
- Players let skill performance happen rather than trying to make it happen. Galway discusses how to 'program the self computer' by learning movements through visual and feeling images rather than 'how-to-do-it instructions'
  - Guided inquiry through player problem solving and teacher use of well-considered and targeted questioning
  - Game simplification to represent the tactical logic of the game at the developmental readiness of the learner
  - Modification of game and player constraints (such as rules, boundaries of play, playing implements etc) to focus, shape and direct learning and progress learning
- From the outset, Game Sense teaching and coaching literature described skill as the application of technique in the context of play, therefore tactical, technique and fitness components are taught (at least initially) contextually in a designer game to represent the “whole” and offer means of integrated tactical and technical learning.
- Game development proceed from simple representation of the dynamics of the environment close to the ball using SSGs and gradually increase the complexity of the representation towards greater complexity of on-the-ball and off-the-ball play as players technical and tactical proficiency develop.
- The method was developed by considering the sequence of maturity of player awareness of action in the players environment, by beginning with coaching the immediate vicinity first, and then spreading that awareness to include more players and action further from the players vicinity. It was proposed by Alan Wade, Eric Worthington, Ian Franks, Horst Wein (and others) that game development proceed from simple representation of the dynamics of the environment close to the ball using SSGs and gradually increase the

complexity of the representation towards greater complexity of on-the-ball and off-the-ball play as players technical and tactical proficiency develop.

- SSGs and designer games are one “instructional tool” in playing with purpose during a practice session. Another Instructional tool that moves the SSG approach towards Game Sense coaching is the invasion game principles of play.
- I often discuss the value of playing representative and modified games with novice players, and "match-simulation" and "conditioned" games for play with purpose with more experienced players further along the game development continuum.
- What you do when you play, you need to do at practice, at all levels of game development. The more you make training/practice like the game (that is, like play), the more likely it is that you will both "develop intelligent players" and develop bodily capable players as you will be doing at training what the players have to do when they play - and you will be engaging the players emotionally by making training something they enjoy doing and motivates them to be at training in the first place: that is, playing. I suggest that will bring greater joy and "fun" for participants, and with juniors and youth that may well translate into greater retention of players as well.
- Teaching sport in a reductionist framing of sport as compromising a series of technical actions divorces the technical actions from the context: that is, the technical action is a response to the specifics of the play at that moment. Technical actions need to be stable in that they are repeatable (consistency) and controllable (allowing placement and positioning outcomes from the action) by the player, but they also need to be flexible and adaptable to the performance dynamics of the movement.
- From a coaching perspective, creating moments of advantage by localised disturbances in the system, designed to provide a tactical advantage from which an opportunity to score arises, became a coaching/teaching focus. I quickly understood that these moments cannot be taught in ‘off the line’ or ‘marker based’ drills. It required the use of representative games to create match simulations.
- Wade suggested that individual technique through repetitive practice occur outside of the training from practice. Later in the book, Wade indicated individual technical work may occur in the warm-up phase of practice prior to the training form commencing.
- Equally, coaches who do not understand what Hughes called 'principles of learning' can take players down 'dead-end' or unproductive learning, especially if players are simply left to play without purpose at practice, or the coaching focuses too much on developing the 'pieces of the puzzle' rather than on 'building the jigsaw'.
- Closed drills are those that provide a relatively stable practice environment. For team sports, that means a practice environment where defenders or opposition are removed from the action, or placed in passive roles. Typically, it will also involve narrowing the

focus of the practice to a 'moment' or to an 'action'. Closed drills are often used in "craft sessions" to develop or refine specific movement actions

## General Notes

- Motor skill proficiency, tactical decision making and physical fitness distinguish the elite from the sub elite and recreational player.
- Research is starting to "paint the picture" the more expert the player the more that individual is likely to have accumulated "play" during the athletes developing (age 5-12) and specialising years (12-16).
- I now understand from research in skill acquisition that 'skilled players' have better anticipation and decision making skills. Skilled players are expert decision makers, and often this ability is a result of accumulating more hours in play and game like activities than the players that have not reached this attainment (Williams & Ford, 2013). Coaching that is over-reliant on drill based activities that lack coherence to the complexity of the game context may hinder the development of players, as the players do not get provided the guided and scaffold exposure to the game action sequences that emerge from the complexity of game play to develop the pattern recognition abilities of the skilled performer (Williams & Hodges, 2005).
- Traditional approaches to coaching, foregrounding behavioural replication through command style instruction and practice style pedagogy, is not where the majority of coaching/teaching practice needs to sit when games require performance in the moment, and information is emergent from the situated dynamics of the moment. The 'right type of brain' for the dynamics of the game is not built by reproduction conformity to 'one way of doing things'.
- Digital games provide plenty of practice volume to develop the technical skills, strategic and tactical thinking required to complete the level. Repetition without realising repetition is occurring is present as even though you might be confronting different challenges as you progress through the level, the skills and abilities required to complete the challenges are the same. This permits habits of thinking and acting to occur.
  - Lots of deliberate practice. This means that solutions to problems are well understood before the player is confronted by harder challenges.
  - Focus is on playing. The digital game provides tutorials and practice opportunities that players can exit the game and go to if they choose to do so, but the engagement is focussed on the game play. Games situate the meaning of skill development in the context of the action of the play.
  - Learning is rewarded. As players improve, they can get upgrades – to weapons, armour, special abilities etc and etc. Badges are awarded recognising achievement as new levels of skill and ability are demonstrated by the player as a habit of

