



Coach Learning and Development: A Review of Literature

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January 2010

Acknowledgements

The project was conceived and funded by sports coach UK.

The report was researched and written by Christopher Cushion, Lee Nelson, Kathy Armour, John Lyle, Robyn Jones, Rachel Sandford and Claire O'Callaghan representing Loughborough University, the University of Wales in Cardiff and John Lyle Consulting.

The document was reviewed by Julian North and Melina Timson-Katchis.

Sincere thanks to all involved.

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Executive Summary

Introduction

The purpose of this review was to provide an overview and analysis of the existing literature on coach learning. In this context, learning embraces all the processes and structures that enable coaches to construct and develop the knowledge required to engage effectively in their professional practice. The review focused on coach learning, but also explored relevant literature on related topics in education, health, business and professional learning fields.

Methodology

The review utilised a systematic methodology advocated by the Evidence for Policy and Practice Centre. (EPPI). Ensuring the review was systematic and transparent presented challenges, particularly in identifying robust and defensible inclusion/exclusion criteria. This resulted in a tension between inclusion and research that was useful, relevant, and having an impact on the field. For this reason, judgement of value was based on an aggregation of methodological quality, methodological relevance, and topic relevance.

The review had two phases. First a search and screening phase that produced a descriptive matrix of literature. The key words agreed and used for the search were: coach education, coach learning, coach education and learning, professional development and adult learning, with coach education/coach learning always used as linked terms. The search yielded over 1000 returns, with 147 papers read of which 46 met all of the criteria for inclusion in the primary matrix. The search identified additional topics that were used in a secondary search in the areas of medicine/health professions, education and business. This search resulted in 185 papers of which 28 met the criteria for inclusion in the secondary matrix.

The second phase of the review comprised of analysis and synthesis of the included papers to form a review narrative. The narrative writing phase allowed an interpretation of the literature against the initial criteria and overall research questions. To structure the discussions surrounding coach learning and provide a framework to integrate research from other relevant domains, Coombs and Ahmed's (1974) conceptual model of informal, non-formal and formal learning was used. The framework was a pragmatic conceptual tool to help organise a disparate body of literature.

Findings

Learning Theory

Learning is a broad and complex field. It is a contested construct informed by a range of theories drawn from three main approaches: behaviourism, cognitivism and social/constructivism. Therefore, there is no single all encompassing theory of learning upon which to base coach development. Despite having assumptions about learning and built in views of how people learn, approaches to coach learning remain largely and explicitly uninformed by learning theory. Most learning is undertaken within a cluster of ideas or experiences, or the result of the default view for the particular programme.

Evidence of use, implementation and impact on practice from all approaches to learning is not yet available.

- There are significantly different ways of understanding learning.
- There is a relative absence of empirically informed research into coach learning.
- Theoretical eclecticism is preferable to 'the only' (perfect) way. But coach learning needs to be explicit about the assumptions informing it, and how these relate to an understanding of how people learn, and aligns with the objectives of a programme.

Coach learning is influenced by a complex mix of formal, non-formal, informal directed and self-directed learning experiences. However, this developmental mix for coaches is largely individualised and ad hoc. While the literature suggests the balance tends to be toward informal learning, the optimal mix of learning experiences needs to be addressed. In this respect, the research available on coach learning is limited by a tendency to focus on expert or elite coaching practitioners. This group of coaches has been shown to favour self-directed learning and therefore engage in activities to match.

- The research currently gives us little appreciation of the teaching and learning preferences, and needs, of coaches across coaching domains and within the developmental spectrum.

Informal Learning

Informal learning through coaching experience and engaging with other coaches is currently the dominant mode undertaken. This is due to the limitations of current formal provision, the lack of an overarching structure and issues around volunteerism, which combine to encourage a negotiated and individual learning curriculum. This curriculum is not unproblematic, often ignoring underlying power relations and promoting and reinforcing certain ideological interpretations of knowledge and practice.

Experiential learning is defined as being intentional and can be mediated or unmediated. It is different to learning from experience which is largely unintentional. The existing coaching literature does not clarify the extent to which coaches learning from doing is intentional or unintentional.

Reflection is identified consistently in the coaching and related literature as a means to support experiential learning. Reflection has research evidence from coaching and other domains of its efficacy, but not linking directly to coach effectiveness. The research suggests that time and space is required within a learning programme to develop reflective skills, otherwise these are likely to be superficial and uncritical.

Mentoring has been identified as offering both structured and unstructured support for coach learning. Mentoring is widely advocated within all of the domains reviewed. However, the research into mentoring falls short of robust evaluation, but a number of reviews have been undertaken that contain guidance for developing mentoring and mentoring relationships. The impact of mentoring on coach learning needs to be researched.

Situated learning and communities of practice have been identified in coaching and other domains as useful concepts to structure and understand learning. The literature suggests

that the purposeful use of situated learning should recognise that the theory is incomplete. Without attention to power relationships and the learning aims, access to learning opportunities and the scale of learning taking place may be limited. In coaching, communities of practice have been implemented with mixed success. The literature highlights the need to engage a facilitator.

- Reflection, mentoring and situated learning can structure learning, but each of these is not without their own issues. They require time and effort to develop and become embedded into coach learning. They need research evidence linking them to changes in coaching practice.
- It is unclear to what degree coach experiential learning is intentional or unintentional, and a clearer understanding would inform what experiences could be incorporated into planned learning episodes.

Non-formal Learning

The literature reports behavioural coach education interventions and there is a body of evidence supporting the idea that coach behaviour can be manipulated and changed. The evidence of the efficacy of these interventions could be enhanced by research designs that include random assignment to intervention groups, pre-post assessments of coaching behaviour and adequate sample sizes.

Significant research into non-formal learning has been conducted in other domains, most notably investigating continuing professional development (CPD). The review identified several challenges in implementing CPD in coach learning: to design CPD that takes cognisance of the complexity of learning, to ensure professional learning and the professional practice of teaching (coaching) are conceptualised as a single activity, to find better ways of understanding and evaluating the links between different forms of professional development and learning and to understand how best to structure different types of professional development opportunities to meet learning needs.

Formal Learning

External evaluation of formal coach learning is critical, yet to date only one study has considered the impact of formal learning on developing coaches' knowledge and understanding, the impact on coaches' practice, or if the programme matched the expectations of the learner. Formal coach education remains unevaluated. However, research highlighting coaches' experiences and perceptions of formal provision has been highly critical: courses often give little more than a basic understanding; coaches already know about and put into practice much of what is covered; some of the theoretical material covered is considered too abstract from everyday practice to be considered worthwhile; courses can be guilty of trying to cram too much information into a relatively short period of time; and coaches, later in their careers, have come to question much of the information acquired during initial courses. As a result of such experiences, some coaches have admitted to attending later awards only because they are compulsory. It is hoped that the UK Coaching Certificate will address some of these issues.

There is a body of research criticising formal learning for taking an atheoretical approach and not aligning delivery with a view of how people learn. Additionally, this literature has

questioned the conceptual boundaries of coaching, the definitions of what a coach is and the lack of alignment between these and formal learning provision, suggesting that formal coach learning is, in fact, training or even indoctrination rather than education. In response to these criticisms, alternative approaches have been proposed that draw on principles from adult learning. These include reflection and mentoring, and approaches such as problem based learning (PBL). There are no empirical studies in coach learning to show if these approaches would be more effective. In other domains, the evidence is equivocal. The research recommends variety in formal learning but argues there are no prescriptions or ultimate mix of approaches. Noteworthy from the research is that approaches such as PBL and reflection take time to develop and it is questionable if the current duration of formal provision is sufficient to facilitate this approach to learning.

- There has been scant systematic research on the effects of coach learning on improvements in coaching practice or on athlete outcomes. Coach learning needs effective evaluation without which it is impossible to determine what works, why and for whom.
- Coaching needs to engage critically with the central tenets behind the theories and alternative approaches to learning to specifically develop coach learning theory. As with a number of domains, there is a tendency to look at second order research that has taken ideas from first order research. Uncritically recycling theory and learning approaches into coaching runs the risk of compounding limited thinking.

Learning Styles and Expertise

From the large scale reviews of the existing literature and research in a number of domains, the evidence base for learning styles can be considered fragile and often contested. There seems a need to evaluate the theoretical robustness of the research findings and the applicability of these to a coach learning agenda. Indeed, it is important that the assumptions about learning styles should not become axiomatic, but rather an element of learning to be scrutinised as social constructions in an area of developing work. While waiting for this research, an approach of balance and variety seems warranted, with learning styles used as a tool to open up a dialogue about personal development, rather than one of pedagogical impact.

Like the broader expertise literature, the majority of studies considering coaching have centred on the general properties and characteristics of expertise and knowledge. There is less of a focus on the detail of acquisition, development and/or construction of expertise. Consequently, it is difficult to extrapolate meaningful guidance for coach learning. The learning process identified in developing expertise does, however, suggest practical experience and mentoring as mediating factors, and a need to master the relevant knowledge and skills of the domain. The research also suggests the domain specificity of superior performance. The interesting challenge for coaching is the question of whether coaching domains are defined clearly enough to identify the relevant knowledge and requisite skills. This is not currently evident in the coaching literature.

- The expertise literature suggests there is a need for more robust definitions of domains, so that knowledge and skills can clearly be identified to inform curricula. The findings from the coach learning literature can not realistically be stretched to fit across all domains and points in coach development.

- There is currently insufficient evidence to warrant learning styles as a key tenet of coach learning.

Learning Motives and Deterrents

The literature from a range of domains suggests engagement with learning is driven by a desire to acquire knowledge to enhance practical competencies. A lack of this inner drive will contribute towards non-participation, as will issues around time and money. There remains a lack of literature looking specifically at learning motives and deterrents for coach learning.

Coach Learning Research

Although coach learning is developing as a legitimate area of enquiry, the research base informing it has so far largely developed along serendipitous lines. Research has been more influenced by personal and methodological interests of scholars rather than attempting to develop a conceptually orientated and consensual research agenda. There is a dearth of research evaluating the structure, content and provision of coach learning, plus how this directly impacts upon the coaching practitioner. In this respect, there is a need for rigorous examination of content, delivery, assessment and impact upon coaches' professional knowledge and practice.

- The literature investigating learning in coaching and other domains is highly variable in terms of quality and scope. More longitudinal research is required to provide evidence of implementation and impact.

Recommendations

- There are significantly different ways of conceptualising and understanding learning.
- There is a relative absence of empirically informed research into coach learning.
- Theoretical eclecticism is preferable to the only (perfect) way but coach learning needs to be explicit about the assumptions informing it and how these relate to an understanding of how people learn and aligning with the objectives of a programme.
- The research currently gives us little appreciation of the teaching and learning preferences and needs of coaches across coaching domains and within the developmental spectrum.
- Reflection, mentoring and situated learning can structure learning, but each of these is not without their own issues. They require time and effort to develop and become embedded into coach learning. They need research evidence linking them to changes in coaching practice.
- Mentoring plays a key role in informal and formal learning. It can be experienced both positively and negatively and needs more research evidence to identify its impact on practice. The role of mentor's content knowledge on the process and impact of mentoring remains unknown.

- It is unclear to what degree coach experiential learning is intentional or unintentional, and a clearer understanding would inform what experiences could be incorporated into planned learning episodes.

Inferences about coach learning include:

- Learners come with a range of experiences. Experience has a subjective nature, and only has meaning when it is given meaning. Coaches need to understand and build on their existing knowledge and experience.
- Domains need robust definitions with knowledge and skills identified to inform curricula.
- Learning needs to be facilitated in an appropriate environment. Knowledge needs to be contextualised and the mode of learning and the environment should align; for example, reflection and PBL are developed in short superficial learning episodes.
- Coaches need to engage in practice, which needs to be supported. This type of learning, as well as other experiences, need to allow meaningful reflection.
- Learning is largely an individual experience; however, there is currently insufficient evidence to warrant learning styles as a key tenet of coach learning.
- There has been scant systematic research on the effects of coach learning on improvements in coaching practice or on athlete outcomes. Coach learning needs effective longitudinal evaluation without which it is impossible to determine what works, why and for whom.
- Coaching needs to critically engage with the central tenets behind the theories and alternative approaches to learning to specifically develop coach learning theory. As with a number of domains, there is a tendency to look at second order research that has taken ideas from first order research. Uncritically recycling theory and learning approaches into coaching runs the risk of compounding limited thinking.
- The literature investigating learning in the coaching and other domains is highly variable in terms of quality and scope. More longitudinal research is required that provides evidence of implementation and impact.

1.0 Introduction

Traditionally, the coaching environment has been viewed as a place where athletes learn. More recently, however, this context has been thought of as a place in which coaches' learning and development takes place (Cushion, 2006). Learning is an important term as it places the emphasis on the person in whom change is expected to occur or has occurred, and is therefore described as an 'act or process by which behavioural change, knowledge, skills, and attitudes are acquired' (Jarvis, 2004, p. 100–101). Learning can happen through a number of means; for example, through experience, reflection, study or instruction (Nelson et al., 2006). Learning can embrace all of the mechanisms through which coaches acquire the knowledge that informs their professional practice. Jarvis (2004) offers support to this notion stating that 'many different learning processes occur during the human lifespan, but not all of them may be considered educational' (p. 43). Coach learning, therefore, not only occurs inside but outside of educational settings (Nelson et al., 2006; Cushion et al., 2003). Consequently, while the coach learner is the essential element in the learning process, the coach educator is not, as learning often occurs without teaching. With this in mind, learning is the central focus of the review, as it better encapsulates the means through which coaches develop an understanding of their working knowledge.

The purpose of this review is to address the central theme of coach learning. The aim is to draw conclusions that can suggest how learning can be promoted and developed inside and outside coach development structures and interventions. This purpose cannot be separated from the important following questions: What are the assumptions about coaching that inform coach learning? What are the intended outcomes of coach learning? What kind of learning should be promoted? It is important to consider these questions in order to identify a framework or lens through which the literature can be considered. Any consideration of the literature requires a transparency and recognition of the assumptions about coaching practice and coach learning that may inform our beliefs. Indeed, these assumptions need to be set out at the outset as a prelude to the more in-depth analysis that will follow later in the review. The intention at this stage is not merely to define coaching but to provide a brief overview or framework of ideas that can be used as an interpretive tool. With this in mind, this section begins with a consideration of the nature of coaching and goes on to propose aspirations and appropriate outcomes for coach learning.

1.1 The Nature of Coaching

The nature of coaching has become increasingly subject to debate (Cassidy et al., 2004; Cushion et al., 2006; Jones, 2000; Lyle, 2002). This has resulted from the widespread realisation and acceptance that coaches, far from being 'merely technicians' engaged in the transfer of knowledge, are practitioners who engage in a complex sociocultural process that involves a myriad of interacting variables (Cushion, 2007; Gilbert, 2007; Jones, 2000; Lyle, 2007b; Mallett, 2007; Petitpas, 2007). Indeed, there has been a growing appreciation of the subtle idiosyncrasies that make up the coaching process, conceptualising it as multifaceted, dynamic and messy in nature (Cushion, 2007; Jones et al., 2004; Lyle, 1999, 2002).

There has also been increased recognition that there are a number of social pressures and constraints that impinge upon the coaching process; including those that are

ideological, institutional, cultural, ethical and national in nature (Jones, 2000). Power dynamics are an inherent underlying component of this social system and can manifest itself in competing egos and hidden hierarchical structures (Cushion, 2001; Cushion and Jones, 2006; Jones, Armour, and Potrac, 2002; Jones et al., 2004; Potrac et al., 2002; Purdy, Potrac, and Jones, 2008). As a consequence, coaching effectiveness is not dependent upon the efficient application of a sequential process, but on the quality of interactions between coach, athlete(s) and context (Cushion et al., 2006). Coaching cannot be viewed as occurring in a vacuum, but as part of complex realities associated with modern day sporting environments, which involve interactions between individuals of different ages, class, experiences, gender, philosophies, race, and values (Potrac et al., 2002). Hence it has been argued that coaches are social beings that operate in a social environment, with their activities needing to be evaluated, understood, and explained as such (Jones et al., 2003).

Coaching can be considered as a unique occupation that combines a multiplicity of roles (Jones, 2000). These primarily involve a central tenet of improving athlete or team performance, where this performance is tested in competition. However, coaching remains a social activity where practitioners are responsible for balancing individual and collective needs while managing the many and varied dilemmas that inevitably arise from this complex process (Potrac et al., 2000). While coaching has a central purpose (typically intervention to achieve a set of goals) that frames coaches' practice, coaching is not an activity that can be easily reduced to the application of a generic set of rules or be easily presented as a set of predictable processes. Instead, coaching is a dynamic and fluid endeavour (Cushion et al., 2006; Mallett, 2007), inextricably linked to the constraints and opportunities of human interaction (Cushion et al., 2003; Jones, 2000). Coaching is a cognitive activity that requires practitioners to make decisions based upon a multitude of dynamic situational factors (Jones et al., 2003), which are further confounded by a variety of domains within which coaches operate. This is not to suggest that coaching is entirely chaotic in nature and has no visible patterns or regularities (Cushion, 2007; Lyle, 2007b). Instead, expert coaches have been shown to employ standardised routines and cognitive plans to help guide their practices and decision-making processes (Saury and Durand, 1998).

The proposition is that coaching is an ambiguous, complex and dynamic process that requires practitioners to adapt to the given environmental conditions (Nash and Collins, 2006). While it would appear that expert coaching practitioners do in fact use standardised strategies and routines in an attempt to cope with the many varied constraining factors of the coaching process, these routines and strategies are purposely flexible by design, so permitting improvised adaptation to the arising contextual demands (Saury and Durand, 1998). The nature of coaching would subsequently appear to be neither totally reason based nor entirely planned (Cushion, 2001; Jones et al., 2004; Saury and Durand, 1998), but rather an activity where practitioners are continuously adjusting to context in a process that has been coined 'structured improvisation' (Cushion et al., 2006, p. 94).

1.2 The Purpose of Coach Learning

Certification of coach learning demonstrates that coaches have satisfied governing bodies of sports' quality assurance criteria by acquiring and displaying a desired minimum level of competency. An assumption is made that coaches will leave a given

learning episode having the requisite and standardised knowledge, and a battery of strategies, to work effectively as coaches at the level for which they have been prepared. This process suggests an emphasis on formal learning that promotes an instrumental purpose. However, the complex nature of coaching described above, replete with its many subtleties and nuances, seriously calls into question the legitimacy and value of an overly instrumental approach to coach learning and its provision.

Moving beyond this instrumental perspective there have been recent calls for coach learning to develop what have been termed 'imaginative, dynamic, and thoughtful coaches' (Cushion et al., 2003, p. 216). It should encourage practitioners to think creatively about alternative ways of coaching, thus being better prepared to deal with the associated realities of their professional work (Cassidy et al., 2004). These assumptions about the nature of coaching and what coaches need to operate effectively within it, form the lens through which the wider coaching literature has been considered. It should be noted that this interpretation of coach learning is founded on the assumption that the coach will also have a solid base of applied knowledge and experience relevant to sports performance, learning, the technical aspects of the sport, understanding interaction and appreciating the consequences of one's own behaviours in achieving desired ends. Such an approach to coach development and learning should help avoid what Jones and Turner (2006) describe as the 'reality shock' of assuming an actual coaching position within a given coaching context.

2.0 Learning Theory: An Overview

What is learning? There are significantly different ways of understanding learning (Hodkinson et al., 2008). Any understanding relates to how the person is perceived, the nature of reality and the nature of knowledge. In other words, an underlying philosophy exists that informs understanding. It is this underlying philosophy that frames theories, theoretical models, and subsequent practice (Light, 2008; Brockbank and Magill, 2007). Importantly, theory is not value free and cannot be divorced from the wider world of ideology and belief (Jarvis, 2004). All theories of learning are based on assumptions concerning the individual, the world and the relationship between the two.

Merriam and Cafferella (1999) typified the variety of learning theories as behaviourist, cognitive, humanist and social, while Brockbank and Magill (2007) collapsed humanist and social theories seeing them simply as constructivist. Alternatively, Anderson et al. (1996) and Greeno (1997) capture learning theories as opposed epistemological couples and classify theories as cognitive or situational. Sfard (1998) takes a similar stance and examines contrasting root metaphors for learning as acquisition and as participation. This overview considers behaviourist, cognitive and constructivist theories of learning.

2.1 Behaviourism

Behaviourists focus on the outcomes of stimulus, without necessarily attending to social meaning (Brockbank and Magill, 2007). There are two main forms of behaviourist theory, connectionism and conditioning. Connectionism is associated with Thorndike (1928) and recognises 'trial and error'. Stimulus and response are connected, strengthened or broken as a result of the consequences of an action. If a learner discovers an act or explanation to be effective or valid it will be repeated until the consequences of the action no longer produce the desired response (Jarvis, 2004).

