Exploration into How Educational Neuroscience May be Used in a Developmental Football Context

Introduction

Education in football in the United Kingdom has historically adopted a model of following traditionally accepted norms towards coaching methodology and philosophy. There has been an insular stance towards academic discourse, research and epistemological practices that can be viewed as ‘outside’ football knowledge (Haywood, 2008; Pain 2010).

My experience as a player, coach, coach-educator and postgraduate student had led me to believe there is an opportunity to use and incorporate evidence-based research from neuroscience and education into more meaningful sessions and programmes within a professional football academy setting. During my experience whilst studying for a Masters in Coaching Science at the University of West of England (Hartpury) I gained a better understanding of motor skill acquisition and took a keen interest in the neurological adaptations that occur during the adolescent stages of footballers when acquiring motor skill and the environments in which it is most conducive.

In this document, I will look to explore and summarise how learning is understood and applied currently in professional football and will discuss potential evidence-based research in neuroscience and education that could be used to influence adapted strategies. This would form the basis for an action research study linking neuroscience, education and professional football coaching.

Background

Having been engaged in the discourse surrounding neuroscience, education and elite football coaching I became aware that perceptions and interpretations of football coaching practitioners of epistemological studies of learning and memory are one of suspicion and scepticism. This section will set to summarise the main areas that will form the basis for further exploration and will attempt to investigate recent cognitive-neuroscientific findings in the context of elite football from ontological and epistemological assumptions underpinning neuroscience and education.

Football and Education

Coaching in England has historically and traditionally shown to have an insular view towards academic discourse and research that can sit outside football knowledge (Haywood, 2008; Pain 2010). Whilst improving more recently includes the sciences of the mind and brain and knowledge within football education could be described as ‘limited’ and treated with scepticism. Psychology within football has been included within the Sports Science department, however, it is given far less priority and resource as the fitness components of the department (Pain and Harwood,2004, p820).

In recent years The Football Association and the Premier League set about focussing on

development programmes in particular how children learn and the methodology to coaching.

The Football Association introduced a Youth Award and the Premier League set up and maintains the Elite Player Performance Plan (EPPP).

The Youth Award sets about challenging football's traditional norms and is identified as the Football Associations blueprint to maintain a focus that it is about players learning, and teaching and teaching practices (Levett, 2014). The overarching aim of the course is ‘It has been designed specifically to help create a highly-skilled, world-class community of youth coaches within the English game by building upon expertise gained within The FA’s Long-Term Player Development Model and working towards improved delivery of high-class technical programmes for young players.’

The Football Association uses a framework to guide their approach called ‘The Four Corner Long Term Development Model’ and consists of Technical/Tactical, Psychological, Physiological and Social components. This framework informs all practices in England and outlines the range of coach education courses and is seen as fundamental to the long-term development plan within the game. The Football Association states that coaches should have an understanding of the four corners and awareness of the interconnected nature of each area, emphasising that each corner ‘does not exist in isolation’. The Football Association emphasises this further through its own publication the Future Game that; coaches to have an understanding of both, developmental processes and appropriate pedagogical methods. In its desire to produce ‘excellent teachers of the game’ the FA states that coaches need to ‘understand the complexity of issues that impact upon player development and develop a sense of what type of environment, practice, coaching method, support or interventions needed for the individual player at certain stages in their developmental journey’ (Future Game, 2010, p. 10). Further, the document states that; ‘providing age-appropriate coaching and support which strives to meet the individual needs of young players at their age and stage of development is fundamental to this process’.

The document further advocates that coaches need to have a detailed knowledge of how children learn and recommend a number of methods to coach; ‘allow players the opportunity to problem solve; present information visually, verbally and kinaesthetically; don’t always offer the solution’. It suggests alongside this a need to develop coaches that can be innovative and creative and who can employ a variety of pedagogical methods. In the Football Associations Future Game document, the terms creativity and decision-making are mentioned multiple times. Neurocognitive research focusing on the brain, creativity, and learning (Howard-Jones et al, 2005; 2008) might be considered beneficial in coach education programmes for football coaches.

The Premier League who governs and fund professional football academies in England set up the Elite Player Performance Plan (EPPP) in 2011. This process was in collaboration with the Football Association set about interlinking with the Football Associations Youth Award (Southgate, 2011). The EPPP’s goal, to create ‘a world-class academy system’ (Roddy, 2017).