behaviour. Players don't wait till the end of the game to get graded and feedback, feedback and reward mechanisms happen continuously throughout the game.

- A skill learning perspective that can help teachers and coaches use similar ideas for deliberate game design is the constraints-led perspective. The constraints-led perspective assists us to understand how modifying for exaggeration, reduction, simplification or elimination of game elements can help teachers and coaches plan for deliberate shaping and focusing of learning through game design that creates play with purpose. Game-centred teaching approaches – such as the Australian Game Sense approach, North American Tactical Games Approach, and UK Teaching Games for Understanding (TGfU) model, all emphasise the special characteristic of modifying games to shape and focus player learning.
- Light (2013) suggested a loose framework of four pedagogical principles identifies GBAs. These pedagogical features are: 1. deliberate design of the game as a physical learning environment; 2. emphasising questioning to promote inquiry and interaction; 3. promoting inquiry through problem solving; and, 4. a supportive environment. It is the second of Light's four pedagogical principles that we argue distinguishes GBAs because the use of small-sided and modified games was an accepted pedagogy for games teaching prior to the explanation of GBAs, and also because teachers do not see small-sided and modified games in GBAs as necessarily different to what they already do (Pill, 2011).
- Generally, descriptions of the GBAs as guided discovery do not specifically stipulate that the discovery of new knowledge must occur, rather they emphasise that the instructional strategy of questioning is central to stimulate thinking or intellectual engagement (Light, 2013) about the game instead of using didactic teaching approaches (Pill, 2013).
- This specificity of momentary conditions creates game events that are unique and inherently variable from moment-to-moment. That is, behaviour is emergent from the dynamics of the moment. The individuality of player ability and how this combines collectively to bring about tactical responses through the system of ball movement in play suggests the need for the coaching of situation-oriented patterns of play based on the classification of teams in offense versus a defence situations. DST can offer a heuristic for the GSA approach by focussing attention on new ways to solve questions of motor development for volleyball competency and expertise as problems of information-movement coupling, which can also be thought of as perception-action coordination of interceptive actions. These are actions that involve coordination between the player's body parts, and/or an object, and/or surface, and/or or target in the environment (Davids et al., 2002) - such as performing a forearm pass in volleyball. The dynamic systems theory postulates that 'purposeful movement' stems from the interaction of the personal coordination dynamics of the player with the task factors and goals, and environmental factors (Ives, 2014). There is a paradox between volleyball

coaching for certainty of players actions through a common optimal movement pattern as a template for movement skill and game unpredictability (Handford, 2006) .

- Sports like tennis have, however, commonly been coached with a technical-before-tactical ‘sport as techniques’ paradigm where skill has been equated with technique. In contrast, the Game Sense (GS) approach emphasises the game as a dynamic and complex system where skill is the demonstration of technique meeting the solution to the configuration of play in the moment (Pill, 2013). GS coaching thus begins from the perspective that “technique + game context = skill” (den Duyn, 1997, p.3) and so the practice of the sport teacher “is game-centred rather than technique centred” (den Duyn, 1997, p.2).
- The traditional coaching approach where learning a stroke typically occurs without a tactical intention, is seen to be deficient as in match play every stroke requires decision-making and is performed with a tactical intent (Elderton, 2009). Players must learn the cognitive skills of problem solving and decision making to guide two basic tactical conditions of the game - shot selection and court position, in order to be successful on the court (Mitchell, Oslin & Griffin, 2013). Consequently, there is increasing appreciation of the value of guided exploration at all levels of game development to develop ‘thinking players’. The development of thinking players is a particular emphasis of the GS approach where “the game becomes the focus of the practice session (rather than the technique) and challenges players to think about what they are actually doing and why” (den Duyn, 1997, p.2).
- "Tactics are modifications or adaptations of play within a team system" (p. 74). In this section of the book, Wade explained why "during a match we should read certain aspects of the opposing team's play. The general pattern of their play should be recognized and, after a while, the styles of individual players noted" (p. 77).
- In Chapter 5, a very "game-based" form of practice is suggested, training take the form of:
  - Match Practice - developing systems of play
  - Small sided games - developing principles of play and tactical possibilities
  - Functional training: phase practice - developing understanding between small groups of players
  - Tactical practice - developing set play
- Chapter 9 "Skill" is interesting in that skill is defined as "the application of techniques in a situation where the player has co-operative possibilities and, at the same time, is opposed by one or more players" (p. 181). Decision-making is stated as "probably the most important single factor in developing skill at the game. It follows therefore, that practice situations must include these elements" (p. 181). In this chapter we read what is essentially a "game-based" approach foregrounding the "considerable importance that a player should understand why a certain aspect of play is necessary as opposed to merely