Classical conditioning (Pavlov, 1927) suggests that the subject learns (is conditioned) to associate presentation of a reward with a stimulus (Jarvis, 2004). Whereas operant conditioning (Skinner 1951) occurs when the response is shaped by the reward, so that after each action that achieves the desired behaviour the learner is rewarded (Jarvis, 2004).

In a behaviourist approach, learning should be progressed step by step, building on previously learned material (Armitage et al., 2003). The role of the teacher is to deliver or transmit learning through small simple tasks (Tusting and Barton, 2006). The tasks are practised repeatedly and positive feedback reinforces the desired behaviour and stimulates motivation for the learner to continue (Tusting and Barton, 2006; Armitage et al., 2003). Behaviourism assumes that all learning can be measured (Armitage et al., 2003). What a coach or student can do as a learning outcome, is a behavioural outcome (Armitage et al., 2003). In this type of learning, cognitive processes are not necessary to explain the acquisition, maintenance and generalisation of behaviour (Schunk, 2009).

2.2 Cognitivism

Unlike behaviourism, cognitive approaches tend to scrutinise internal mental structures and see learning as transforming those structures (Brockbank and Magill, 2007). Cognitivists relate their theories to the subject matter, and these theories are primarily

about acquiring knowledge (Jarvis, 2004). There have been many cognitive approaches to learning, these include:

1. Gagné's (1985) model for understanding the relationship between learning and instruction. Gagné proposed that learning is progressively linked to phases within the instructional process. In this sense learning is progressive and is primarily about information processing (Tusting and Barton, 2006).
2. Ausubel (1963) promoted reception learning or instruction. In this case, learning needs to be meaningful and related to the learners' existing knowledge. This is achieved through an exposition of the topic by the teacher or instructor that allows the construction of new meaning (Armitage et al., 2003).
3. Mezirow (1981) is concerned with transformation and focuses on meaning and reflection to develop learning. He proposed seven different levels of reflection (Mezirow, 1981). An individual's construction of reality is transformed as a result of reflecting on experience and plotting new strategies (Jarvis, 2004).

If cognitive processes are altered in interaction with the environment, the focus switches to cognitive constructivism or social learning theory (Brockbank and Magill, 2007; Tusting and Barton, 2006). Advocates of such a position include Bandura (1977) and Bruner (1979). Bruner, for example, argued that the learner should have a fundamental understanding of the underlying principles of a subject. Bruner promoted discovery learning as the most effective and authentic method of achieving real understanding. This involved confronting a learner with a problem and allowing them to explore it and try out solutions. In another approach, Bandura (1977) developed a social learning theory that was based on observational learning; drawing attention to vicarious, symbolic and self-regulatory experiences and processes (Tusting and Barton, 2006). In this case 'learning is largely an information processing activity in which information about the structure of behaviour and about environmental events is transformed into symbolic representations that guide action' (Bandura, 1986, p. 51).

2.3 Constructivism

Constructivism is not strictly a theory but a description that encompasses a range of approaches to learning. Under this umbrella term, these approaches share a common epistemological or philosophical explanation about the nature of learning (Simpson, 2002; Schunk, 2009). Constructivist approaches are concerned with how learners build their own mental structures through interaction with their environment. These theories of learning have a cultural and historical aspect with respect to individual experience (Brockbank and Magill, 2007). With constructivism, understanding and experience are in constant interaction, and through participation, persons, action and the world are connected in all knowing and learning (Lave and Wenger, 1996). The constructivist approach also stresses the developmental nature of learning, in that there are phases of learning skills and the way these are learned will change over time with experience. Several theories of how individuals construct knowledge exist. The common thread running through them suggests that learning is most effective when new knowledge and skills are used, and individuals construct meanings for themselves within the context of interaction with others (Kerka, 1998).

Examples of theorists advocating this approach include Vygotsky (1978) and Lave and Wenger (1991). Vygotsky's work attempts to link the social and the individual levels of cognition (Hung, 2002). A key proposition in understanding this is the Zone of Proximal Development (ZPD) (Vygotsky, 1978). The concept of a ZPD has been subject to a range of interpretations, but is most commonly associated with the distance between problem-solving abilities of an individual when working alone and that individual's problem-solving abilities when assisted by, or collaborating with, more experienced people. This interpretation, characterised by a scaffolding analogy, has led to notions of learning that provides initial support for tasks that are later performed alone (eg Greenfield, 1984; Wood et al., 1976).

A constructivist view of learning would suggest that cognitive approaches ignore the social aspect of learning. As a result, cognitive approaches tend to promote an impersonal and objective view of knowledge, skills, tasks and learning. Therefore, any resulting theoretical analysis and subsequent instruction is driven by knowledge rather than practice domains (Lave and Wenger, 1996). In contrast, however, situated learning considers learning within social and cultural contexts. The individual here is involved less with objective de-contextualised knowledge acquisition and more with constructing knowledge through direct experience of social practice (Gilbert and Trudel, 2001). A further feature of a social practice approach is that learning is multidimensional, in that more than one thing at a time can be learned, and this can be both implicit and explicit. This approach proposes that learning occurs best when novices collaborate with more experienced and more knowledgeable others on a shared task (Vygotsky, 1978). Principles and theories of adult learning tend to draw on constructivist assumptions. These include, problem based learning (discussed in section 4.5.3, p. 54), reflection, (discussed in sections 4.3.4, p. 34 and 4.5.2, p. 50) and experiential learning (discussed in section 4.3.1, p. 27).

Table 1: Theoretical approaches and implications for learning (Schunk, 2009)

| Theoretical Approach | Implications for Learning |
|---|---|
| Behavioural/conditioning | <ul style="list-style-type: none"> • Complexity reduced into smaller progressive parts reinforcing desired behaviour. • Clear measurable objectives. • Proceed in small steps. • Deliver reinforcement. |
| Cognitivism/cognitive constructivism/ social cognitivism | <ul style="list-style-type: none"> • Relate new information to known information and understand the uses of new knowledge. • Give strategies that allow the practice of concept leaning, problem solving and self-regulation. • Learn by doing, observing and modelling. Learners set goals. |
| Constructivism | <ul style="list-style-type: none"> • Interact with others using mediational tools. Structure learning environment to construct understanding, provide support (scaffolding) for learning. • Engage in social practice. |

2.4 Some Conclusions

While clear assumptions and beliefs are not always articulated and, indeed, may be implicit, approaches to coach learning and education rest upon underlying views and assumptions about how people learn (Light, 2008). The approaches to learning described demonstrate something of the complexity of learning (Tusting and Barton, 2006).

The core concepts through which learning have been examined are paradigmatically different and largely incompatible (Alexander, 2007). That is, the different assumptions underpinning learning from different perspectives creates divisions or dualisms that are impossible to reconcile. These dualisms include thought and action, self and other, 'knower' and known, person and world, subjective and objective. Therefore, a given philosophical approach to understanding the nature of knowledge, the person and social world will carry with it an implicit model of learning.

Developing coach learning means understanding these different conceptions of learning, the theories supporting them and the assumptions about learning that underpin them is essential. Moreover, implementing any approach to coach learning requires a sound knowledge of its principles (Light, 2008). For a detailed review of approaches to learning including guidelines to constructing learning using different approaches see Schunk, (2009). Understanding assumptions about learning and challenging them with alternatives allows a deeper understanding of learning to be developed, and allows the growth of coach learning based on a clear understanding of learning theory.

While it would be impossible to justifiably advocate a single approach to learning, Tusting and Barton, (2006) make the following observation following a review of adult learning theory:

It is clear that it would be partial and misleading to see adult learning only as an individual cognitive phenomena, or even as something that can be fully controlled by a teacher transmitting particular curriculum content. Instead, learning is present in a dialectical interaction between individual, situational, and social factors. The learner's contexts, purposes and practices are the most important factors in the process (p. 45).

From this work Tusting and Barton (2006, p. 45–46) and others (eg Schunk, 2009; Jarvis, 2004 inter alia) it is possible to make some inferences for coach learning:

1. Learners build on their existing knowledge and experience.
2. Learning is initiated by the learner and a role of the educator is to provide an appropriate environment for learning to occur.
3. Learners have the ability to, and should, learn about how they learn.
4. Learning occurs through engaging in practice and this needs to be supported.
5. Learners need to reflect meaningfully and build on their experiences.
6. Much learning is idiosyncratic and incidental and cannot be planned in advance. The environment can be shaped to encourage experiential learning.
7. Learning should enable the learner to reorganise experience and see things in new ways, thus having a transformative outcome.

3.0 Methodology

Attempts have already been made to map the existing coach learning literature; for example, Nelson et al. (2006) utilised Coombs and Ahmed's learning framework to map the literature into formal, non-formal and informal learning. Similarly, Trudel and Gilbert (2006) utilised Sfard's (1998) metaphors on learning (acquisition and participation) to categorise the literature on coach education and coaching more broadly. While useful and informative mapping exercises, both of these reviews are based largely upon informal and implicit procedures and methods and, as such, are perhaps overly dependent on trusting the expertise of the reviewer (Gough, 2007).

The approach adopted in this case was that advocated and utilised by the Evidence for Policy and Practice (EPPI) Centre. Systematic research reviews and syntheses are designed to avoid implicit assumptions and to encourage questions-driven, transparent methods of research (Gough, 2007). The discussion below outlines issues and problems encountered when attempting to apply this methodology to a less established research field such as coach learning. With this in mind, the methodology from a previous review of coaching science (Gilbert, 2002) and physical education (Silverman and Skonie, 1997) was referred to, to provide support and a reference point in addition to the EPPI guidelines.

Because of the diverse range of perspectives from which learning can be viewed (as discussed in Section 2.0 p.4), the review had to encompass a wide range of conceptual and methodological standpoints. For this reason, the review was divided into two phases. First, a descriptive map of the research was compiled, for which a rigorous pre-defined methodology (outlined below) was utilised. Second, an iterative method of reviewing was used in a synthesis phase, where the findings from part one were considered. The second part of the review has been concerned primarily with the organisation of a clear conceptual framework to present and interpret the evidence found.

3.1 Inclusion Criteria

The review considered the relevant English language research undertaken since 1993 (this figure represented 15 years of research). The focus has been on research in coach learning and education over this period, while also including work in relevant domains and disciplines (eg adult education, education, professional learning).

The review includes published articles and books/book chapters, as well as unpublished theses and dissertations, and other unpublished sources as appropriate (see section 3.6, p.11). Although inclusion criteria are outlined, the nature of the literature presented something of a challenge. For example, if only studies impacting learning were included that were characterised by randomised controlled trials with pre- and post-testing, then no coach learning literature would have been included in the review. Similarly, if minimum sample size or methodology criteria were used as inclusion criteria, again, this would have excluded a large number of studies. The overwhelming majority of the coach learning literature and much of the wider learning literature is descriptive or conceptual in nature, concerning the value of a theory or approach. Consequently, the review team attempted to discern areas in which impact had been found and provide a narrative description of this. As a result, the review has an underlying tension or trade off between the published research, rigorous inclusion criteria and findings that are clearly useful,

relevant and have an impact on the field. Arguably, one of the primary findings of the review is that the research field cannot sustain the rigor required of a systematic review. That is, the application of strict criteria implied by such a systematic methodology by its nature would exclude useful research. Consequently, issues of quality and trustworthiness came to the fore as part of an iterative inclusion criteria.

3.2 Quality/Trustworthiness

A range of mechanisms were put in place to ensure the quality and trustworthiness/reliability of the work. As the review developed, these processes became intertwined with the evolution of the inclusion criteria. The processes described below provide a common thread linking the descriptive review to the analysis and synthesis of work. While typically these processes would be described last, it is important to foreground these details so they can more clearly frame the review process. Indeed, while these sections are written up discretely, the review methodology was a holistic process.

3.3 Internal Review/Appraisal

First, the reference list of each published research paper was reviewed manually and cross-referenced against the computerised database search results. This helped in identifying new references but was also useful in validating the bibliography. Secondly, a manual search was conducted (rather than electronic) of the 2006, 2007 and 2008 issues of coaching and pedagogy journals that are known for publishing coach learning and development research. This step was important because there is often a delay between publication and computerised database referencing (Gilbert, 2002). Furthermore, recently published articles typically will not be cited in other articles because of publication timelines. Third, saturation was reached using electronic and manual search methods, and a reference list was generated containing all of the identified published research.

3.4 External Review/Advisory Group

The advisory group was formed of those with methodological and subject area expertise and who have made significant contributions to the coach development and learning area. This group comprised of the research team and Professors John Lyle and Robyn Jones. The summary reference list and matrix (see section 3.6 p.11) were distributed to the advisory group. The engagement of the advisory group generated a range and depth of feedback including, for example, shortlists of selected readings and a review and scrutiny of the entire bibliography. This feedback, similar to the manual review of reference lists, assisted in generating new references, identifying errors in referencing information and sourcing recently published articles, as well as contributing to the discussion around the structure of the second phase of the work: analysis and synthesis.

3.5 Monitoring Process

Throughout the research, the project leader checked the integrity of the review process by cross-checking for accuracy and coding consistency. In addition, the team monitored the trustworthiness of the studies themselves. Therefore, as part of the review process, there was an attempt to judge the quality of each manuscript. The criteria utilised were those recommended by the EPPI:

1. Trustworthiness of the results assessed by the quality of the study (methodological quality).
2. Appropriateness of the use of the study for addressing the research questions (methodological relevance).
3. Appropriateness of focus for answering the review question (topic relevance)
4. Judgement of overall weight of evidence based on 1–3.

While strict inclusion criteria based on a rigorous methodology raised issues around the literature (discussed above), items two and three of the criteria formed the basis against which the studies were judged. This was particularly the case in phase two where writing the analysis clearly identified research not meeting criteria two and three.

3.6 Search Strategy and Screening (Part One/Descriptive Review)

An exhaustive search using computerised databases and encyclopaedias, was conducted for all English language research relevant to coach learning published in academic journals between 1993 and 2008. Published peer reviewed papers were analysed because 'it represents an area's scholarship and provides a foundation to understand research trends' (Silverman and Skonie, 1997, p. 300). Although periodicals are the most common outlet for coach learning and development material, research is sometimes published as entire books, sections of book and conference proceedings. These important sources were not overlooked when seeking to understand, or study, coach learning and development. These were supplemented by other sources, including appropriate unpublished sources. The search was limited to English language research because of practical and research considerations. It is beyond the scope of the current project to include a comprehensive listing of non-English based research. The computerised search focused on a broad generic database (Metalib), to initially identify specific subject databases (eg PsychINFO, SportDiscus) (see Table 2). The following search criteria were used: coach learning, coach education and coach development. Metalib only allows search limiters within specific database searches. Therefore, the initial database search produced a larger number of returns (Table 2). The returns with the search limiters are illustrated in the subsequent data (Tables 3-9). In addition to the computerised database search, all issues (1993–2008) of educational indexes and relevant encyclopaedias (including subject ones) were electronically searched where appropriate, and manually searched using the same criteria. Databases that identify theses/dissertations were also searched.

Table 2: Initial database search

| Database | Number of Returns | | |
|--|-------------------|----------------|-------------------|
| | Coach Education | Coach Learning | Coach Development |
| ANTE | 0 | 0 | 0 |
| Article First | Unavailable | Unavailable | Unavailable |
| ASSIA | 1 | 0 | 0 |
| BHI (British Humanities Index) | 1 | 0 | 0 |
| Biological Sciences | 1 | 0 | 0 |
| Biology Digest | 0 | 0 | 0 |
| Biotechnology and Bioengineering Abstracts | 0 | 0 | 0 |
| ERIC | 35 | Unavailable | Unavailable |
| Medline | 210 | 50 | 107 |
| Physical Education Index | 31 | 1 | 4 |
| PsycARTICLES | 0 | 1 | 0 |
| PsycINFO | 71 | 6 | 32 |
| Sociological Abstracts | 6 | 0 | 0 |
| SportDiscus | 491 | 9 | 57 |
| Web of Science | 18 | 1 | 6 |
| Zetoc | 58 | 3 | 12 |

This initial search was followed by individual database searches. In each case, the key words of coach education, coach learning, coach education and learning, professional development, adult learning, and combinations of these words were used to guide the search process. It should also be noted that coach education/coach learning etc were always used as linked terms. The following limiters were used for all searches published between 1993 and 2009 (most databases included 2009): journal articles, peer reviewed journals and published in English. The results of these searches are outlined in Tables 3–8 below.

Table 3: SportDiscus

| Search Term | Number of Publications |
|--|-------------------------------|
| Coach education | 47 |
| Coach learning | 2 |
| Coach education AND learning | 10 |
| Coach learning AND education | 1 |
| Coach education AND development | 24 |
| Coach learning AND development | 0 |
| Coach education AND learning AND development | 0 |
| Coach education AND empirical study | 0 |
| Coach learning AND empirical study | 0 |
| Coach AND empirical study | 3 |
| Coach AND professional development | 13 |
| Coach education AND professional development | 2 |
| Professional development | 413 (39 full text) |
| Professional development AND sport | 101 (2 full text) |
| Adult learning | 25 |
| Adult learning AND sport | 6 |

Table 4: Physical Education Index

| Search Term | Number of Publications |
|--|-------------------------------|
| Coach education | 15 |
| Coach learning | 1 |
| Coach education AND learning | 4 |
| Coach learning AND education | 1 |
| Coach education AND development | 7 |
| Coach learning AND development | 0 |
| Coach education AND learning AND development | 2 |
| Coach education AND empirical study | 0 |
| Coach learning AND empirical study | 0 |
| Coach AND empirical | 7 |
| Coach AND professional development | 2 |
| Coach education AND professional development | 1 |
| Professional development | 77 |
| Professional development AND sport | 34 |
| Adult learning | 6 |
| Adult learning AND sport | 3 |

Table 5: ERIC

| Search Term | Number of Publications |
|--|-------------------------------|
| Coach education | 3 |
| Coach learning | 0 |
| Coach education AND learning | 0 |
| Coach learning AND education | – |
| Coach education AND development | 1 |
| Coach learning AND development | – |
| Coach education AND learning AND development | 0 |
| Coach education AND empirical study | 0 |
| Coach learning AND empirical study | – |
| Coach AND empirical study | 0 |
| Coach AND Professional development | 27 |
| Coach education AND professional development | 0 |
| Professional development | 2817 [0 full text] |
| Professional development AND sport/coach | 27 / 27 |
| Adult learning | 509 [0] |
| Adult learning AND sport/coach | 0 / 2 |

Table 6: Zetoc (no option for peer reviewed/limited full text)

| Search Term | Number of Publications |
|--|-------------------------------|
| Coach education | 42 |
| Coach learning | 3 |
| Coach education AND learning | 3 |
| Coach learning AND education | 0 |
| Coach education AND development | 5 |
| Coach learning AND development | 0 |
| Coach education AND learning AND development | 1 |
| Coach education AND empirical study | 0 |
| Coach learning AND empirical study | 0 |
| Coach AND empirical study | 0 |
| Coach AND professional development | 3 |
| Coach education AND professional development | 1 |
| Professional development | 5590 |
| Professional development AND sport | 36 (mainly PE related) |
| Adult learning | 1365 |
| Adult learning AND sport | 1 |

Table 7: Medline

| Search Term | Number of Publications |
|--|-------------------------------|
| Coach education | 2 |
| Coach learning | 1 |
| Coach education AND learning | 1 |
| Coach learning AND education | 1 |
| Coach education AND development | 0 |
| Coach learning AND development | 0 |
| Coach education AND learning AND development | 0 |
| Coach education AND empirical study | 0 |
| Coach learning AND empirical study | 0 |
| Coach AND empirical study | 1 |
| Coach AND Professional development | 5 |
| Coach education AND professional development | 0 |
| Professional development | 2055 (0 full text) |
| Professional development AND sport/coach | 6/5 |
| Adult learning | 384 (0 full text) |
| Adult learning AND sport/coach | 0/1 |

Table 8: PsychINFO(no option for limited to full text)

| Search Term | Number of Publications |
|--|-------------------------------|
| Coach education | 63 |
| Coach learning | 4 |
| Coach education AND learning | 41 |
| Coach learning AND education | 4 |
| Coach education AND development | 60 |
| Coach learning AND development | 4 |
| Coach education AND learning AND development | 41 |
| Coach education AND empirical study | 46 |
| Coach learning AND empirical study | 3 |
| Coach AND empirical study | 1085 |
| Coach AND professional development | 95 |
| Coach education AND professional development | 22 |
| Professional development | 6368 |
| Professional development AND sport/coach | 133/95 |
| Adult learning | 1794 |
| Adult learning AND sport/coach | 35/29 |

It is worth noting that papers identified through the other databases in the MetaLib search (PsycARTICLES, Sociological Abstracts and Web of Science) were checked against the papers found through the search of the five databases shown above, in order to ensure no relevant papers were missed.