Neuroscience and Education

Since the turn of the century, there has been a gathering pace of interest to formulate a better understanding of relationships between cognitive science and education which may develop a clearer understanding of teaching and learning (OECD, 2007).

The council of Educational Research and Innovation of the Organisation for Economic Co-operation and Development (OECD) formed various projects including the one on the learning sciences and brain research. This facilitated collaboration in educational research which included the foundation of the Mind, Brain and Education (MBE) programme which connects cognitive science, biology and education (Fischer et al, 2007). Similar programmes connecting neuroscience, cognitive science and education followed at Cambridge University (Goswami, 2006), Dartmouth (Baird et al,2007) and Bristol University (Howard Jones, 2007).

Writing in 2009, Kurt Fischer, Head of the Mind, Brain and Education programme at Harvard stated ‘what is required is a new approach that connects research and education. More specifically the goal requires joining biology, cognitive science, development and education to create a sound grounding for research in education’ (Fischer, 2009).

In the last decade, moves were made for an new professional category with the relevant skill to formulate the appropriate questions between education and cognitive neuroscience (Gardner, 2008). These educational research specialists have ben coined ‘neuroeducators’ (Gardner, 2008) and ‘neuroengineers’ (Fishcer, 2009). These professionals aim to apply evidenced-based research that is relevant from cognitive science and neuroscience into learning and educational contexts. There needs to be a collaboration where concepts derived from neuroscience can be applied to settings more associated with education (Howard-Jones, 2009). Neuro-educational research attempts to connect social, biological and experiential sources of evidence for understanding the varied influences we associate with learning (Howard-Jones, 2009).

Contextual Challenges

It seems apparent that some of the criteria outlined as being fundamental for teaching and learning in football contexts will resonate in neuro-educational science discourse. This includes psychological and social developmental understanding and the importance of creating positive learning environments where the learners have autonomy and independence in decision making. This is outlined in a neuroscience model that combines behavioural, cognitive and environmental levels of description (Morton and Frith, 1995) and which was built upon with a ‘levels of action’ theoretical framework approach (Howard-Jones, 2006).

Whilst the Football Association and Premier League aspire to develop coaches who become ‘excellent teachers’ with a good understanding of the environment, practice and player development, research suggests that this will be challenging due a lag in evidence-based research and it’s practical use within football academies (Ford et al, 2010). This supports previous work which states coaching behaviours do not reflect scientific advances in understanding skill learning and practice (Farrow et al, 2008; Williams et al, 2005).

Football has struggled to use a less instructional style of coaching/teaching and uses traditional block practice (also known as ‘drills’) which are less pedagogically relevant (Cushion and Jones, 2001). Despite evidence-based research, football avoids using ‘play’ as a form of

practice which Ward et al, 2007 identifies as a highly performance relevant and accurately recreates the cognitive, perceptual and motor demands of competition. This is also supported by motor-skill acquisition specific to football academies (Williams and Ward 2008) and expert performance (Ward et al, 2007).

The disconnect between coach education within the Football Association and Premier Leagues aspirations is further demonstrated by the reluctance to use a less instructional, hands-off approach in which players are encouraged and allowed to problem solve independently from the coach using game-related practices that will promote deeper implicit learning (Davids, et al 2008: William and Hodges, 2005). This is further supported by research in football practice (Farrow et al, 2008; Ford et al 2010) which states coaches rely on emulating coach peers, tradition or previous experience in the sport rather than evidence-based research. This continues the delay between research and practical application in football settings (Williams and Hodges, 2008).

I have noticed through reflecting on my practical work and theory classroom-based work that in current football culture disputes have arisen over on the effectiveness of minimal instruction. Despite many advocating this style which encourages learners to construct essential information for themselves (e.g Bruner 1961: Paper,1980: Steffe & Gale, 1995) there are those who suggest novice learners should be provided with direct instructional guidance. There is strong evidence from effectively designed, controlled experiments and studies thatç support the stance of instructional guidance (e.g Moreno, 2004: Tuovinin & Swelloer, 1999). Browne and Campione (1994) suggest that students in classrooms using just pure discovery methods and minimal feedback often became lost and frustrated. Observations of my own work would suggest that this is my most effective work and is further enhanced when there is a relationship with the players. The deeper the relationship the more nuanced and subtle the interventions become.