being shown how it is achieved" (p. 185). In keeping with the training form suggested in Chapter 5, it is asserted that "all coaching should begin with some form of realistic competitive situation"

- Although some illustrations of practice sessions in the book look somewhat "traditional", progressing from warm-up to skill practice to games, Worthington suggested that "initially, the coach should do no more than organise the players to play" (p. 160). This led into one of the key coaching tenets of the text, Realism - "To effect the best transfer from what is done in training session, practices should be used which are similar to those that players face in the game...the more realistic a practice the better the transfer will be" (p. 161).
- In Chapter 7, Worthington set out an explanation for the purpose of what was called "conditioned games", which are different to games where players are allowed to respond "freely" as the coach deliberately restricts the game to change the condition of practice. It is explained that the conditions of games can be purposefully changed in the following ways:
  - Vary the number of players
  - Change the pitch shape or size
  - Change the method of scoring
  - Change the laws of the game
- The "art" of coaching is described as organise, observe, then coach.
- Many coaches focus on the motor development of technical skills and physical development as 'fitness' using drill exercises. Accompanying these activities is an authoritative stance exemplified by an over reliance on prescriptive or 'command' style coaching. Often practice contains nothing that looks like the game players are being prepared to play.
- Grehaigne (and colleagues) have defined strategy as the elements discussed in advance in order that a team organise itself, while tactics are an in the moment of the game adaptation to the opposition. In describing team games as an opposition relationship in which two teams coordinate their actions in order to win the ball, maintain possession of the ball, and move the ball into a scoring position, three 'indissociable' characteristics are described:
  - A group of players confronts another group of players fighting for, or exchanging possession, of an object (which Grehaigne and colleagues describe as a rapport of strength)
  - Players have a choice of motor skills
  - The game involves individual and collective strategies
- A key idea in this paper is that while players can choose to perform only what they know how to do or can do, performance is determined by the players making the most appropriate choice among the various solutions at the players disposal and by the speed

of this decision making. Efficiency during play therefore relies on the player having efficient actions rules and play organisation rules that can aid the in the moment strategic. In this paper, Grehaigne and colleagues refer to Mahlo (1969) when describing techniques as the tools for tactics. The thrust of the argument is that during the game, players need to pay attention to the shifts in configurations of play in order to better understand how the play is evolving. Further, to assist players develop this capacity, novice players should be guided with landmarks that provide them with a reference to probable indicators of the evolution of the situation of play, so that over time they learn to ignore the parameters that are not pertinent in making appropriate decisions. Grehaigne and colleagues propose three types of practice settings to develop this understanding:

- In the book Peak this myth is set aside as Ericsson explains that it is not the hours of practice that are most important, but how the time is used. In this book, Ericsson explains the 'how' and 'why' of deliberate "purposeful practice".
- Deliberate practice is not simply going out to play. Deliberate practice is targeted at a learning path towards improvement. The learning path should be monitored so that the practice can be adapted as and when necessary in challenge point to keep the learner moving along the learning path. According to Ericsson (and others), deliberate practice is assisted when monitored by a knowledgeable 'teacher' (a pedagogical-content expert) able to provide effective feedback at an effective time in an effective manner. Deliberate practice therefore involves 'stretch' out of one's 'comfort zone'. Deliberate practice also assumes effort on behalf of the learner.
- Deliberate practice involves activities that are designed or used for the purpose of improving players performance. The activities may be designed by the learner/s or the teacher or sport coach.
- Ericsson and Pool (2016) set out 5 principles of deliberate practice:
  - The challenge point of the activity provides stretch - participants are pushed to the boundary of their comfort zone. In education terms, we might refer to this as the zone of proximal development
  - The activity has specific, well-defined goals
  - There is effort on behalf of the learner to focus on the defined goals. In education terms, we might say the learning goals are visible and explicit, and Hattie's work on understanding learning has some relevance here
  - There is high quality feedback
  - A mental representation of expertise is developed