In addition to the above databases, and as part of the process of cross-checking a number of special issues of journals relating to coach education/learning were also searched. In particular:

- *The Sport Psychologist*, 20 (2) 2006
- *International Journal of Sports Science and Coaching*, 1(3) 2006
- *International Journal of Physical Education*, 38 (1) 2006

The search worked according to the following principles. Abstracts were subject to content analysis to ensure key words that identified the article represented the content of the article. It was not uncommon to have key phrases such as coach learning appear as key words of an article, but then not actually feature in the content of the article. Those papers deemed to be relevant to the literature review were then printed off and read in full (where full text was not available, an inter-library loan was requested). From the initial searches, the inclusion criteria described in Section 3.5 (p.10) were applied to identify relevant research. This process resulted in over 1000 paper abstracts being viewed on screen (although papers that appeared more than once were obviously passed over on second viewing) and yielded 147 papers to be read more closely in abstract form.

Table 9: Citations by Journal

| Journal Name | Number of Citations in Database |
|---|--|
| <i>International Journal of Sports Science and Coaching</i> | 14 |
| <i>The Sport Psychologist</i> | 11 |
| <i>International Journal of Evidence Based Coaching and Mentoring</i> | 6 |
| <i>Physical Education and Sport Pedagogy</i> | 4 |
| <i>Sport, Education and Society</i> | 4 |
| <i>Quest</i> | 3 |
| <i>Reflective practice</i> | 3 |
| <i>Ergonomics</i> | 2 |
| <i>Journal of Sport Sciences</i> | 2 |
| <i>Journal of Teaching in Physical Education</i> | 2 |
| <i>International Journal of Sport Psychology</i> | 2 |
| <i>International Journal of Physical Education</i> | 2 |
| <i>Journal of Hospitality, Leisure, Sport and Tourism Education</i> | 1 |
| <i>Journal of Sport Behaviour</i> | 1 |
| <i>Physical Educator</i> | 1 |
| <i>Sociology of Sport Online</i> | 1 |
| <i>The Online Journal of Sport Psychology</i> | 1 |
| <i>Pedagogy</i> | 1 |
| <i>International Journal of Coaching Science</i> | 1 |
| <i>International Sports Studies</i> | 1 |
| <i>Strategies: Journal of Theory, Culture and Politics</i> | 1 |
| <i>Research Quarterly for Exercise and Sport</i> | 1 |

Applying the inclusion criteria 65 papers were included in the database and were read in full. As the search progressed, it was clear that a number of papers were appearing on a frequent basis and so fewer new papers were being identified. The iterative nature of the process and use of the inclusion criteria, particularly items two and three, resulted in 46 papers selected for the final database. These have been published in 22 different journals. The breakdown of citations by journals is shown in Table 9.

Through the process of undertaking the search, and then reading and summarising the papers for the database, it became clear that a number of common themes/areas in relation to coach learning could be identified from the literature:

- Mentoring
- Expertise/knowledge acquisition
- PBL
- Reflection
- Communities of practice/situated learning

- Experiential learning
- Workplace learning.

Moreover, there were numerous examples where the research included in the database had referred to or drawn upon examples from research in other professions to highlight key points. The three main professions identified through the literature were:

- medicine/health professions (in particular nursing)
- education
- business.

These core themes and professions were used as the basis for a secondary search of literature. The objective was to identify relevant research being undertaken in other fields and to fulfil an aim of the review; namely, to examine whether any lessons could be learnt from them in relation to coaches' learning and development. The first stage of the secondary review was to conduct a search of a number of databases that had not been used in the initial search. These databases were identified to cover a range of other disciplines (primarily those professions noted above) that could have contained relevant research sources (medicine and allied professions, nursing, pharmacy, physiotherapy, education and business management). The same protocol was followed as in the initial search. The four databases searched were BioMed Central, Business Source Premier, PubMed and Web of Knowledge. The results of the search are illustrated in Tables 10 and 11.

Table 10: Secondary database search: PubMed and BioMed Central

| Search Term | Overall returns | Initially Identified and Abstract Read |
|--|---|---|
| Coach education | 282 | 14 |
| Coach learning | 68 | 16 |
| Coach education AND coach learning | 58 | 16 |
| Coach education AND learning | 1 | 1 |
| Coach learning AND education | 51 | 16 |
| Coach education AND development | 71 | 15 |
| Coach learning AND development | 20 | 3 |
| Coach education AND learning AND development | 17 | 3 |
| Coach education AND empirical study | 0 | 0 |
| Coach AND empirical study | 0 | 0 |
| Coach AND professional development | 34 | 9 |
| Coach education AND professional development | 29 | 8 |
| Professional development | 2526 | - |
| Professional development AND sport | 12 | 0 |
| Adult learning | 411 | 37 |
| Adult learning AND sport | 1 | 1 |
| Total identified as relevant | 18 (three of which were already included on the database) | |

Table 11: Secondary database search: Business Source Premier

| Search Term | Overall returns | Initially Identified and Abstract Read |
|--|------------------------|---|
| Coach education | 2 | 0 |
| Coach learning | 3 | 0 |
| Coach education AND coach learning | 1 | 0 |
| Coach education AND learning | 1 | 0 |
| Coach learning AND education | 1 | 0 |
| Coach education AND development | 0 | 0 |
| Coach learning AND development | 0 | 0 |
| Coach education AND learning AND development | 0 | 0 |
| Coach education AND empirical study | 0 | 0 |
| Coach AND empirical study | 0 | 0 |
| Coach AND professional development | 33 | 1 |
| Coach education AND professional development | 0 | 0 |
| Initial professional development | 3 | 0 |
| Professional development AND sport | 10 | 0 |
| Adult learning | 538 | 0 |
| Adult learning AND sport | 3 | 0 |
| Total identified as relevant | 1 | |

NB. A search of the Web of Knowledge database yielded no results.

The second phase of the secondary search involved a broad search for literature that related to the core themes (mentoring, problem-based learning etc) in the key professions (medicine/nursing, business and education) identified through the initial search. The same protocol was followed and applied from the initial search. In addition to searching online databases, reading relevant reports, cross checking reference lists and books/book chapters was undertaken. From this process and through applying the inclusion criteria, 185 papers were identified as potentially relevant to the literature review and were read in abstract form. From this number, 36 were selected for inclusion in the review and read in full with 28 finally included in the matrix (these figures include all search results, not just the electronic database data in Tables 10 and 11).

A categorising system and a research review matrix were developed as used in similar projects (eg Culver, Gilbert and Trudel, 2003; Gilbert, 2002; Silverman and Skonie, 1997). The following information was coded for each article: author names, year of publication, publication outlet, research focus, research approach, methods of data collection, participant type and learner demographics (including, for coaching: context of coach, location, position in development pathway and sampling criteria, and for learning: number and gender of participants, context of learning environment and sampling criteria). The research approach was coded as quantitative, qualitative or mixed/other. This classification was determined based on criteria used to differentiate quantitative and qualitative research (Creswell, 1994). For example, qualitative studies are characterised by inductive reasoning, purposeful sampling, small sample sizes, naturalistic settings, researcher as instrument and descriptive or interpretive data analysis (Creswell, 1994; Thomas and Nelson, 1996). The coding form was reviewed and, where necessary, revised, based on research team meetings and inter-coder reliability tests with the researchers. The inter-coder reliability test took the form of a moderation process with the researchers all coding at least three articles. Each time this was undertaken, articles were used to represent different foci, research approaches and participant types. The results for each component of the coding form were then compared for reliability.

The process outlined above enabled categorisation and description of the relevant literature, which has allowed a broader field of research to be addressed. The map can usefully be viewed as a resource in its own right. It can answer questions about what research is available on a given topic and go some way to identifying gaps in the research field, thus providing future directions for research (discussed later in the review). The map also provided a basis for narrowing the review and identifying the context in which the in-depth critical review and synthesis could be undertaken.

3.7 Analysis and Synthesis (Defining the scope)

The descriptive mapping exercise produced a clear picture of the body of work for the review. The mapping also informed the potential interpretation framework that could be applied to the literature, and it was at this stage that more refined and specific research questions were considered. sports coach UK identified a number of wide-ranging issues to be discussed:

- How do coaches learn to coach?
- What are the factors helping/hindering coach learning and development?

- What types of knowledge and skills do coaches need to coach effectively, and how does this vary between coaches? How does this vary between coaches at an individual level, between sports and levels?
- What links are there between coach development and the coaching/wider expertise literature?
- In what environments, and from what sources (experience, observations, and workshops) do coaches learn most effectively? How does this vary in terms of the type of knowledge and skills they need?
- How has the literature treated these learning environments in terms of their usefulness to the coach? How justified are these treatments?
- What are coaches' preferred learning styles; for example, visual, audio or kinaesthetic? Is there something about coaches and coaching which favours one or the other? Are learning styles important?
- How do coaches process/transfer the knowledge they receive into models of coaching practice? What is the role of reflection?
- How have existing models of learning (behaviourism, cognitivism, development theories, social constructivism, situated cognition, ecological theories, adult learning theories, neuroscience) impacted on the development of coach learning models? What is the implication of these models on establishing effective coach learning?
- What are the stages of development of a coach? How do they vary according to perspective; for example, motor learning development, expertise? How are these stages defined? How long does it take for a beginner coach to become an expert?
- How does the definition of coaching alter how we think about coach learning and development?
- What kind of environments are most conducive to coach learning and development? How do these environments vary between coaches?
- How can development agencies best support coaches to develop?

The aim of this phase was to develop a data extraction protocol enabling a synthesis of research findings to answer the research questions described above. The synthesis is presented in the form of a structured narrative in Section 4.

4.0 Review of Literature

4.1 Introduction

A problem for any review of the coach learning literature is an apparent lack of definitional clarity that can leave a consideration of research evidence speculative and imprecise. This is well illustrated, perhaps, by the wide range of terminology employed, at times uncritically, to describe coach preparation, learning and development. Examples to illustrate this include, coach learning, coach education, coach training, coach development, continuing professional development (CPD), plus coaching and sport instructor certification among others. These terms are often used interchangeably and inconsistently within the literature. Indeed, coach learning itself has only recently been presented as a term that encapsulates research into, and understanding about, the broader learning of coaches (Nelson et al., 2006). As discussed earlier, the recognition and use of coach learning as a term enables a view of the development of coaches that 'extends far beyond any formal training programme' (Côté, 2006, p. 221). Yet, within the literature there remains a 'lack of concern about how coaches learn' (Nelson and Cushion, 2006, p. 174) while Lyle (2007a) has argued that coach educators are often unaware of frameworks that could underpin and guide their practices.

In the broader learning literature there remains considerable debate about contrasting ways to understand learning (Hodkinson et al., 2008). This is reflected in Section 2.0 (p. 12). This body of work argues the respective merits of cognitive as opposed to situational theories of learning (eg Anderson et al., 1996; Greeno, 1997). Similarly, writers such as Sfard (1998) and Säljö (2003) approach the issue from the root metaphors of acquisition (cognitive) and participation (situated) to conceptualise and debate learning (Mason, 2007). Indeed, Trudel and Gilbert (2006) have used Sfard's metaphors as a useful tool to divide and view the coach education literature. As discussed in Section 2.0, understanding these broader differences in looking at and conceptualising learning do matter. However, the epistemological dualisms that these differences produce create the basis of meta-theoretical dilemma. It is not the purpose of this review to attempt to resolve the tension between these conceptualisations of learning, if indeed they could be solved. Instead, the review is structured in such a way as to illustrate and discuss the research that is focused on the avenues through which coaches best learn. The aim of which is to address the research issues discussed in Section 3.7 (p. 25).

In order to achieve this, the review is structured around Coombs and Ahmed's (1974) conceptual framework of formal, non-formal, and informal learning. There are considerable debates and complexities around the use of the terms formal and informal learning (discussed later and see also Colley et al. [2003a] for an extensive review). However, the framework has broad acceptance and use in adult learning literature (eg Merriam and Caffarella 1999; Tuijnman and Boström, 2002; Jarvis, 2004). Therefore, the framework was deemed fit for purpose; enabling an organization of the research findings, a platform to structure the discussions surrounding coach learning, while providing a framework to integrate research from other relevant domains.

Each of the following sections presents an overview of research conducted in the given component of coach learning (informal, non-formal, formal) and then integrates and

considers relevant research from related learning domains. A word of caution is required here: for the purpose of clarity, the three categories are discussed separately but they should be understood as interconnected modes of a complex learning process rather than discrete entities. In reality, they may exist simultaneously in concert or conflict. Indeed, as Colley et al. (2003a) point out, it is often the blending of learning types that is significant; not their separation. Moreover, with this blending, there are few learning situations where all modes are completely absent and often, one exists within the other.

4.2 Learning Sources: Informal, non-formal, and formal

Understanding sources of learning for coaches has been studied for over a decade, although the momentum for this research has increased recently with the bulk of the research being published post 2000. As a result, it could be argued that the study of coach learning situations has become a distinct and legitimate area of academic inquiry (see Table 12). Elite coaches have in most instances been the focus of investigation (Abraham et al., 2006; Fleurance and Cotteaux, 1999; Gould et al., 1990; Irwin et al., 2004; Jones et al., 2003, 2004; Salmela, 1995; Schempp et al., 1998, 2007), although the nature of elite coaching is not explored. More recently, three studies have concentrated instead on developmental sport coaches (Erickson et al., 2008; Lemyre et al., 2007; Wright et al., 2007).

From this research an initial understanding of the learning situations in which these two groups of coaches engage with has begun to evolve. Future studies might usefully attempt to build on these earlier investigations by further exploring the similarities and difference between the learning biographies of elite and voluntary youth sport coaches. Additional insight into the learning activities of UK coaching practitioners is also required, as the vast majority of coach-learning investigations have been conducted in Canada and the United States (Erickson et al., 2008; Fleurance and Cotteaux, 1999; Gould et al., 1990; Lemyre et al., 2007; Reade et al., 2008a; Salmela, 1995; Schempp et al., 1998, 2007; Wright et al., 2007). Understanding about the learning histories of UK coaches remains limited to a few articles that have focused exclusively on elite level coaches (Abraham et al., 2006; Irwin et al., 2004; Jones et al., 2003). Timson-Katchis and North's (2008) report remains the only notable exception with initial findings of a coach tracking study presenting data from 1264 coaches. Further research into how UK coaching practitioners learn would appear necessary not only at the elite level, but across a wider range of coaching domains.

The research has used different approaches, with some identifying participants from a single sport (Irwin et al., 2004; Jones et al., 2003; Schempp et al., 1998, 2007; Wright et al., 2007), others from a range of individual and team sports (Abraham et al., 2006; Erickson et al., 2008; Gould et al., 1990; Jones et al., 2004; Lemyre et al., 2007; Reade et al., 2008a; Salmela, 1995), whereas other researchers have aggregated data from more disparate samples of coaches. For example, Jones et al., (2003, 2004) presented coach case studies through life-story narratives. Although the findings of life-story narrative approaches seem to have presented a clearer understanding of individual cases, sample sizes are inevitably restricted by this method and can therefore limit the confirmation of findings across multiple cases.

A number of the studies have employed inductive content analysis to organise qualitative data (Erickson et al., 2008; Fleurance and Cotteaux, 1999; Irwin et al., (2004) Salmela, 1995; Schempp et al., 2007; Wright et al., 2007). Studies employing this method

of analysis have varied in the number of identified learning sources. Investigations have reported between three and 17 learning categories (see Table 12). These variations might be explained by differences in the methodologies employed, the participants' learning experiences, or perhaps the depth of analysis applied to the data. Nevertheless, future studies should strive to detail each of the learning sources identified by their participants.

While inductive analysis of interview data has been widely employed, Schempp et al. (1998) utilised a Q-sort technique to establish how expert golf coaches ranked pre-defined learning categories in order of importance. The only other investigators to have studied the issue of importance are Gould et al., (1990), Irwin et al., (2004) and Erickson et al., (2008). Having inductively created themes from interviewing 16 elite gymnastics coaches, Irwin et al. (2004) then asked their participants to rank the importance they attached to each learning category. Gould et al. (1990), on the other hand, asked their participants to rank learning sources in order of their perceived impact upon coaching development. Similarly, Erickson et al. (2008) asked their participants to rank their most important sources of knowledge and their ideal sources. Despite differences in the terminologies and number of categories employed, all four studies found their participants considered practical coaching experiences and learning from other coaches to be of primary importance.

Indeed, the finding that coaches learnt by observing and discussing with other practitioners is a recurring theme reported consistently in literature discussing coach learning (Abraham et al., 2006; Bloom et al., 1995; Cushion et al., 2003; Gould et al., 1990; Irwin et al., 2004; Schempp et al., 1998, 2007; Wright et al., 2007). It is clear that informal learning of this nature has become a well-established learning pathway for coaches, with its implications for knowledge development and the professional socialisation of coaches being recognised in the literature (Cassidy et al., 2004; Cushion et al., 2003). Importantly, these studies reported that coaches perceived their formal coach education experiences to have been of considerably less significance to their overall development than other means of learning.

Table 12: Overview of research and learning sources

| Study | Participants | Method(s) | Data Analysis | Learning Categories |
|-------------------------------|--|---------------------------------|-------------------------------|---|
| Abraham et al., (2006) | 16 expert coaches from 13 sports | In-depth interviews | Inductive/ deductive analysis | Courses, experience, other coaches and serendipitous (ie reading books, encounters with sport scientists, and experiences outside of sport). |
| Erikson et al., (2008) | 44 voluntary coaches, mixed sports on Canadian National Coaching Certification Program (NCCP) level two or three | Interviews | Qualitative and quantitative | Experience, other coaches/peers, formal courses, mentor, observing others, clinics, print/electronic material. |
| Fleurance and Cotteaux (1999) | 10 expert coaches | In-depth interviews | Inductive analysis | Formal education, interaction with high-level athletes, ongoing education, mentors, personal commitment to coaching, playing experience and professional experience. |
| Irwin et al., (2004) | 16 elite gymnastics coaches | In-depth interviews | Inductive analysis | Coaching courses, coaching manuals, foreign coach and travel, mentor coaches, past experiences as a performer, squad sessions, trial and error and video and observations. |
| Jones et al., (2003) | One elite soccer coach | Field notes and five interviews | Life-story narrative | Coach certification, learning from others and learning from the self (ie experiential learning and past playing experiences). |
| Jones et al., (2004) | Eight elite coaches, from five individual and team sports | In-depth interviews | Life-story narrative | Athletes, athletic experience, coach certification, coaching experience, conferences, mentors, other coaches, previous jobs, teacher training, seminars/workshops, and reading. |
| Lemyre et al., (2007) | 36 voluntary coaches from three team sports | In-depth interviews | Deductive analysis | Interactions, Internet, resource materials and training courses. |

| Study | Participants | Method(s) | Data Analysis | Learning Categories |
|---------------------------------|--|---|---------------------------------------|---|
| Reade et al., (2008a) | 205 collegiate coaches, 12 team or individual sports | Questionnaire | Quantitative | Other coaches, clinics, seminars, conferences, video, researchers/academics, watching elite performance, printed material, academic journals, trainers and online. |
| Salmela (1995) | 21 expert coaches from four team sports | In-depth interviews | Inductive analysis | Athletic experience, coaching experience and mentors. |
| Schempp et al., (1998) | 11 expert golf instructors | Q-sort ranking and interviews | Quantitative and qualitative analysis | Books, certification programmes, films and videos, formal education, journals and magazines, other teachers, playing experience, popular media, students, teaching experience and workshops. |
| Schempp et al., (2007) | 31 expert golf instructors | Open-ended questionnaires | Inductive analysis | Adapt teaching practice, develop business strategies, reading, seeking help from others and using technology. |
| Timson-Katchis and North (2008) | 1264 coaches from a range of sports working across a range of levels | Initial interviews (n=20), then mixed questionnaire | Inductive analysis | Practice, working with athletes, observation, coaching qualifications, past experience, reflection, workshops, one-to-one coaching, parents, coaching other sports, conferences, printed material, other employment, DVD/video, other education, advice and online. |
| Wright et al., (2007) | 35 voluntary youth ice hockey coaches | In-depth interviews | Inductive analysis | Books/videos, coaching clinics/seminars, face-to-face interactions with other coaches, formal mentoring, Internet, large-scale coach education programmes and personal experiences related to sport, family and work. |

4.3 Informal learning

Learning in informal situations has been identified as, 'the lifelong process by which every person acquires and accumulates knowledge, skills, attitudes and insights from daily experiences and exposure to the environment' (Coombs and Ahmed, 1974, p. 8). Thus learning takes place in a wide variety of contexts; the majority of which occur in an informal setting beyond dedicated formal learning institutions (Brookfield, 1986; Merriam and Caffarella, 1999). Consistently, coaching research has indicated that practitioners learn through various avenues, including previous experiences as an athlete (eg Irwin et al., 2004; Jones et al., 2003, 2004), informal mentoring (eg Bloom, et al., 1998; Cushion, 2001) practical coaching experiences, and interactions with peer coaches and athletes (eg Abraham et al., 2006; Erickson et al., 2008; Fleurance and Cotteaux, 1999; Schempp et al., 1998; Wright et al., 2007).

Self-directed learning is a term that is often used interchangeably with informal learning (Merriam and Caffarella, 1999), although the former implies an instrumental sense of purpose that may not apply to some experiential learning. In addition to the avenues already identified, the literature highlights that coaches engage in other forms of informal or self-directed learning such as exploring the Internet (Erickson et al., 2008; Lemyre et al., 2007; Reade et al., 2008a,b; Schempp et al., 2007; Wright et al., 2007), as well as reading coaching manuals (Erickson et al., 2008; Irwin et al., 2004; Schempp et al., 2007), books (Abraham et al., 2006; Lemyre et al., 2007; Schempp et al., 1998, 2007; Wright et al., 2007) and journal articles and magazines (Reade et al., 2008a,b; Schempp et al., 1998, 2007). Coaches have also been shown to watch educational sports science videos (Reade et al., 2008a,b; Wright et al., 2007), footage of coaching sessions (Irwin et al., 2004; Schempp et al., 2007) and recordings of the performances of their, and other coaches', athletes (Irwin et al., 2004; Schempp et al., 1998, 2007).

In developing their knowledge, coaches actually learn and prefer to learn from a range of sources that combine to provide a broad picture of coaching. These sources currently tend to come from informal means (Erickson et al., 2008). There has been significant interest in developing informal learning for coaches; however, the use of such approaches may be as much a commentary on the efficacy of other learning provision than on the effectiveness of learning informally. Indeed, Erickson et al.'s (2008) study suggests that formal-learning opportunities would be preferred by coaches, suggesting a more balanced approach. Indeed, the nature of this balance is worthy of more research to understand what coaches could gain from learning sources that are both formal and informal, and the interaction between the two.

4.3.1 Experiential Learning

Learning from experience or experiential learning is considered in the wider learning literature in many different ways with different processes involved (Moon, 2004; Jarvis et al., 2003; Jarvis, 2004). In terms of the coaching literature, experiential learning has not been treated with the same clarity, with research often using the terms interchangeably and without definition (eg Cushion et al., 2003, 2006; Jones et al., 2004). While it seems there is no single all-encompassing definition of experiential learning, there are many ways in which the term can be used (Moon, 2004). Some clarity around the distinctive features of this learning process would seem useful to help understand coach learning, particularly as experiential learning is cited consistently as a

key mechanism in coach development (eg Abraham et al., 2006; Erickson et al., 2008; Fleurance and Cotteaux, 1999; Schempp et al., 1998; Wright et al., 2007).

Numerous authors suggest all learning is essentially experiential (eg Moon, 2004; Boud et al., 2000; Jarvis, 2004; Michelson, 1999). However, there remains a distinction between learning from experience and experiential learning. Usher and Soloman (1999) in considering workplace learning define learning from experience as 'taking place in the life-world of everyday contexts'. They contrast this with experiential learning and identify two factors that highlight it. First, it is 'a key element of discourse which constructs experience in a particular way'. Second, it is 'something from which knowledge can be derived through abstraction', that is, that approaches such as reflection and observation can be used to derive learning from it' (p. 161). With this useful distinction, it is possible to examine how elements of experiential research and theory relate to coach learning.

Moon (2004), acknowledges the size of the research field on experiential learning noting examples from training and development, adult education, school science education, work experience and work based learning, nursing and outdoor education. The author also notes literature dedicated to the notion of experiential learning itself (eg Boud and Miller, 1996; Greenaway, 2003). It is not the intention here to consider this literature in its entirety, but draw relevant evidence and examples to inform the development and understanding of experiential learning within coach learning and development.

The literature makes a distinction between mediated and unmediated, or primary and secondary experiences (Jarvis, 2004; Moon, 2004). Jarvis (2004) describes a primary experience as one where a person enters a situation and experiences it subjectively. He argues that through an experience, a disjuncture exists between the person's biography and the experience they are having, and constructs the possibility for a learning experience. The secondary experience is mediated and is not always interactive (Jarvis, 2004). Newman (1999) suggests this experience is constructed or engineered in some way. Often the learning experience is presented as a sequence of activities; for example, Kolb's cycle (Kolb, 1984) with the assumption that learning can result from the experience if it is simply organised correctly (Moon, 2001). However, Moon suggests a need to recognise experience as more 'slippery', and the need to enable a realistic view of learning, citing Eraut who states: 'tidy images of leaning are usually deceptive' (2000, p. 8).

Indeed, the evidence suggests experiences are of a complex constructed nature; for example Fraser (1995) suggested that: 'we internalise our knowledge of the world which is consistent with our world view. If that manner is jaundiced and fragile, then how do we know we are seeing anything other than a reflection of our own fragility?' (p. 59). Some authors, however, argue that experience illustrates an authentic representation and voice of the individual (Usher and Edwards, 1994; Usher, 2000a, 1993). This is perhaps an overly simplistic view, as Jarvis (2004) argues experience has no meaning until the individual, who, in turn, draws on socially constructed meaning, endows it with meaning. Indeed, the need to understand the subjectivity of experience is a consistent message from the literature in developing progressive knowledge derived from experiential learning (Boud et al., 2000; Boud and Walker, 1998, 2000).

One of the most commonly cited models of experiential learning is the Kolb cycle (Kolb, 1984). Kolb's work has four elements that make up the cycle: concrete experience,

observation and reflection, formation of abstract conceptions and testing implications of concepts in new situations. Kolb's cycle has been criticised for being overly simplistic or formulaic (Jarvis, 2004; Rowland, 2000; Moon, 2001). However, it remains popular, perhaps because of its simplicity. The cycle emphasises the experience of the individual and does not take account the social aspects of learning, power relationships, and over simplifies the nature of experience (Newman, 1999) while not taking into account tacit knowledge (Eraut, 2000). Indeed, Newman (1999) suggests the cycle is 'too ordered, too regular, too predictable' (p. 84).

However, as Moon, (2004) suggests, it may not be the cycle that is problematic but the way it is interpreted and used. Cowan (1998) profitably used the Kolb cycle and combined it with a reflective process from Schön (1987) to produce a more iterative upward spiral rather than a simple cycle. Boud and Walker (2000) further added to the cycle with more detailed processes of reflection. Both of these authors use Kolb but with additions to it attempt to avoid the mechanistic nature of the model (Moon, 2004). Kolb's popularity is noted by Moon (2004) in the field of training and management, but the author argues its use is often to manage and support learning (a sequence of activities) rather than a description of the learning process itself. In the coaching literature, Kolb's cycle has only been used as an example of a model of learning not used by coaches, which may be useful (Wikely and Bullock, 2006).

The cycle of experiential learning as depicted by Kolb is closed. The development of spiral processes deals with this to a degree but still results of a recycling of experience (Moon, 2004). The closed nature of the cycle means that if an error is made in evaluation and something is learned incorrectly, no external feedback will perpetuate erroneously learned behaviour (Mulligan, 2000). Moreover, if learned correctly, sometimes effective learning in a given context will not automatically transfer to a different context (Wallace, 1996). Indeed, Wallace (1996) argues that: 'the more different the context of the experiential learning situation, the more additional learning is required for transfer into the context of use and the greater need for support' (p. 18). Tennant (1999) goes further when considering experiential learning in the workplace and argues that a community of discourse through which learning occurs and is communicated is important, and that a climate of support is crucial in the transfer context.

As Moon (2004) argues, the literature surrounding experiential learning is diverse, making generalisations problematic. A common theme is the importance of reflection, although the detail is difficult to discern. Indeed, Sutherland (1997) argues that experiential learning is a term often used to suit the context in which it is applied. However, Moon (2004) attempts to outline some boundaries and implications of experiential learning; it is not usually mediated or taught; the material of learning is usually direct experience; the learning is empowering, but this may come from the experience rather than the learning; there is reflection either deliberately or non-deliberately; there is an active phase of the learning; there is a mechanism for feedback; and there is a formal intention to learn. This final point is emphasised: 'the intention to learn from a particular time from a particular experience is what justifies the use of a specific term such as "experiential learning" and provides a distinction from incidental or everyday learning' (Moon, 2004, p. 120).

This is an important distinction for coach learning, as intentional and incidental learning are not currently discussed. Indeed, the research evidence from coaching identifies coaches learning from their experiences but does not distinguish or differentiate different types of experiential learning. Of course, with overt intentions to learn there will always be incidental learning that provides useful insight (Eraut, 2000), but the nature of these within coaching is worthy of further consideration.

4.3.2 Informal Learning Structures

A central component of Gilbert and Trudel's (2001) description of the experiential learning process was that much coach learning occurred through interactions with others (Erickson et al., 2008; Lemyre et al., 2007). The importance of learning through interaction has been consistently reported in the coaching literature. Schempp et al., (1998), for example, concluded from their data that:

A common theme linking these knowledge sources was the people factor. The expert golf instructors in this study were clearly people oriented. They learned much through a dynamic interaction process that involved many people: students, other teachers, and people from other professions (p. 301).

Coaches of a diverse range of levels and sports have reiterated the importance attached to learning from interactions with athletes (Reade et al., 2008a; Schempp et al., 1998, 2007), other coaching practitioners (Abraham et al., 2006; Erickson, et al., 2008; Irwin et al., 2004; Jones et al., 2003; Wright et al., 2007) and informal mentors (Bloom et al., 1998; Irwin et al., 2004; Jones et al., 2004; Salmela, 1995). In relation to the last of these, Bloom et al.'s (1998) study of 21 elite coaches served to demonstrate that the practitioners under investigation mentored many athletes and developing coaches.

Colley et al., (2003a) conducted research and an extensive review of different discourses around non-formal and informal learning for the Learning Skills and Development Agency. Colley et al.' (2003a) noted that informal learning often takes place in contexts where the prime purpose of the activity or organisation is not learning. As a result, context is hugely influential in any learning that takes place and will directly impact a number of things: what counts as knowledge in the domain, the nature of tacit behaviours, attitudes and acceptable dress and behaviour. Consequently, both the process and product of informal learning are often unplanned (Colley et al., 2003a). In considering workplace learning, Billet (2001a,b) argues that the context and structure of informal learning defines a view of identity and roles that dominate the constructed version of the profession under study. Informal learning, therefore, can lead to an uncritical acceptance of professional attitudes and responsibilities. This perspective has some support in coaching where Cushion et al., (2003; 2001) discuss the unstructured and uneven nature of informal learning and mentoring in terms of quality and outcome; suggesting that it is uncritical in style and serves to reproduce the existing culture, power relations and, importantly, coaching practice.

Colley et al., (2003a) cite research undertaken within Further Education teaching where formal structures of work organisation are not primarily designed to foster learning but strongly facilitate certain types of learning. The authors argue that organisational structure means there are always formalised dimensions to what is characterised as informal learning, and those formal dimensions are significant (Billet, 2003). Moreover,

Colley et al (2003a) point out that workplaces are often structured in ways that result in unequal access to learning and, consequently major variations in terms of the quality and type of informal learning possible.

Colley et al., (2003b) also considered adult continuing education. They argued that there are often unexamined assumptions about the existence and process of informal learning and that there is limited literature explicitly addressing this. In a similar vein to coaching, these implicit assumptions exist because the learning has its roots in practices which pre-date the establishment of structured learning, which, in turn, can often be perceived as alternative, additional or in opposition to formal learning (Colley et al., 2003b). In adult continuing education, the absence of any overarching structure and the presence of voluntarism has meant learning can be assumed to be informal, in the sense that there was no externally imposed or common syllabus (Colley et al., 2003b). The findings from the research noted that a formal syllabus and accreditation have supplanted the informal, negotiated curriculum and the notion of voluntary learning. This has resulted in some conflict while the transition to a more formal approach is negotiated (Colley et al., 2003b).

Informal learning has been considered specifically in the wider workplace learning literature. For example, Billet (2000) undertook mixed method case studies with five different organisational types. Billet (2000) argued that the learning accessed through participation at work alone may not be sufficient for developing the requirements of expertise at work. The author argues for guided learning (mentoring) and selected strategies to support and monitor the development of conceptual knowledge that would otherwise remain hidden if left to develop unsupported. Despite this suggested intervention, the research suggests that everyday participation remains the strongest identifiable contribution to learning. Mentoring enabled mentors and mentees to reflect on practices in the workplace and gave a purpose to interaction with colleagues.

Billet (2000) goes on to usefully conceptualise a learning curriculum structured through everyday activities, with direct and indirect guidance furnished from social and physical sources. These include observing and listening to others, and the workplace. The learning curriculum by its nature is complex, and works with ongoing and many levels of contribution (Billet, 2000). In this sense, learning, thinking and acting are not separate activities. Learning is not separate or intentional but part of everyday conscious experience. However, Billet (2000) points this does not necessarily generate new knowledge, and that learning may not be robust or transferable to other contexts, or even desirable within its own context. However, the workplace does provide goal-directed informal learning activities that are sources of knowledge construction, and mentoring has an impact on this process.

Fuller et al., (2005) brought together studies investigating modern apprenticeships in industry (Fuller and Unwin, 2003b) and workplace learning in four different school departments (Hodkinson and Hodkinson, 2002, 2003, 2004). These studies included the consideration of informal learning within a sometimes formal structure. In this research, Fuller et al., (2005) utilised situated learning (Lave and Wenger, 1991) as a framework for analysis, and identified individual and contextual factors that impact learning. The use of situated learning is useful, as this theory has been offered as having utility to explain and frame learning within the coaching domain (eg Cushion, 2006; Cassidy et al., 2009). Lave and Wenger (1991) were unhappy with overly simplistic views of

learning by doing (Fuller et al., 2005), arguing instead for learning to be conceived as a complex relational, situated endeavour. This required a conceptual shift from the traditional view of 'the individual as learner to learning as participation in the social world, and from the concept of cognitive process to the more-encompassing view of social practice' (Lave and Wenger, 1991, p. 43). Lave and Wenger (1991) argue that social practice is the primary, generative phenomenon, and learning is one of its characteristics. As such, it should be analysed as an integral part of social practice. This view seems to be analogous with the evidence from the workplace learning literature on how informal learning and knowledge evolve from practice.

Participation in social (communities of) practice, by definition, will involve learning (Cushion, 2006). The process of becoming a member of a community allows learning to take place, thus the processes, relationships and experiences that constitute a participant's sense of belonging underpin the subsequent learning (Fuller et al., 2005). Lave and Wenger characterise this notion as legitimate peripheral participation:

Legitimate peripheral participation provides a way to speak about the relations between newcomers and old-timers, and about activities, identities, artefacts and communities of knowledge and practice. It concerns the process by which newcomers become part of a community of practice. (p. 29).

Learners progress from less important tasks toward crucial core tasks, thus moving from peripheral to full or central participation. As this occurs, understanding unfolds with the learner developing a view of what the activity entails. This process ensures learning itself is an improvised practice where the curriculum unfolds in opportunities for engaging in practice (Fuller et al., 2005). The individual is located within the community of practice and facilitates learning through mutual engagement in an activity that is defined by negotiations of meaning both inside and outside the community (Fuller et al., 2005). As communities are social structures, they involve power relations, and the way power is exercised can make legitimate peripheral participation empowering or disempowering (Lave and Wenger, 1991; Fuller et al., 2005).

Extensive case study evidence provided by Fuller et al., (2005) identified significant differences in the forms and extent of participation in learning. Importantly, the authors identified these differences as being contained between the aims of respective learning programmes. For example, the aim of developing well-rounded experts was described as an 'expansive' programme (Fuller and Unwin, 2003a). Whereas a 'restrictive' programme was one that was given low priority within the organisational context and was used primarily to develop compliant and useful workers. Consequently, access to learning opportunities was restricted, with the aim being to develop 'narrow' experts. All of the participants in the research were engaged with learning, but their experiences were uneven because of the differences in engagement with models of different scope, length and aim.

This body of research presents empirical evidence that Lave and Wenger's (1991) theory is a useful theoretical framework to understand learning, but is incomplete (Fuller et al., 2005). Indeed, the authors are critical of Lave and Wenger's seemingly positive assumptions concerning informal learning and Fuller et al., (2005) argue that informal learning is not benign, and power relations within legitimate peripheral participation must be recognised. Moreover, Fuller et al., (2005) also argue that structured courses

are an integral part of learning within a community, and for these to be effective, they must be accepted as a legitimate activity.

4.3.3 Formalising Informal Learning and Mentoring

Cervero (1992) contends that the 'popular wisdom among practicing professionals is that the knowledge they acquire from practice is far more useful than what they acquire from more formal forms of education' (p. 91). In developing as practitioners, coaches therefore, are 'initiated into the traditions, habits, rules, cultures and practices of the community they join' (Merriam, 1983, p. 37). This initiation is conducted with and through others, through observation and participation. Key to this initiation, therefore, is the process of mentoring. Indeed, several authors discuss the pervasiveness and impact of informal mentoring (Bloom et al., 1998; Cushion, 2006; Cushion et al., 2003). Mentoring is the most visible example of a practice where formal and informal learning meet (Colley et al., 2003a). Control of the experiences and interactions of coaches is suggested by a number of authors (Cushion et al., 2003; Cushion, 2006; Werthner and Trudel, 2006; Trudel and Gilbert, 2006; Gilbert and Trudel 2004b, and mentoring is conceived as bringing an increasing formalisation of a practice that is inherently informal (Colley et al., 2003a). However, research also suggests that there are complex issues surrounding the transfer of informal learning to more formal domains.

Colley et al. (2003a) examined mentoring interventions with socially excluded youth. 'Natural' mentoring (Philip, 1997) is described where a mentor is sought out by a mentee, from within their own community: a process not dissimilar to that described in coaching examples (Bloom et al., 1998; Cushion et al., 2003; Jones et al., 2009). This process is entirely unplanned but intentional, with the mentee controlling the agenda and interactions, with social structure offering the formality (Colley et al., 2003a; Billet, 2001a). This can also be described as informal mentoring from a detached individual with similar agency from the mentee (Philip, 1997). This type of informal mentoring is in operation with reports of effectiveness in a number of domains, including coaching (Bloom et al., 1998). As Colley et al., (2003a) suggest, the findings from natural or informal mentoring have been seized upon for the introduction of planned formal mentoring programmes: a process also mirrored within coaching (Cushion, 2006; Jones et al., 2009).

The outcome of this formalisation is mentoring known as engagement mentoring (Colley, 2000, 2001a) that takes place within an institutional framework, and is shaped by policy makers and professional practitioners. Colley et al., (2003a) note this type of mentoring has a more or less overt compulsion to participate for the mentees, a narrow frame of outcomes and a high level of recording and monitoring. Importantly, mentors are often drawn from higher-status individuals outside the community. These findings are supported in a recent review of mentoring undertaken by Jones et al., (2009), who examined the nature of mentoring in nursing, business, education and sports coaching.

Engagement mentoring relationships are marked by social distance, competing value systems, and more intense power differentials than informal mentoring (Freedman, 1999). Indeed, Colley et al., (2003a) from their review and research strike a cautionary note concerning problems with formalising as 'fervour without infrastructure' (Freedman, 1999, p. 2). They argue that the perception of mentoring as inherently informal means minimal training and support for mentors. Formal mentoring can expose the frailty of

dyadic models of mentoring relationships and introduces the triadic element of external interests pursued by dominant groupings (Colley et al., 2003a; Jones et al., 2009). The findings from the reviews and research into mentoring suggest that there can be unthinking assumptions that such transference is straightforward. In fact, the mentoring process changes as it becomes applied through planned and formalised programmes. The nature of mentoring within formalised programmes is discussed further under formal learning (section 4.5.2 p. 50).

4.3.4 Reflection

Gilbert and Trudel (2001) argue that participating in coaching provides a mechanism for gaining knowledge; in other words, learning through doing. This mechanism is reflection in, and on, these experiences (Erickson et al., 2008). Arguably, the best theoretically framed explanation for how coaches informally learn has come from Gilbert and Trudel's (2001) experiential learning model. The authors demonstrated how six model youth-sport coaches learned by engaging in three forms of reflective practice: reflection in action (ie during the action present), reflection on action (ie within the action-present but not in the midst of activity) and retrospective reflection on action (ie outside of the action present). In so doing, Gilbert and Trudel (2001, 2004b, 2005) presented evidence that Schön's (1983, 1987) theory of reflective practice provides an effective framework for analysing and explaining how coaches frame their knowledge and learn from practical coaching experiences.

Gilbert and Trudel's (2001) model of experiential learning highlighted six distinct components within this process: coaching issues, role frames, issue setting, strategy generation, experimentation and evaluation. The last three of these components comprised a sub-loop that coaches repeatedly went through before solving their specific coaching problems. According to the authors, coaching issues provided the impetus for reflection to occur. Reflection, however, was bound by the coaches' personal coaching philosophy, which the authors referred to as a role frame. Role frames acted as filters that influenced which scenarios were and were not considered worthy of reflection. The third component, issue setting, was recognised as the process of identifying why a situation was conceived as being a coaching issue. Upon identifying a troublesome situation (ie labelled as a coaching issue) a reflective conversation was triggered. This led the coach to draw upon a pool of resources (ie coaching repertoire, creative thoughts, coaching materials, advice seeking, joint construction, and reflective transformation) in an attempt to generate a strategy that could address the coaching issue. The strategy was subsequently implemented and its effectiveness evaluated. If resolved, the strategy was perceived to be effective and the coach disengaged from the reflective conversation. If the issue remained unresolved, the strategy was labelled ineffective and the coach returned to the strategy generation phase.

The selection of options at each stage in a reflective conversation is influenced by peers, the coach's stages of learning, the issue characteristics, and the environment (Gilbert and Trudel, 2005). This line of research shows that coaches have the potential to learn through experience by building repertoires, and their reflection on their actions should not be perceived as an isolated activity but a social activity (Gilbert and Trudel, 2006). Indeed, with elite coaches (Fleurance and Cotteaux, 1999; Jones et al., 2004) the value of head coach consultations with respected peers and assistant coaches to check the accuracy of their assumptions as part of this process, has also been found

The theory of reflection appears to offer a great deal to understanding coaches' informal experiential learning. However, there is limited research exploring this phenomenon. Several theoretical and conceptual publications argue that reflection is a valuable tool for understanding coaches' informal learning (eg Cushion et al., 2003; Cushion, 2006; Cassidy et al., 2004, 2009), but this is not supported with empirical data. As Gilbert and Trudel (2006) suggest, experience and interaction with others are inevitable phenomena in coaching. This type of learning deals with knowing not knowledge (Sfard, 1998) and control of the learning content is therefore impossible. To ensure an even development for coaches, these experiences and interactions should be facilitated in some way (Cushion et al., 2003; Cushion, 2006; Werthner and Trudel, 2006). One possible method of facilitation is through the use of mentors to identify and develop learning opportunities (Cushion, 2006).

4.3.5 Past Athletic Experience

It would appear that learning not only occurs while engaging in the process of coaching but has its genesis some time before. A significant part of informal learning, relates to coaches serving what has been described as an 'apprenticeship of observation' (Sage, 1989) as athletes and coaches (Cushion et al., 2003; Jones et al., 2004).

While much development clearly takes place throughout a coach's career in the coaching role, it would appear that job-related learning often starts many years before any conscious decision to enter the profession. Analysis of the literature reveals that both elite performance coaches (Abraham et al., 2006; Irwin et al., 2004; Jones et al., 2003, 2004; Salmela, 1995; Schempp et al., 1998) and voluntary youth-sport coaches (Erickson et al., 2008; Lemyre et al., 2007; Wright et al., 2007) have acquired much understanding of the coaching role as athletes. Practitioners have reported these experiences provided them with a basic understanding of their sport's rules, procedures and drills (Bloom et al., 1998; Lemyre et al., 2007), allowed them to see and learn from different coaches (Lemyre et al., 2007; Wright et al., 2007), helped them to gain an understanding of how performance feels for their athletes (Irwin et al., 2004; Schempp et al., 1998) and facilitated their ability to better relate to their athletes by empathetically understanding things from the athletes' perspective (Irwin et al., 2004; Jones et al., 2003; Schempp et al., 1998).

Sport participation experience as an athlete is, therefore, unquestionably a source through which coaches learn. The importance coaches attach to these past experiences would, however, appear open to further investigation. Whereas elite gymnastics coaches identified athletic experience as the third most important learning source (Irwin et al., 2004), elite golf coaches ranked it as being relatively unimportant when compared to other knowledge avenues (Schempp et al., 1998). One of the elite gymnastics coaches in Irwin et al.'s (2004) study actually reported that sporting experiences could in fact be detrimental, as previous sporting success can result in a lack of understanding and compassion towards others. So it would appear that additional research into both the positives and negatives associated with having gained previous athletic experience is required, as is a recognition that there may be sports-specific differences.

Through his study of elite Canadian team-sports coaches, Salmela (1995) discovered that: 'all expert coaches were intensely involved in many sports as children and adolescents' (p. 5). Two studies have recently attempted to investigate this empirically

and map out the developmental pathway of coaches (Gilbert, Côté and Mallett, 2006; Erickson, Côté and Fraser-Thomas, 2007). Utilising an approach first proposed by Côté, Ericsson and Law (2005) for examining the developmental pathways of elite athletes, Gilbert et al., (2006) modified this procedure for use with coaching practitioners. Here, both Gilbert et al., (2006) and Erickson et al., (2007) employed retrospective interviews to obtain qualitative accounts of their participants' experiences as athletes and coaches. While these investigations were not focused on learning per se, analysis of the data derived from 15 successful teams sport coaches (Gilbert et al., 2006) and 19 high-performance individual- and team-sport coaches (Erickson et al., 2007) indicated some intriguing results.

Gilbert et al., (2006) found that successful team-sports coaches accumulated thousands of hours as sports participants and performers across a number of sports before coaching. For example, successful developmental-sport and elite-sport coaches accumulated an average of 4600 hours as athletes (Gilbert et al., 2006). The data demonstrated that all participation coaches competed as athletes, with reported percentages exceeding 90%, with five or more years in the sport they now coach. In addition, 75% of coaches in development sport have experience as competitive athletes in the sport they now coach. Over 90% of elite coaches are former competitive athletes. The data also suggested that coaches in this domain have five or more years of assistant coach experience before becoming a head coach.

Building upon this preliminary investigation, Erickson et al., (2007) constructed five developmental coaching milestones from their analysis of the data from 19 Canadian university head coaches, comprising a range of sports. These were: diversified early sport participation (age 6–12), competitive sport participation (age 13–18), highly competitive sport participation/introduction to coaching (age 19–23), part-time early coaching (age 24–28) and high-performance head coaching (age 29+). While the majority of the study's participants had elite-level experience as an athlete in the sport they now coached, Erickson et al., (2007) reported that their findings were consistent with those of Salmela (1995) in that elite level athletic experience was not necessarily a prerequisite for becoming a coach. Erickson et al., (2007) also discovered, perhaps unsurprisingly, that despite forming part of the coaches' developmental process, the amount of time engaged in formal training was minimal when compared to the actual practice of coaching. As has already been discussed, however, much learning can occur on the job through the process of reflective practice. Informal mentoring was identified once again by Erickson et al.'s participants as having been an important developmental process.

4.3.6 Informal Learning: Some Conclusions

This section of the review has considered the literature related to informal learning in coaching and other domains. The findings have demonstrated that learning frequently occurs outside educational settings, and often in environments where the primary purpose is not learning. Informal learning was shown to occur through interactions with athletes and other practitioners, reflection upon coaching experiences and often through self-directed study. Both reflection (Schön, 1983, 1987) and situated learning (Lave and Wenger, 1991) have been suggested as useful theoretical frameworks to understand informal learning. Several authors make compelling arguments for their use within coach

learning. However, this work is largely conceptual and there remains limited empirical evidence from coaching and, therefore, more studies are required.

Given the existing body of research it is impossible to identify any unifying theory of informal learning to which the entire field of practice could subscribe. While such grand theory may not be appropriate, the existing research does begin to help develop an understanding of the processes at work. While learning occurs when practising as a coach (intentionally and unintentionally), evidence was also presented demonstrating that learning to become a coach often starts as an athlete. The usefulness of knowledge developed during this period however, has to be subject to greater scrutiny and cannot be simply accepted as positive. Indeed, this was identified as an area requiring further research. Informal learning occurs without a prescribed curriculum and is often facilitated by an 'other'. Importantly, as the evidence from workplace learning suggests, this learning ignores power relations in which the 'other' dominates the process, and particular ideological interpretations of high-status knowledge are enforced. Experiential learning is more than just doing: coaches must become competent at setting problems and then developing and evaluating their strategies for solving the problems they have identified (Trudel and Gilbert, 2006). Without a form of reflective process, coaches simply accrue experience without it meaningfully impacting on their practice (Kidman, 1997; Gilbert and Trudel, 2001).

4.4 Non-formal Learning

Learning that has occurred in non-formal situations has been conceptualised as, 'any organised, systematic, educational activity carried on outside the framework of the formal system to provide select types of learning to particular subgroups in the population' (Coombs and Ahmed, 1974, p. 8). Examples of non-formal learning include coaching conferences, seminars, workshops and clinics (Nelson et al., 2006). Although formal and non-formal learning share many similar characteristics, non-formal learning differs from the former as it tends to present a particular subgroup of a population (eg high-performances coaches) with alternative sources to those of the formal structured learning pathway (ie short courses typically focused on a specific area of interest).

Research indicates that coaches engage in non-formal learning activities (Erickson et al., 2008; Schempp et al., 1998), although there has been a tendency in the literature to consolidate all forms of formal and non-formal provision under headings such as 'coaching courses' (Irwin et al., 2004). As was previously discussed, the number of reported learning categories varies significantly between studies. This might have resulted from the absence of a conceptual framework that could have informed the analysis process. It could be argued, then, that a more useful approach would have been to identify a conceptual framework (formal, non-formal informal; participation/acquisition, mediated, unmediated) and detail the various endeavours that coaches have engaged within the framework, rather than report broad categories comprising of distinguishable learning sources. There is also a need to assess the impact of these non-formal learning activities on the development of coaches, as empirical research in this area is largely absent.

The literature does, however, contribute to understanding non-formal provision through coach education interventions set up specifically as research projects. For example, Conroy and Coatsworth (2006) developed a training programme for coaches to increase

certain behaviours and reduce others. This research suggested that interventions can change the quality of micro interventions between coach and athlete. Conroy and Coatsworth utilised Coach Effectiveness Training developed by Smoll and Smith (1984), as a coach behavioural intervention. Conroy and Coatsworth (2006) developed the Penn State Coach Training Programme which aimed to have a direct effect on coach behaviours based on interpersonal theory (Pincuss and Ansell, 2003) and self-determination theory (Ryan and Deci, 2000), where the mechanism of training effects involves a process of internalisation. Experimental designs with randomized groups were used (Conroy and Coatsworth, 2006; Conroy and Coatsworth, 2004). The treatment group received the intervention, while the control group received a sports science training programme (injury prevention, hydration, nutrition). Pre- and post- measures of coach behaviour for the groups found differences in the experimental group.

The authors commented on the quality of coaching research, arguing that coaching research designs rarely had random assignment to training groups, pre-/post-assessments of coaching behaviour and adequate sample sizes. Experimental research designs are advocated by these authors; however, the myriad of variables and factors that can impact learning suggests there are issues applying the findings beyond the context of the intervention: learning and its impact is not linear. Cross-sectional designs and 'opinionaire' studies (collecting participant opinions) do little to create a meaningful evidence base. Until more research is carried out with rigorous methodologies, conclusions about the efficacy of training for changing coach behaviours will be premature (Conroy and Coatsworth, 2006). In addition, the authors draw on recent research and note that modifying coach behaviours should be aligned with reflective practice as well as mentoring in communities of practice to effect long lasting and meaningful behaviour change.

In a similar, study Kidman and Carlson (1998) used action research to modify the behaviour of five coaches, using coach behaviour analysis, self-reflective analysis and feedback from a sport-specific expert. Changes in coach behaviours were noted and coaches reported they benefited from the programme. While conclusions concerning coach learning in this case can be tempered due to a lack of control group and a small sample size, pre- and post- measures of coach behaviour can evidence behavioural change.

In addition to governing bodies of sport, specific associations and clubs employing coaches are other non-formal learning sites. While contextualised learning has been shown to occur informally through reflection, Rynne et al., (2006) suggested that organisations such as the Australian Institute of Sport seek to promote workplace learning by educating its employees. Arguably, one such example is presented by Culver and Trudel (2006, 2008) who drew on the work of Wenger (1998) to cultivate three coaching communities of practice (CCoPs) within a Canadian alpine ski club, a karate club and with high-school-sport coaches. Analysis of the data revealed that those practitioners who participated in facilitated CCoPs appreciated round-table discussion opportunities, and found them to be both valuable and enjoyable. These experiences allowed the participant coaches to see how others were thinking, to listen to the advice of others and to experiment with new ideas in practice. The third CCoP was, however, less successful. Despite it comprising of coaches that had already benefited from participating in two previous CCoPs, the group lacked leadership and direction because the facilitator did not attend. The results of these studies, therefore, suggested the

facilitator played an important role in the group learning process, adding a certain amount of structure to the learning (Culver and Trudel, 2008).

McCaughy et al., (2005) considered non-formal learning investigating a 'teacher-mentoring-teacher' programme. They conceptualised non-formal learning within CPD (reviewed fully in Section 4.4.1) and outlined some characteristics of this type of learning that may be analogous to non-formal coach learning or CPD. These include: short (perhaps one off) workshops with little or no follow-up, predetermined and highly structured sequences and activities, didactic instruction with passive learning; random groupings of teachers, decontextualised content and a lack of reflection in and on the teacher's own teaching (Armour and Yelling, 2004b; Garet et al., 2001). McCaughy et al., (2005) argue this type of non-formal learning is problematic as little learning occurs when time is short and the needs of the recipients are not the focus of the process. Indeed, referencing key work by Sparks (2002), Armour and Yelling argue that:

...traditional forms may be ineffective and may be described as the 'batch processing' of teachers who are talked at in the name of exposing them to new ideas... These traditional approaches are unlikely to be effective in raising the standards of teachers' or pupils' learning... Instead such professional development is more likely to result in 'fragmented and incoherent teacher learning that lacks intellectual rigour, fails to build on existing knowledge and skills and does little to support the day-to-day challenges of improving student learning (Armour and Yelling, 2004b, p.72-73).

4.4.1 Continuing Professional Development (CPD)

The term CPD has recently 'marched into the discourse of education' (Armour and Yelling, 2004a, p. 96) and has filtered its way through to the literature discussing the development of physical education teachers (Armour and Yelling, 2004b) and sports coaches (eg Cushion et al., 2003; Jones et al., 2004; MORI 2004). Craft (1996) has defined CPD as 'all types of professional learning undertaken (by teachers) beyond the initial point of training' (p. 6). However, as Nelson et al., (2006) point out, the phrase 'beyond the initial point of training' (Craft, 1996, p. 9) can be more easily identified in physical education than coaching.

Physical education teachers in the UK, for example, are required to undertake a higher education qualification before being permitted to work autonomously within an educational institution (Capel, 2004). This would constitute the physical education teacher's initial education and any professional learning thereafter is clearly identifiable as CPD. Coaching, however, is significantly different in that it is possible to practise without any formal qualifications. In the UK approximately 1.1million people undertake coaching related roles, of these approximately 600,000 are deemed coaches (North, 2009). North suggests that 53% of the individuals deemed coaches hold a governing body of sport qualification. Coaches can undertake undergraduate and postgraduate studies in coaching or sports science disciplines, but these qualifications do not currently certify the graduate as a coaching practitioner as they are not formally recognised by the UK governing bodies of sport (Nelson et al., 2006). Therefore, an individual currently intending to become an accredited coaching practitioner can only do so by undertaking their governing body coaching of sports' award(s). So we are left with the paradoxical

position of a governing body of sport qualified coach seeing a university qualification as CPD, while a coach undertaking their degree before a governing body of sport award sees the degree as part of their initial step in formal coach learning (Nelson et al., 2006).

Within a broader umbrella of coach learning, it is possible to adapt Craft's (1996) definition of CPD to read 'all types of professional learning undertaken by coaches beyond initial certification' (Nelson et al., 2006, p. 255). The term 'initial certification' thus replaces and encompasses 'initial training' (depending upon the focus of the certification process) plus any other non-formal and informal learning undertaken prior to becoming certified. With respect to the term professional, however, it should be noted that coaching remains an emerging profession in many western nations. In the UK, for example, only 3% of the 1.1million coaches work in a full-time capacity, whereas 76% of all coaches are comprised of unpaid volunteers (North, 2009).

The bulk of the CPD literature comes from education. While this overview of CPD research in education is informative, it should be remembered that there is no assumption that the needs of teachers and coaches are the same. Nonetheless, it is also clear that teaching and coaching have some important similarities (Jones, 2006), and research from coaching suggests that teachers and coaches do share some concerns about CPD provision. Definitional considerations aside, the education literature arguably offers a source from which coach learning and development could draw valuable lessons.

The traditional CPD model is based on providing teachers with a series of one day, off-site courses on specific topics, with little or no follow-up support (Armour and Yelling, 2002). This model is based on a simplistic understanding of learning as a linear process that leads from a CPD provider, through a CPD activity that is usually undertaken out of the practice context, to a teacher whose learning is thereby enhanced and, finally, to pupils whose learning is also enhanced (Armour and Yelling, 2002). However, what has become clear is that professional learning is simply not that straightforward. At the very least, it should be recognised that teachers, just like pupils, have different learning needs. Moreover, it is also widely agreed that school structures can hinder professional learning for teachers, particularly where neither time nor opportunity is available for teachers to embrace new learning and embed it, over time and with support, into their existing practices (eg Mayer et al., 2003; Klingner, 2004; Peressini et al., 2004).

This is well illustrated by Garet et al., (2001), who completed an extensive investigation through the surveying of 1027 mathematics and science teachers who had undertaken funded CPD activities. From their data they were able to statistically establish links between the structural (ie form, duration and degree of collective participation) and core (ie content focus, degree of active learning and level of coherency) characteristics of the participants' CPD activities and their self-reported impact upon the development of knowledge and practice. The authors discovered that effective CPD activities involved a substantial investment of time, were focused on academic subject matter, provided teachers with hands-on opportunities and were integrated into the daily life of the school. (These findings provide an uncomfortable comparator for almost all forms of coach learning provision.)

Garet et al.'s research brings into stark relief that the central problem for teachers' professional learning is not that one-day courses are always ineffective, but that for most teachers this is the only form of CPD either available or recognized. The traditional

model also fails to account for the sheer range of professional development activities required to support practice in teaching (and, surely, in coaching). Garet et al., (2001) summarise this range as follows:

Some activities are intended primarily to improve teachers' knowledge of subject-matter content; some are designed to improve general pedagogy or teaching practices, such as classroom management, lesson planning, or grouping methods; and some are intended to improve what Shulman (1987) has termed 'pedagogical content knowledge' – teaching practices in specific context domains, such as teaching multi-digit addition in elementary mathematics or forces and motion in physics (Garet et al., 2001, p. 923).

Perhaps of even greater significance is a project recently completed by Armour and Yelling (2002; 2004a; 2004b; 2007) into the CPD activities and experiences of physical education teachers. The first two phases of this project (Armour and Yelling, 2002; 2004a; 2004b) involved 85 experienced physical education teachers and collated data via semi-structured interviews (20 teachers) and open-ended profile questionnaires (a further 65 teachers). Analysis of the data revealed that practitioner's CPD experiences generally lacked relevance and coherence. Moreover, the teachers reported effective CPD as being: practical, relevant and applicable, able to provide ideas and practices, delivered by a good presenter, challenging and thought provoking and able to offer time for reflection and collaboration. The participants also advised policy makers to give careful consideration to course funding, cost and quality of supply cover, time and teacher workload, and the location of CPD activities.

The final phase of this project tracked the learning activities of 10 case study teachers over an academic year (Armour and Yelling, 2007). Through a mixed method design (ie field notes, learning diaries, individual interviews and a focus group interview) it was discovered that teachers often considered the attendance at official CPD courses as hoop jumping exercises necessary for CV construction. While such courses were not always held in high regard, the teachers often valued their attendance because it offered an opportunity to interact with other practitioners. Moreover, the teachers often attempted to overcome the shortcomings of formal provision by engaging in informal self-selected professional learning networks. Armour and Yelling (2007) highlighted that these unofficial activities somewhat ironically presented precisely the kind of CPD that is recommend by much of the literature discussing effective professional learning and suggested that physical education CPD provision should subsequently be 'turned upon its head'.

The outcome of the current extensive research is in agreement that no single approach to CPD will work for all teachers all of the time. Instead, in order to be effective, a rich variety of learning experiences is required (Guskey, 1994; Klingner, 2004; Sandholtz, 2002). Much research has sought to identify the characteristics of effective CPD and the two examples that follow are illustrative of the wider findings. First, Sparks (2002, p. 1–4) defined effective CPD as that which:

- deepens teachers' content knowledge and pedagogical skills
- includes opportunities for practice, reflection and research
- is embedded in the workplace and takes place in the school day

- is sustained over time
- is founded on a sense of collegiality and collaboration.

Second, similar findings emerged from research on schools in the United States that were failing in one or more aspects of provision, and where CPD for teachers was placed at the heart of school improvement strategies. West Ed (2002, p.12) entitled the report of their findings: 'Teachers who learn: Kids who achieve' and concluded that in order to make CPD effective, schools should:

- ensure student-centred goals underpin all professional development
- accept an expanded definition of professional development, embracing a wide range of formal and informal learning experiences
- recognise, value and make space for ongoing, job-embedded informal learning
- structure a collaborative learning environment
- ensure there is time for professional learning and collaboration
- check (constantly) whether professional development is having an impact on pupils' learning.

The last point is important. Numerous researchers have pointed to the challenge of linking teacher learning to enhanced pupil learning. For example, Guskey (1994; 2002) argues the profession still needs much better evidence about the effects of different forms of CPD on teaching, learning and student achievement. Guskey also argued that in education, we need a paradigm shift in CPD. Instead of viewing teachers as passive learners, CPD should be viewed as an opportunity to help teachers to develop as independent thinkers and knowledge creators. Similarly, Day and Sachs (2004) identified two different models of CPD. The deficit model assumes that CPD providers must 'fill' teachers with knowledge that they lack; this would appear to be the prevailing model to date. The aspirational model, however, acknowledges the need for teachers to engage in continuous learning within schools that value professional learning and that operate as school-wide learning communities. Clearly this view represents something of a departure from the traditional CPD courses that many teachers have attended throughout their careers.

James et al., (2007, p. 217), in the conclusion to a major teaching and learning project undertaken in England, argued that teachers need to move away from 'performing teaching' to 'supporting learning'. In addition, these authors argued that teachers who were most successful in supporting student learning were those who 'took responsibility for what happened in their classrooms. They were not inclined to blame external circumstances or pupil characteristics...' (p. 215). What these and earlier research findings have in common is a view of schools and teachers as active in their professional growth and development. However, a further complication identified in the research on effective CPD by both Sparks (2002) and West Ed (2002) is learning context; essentially, context matters, and embedding learning within 'real' teaching contexts is pivotal. It is apparent that teachers (like most learners) need considerable support to use information that is delivered in contexts very different to the ones in which they work (Penuel et al., 2007). However, the traditional model of CPD fractures the link between professional

learning and practice, based on the assumption that teachers will be able to take knowledge from one context and adapt it to the needs of learners in different contexts. Given the evidence that such transfer is fraught with difficulties, it is now argued that professional learning must be embedded in practice wherever possible, and the establishment of professional learning communities of practice is suggested as a way forward.

Although it is clear that learning can take place in numerous ways, there is a growing belief in the importance of constructivist models of learning in the context of professional development. The key features of constructivism are discussed in section 2.2 (p.5) and are summarised by Simons (1993) as learning that is active, constructive, cumulative, goal-oriented, diagnostic and reflective. In addition, Simons suggests that effective learning is most likely if the conditions are self-regulated, intrinsically motivated, discovery-oriented, contextual, problem-oriented, case based and social. In addition, Vygotsky (1978) identified the benefits of working collaboratively in order to learn effectively. These constructivist characteristics of learning also match closely the findings on effective adult learning (Tusting and Barton, 2006) discussed in section 2.2 (p.5).

A belief in social constructivist approaches to learning underpins recent suggestions that establishing professional learning communities (PLCs) within communities of practice (Wenger, 1998) is an effective mechanism to enhance teachers' learning. Indeed, the desirability of establishing PLCs reverberates throughout the teacher professional development literature. As Little (2002) comments:

Research spanning more than two decades points consistently to the potential educational benefit of vigorous collegial communities. Despite some caveats, that research has steadily converged on claims that professional community is an important contributor to instructional improvement and school reform (Little, 2002, p. 917).

Most recently, Lieberman and Miller (2008, p. 206) made the strong claim that 'professional learning communities...hold the promise of transforming teaching and learning for both the educators and students in our schools'. This seems to resonate with Hodkinson et al's (2008) metaphor of learning as 'becoming':

...learning can change and/or reinforce that which is learned, and can change and/or reinforce the habitus of the learner. In these ways, a person is constantly learning through becoming, and becoming through learning (Hodkinson et al's 2008, p. 41).

Nonetheless, it has become fashionable to call for the establishment of PLCs in education. This is not an easy process particularly where schools are unprepared for the change. Teachers are unfamiliar with the process and, crucially, professional development providers lack the skills required to establish and support such communities (Stein et al., 1999).

Armour and Yelling (2007) illustrated the importance placed on learning with and from each other, identifying this as the most powerful source of professional learning for teachers in their study. Deglau and O'Sullivan (2006, p.395) reported the success of a long-term CPD programme for physical education teachers in the United States and, in particular, noted that 'its commitment to providing opportunities for teachers to engage

with each other within a community of practice resulted in many of the teachers forming strong identities as teaching professionals'. Ko et al., (2006) also argued that in order to be effective, physical education CPD should be situated and grounded in teachers' practices, which O'Sullivan (2007, p.6) reported that 'when teachers collaborate in such communities they are more willing to take risks, reflect on their failures and share successful programmes and practices'.

Yet, as Patton and Griffin (2008) remind us, teachers as individuals learn in very different ways and establishing collaboration to the level required for effective and sustained learning can be challenging. Similarly, Armour and Duncombe (2004) found teachers of primary physical education struggled to learn collaboratively, particularly where a school lacked enabling professional learning structures. O'Sullivan (2007) also urged caution, commenting that attempts to introduce, develop and sustain communities of practice resulted in numerous challenges; for example, finding ways to inspire deep and critical discussions amongst the teachers involved. Keay's (2006) research also pointed to difficulties in making the theory of PLCs work in practice. There was further support for these points in the evaluation of the national physical education professional development programme in England, where it became clear that although professional development providers were encouraged to establish PLCs, they often lacked the expertise to support the sustained development of such communities (Armour and Makopoulou, 2008; Makopoulou and Armour, 2006).

Despite these caveats, it seems clear that the quest to embed professional learning in practice will lead to further attempts to establish PLCs, such that professional learning and professional practice are more closely linked. As James et al., (2007, p. 63) argue: 'Advice on specific classroom practices may be useful in the short term but continuous and progressive professional development will have more lasting value'. This last point about 'value' is critical, raising questions about measuring the effectiveness of professional development.

It is suggested that the ways in which professional development activities are evaluated may need to be reconsidered. Mujis and Lindsey (2008) identify inadequate evaluation as a key concern because most evaluation (if it takes place at all) takes the form of surveys of teachers' opinions (opinionnaires) collected immediately after attendance at a CPD event. This approach tells us nothing about whether and how teachers use what they have learnt, and whether pupils' learning improves as a result, or, indeed, declines. This makes it impossible to determine how best to spend the funds available for professional development; essentially, without effective evaluation it is impossible to determine what works, why and for whom (Wayne et al., 2008). Garet et al., (2001, p. 917) contend there has been 'relatively little systematic research on the effects of professional development on improvement in teaching or on student outcomes'. Guskey (2000) raised similar concerns and argued that in order to be effective, evaluation needs to be undertaken at five distinct levels: participant support, participant learning, organisational support, participant behaviour and student learning outcomes. It could certainly be argued that most current forms of CPD evaluation do little more than confirm attendance at an activity, providing little or no evidence of participant learning. Thus, as Guskey (2000) suggests, only where evaluation at all five levels is undertaken can learning be identified and, as a result, value for money determined.

4.4.2 Non-formal Learning: Some Conclusions

The field of teacher professional learning within education is vast and this overview is necessarily selective. However, it covers the key topics addressed over the last 10 years, culminating in the most recent evidence on establishing PLCs. It is important to note, however, that the research findings do not suggest that the traditional model of CPD is redundant; rather, it should form only one part of a much wider range of professional learning activities. Looking ahead, the key challenges facing CPD in education (coaching) are to design CPD that takes cognisance of the complexity of learning, to ensure professional learning and the professional practice of teaching (coaching) are conceptualised as a single activity, to find better ways of understanding and evaluating the links between different forms of professional development and learning, and to understand the learning needs of professional development providers.

4.5 Formal Learning

Learning that has occurred in a formal situation is defined by Coombs and Ahmed (1974) as something that has taken place in an 'institutionalised, chronologically graded and hierarchically structured educational system' (p. 8). Formal programmes have characteristically required candidates to demonstrate prerequisites outlined in admissions guidelines, before embarking on a course that enforces compulsory attendance, standardised curricula and culminates in certification of some kind.

Activities conforming to this definition of coach learning include large-scale coach certification programmes developed by the governing bodies of sport and Higher Education courses relating to coaching and the sport sciences (Nelson et al., 2006). As a sub-component of coach learning, formal coach education has understandably attracted considerable attention with numerous scholars having researched (eg Cassidy et al., 2006; Culver and Trudel, 2006; Demers et al., 2006; Gilbert and Trudel, 1999a; Hammond and Perry, 2005; Jones and Turner, 2006; Knowles, Gilbourne, Borrie and Nevill, 2001; Knowles et al., 2005; Knowles, Tyler, Gilbourne, and Eubank, 2006; Maleté and Feltz, 2000; McCullick, Schempp and Clark, 2002; McCullick et al., 2005; Nelson and Cushion, 2006; Vargas-Tonsing, 2007; Wiersma and Sherman, 2005) and specifically written about this topic (Abraham and Collins, 1998; Cassidy et al., 2004; Cushion et al., 2003; Lyle, 2002, 2007a; Trudel and Gilbert, 2006). These studies will be considered in more detail in the coming sections, demonstrating the insights they have provided for coach learning.

4.5.1 Evaluation of formal coach education

Despite the seemingly large body outlined above, closer inspection reveals that, to date, there have been few studies that have as their aim attempted directly to investigate and evaluate coach education programmes. As a result, there remains no evidence to link certification as a result of coach education with coaching competency, despite many courses being competency based. In other words, it cannot be said that the competency achieved has been as a result of the programme.

Those few studies that have attempted to evaluate coach education, however, tend to have utilised mixed methodology designs. Gilbert and Trudel (1999a,b), for example, were the first scholars to outline a comprehensive strategy that could evaluate large-

scale coach education programmes, and still remain the only researchers to have measured whether course attendance directly impacted upon both the knowledge and practice of an attendee. While the authors' primary focus was on establishing the efficacy of their evaluation strategy, the mixed methodology employed (ie participant observations, semi-structured interviews, stimulated recall interviews, and systematic observations) demonstrated that the Canadian National Coaching Certification Program (NCCP) level two theory course had a negligible impact upon a youth ice hockey coach's knowledge, decision-making and instructional behaviours. These findings were, however, unsurprising as the coach revealed in his post-course interview that he already possessed a basic understanding of the programme's content, through previous course attendance and his own self-directed learning. So it would appear that the programme's impact was limited by the coach's previous learning endeavours. This meant that the course served only to reinforce much of what the coach already knew, rather than having introduced a substantial body of new information.

While Malete and Feltz (2000) did not directly study whether coach education attendance influenced knowledge, decision making, or practice, they did measure its impact upon coaching efficacy. More specifically, the researchers had a group of coach learners (n = 36) complete the coaching efficacy scale both prior to and after the attendance of a coach education programme comprising of two, six-hour sessions. Analysis of the learners' data demonstrated that course attendance had a significant impact upon the practitioners' perceived ability to coach when compared to that of a control group (n = 24). Although previous studies have demonstrated that efficacy is positively related to performance, there is unfortunately no way of confirming whether the coaches in this study acquired further understanding, altered their coaching practices or decision-making processes, as a result of course attendance. Put simply, this is research into coaching efficacy, but a measure of coaching efficacy is not a measure of competency, or quality.

Utilising a slightly different approach, McCullick et al. (2002) attempted to evaluate the effectiveness of the Ladies Professional Golf Association (LPGA) national education programme. The researchers employed a mixed method qualitative design (ie documentation analysis, field notes, interviews, and participant journals) and framed their findings against eight of Goodlad's (1990) tenets of effective teacher education. The authors discovered that the programme adhered to Goodlad's assumptions and concluded that golf teacher education (GTE) programmes must resultantly conform to the following criteria if they are to be effective: '(a) GTE programs must be run by a faculty that are in consensus about what golf teachers should know and do, (b) the faculty have to model the behaviours they wish to see from their graduates and (c) the practice of teaching under the watchful and knowledgeable eyes of the faculty is necessary' (McCullick et al., 2002, p. 218).

Knowles et al., (2005) also used a theoretical framework when assessing the educational programmes of six UK governing bodies of sport. Using reflection as a theoretical guide, the researchers established categories they perceived should appear in educational documentation if a programme was actively supporting the teaching and development of reflective practice. Deductive analysis of the governing bodies of sports' course documents revealed that the programmes did not provide clear structures for developing reflective skills. Similarly, Nelson and Cushion (2006) also drew upon reflection as an analytical framework and found from their data (ie documentation review, in-depth

interviews, and an observation) that governing bodies of sports' courses were also unlikely to promote the development of reflective practitioners.

So it would appear that despite reflection being an important means through which coaches learn, it seems far from being fully embraced and embedded within coach education provision. Reflective strategies can be used in coach learning but these approaches also require time, commitment and programmatic effort (Gilbert and Trudel, 2006). The question remains how much might learning to reflect on a course be used in actual coaching practice? A similar issue can be found in the education domain where 'educators seem to assume that reflective thinking learned via reflective practice would be retained, generalised and or transferred to ordinary settings. No evidence exists to support this assumption' (Tsangaridou and Siedentop, 1995, p. 228).

Hammond and Perry (2005) utilised a mixed-method design by collecting data through documentation analysis (ie syllabus documents), an interview (ie course instructor), notation analysis (ie of course delivery) and questionnaires (ie course attendees). Their data highlighted that the delivery of two soccer courses deviated significantly from the syllabus guidelines. These deviations related not only to the focus of content, but the delivery of information. While the syllabus document recommended delivery should be primarily practical in nature, attendees passively received information for approximately three-quarters of the course duration. Similarly, Gilbert and Trudel (1999a) reported that the NCCPS course studied was as much as six hours 15 mins short of its recommended duration of 21 hrs 40 mins. The course tutor failed to follow guidelines by allowing participants to access their course books during the end of course examination. So, early evidence would appear to support the proposition that delivery inconsistencies occur during formal coach learning.

While the external evaluation of coach education programmes is a potentially valuable line of inquiry, the literature reveals that only one study has considered the impact of course attendance upon understanding, coaching practice and whether provision matched the expectations of its learner (Gilbert and Trudel, 1999a). Evaluation of coach education beyond perceptions and opinions, in terms of coach learning and impact on practice, is a critical area for future research.

Evidence has suggested that coaches have tended to attach much less importance to formal coach education when compared to other more informal means of acquiring knowledge (Gould et al., 1990; Irwin et al., 2004; Schempp et al., 1998). When asked to comment on their experiences, coaches have suggested that: courses often give little more than a basic understanding but offer a starting point (Abraham et al., 2006; Jones et al., 2004, they often arrive already knowing about, and putting into practice, much of what is covered, meaning that little new knowledge is gained (Gilbert and Trudel, 1999b; Irwin et al., 2004), some of the theoretical material covered is considered too abstract from everyday practice to be considered worthwhile (Lemyre et al., 2007), courses can be guilty of trying to cram too much information into a relatively short period of time (Lemyre et al., 2007) and they have come to question much of the information acquired during courses later in their careers (Irwin et al., 2004). As a result of such experiences, some coaches have even admitted to attending later awards because of their being a compulsory requirement only (Wright et al., 2007). The element of compulsion and the need for certification means that coaches are unlikely to directly contest the programme (Cushion et al., 2003). Indeed, Cushion et al., (2003) suggest that coaches give an

outward appearance of acceptance while sometimes harbouring and restricting their disagreement with, and rejection of, the official coaching orientation. So, while coach education may give the appearance of being subject to a so-called wash out effect (Zeichner and Tabaachnick, 1981), evidence suggests that many coaches probably never accept or appropriate the programme behaviours and beliefs but, out of necessity, merely appear to (Cushion, 2001).

While existing coach education provision has been viewed somewhat negatively, it should be noted that researchers have also reported that: courses have provided some practitioners with an initial source of interest and enthusiasm (Irwin et al., 2004), those with limited athletic or coaching experience have found attendance to be useful (Wright et al., 2007), coaches have been highly appreciative of the practical components of formal courses (Lemyre et al., 2007), practitioners have viewed the attendance of coach education as an ideal opportunity to meet and engage with other coaches (Irwin et al., 2004; Lemyre et al., 2007), some coaches have suggested that they gained greater understanding as a result of their attendance (Irwin et al., 2004) and that coaches want the issues with formal coach education provision to be addressed so they are able to learn more from it (Erickson et al., 2008). So, it would appear that lessons for coach learning from these more positive aspects could be drawn. Nonetheless, it could be concluded from the research evidence that current forms of coach education provision are far from optimal. While coaches' perceptions of coach education provision will inevitably be shaped by their current understanding and previous experiences (Werthner and Trudel, 2006), it would appear that in its current format, coach education seems only to serve adequately those possessing a limited amount of both.

Whereas the vast majority of researchers have focused on asking coaches to reflect retrospectively upon their educational biographies and consider the usefulness of the various programmes attended, McCullick et al., (2005) ascertained the perceptions of those actually in attendance on an LPGA course. The study's 30 participants consisted of 25 course candidates and five coach educators. Data was collected through focus group interviews (ie with educators and candidates), journals (ie candidates reflections upon the programme and course tutors) and observations (ie an investigator attended the course and kept field notes). Inductive analysis of the triangulated data revealed that participants enjoyed the curriculum's progression. Having knowledgeable educators able to present examples and provide feedback were also considered important. Indeed, the participants felt that the balance between class and practice time was a key aspect. The integration of research was also thought to be important, as content supported by a sound body of knowledge was deemed credible.

More recently, Chesterfield et al., (in press) investigated how six coach learners perceived and responded to the content knowledge and assessment processes of an advanced football coaching award programme. Analysis of the interview data revealed findings in keeping with Nelson et al.'s (2006) assertion that formal provision can be described as indoctrination in some cases. The participants of Chesterfield et al.'s (in press) study felt that the course required them to structure sessions, deliver information to players and provide feedback in a manner prescribed by the instructor. The learners largely rejected the methods advocated, as they were not seen to be relevant and applicable to their actual coaching contexts. 'Studentship' (Graber, 1991) and 'impression management' (Goffman, 1959) were consequently employed by the coach learners as strategies to pass the course. This entailed shaping coaching behaviours, and

completing course logbooks to meet the perceived expectations of their examiner. So the studies of Chesterfield et al., (in press) and McCullick et al., (2005) have once again demonstrated a contrast in learners' experiences of, and perceptions about, the value of formal coach education.

Having outlined the many critiques of formal coach education, it is possible to call the education within coach education into question. When reviewing the coaching literature, it soon becomes apparent that coach education is the terminology most frequently employed to describe formalised provision. Importantly, this evidence is largely based on the key assumption that provision of this nature has been conceived as an educational endeavour. Despite this, developmental courses could, perhaps even should, be more appropriately labelled coach training or even indoctrination in some cases. According to Buckley and Caple (2000), education and training have a number of significant conceptual differences. They consider training to be more job orientated because it focuses on the acquisition of knowledge, behaviours and skills specific to a profession. Training, therefore, 'tends to be a more mechanistic process which emphasises uniform and predictable responses to standard guidance and instruction reinforced by practice and repetition' (p. 2). Education, on the other hand, is viewed as being more person-orientated, focusing on providing 'more theoretical and conceptual frameworks designed to stimulate an individual's analytical and critical abilities' (p. 2). While training promotes uniformity of knowledge and practices, education attempts to increase variability by emphasising and explicating individual differences.

The research critiquing formal provision would seem to locate it as training rather than education. The literature suggests coaches are often subjected to a standardised curriculum that privileges a technocratic rationality through a tool box of professional knowledge and a gold standard of coaching (Abraham and Collins, 1998; Cushion et al., 2003). This approach is aimed at developing coaches to have the requisite standardised knowledge and a battery of strategies to overcome what is perceived as typical coaching dilemmas in their domain. This would suggest that formal learning provision could in fact be labelled as coach training. When viewed in this light, coach training is arguably effective in achieving its desired learning objectives. The gaining of certification offers support to this notion as it demonstrates that many practitioners have satisfied the governing body of sports' criteria by acquiring and displaying desired minimum levels of coaching competency.

Some formal learning provision could perhaps even be described as indoctrination, which can be defined as 'activities that set out to convince us that there is a 'right' way of thinking and feeling and behaving' (Rogers, 2002, p. 53). In this respect, indoctrination denies the learner choice and instead exposes the learner to a single set of values and attitudes that they are expected to acquire and abide by. Examples of this might include indoctrinating a prescribed method of delivery, feedback sequence, coaching philosophy, tactical and technical approach (Jones et al., 2003). Currently, formal coach learning defines what knowledge is necessary for coaches to practise and how that knowledge can best be transmitted. Certification requires coaches to structure sessions, deliver information to athletes and provide feedback in a prescribed manner to be deemed competent. With this in mind, formal learning that delivers a bio-scientific discourse, within a techno-rational approach to coaching, might be appropriately described as training or even indoctrination in certain instances. Approaches with a constructivist orientation, on the other hand, might be conceived as educational endeavours. When

viewed through these descriptive lenses the practices of both orientations understandably make sense conceptually.

The implications of this are that perceptions of formal learning are changed by a given perspective of coaching, how it is defined and what that then requires the coach to do. If one believes that coaching is stable, consistent and identical across and between contexts, the generation of best practice models that are taught through training becomes a logical proposition. Likewise, for those who believe that coaching is an individual activity with its own contextual make-up, that is itself in constant flux educating coaches to become aware of this inherent complexity, diversity, and assisting them in becoming capable of adapting to these contextual demands, would be an appropriate way to develop learning.

The UK Coaching Certificate (UKCC) is designed to address the issues of formal coach education provision. Indeed Lyle (2007c) states that the UKCC has been designed to replace the existing ad hoc coach education system in the UK, through the provision of a standardised framework of qualification specifications, learning programmes and learner-centred resources. He argues that the learning programmes are intended to give greater emphasis to the socio-pedagogical skills of the coach: the how to element of expertise. Through the improved system, coaches should develop the capacity to work flexibly and within diverse environments, and learning programmes will be less directive and more enabling (Lyle, 2007c). He goes on to argue that the weaknesses of the present system have been redressed in the UKCC; these include concerns about the comparability of provision, an absence of rigorous quality control measures, a perceived vacuum in coach education philosophy, limited scale and depth of preparation with an overemphasis on sport-specific technical content, limited coach educator/tutor training, a lack of variety in delivery methods and lack of attention to individual needs, recognition of poorly developed delivery/how to skills and too much simulation in programmes (too much classroom activity).

Lyle (2007c) argues that the UKCC has been conceived and is being implemented as a 'step change' in provision. However, he also points out that it is important to recognise that its initial operationalisation remains developmental and to acknowledge the scale of change required. There is currently little research addressing these substantive changes to formal coach education. However, research carried out while this process is ongoing suggests the danger of a gap emerging between the rhetoric of UKCC and the reality of what happens on the ground. For example, Nelson and Cushion (2006) identified a governing body of sport who was trying to align with these changes and suggested that the course was in danger of being simply a re-branded version of an existing provision and is likely to remain overly prescriptive and de-contextualised. While more recently, Norman (2008) interviewed six head coaches of national teams who reported that their governing bodies were not succeeding in putting into place adequate coach education programmes. The UKCC provides a powerful impetus for change and offers the opportunity to address the shortcomings of formal provision. Clearly, further research is required before establishing a detailed appreciation of the UKCC's impact.

4.5.2 Formal Learning: Reflection and Mentoring

Over the past decade an increasing number of higher education institutions have offered academic courses focusing on sports coaching (Jones, 2005; Lyle, 2002). Increased

provision has arguably resulted from a growing appreciation of coaching as an intellectual endeavour requiring practitioners who are capable of engaging in complex sociocultural processes akin to that of an educator (Jones, 2001, 2006). This situation has allowed coaching scholars to experiment with delivery approaches and to present alternative frameworks that might be utilised to enhance the future provision of coach education.

One such approach was undertaken by Knowles et al., who recorded their learners' experiences of a second year undergraduate coaching module, designed to facilitate their ability to reflect (Knowles et al., 2001). Students were first required to attend lectures on the theory and practice of reflection. This was followed by the completion of a 60-hour coaching placement, the attendance of reflective workshops, and the keeping of a reflective diary. Analysis of the participants' (n = 8) reflective journal entries and interview data demonstrated that course attendance resulted in an enhanced ability to reflect. Six of the eight student coaches appreciated their having had an opportunity to openly discuss coaching issues with other group members.

Despite these positive findings, Knowles et al., (2001) concluded that the 'development of reflective skills is not a simplistic process even with structured support. Coach educators cannot therefore assume that development of reflective skills will be a naturally occurring phenomena that runs parallel to increasing coaching experience' (p. 204). In a follow-up study, Knowles et al., (2006) discovered that while graduates continued to engage in reflective practice post-course, their approaches were different to those espoused during the course. The results demonstrated that the participants only engaged in technical reflection, tended to focus on negative aspects and no longer kept reflective diaries. Knowles et al. (2006) argued that these findings could be explained by the coaches having to work in a culture that lacks accountability, requires coaches to practise in isolation and that tends not to present coaches with opportunities to engage in structured reflection. These points notwithstanding, it could also be suggested that the intervention simply did not work and the nature of such interventions require considerable thought by researchers' and enough time and practice for the coaches to ensure that they take hold.

Reflection would appear a central theme in formal provision, as Nash (2003b) also published a study outlining a third year undergraduate module designed to develop her student coaches' capacity to engage in reflective practice. Central to Nash's (2003b) course to support reflection was formalised mentoring. Students (n = 115) were required to engage in a 36-hour work placement under the guidance of a mentor coach (n = 110). Each group completed a questionnaire comprising open and closed questions upon completing the placement. Analysis of the data revealed that effective mentors were identified as possessing the following five qualities in rank order: effective communication skills, knowledge of their sport, experience, approachability and enthusiasm. Interestingly, the top three qualities highlighted by the coach learners were effective communication skills, approachability, and enthusiasm, whereas the mentors ranked knowledge of sport, experience, and organisation and leadership most highly. So it would appear that discrepancies existed between the views of protégés and their mentors, with the former more concerned about the interpersonal relationship when compared to the latter. It should be noted that neither Knowles' nor Nash's work considered coaching competence or effectiveness, and were focused specifically on reflection.

Ideas about reflection have spread across a range of domains including nursing (eg Burns and Bulman, 2000), healthcare (eg Taylor and White, 2000) and teaching (eg McAlpine and Weston, 2002; Moon, 2004). In this wide-ranging literature there remain concerns about the relationship between reflection and effective behaviour (eg Ferry and Ross-Gordon, 1998; McAlpine and Weston, 2002; Moon, 2004). Related to this is what Moon (2004) describes as an increasing awareness of a 'depth dimension' of reflection and a recognition that superficial reflection may not be effective as a means of learning (eg Mezirow, 1998; Kember et al., 1999, 2000; Kim, 1999). Indeed, Lyons (1999) examined experiential learning in formal nurse education. Not unlike the examples from sport, the author observed that there was a struggle to get learners to reflect. Lyons (1999) notes that reflection is often undertaken in a superficial way, which in fact might be little different from simply descriptive writing. Indeed, a number of authors have commented on the inadequacy of much activity performed in the name of reflection because it is, in fact, largely non-critical and non-reflective (Kim, 1999; Moon, 2004). This suggests that reflection has a range of applications, with a continuum from shallow description at one end to deep critical reflection at the other.

A number of authors offer frameworks for reflection that acknowledge this variety (eg Kember et al., (2000); Hatton and Smith, 1995). Hatton and Smith's framework was based on experimental work and reviews of literature from teacher education. Hatton and Smith (1995) describe four distinct forms of reflection: technical examination of immediate skills and competencies, descriptive analysis of performance, skills and competencies, dialogic exploration of alternative methods to solve problems and critical thinking of the effects of a course of action. Cushion (2006) suggests this framework as a useful tool in understanding not only reflection but the role of a mentoring relationship. He argues that these forms of reflection fit very well with concepts regarding the role of the mentor. Indeed, mentors and protégés could be engaged in one or more of these types of reflection within a mentoring relationship. This collaborative reflection has the potential to develop individuals' professional practice and knowledge, and can also contribute to the development of the field in a meaningful way. In addition, reflection, regardless of the form it takes, is a useful concept in the discussion of mentoring as it enables an examination of practice and a consideration of taken-for-granted assumptions that influence that practice (Cushion, 2006; Loughran, 2002).

Like much of the wider mentoring literature Cushion (2006) offers theories and ideas 'for' mentoring, rather than evidence 'of' mentoring. This is illustrated well by Ehrich et al., (2004) who reviewed 300 articles across business, education and medicine and found that the majority of studies were descriptive and focused on the value of engaging in mentoring. This conclusion is supported by recent work by Jones et al., (2009) who reviewed mentoring in business, education, nursing and sport. Ehrich et al., (2004) found that some mentoring programmes were evaluated while some were not, or were evaluated by 'vague and imprecise techniques'. Very often, the authors argue, evaluation consists simply of testimonials and opinions. Sambunjak et al., (2006) reviewed mentoring in academic medicine, identifying 3640 citations. Of those reviewed, 87% were cross sectional and/or self-report studies. These authors again highlight that mentoring is perceived as important but can find little evidence to support this. They recommend more evidence-based practical guides but acknowledge this requires research, with more rigorous methods that deal with specific context and cut across disciplines. Moreover, systematic reviews in nursing (Dorsey and Baker, 2004) and

business (Underhill, 2006) reported a lack of valid evidence for the effectiveness of mentoring due to a lack of experimental data. These findings are supported by Jones et al., (2009) who suggest that many of the claims about mentoring are largely unfounded. These authors cite Colley et al., (2003a, p. 1) who conclude that 'existing research evidence scarcely justifies [mentoring's] use on such a massive scale, [while] the movement has not yet developed a sound theoretical base to underpin policy or practice'.

These reviews, again, point to reports of perceived strengths and weaknesses of mentoring, which means that it remains difficult to differentiate if the observed outcomes were as a result of the mentoring or other factors. In business mentoring, Perren (2003) conducted a review of literature and concluded that research is lagging behind practice. Perren also argued that current research falls short of robust evaluation and the literature is generally only able to highlight advantages and disadvantages. The author concludes that the academic literature offers only tentative pointers to the efficacy of mentoring, and that more research is needed.

Despite the shortcomings identified in the literature, there remains overwhelming support for mentoring from a wide range of domains (eg Andrews and Wallis, 1999; Carter and Francis, 2001; De Haan, 2008; Dymock, 1999; Ehrich et al., 2002, 2004; Kushnir, Ehrenfeld and Shalish, 2007; McCaughtry et al., 2005; Cope, Cuthbertson and Stoddart, 2000; Stroot et al., 1998) including coaching (Bloom et al, 1998; Cushion et al., 2003; Cushion, 2006; Lyle, 2002; Saury and Durand, 1998; Gilbert and Trudel, 2004a, 2004b, inter alia) with a significant outcome being increased reflection for both mentor and protégé. The literature highlights the importance of formal mentoring (Cope et al., 2000; DeHaan, 2008; McCaughtry et al., 2005) suggesting that this will impact learning. However, the success of learning will be dependent upon the quality of the relationship between mentor and protégé (Dymock, 1999; Cushion, 2006). Both McCaughtry (2005) and Stroot et al., (1998) in looking at mentoring in teaching noted that effective mentors possess rich and sophisticated content, curricular and pedagogical knowledge and have strong listening and communication skills that can support, motivate and emotionally engage a protégé. They suggest that most mentors have not received formal training (Podsen and Denmark, 2000), while Andrews and Wallis (1999) in nursing suggest there is an inconsistency in preparatory courses; consequently, the mentor-protégé relationship might be unlikely to achieve its full promise. The issue of subject matter is further developed by McCaughtry et al., (2005) who found in their intervention programme with teachers that the need for content knowledge for the protégé depended on the role of the mentor. This could be a potential area for further research.

Ehrich et al., (2004) pull together some common issues negatively impacting mentoring in terms of the relationship and the type of learning or non-learning taking place that are worthy of consideration. These include lack of time and training, personal or professional compatibility, undesirable attitudes or behaviours of mentees that caused problems and workloads that went unnoticed. Mentees were concerned with a lack of mentor interest and training, and problematic behaviours (eg overly critical, defensive). In addition, Jones et al. (2009) highlight the possibilities of 'toxic mentoring' with asymmetric power relationships shaping both the mentoring experience and the learning that takes place. Ehrich et al., (2004) go on to state 'mentoring is a highly complex dynamic and interpersonal relationship that requires at the very least, time interest and commitment

of mentors and mentees and strong support from educational or organisational leaders responsible for overseeing programmes' (p. 533).

4.5.3 Formal Learning: Problem-based Learning (PBL)

As part of a wider drive to adopt principles of adult learning within coach learning a problem-based approach has been suggested as an effective instructional method (Trudel and Gilbert, 2006). Although new to coach learning, the approach has been used in other domains (eg medicine and education) (Trudel and Gilbert, 2006; Collier and O' Sullivan, 1997). In a problem-based approach, delivery starts with role-related problems rather than with the presentation of disciplinary knowledge. 'The key to problem-based learning is using material through which students engage with problems in situations as near as possible to real life' (Jarvis et al., 1998, p. 117).

Jones and Turner (2006) studied coaching students' perceptions of their own 12-week undergraduate university based module. Grounded in dissatisfaction towards the unrealistic one-dimensional view of coaching presented by traditional courses, Jones and Turner (2006) recorded their students' experiences of a course delivered using a PBL approach. Analysis of the semi-structured group interview data suggested that this alternative method presented learners with a rare opportunity to implement explicitly theoretical knowledge in an integrated fashion. This, the author's argue, helped their students to start developing an appreciation of coaching's inherent complexities. The incorporation of peer assessment was, however, reported-on less positively. Students found its inclusion to be a surreal experience during which they tended to prescribe lenient grades, due to personal relationships, rather than critically analyse their peers' contributions. Although this research provided no evidence of coach learning, or impact on coaching practice, Jones and Turner (2006) tentatively claim that PBL offers an approach that could 'help coaches towards the higher goals of transferable knowledge, considered flexibility and lifelong learning' (p. 199).

While PBL is relatively new to coach learning with Jones and Turner (2006) the only published research dealing with PBL, other fields, notably medicine, have a range of research upon which to draw. For example, Cohen-Schotanus et al., (2008) compared the performance of 175 medical students on conventional learning and 169 students on PBL in medical school. Their findings reported no differences between the groups for knowledge or clinical competence; however, the authors reported that students' self-rated competencies were higher in the PBL group. In another study, De Lorenzo and Abbott (2004) compared adult learning principles (including PBL) to formal learning (knowledge based and lecture driven) within training to be United States army combat medics. The authors noted the limited amount of empirical research directly comparing methods of learning. They randomly divided 150 students and 14 instructors into experimental and control groups. The adult learning group improved but there was no difference in overall performance to the traditional group. With similar findings to Cohen-Schotanus et al.'s (2008), the students' self-rated competency was found to be higher. The authors argue for the use of a range of methods and variability in adult learning, and suggest further research for all methods.

Smits, Verbeek and de Buissonje (2002), in a review of PBL, question its effectiveness in medical education, postgraduate education and CPD. They identified three studies that directly compared PBL with another educational format and found that there was no

evidence that PBL affected participants' knowledge and performance differently to another method of learning. The authors also identified three studies that evaluated PBL alone and compared it with no other educational intervention. Smits et al., (2002) concluded there were few studies of varying quality and that there was no consistent evidence that PBL was superior to other educational strategies in increasing doctors' knowledge and performance. Similar to the research cited above, Smits et al., (2002) noted higher satisfaction and self-rated competency using PBL. The authors comment that studies in which there is no control group, or the control group received no educational intervention, can give information only to the effects of receiving the education, not on the specific educational method. That is, inferences can only be made about changes in the participants in terms of knowledge or practice, not the mechanism for the change.

Both Stagnaro-Green (2004) and Maudsley and Strivens (2001) draw together a range of research in medical education to consider the applicability of adult learning principles. These authors acknowledge that adult learning principles have tremendous intuitive appeal, but unfortunately they have not undergone rigorous analysis. Few studies have been performed assessing the basic tenets of adult learning principles, and the theories underlying them are not rigorously derived or been shown to be evidence based. Despite this, the authors argue that any learning method needs clear tutor/facilitator training and support and a well-planned curriculum with clear learning objectives (Wetzel, 1996; Bligh, 1995). More broadly, they suggest that adult learning principles, specifically PBL and reflection, are tools to draw on and provide useful insight into understanding learning. However, they argue that there is not a prescribed or ultimate mix of learning approaches for medical students, undergraduate or postgraduate students (Maudsley and Strivens, 2001; Das, Malick and Khan, 2008). Any changes require an effort to evaluate learning approaches that are both established and novel (Stagnaro-Green, 2004).

In their review of coaching and coach education literature, Trudel and Gilbert (2006) note that, like other domains, structuring coach learning with adult learning principles is supported. However, with the exception of Jones and Turner's (2006) initial study, there is no empirical research in coaching to show if this new approach will be more or less effective than any other method. Indeed, a key issue raised by Trudel and Gilbert (2006) that limits the potential of any new approach is that coaching courses tend to be condensed. A PBL approach requires time for participants to define the nature of the problem and how they can deal with it using a variety of resources (Jarvis et al., 1998). If participants are encouraged to work in small groups, it is important to give them time to develop trust and rapport (Trudel and Gilbert, 2006). The limited amount of time that coaches have to invest in their preparation has been noted (Abraham and Collins, 1998), and the appropriateness of 'weekend education programmes' is questionable if we want to facilitate coach learning and development by taking their experience into account (Trudel and Gilbert, 2006). Future research might usefully consider differentiation between early certification (with its limited engagement) and higher levels of certification within which there is more potential for extended practice-based PBL, and consider how and when coaches are introduced to integrated complex coaching issues.

While PBL can be viewed as participation learning (Sfard, 1998), Trudel and Gilbert (2006) point out that the participation metaphor involves the focus on the actual practice of coaching in real time. They argue that in actual coaching practice: problems are not

presented; they have to be recognised and defined, problems have their origins in events that happen weeks, months or even years before (Gilbert and Trudel, 2001), the process of creating solutions includes interactions with other participants in the sports environment (Gilbert and Trudel, 2001) and there is no appointed facilitator to stimulate the reflective process (Trudel and Gilbert 2006). Trudel and Gilbert (2006) suggest that instead, and due to time constraints, coaches are provided with what is called a common coaching problem that they usually discuss in sub-groups. They then have to compare what they have said, to what was an appropriate solution (Trudel and Gilbert, 2006). They argue that 'in most problem-solving approaches, coaches will only "practise" addressing the kinds of issue they might encounter in the field' (Trudel and Gilbert, 2006, p. 520). The authors cite Barab and Duffy (2000, p. 34) from education who note that 'the practices that the learner engages in are still school tasks abstracted from the community, and this has important implications for the meaning and type of practices being learned, as well as for the individuals relations to those meaning and practices'.

While their research was not based on PBL, Cassidy et al., (2006) documented coaching students' experiences of attending their course. The authors attempted to reframe the coaches thinking toward learners and learning and introduced situated and cognitive views of learning as well as principles of adult learning, such as reflection. Eight rugby coaches, of a provincial representative team, voluntarily attended the programme over a period of six months with the contact time totalling 28 hours. The course was classroom based and focused on the application of coaching theory. Cassidy et al., (2006) reported that the group established what resembled a 'community of practice' (Wenger, 1998), with the attendees actively engaged in the sharing of experiences and understandings. In-depth semi-structured interviews were conducted with each coach learner upon their having completed the programme. The results indicated that coaches were appreciative of the courses' theoretical exploration of coaching's inherent complexities; it having assisted their critical reflection upon practice and provided them with an opportunity to engage within group discussion. Again, while a useful insight to an alternative delivery method, there is no discussion of the impact on actual coach learning or coaching practice.

4.5.4 Formal Learning: Some Conclusions

This section has reviewed literature that discusses approaches to formal learning, including perceptions, experiences and empirical data examining different modes of learning. Research specific to coach learning has either presented coaches' retrospective reflections upon their learning biographies (Abraham et al., 2006; Irwin et al., 2004; Jones et al., 2004; Lemyre et al., 2007; Wright et al., 2004) or documented their responses having experienced a particular course (Cassidy et al., 2006; Chesterfield et al., in press; Jones and Turner, 2006; Knowles et al., 2001, 2006; McCullick, 2005; Nash, 2003a). While the exploration of retrospective reflections have provided valuable insights into practitioners' thoughts about the usefulness of some modes of learning, research on learners' experiences of specific courses has tended to focus on undergraduate modules that form part of degree programmes. Indeed, only Chesterfield et al., (in press) and McCullick et al. (2005) have purposely investigated coaches' experiences of programmes certifying graduate coaching practitioners. Understandings gathered from those studies that retrospectively analysed coaches' educational biographies demonstrated that coach education provision, while not without its positives,

has tended to be far from optimal (Abraham et al., 2006; Irwin et al., 2004; Jones et al., 2004; Lemyre et al., 2007; Wright et al., 2004).

It was also highlighted that a rising number of university-based programmes have allowed educator-researchers to use and resultantly advocate communities of practice, mentoring, PBL and reflection as means of enhancing the provision of coach education (Cassidy et al., 2006; Jones and Turner, 2006; Knowles et al., 2001, 2006; Nash, 2003). While useful, these studies have rarely linked these concepts to actual coach learning nor have they examined any impact on actual coaching practice. Hence, we are unable to conclude if these studies made the coaches better at coaching. In addition, competency-based learning (Demers et al., 2006) and issue-based learning (Gilbert and Trudel, 2006) have also been presented as frameworks that could guide the practices of coach educators. This review, therefore, concurs with Lyle's (2007a) observation that 'there are many prescriptions for "better" coach education', which are 'founded on an emerging conceptualisation of coaching as a complex, dynamic, uncertain, and highly contextualised practice' (p. 29). Having made this observation, Lyle (2007a) goes on to contend that these prescriptions are generally what he describes as 'arguments for' rather than 'evidence of' (p. 29). While experimentally testing theoretical frameworks through application in practice seems essential to the identification of an optimal approach, there are, of course, innumerable theories upon which coach educators could possibly draw.

4.6 Learning Motives and Deterrents

4.6.1 Learning Motives

Research investigating participation in the practice of coaching (Lyle, 2002) has shown that participants have been motivated by the enjoyment gained from engaging in practical coaching, their having had a desire to help others improve and because they wished to give something back to their sport (English Sports Council, 1997; Lyle, Allison and Taylor, 1997; Tamura, Davet and Haslam, 1993). Although this is a worthwhile and necessary line of inquiry, as a sub-component of coach motivation, factors driving participation in coach learning have often been overlooked. This notwithstanding, there are a few notable studies that have recently started to present data on this area (MORI, 2004; Vargas-Tonsing, 2007). Given the limited investigation of coach learning motives, research will be integrated and discussed as part of a broader review of literature discussing adult learning motives. It should be noted that the literature from outside coaching has tended to use questionnaire and psychometric instruments that have been tested for reliability and validity. Coaching research has tended to use a questionnaire or instrument designed by the researcher with the research questions in mind but not subject to testing for reliability or validity (eg Vargas-Tonsing, 2007).

Research has served to highlight the importance of investigating what motivates learners to engage with educational opportunities and, conversely, what deters learners. Despite this, research conducted in the sport domain has instead focused on attitudes towards professional education and what incentives might encourage further participation. Hughes (2005), for example, reported findings gathered from 268 certified athletic trainers' completion of a Likert scale questionnaire, namely the Adult Attitudes Towards Continuing Education Scale (AATCES). The results of this study indicated that the participants generally held a favourable attitude towards continuing professional

education (CPE) and saw it as an important factor in their ongoing development. While this demonstrated that these practitioners considered CPE to be of importance, the focus of this study meant that the reasons for current or future engagement remained unknown.

MORI (2004) asked both unqualified coaching practitioners (ie individuals who had practised without being certified) and coaching providers (ie local authority, university, and school representatives) what they believed would encourage the undertaking of coaching awards. Unqualified coaches most frequently cited more local courses and the availability of free courses. Similarly, coaching providers most regularly made reference to the importance of making further funds available to support coaches in their ongoing development. While this study did not provide insight into the reasons for engaging in professional learning, it did discover what might motivate coaches to engage in coach education and learning.

Vargas-Tonsing (2007) also utilised Likert-scale based questionnaires to gather the views of 366 youth sport coaches (who were attending an introductory coaching clinic) on what might enhance the likelihood of their pursuing further forms of coach education. The results indicated the coaches would be more inclined to engage in higher-level coach education if attendance was made a mandatory league requirement or if they could be certain that course content would enhance their ability to coach by being directly relevant to their learning requirements.

In other domains, Garst and Ried (1999) utilised an adapted version of the Educational Participation Scale to discover the motivational orientations of 147 pharmacy students. The researchers discovered that their participants were largely internally motivated to enhance their practical competencies and to provide a service to the community. Similarly, Laszlo and Strettle (1995) discovered that midwives were also highly driven by an internal learning desire, which was independent of external factors. A desire for knowledge and enhanced competency were the two highest reported motives for CPE engagement. In a study of 225 licensed social workers Dia et al., (2005) also found that practitioners were primarily driven by the desire to acquire professional knowledge. Studies utilising the Participation Reasons Scale (PRS) have also elicited comparable findings. For example, Langsner (1993) employed the PRS with 408 therapeutic recreation specialists and highlighted five reasons in the following order of importance: professional services, professional improvement and development, collegial learning and interaction, professional commitment and personal benefits and job security.

The findings from these studies highlight that engagement with learning for adults has a tendency to be internally driven by a desire to acquire knowledge that could enhance practical competencies. Practitioners tend to pursue this knowledge in the hope that it will allow them to provide a better level of service to their clients. Although the literature reviewed has consistently reported similar findings, it would be naïve to directly infer to coaching. Many of these studies were conducted in the health care industry where professions are well established. Coaching, on the other hand, remains an emerging profession with the vast majority of its workforce practising voluntarily or on a part-time basis (North, 2009; Kay et al., 2008). Research specifically investigating the educational and learning motivations of sports coaches is, therefore, necessary.

Despite much learning occurring outside educational institutions, research into learning motives has focused almost exclusively on factors driving engagement within formal education (Jarvis, 2004). A notable exception was a study by Dixon (1993) who investigated, via questionnaire, the characteristics of 88 practising nurses' self-directed learning (SDL) projects. The author reported, that the nurses' primary reasons for completing these studies were associated with their anticipated ability to apply the knowledge or skills gained. It was also discovered that practitioners were highly motivated by the increased self-esteem and pleasure they thought would be gained from participation. Learning for others, to gain credits and to acquire knowledge for material reward, promotion or a pay rise, were all considered of lesser importance.

Although research into SDL projects is able to capture informal learning motives, they are by design, like those studies that have focused entirely on education, unable to report more comprehensively on learning. This position has, however, begun to change. As discussed earlier (Section 4.4.1 p.39) the phrase CPD has gained greater status as it offers a broad term that recognises the diverse avenues through which professionals learn post-initial certification. Its acceptance has initiated a new strand of research into learning motives. Gunn and Goding (in press), for example, recently interviewed 11 practising physiotherapists to gain insight into their CPD experiences. As part of their broader study, the authors discovered that CPD engagement was driven by a strong sense of professional obligation, a wanting to provide the best level of service possible, the personal satisfaction gained from learning and the practical application of acquired information. Likewise, Ryan (2003) concluded from the analysis of a Likert scale questionnaire data that her participant nurses (n = 94) were intrinsically motivated to pursue CPD with the objective of acquiring additional professional understanding. Analysis of the professional learning literature has, therefore, demonstrated that the investigation of factors driving learning engagement is a well-established line of inquiry. Studies into coach learning motives would seem a useful addition to the coaching literature.

4.6.2 Learning Deterrents

A related yet contrasting area of investigation is the identification of learning barriers or deterrents. Consistent with the study of learning motives, deterrents to coach learning engagement have been largely unexplored. The following section, therefore, integrates coaching studies into a broader review of literature discussing barriers to learning.

Research into learning deterrents, like its motivational counterpart, has its roots in the adult education literature. In this field, Cross (1981) formed a useful and widely acknowledged typology (eg Care et al., 2007; Harrison, 1993; McGivney, 1993; Merriam and Brockett, 1997) that has more recently been utilised within research projects as a conceptual framework (eg Human Resources Development Canada, 2001; Sussman, 2002). Cross specifically suggested that learning deterrents can be broadly classified under three distinguishable categories, namely: situational barriers (eg lack of money, time, transportation), institutional barriers (eg inappropriate course costs, inconvenient course schedules, irrelevant courses of study) and dispositional barriers (eg lack of confidence, desire, interest). Consistent with earlier reports, more recent national surveys have once again served to demonstrate that adults most frequently report situational barriers (ie being too busy and a lack of money) and institutional barriers (ie courses being held at inconvenient times, locations, and at too high a cost) as the major

reasons for non-participation in education (eg Human Resources Development Canada, 2001; Sussman, 2002).

Valentine and Darkenwald (1990) attempted to move beyond Cross' (1981) three-part typology, by re-analysing data from an earlier study. The authors suggested that factors deterring adults from engaging in education could be clustered into five distinct categories: educational costs, lack of confidence, lack of interest in available courses, lack of interest in organised education generally and personal problems. While this extends the original typology, Valentine and Darkenwald's (1990) categories arguably collapse into Cross' (1981) original classifications. Whereas those studies mentioned so far have tended to concentrate on the general public at large, Langsner (1994) specifically employed the DPS to discover what factors acted as deterrents to 388 therapeutic recreation specialists' CPE engagement. Analysis of their data revealed that cost represented the largest deterrent. The second factor was work constraints, which was followed by an absence of quality courses, few benefits associated with attendance, family constraints and educational disengagement.

The literature has demonstrated that the investigation of learning deterrents is a legitimate and important area of academic study. The investigation of learning barriers has, however, been largely overlooked in the sporting literature, although two notable studies are now considered. Hughes (2005) utilised the DPS scale to identify the educational barriers of 268 athletic trainers working within the sporting or healthcare industry. The author determined that while the participants perceived there to be few CPE deterrents, a lack of course relevance, time and cost were all highlighted as possible barriers. Of greater significance was an investigation for sports coach UK (MORI 2004). As part of a broader project their study explored what local authority and university representatives considered to be preventing coaches from attempting to obtain coaching qualifications. Analysis of the data demonstrated that respondents perceived the associated cost of attendance, few locally run courses and a lack of time, as being important. While the findings of the sports coach UK study have identified barriers that might be deterring coach education participation, they are based upon the opinions of non-coaches. Future investigations might usefully build upon these findings by asking coaches what factors, if any, have deterred them from taking additional courses.

Researchers in other domains have recognised the importance of studying barriers to learning more broadly. Dixon (1993), for example, utilised a questionnaire design to identify those deterrents that stopped practising nurses from engaging in work-related SDL projects. Analysis of the 88 participants' data revealed that 55% of the nurses identified time as an obstacle, 46% reported the selecting of a study topic as a barrier and, contrary to previous reports, only 9% of the nurses considered money to have been a deterrent. This finding might be explained by the fact that these participants were employees of a recognised profession; a status that sports coaching has not yet achieved (Kay et al., 2008).

Research into learning deterrents, like that of learning motives, has also permeated into the domain of CPD. King's (2004) investigation of the CPD practices of 192 higher education teachers, demonstrated that a lack of time (84%) and the pressure to publish (53%) were the main barriers to further CPD engagement. Other deterrents included funding (21%), a lack of personal interest (12%) and a lack of encouragement (12%). It should be noted that nine of the participants (5%), however, suggested that they

perceived there to be no barriers at all. O'Sullivan (2003), on the other hand, utilised in-depth interviews to study the CPD experiences of 20 chartered physiotherapists. The author discovered that while these practitioners were highly motivated towards the concept of CPD engagement, many actually felt guilty about taking time out for learning. A demanding work environment, where patient needs were considered paramount, meant that these practitioners found it difficult to justify taking time out to learn. Likewise, the physical education teachers in a study completed by Armour and Yelling (2007) also stressed that CPD in its traditional format (ie focus on the attendance of formal courses) was not only perceived as being expensive, but was actually thought to cause disruption to pupil learning by their absence. So, teachers were reluctant to engage in as much CPD as they might have otherwise liked. Analysis of the professional learning literature has demonstrated that the investigation of barriers to learning is also a well-established line of inquiry. Studies into coach learning deterrents would resultantly appear a useful addition to the coaching literature. Research into coach learning deterrents, like that of coach learning motives, should however recognise the diverse situations within which coaches engage.

4.6.3 Learning Motives and Deterrents: Some Conclusions

A key finding was that a lack of time and money were consistently reported as the major barriers to further learning engagement. Research into the learning of active professionals demonstrated that work-related pressures not only made learning time hard to find, but also equally difficult to justify. In relation to educational courses, it was reported that learners often found cost, timing and location to be deterrents. These factors were, at times, further compounded by negative views about the likely associated quality of courses and the benefits (or not, as the case may be) of attendance. The research evidence also suggested that issues specific to the learner (ie a lack of confidence, drive etc) have also been found to contribute towards non-participation. While a considerable body of knowledge was presented, those studies relating to vocational learning tended to be conducted with individuals working within established professions. Coaches work within a vastly different industry. Research specifically investigating the learning deterrents experienced by sports coaches is therefore deemed necessary. Consistent with the argument presented for the investigation of the motives driving coach learning, the study of coach learning deterrents should not be limited to coach education participation. It is suggested that coach learning should be recognised in its broadest sense.

4.7 Learning Styles

As part of a number of themes in the wider learning literature, learning styles is one that frequently appears in a number of practice domains, for example, business and management (eg Sadler-Smith et al., 2000), education (Hadfield, 2006; Heffler, 2001; Isemonger and Shepperd, 2003; Klein 2003), social work and criminal justice (Annison, 2006). In the coaching literature there is often a reference to the relevance of learning styles to coaches (eg Potrac and Cassidy, 2006; Cassidy et al., 2009; Wikely and Bullock, 2006) with the implications that flow from this taken as a given. Similarly, learning styles theory (eg Myers-Briggs, Kolb, Honey and Mumford) appears and in some cases plays an active part within governing bodies of sport coach education courses. However, as far as the coach learning literature is concerned, learning styles is largely

missing from research, review or debate. It is beyond the scope of this review to present a detailed critique of specific theories; however, a specific review of learning styles was undertaken by the Learning and Skills Research Centre (Coffield et al., 2004a, 2004b; Learning and Skills Research Centre, 2004), and it is on this work and recent domain-specific studies that this section is based.

In educational terms, learning styles have been described as 'qualitative differences among individual students' habits, preferences or orientation toward learning and studying' (Klein, 2003, p. 46). However, as Presland (1994, p. 179) points out, there are a 'bewildering variety of definitions and conceptualisations of learning styles' leading Sadler-Smith et al. (2000) to suggest that 'one of the key difficulties for the field is the over-extension of the notion of learning style and the associated semantic confusion generated through the haphazard expansion and dilution of the concept' (p. 243). Indeed, Coffield et al.'s review identified 71 models of learning styles, with 13 as 'major models'. It is perhaps unsurprising that Coffield et al., go on to suggest that learning styles is a field marked by 'debate and constructive critiques as well as disunity, dissension and conceptual confusion' (p. 2).

As Hadfield (2006) suggests, it is difficult to find a way through this huge number of theories. Despite this she attempted to identify a learning style theory for teacher education, noting that a large number of the theories take a similar approach in constructing a two-dimensional model along bipolar axes. The axes could be set up to produce opposites; for example, concrete-abstract and sequential-random (Hadfield, 2006). But these could be any characteristic or dimension. The combination of the two axes gives rise to four basic 'types'. These types are then described in terms of a set of attributes.

The problematic nature of the field is highlighted when not all theories agree on the polarities and type and how these should be combined (Hadfield, 2006). In addition, there is some overlap and intersection of theories with similar oppositions found in some (eg introvert-extrovert), as well as perspectives and oppositions not found in others. Lastly, as well as a range of terminology (Hadfield, 2006), the meaning used for some words are different according to different models. These issues have led to a questioning of the trustworthiness of style categorisations (Duff and Duffy, 2002; Garner, 2000, Henson and Hwang, 2002; Swailes and Senior, 1999).

In business and management, Reynolds (1997) presented a critique of learning styles where he lamented the uncritical way that human resources, CPD and business embraced 'claims to be able to measure human attributes' (Reynolds, 1997, p. 128). While acknowledging the intuitive appeal of learning styles, he questions their theoretical and empirical validity. This critique extends to the reductionist and positivistic, scientific-technical philosophies of psychology and its approach to social existence and human development (Sadler-Smith, 2001). It is a perspective shared by Annison (2006), whose research considers the use of learning styles in probation and social work, and Hadfield (2006) who is critical of the 'pizza cutting approach to personality' (p. 369). Sadler-Smith (2001) while admonishing the uncritical acceptance and lack of reflection upon learning style theory in management, argues that learning style is a term that is too broad and used too often as a 'catch-all' term. Instead, he proposes a separation of the concept into personality, learning preference, learning strategy, cognitive or thinking style and their interaction with the particular context (Sadler-Smith, 2001).

In trying to bring some clarity to the field, Coffield et al., (2004a) importantly identified a continuum of learning style theory. At one end there were those theories that considered learning styles to be fixed (a trait). At the other end were those theories that considered learning styles to be mutable (a state). Those authors advocating the latter position would argue that learners are able to move between learning styles. This is a crucial distinction since the implications for practice hang on the question of whether learning styles are considered fixed or mutable. How far can teaching and learning tasks be matched to learning style, and can learning be truly individualised (Hadfield, 2006)? The complexity of this is highlighted by Coffield et al., (2004a) who propose that 'previous learning experiences and other environmental factors may create preferences, approaches or strategies rather than styles, or that styles may vary from context to context or even from task to task' (p. 2).

From the original 71 theories Coffield et al., reviewed, they examined 13 in-depth, and from this review they found research supporting the reliability and validity of seven models, from which they recommended six. These models were: Jackson's learning style profile (Jackson, 2002); Apter's reversal theory and motivational styles profiler (Apter, 2001); Allinson and Hayes cognitive style index (Allinson and Hayes, 1996); Herrmann's whole brain model (Herrmann, 1989); Entwistle's approaches and study skills inventory for students (Entwistle et al., 1979); and Vermunt's inventory of learning styles (Vermunt, 1994). The seventh but not recommended by Coffield et al. was the Myers-Briggs type indicator (Myers and McCaulley, 1985). This model had equal reliability and validity to the other six, but Coffield et al., could not relate the 16 personality types (four bipolar scales) to informing teaching practice.

Basing usage on evidence of reliability and validity would seem a sensible starting point, but with the definitional confusion and perspectives presented by the models' authors, selecting one model is subscribing to the creator's world view and may neglect other insights afforded by other models (Hadfield, 2006). Moreover, there is also a lack of clarity surrounding the efficacy of matching learning style and teaching technique. Coffield et al., (2004a) for example, found nine studies in favour of matching and nine against. Indeed, there is no evidence that matching improves academic performance in further education (Coffield et al., 2004b). The decision to match or not would seem to depend on whether the educational approach can shift to accommodate learning style (ie is learning style a state or a trait).

4.7.1 Some Conclusions: Implications for Coach Learning

From the existing large scale reviews and research in a number of domains, the evidence base for learning styles can be considered fragile and often contested (Annison, 2006). There seems a need to evaluate the theoretical robustness of the research findings and the applicability of these to a coach learning agenda. As Coffield et al., (2004b) suggest there is a need for 'independent, critical longitudinal studies' (p. 13), and this would seem a legitimate and worthwhile area of research for coach learning. Indeed, it is important that the assumptions about learning styles should not become axiomatic, but rather an element of learning to be scrutinised as social constructions in an area of developing work (Annison, 2006). While waiting for this research, an approach of balance and variety seems warranted, with learning styles a tool to open up a dialogue about personal development, rather than one of pedagogical impact (Coffield et al., 2004b).

4.8 Expertise and Knowledge

In Trudel and Gilbert's (2006) review of coaching and coach education, they argue that large-scale coach education is designed on the unchallenged assumption that coaches exist on a single continuum from novice (beginner) to expert (master). Indeed, the terms expert and knowledge cut across many aspects of coach learning and development, and while not directly the focus of this review, these issues are worthy of consideration. A full review of the expertise literature is beyond the scope of this report, but relevant related research is drawn upon from coaching and other domains in an attempt to give an overview of the area, and identify how this literature might inform an understanding of coach learning and development.

The notion of expertise can be found in the writings of Aristotle who talked about practical wisdom (Jarvis, 2004). This interest in practical wisdom or wisdom of practice is the basis of expert–novice models exploring craft knowledge (Tsangaridou, 2006) that began to appear in educational research in the 1980s (eg Berliner, 1986). As Tsangaridou (2006) suggests, the premise was to find alternative ways to enrich the knowledge base of teaching through comparing and contrasting expert and novice teachers' knowledge, thinking and behaviours.

It is the work of Berliner through Schempp et al., that appears most common in the coaching literature. For example, Schempp et al., (2006) uses Berliner's (1994) typology (beginner, competent, proficient and expert) to describe the developmental stages of expert coaches. This work identifies skills, knowledge, characteristics and perspectives that are common to coaches at each stage of expertise. In a similar vein, McCullick et al., (1998) used Berliner's stages to identify from coaching biographies how expertise may be developed in practice. The authors concluded that coaches should expand their coaching knowledge and develop the use of routines and monitoring in their practice. McCullick et al., (1998) suggested that coaches should identify their current level against the stages and identify what needs to be developed to move to the next. Along similar lines, DeMarco and McCullick (1997) also identify characteristics of expertise. To develop expertise they argued that coaches should gain and learn from experience, gain more knowledge, interact with and observe others, gain additional experiences, set goals, recognise problems, develop memory, develop automaticity in their practice and monitor and evaluate (reflect). Berliner (2001) has added to his work through discussing adaptive or fluid expertise, and characterising this as automaticity and flexibility in practice. As well as the focus on the expert he argues that the context is as important as working conditions and is a powerful influence over the development of expertise. Interestingly, he proposes that expertise can be seen as an increase in individual agency over time.

Like the broader expertise literature, the majority of studies considering coaching have centred on the general properties and characteristics of expertise and knowledge, with less of a focus on the detail of acquisition, development and/or construction of expertise (ie what needs to be developed is identified but not how it can be achieved). Consequently, from this literature it is difficult to extrapolate meaningful guidance for coach learning. In physical education, Dodds (1994) emphasised that 'teaching expertise is not limited to particular teaching perspectives but rather may be grounded in a variety of dispositions, attitudes, beliefs, knowledge and behaviours that comprise a teacher's world view' (p. 156–157). Dodds goes on to argue that the construct of expertise is

global, and 'the teacher's subject matter knowledge, pedagogical content knowledge and conditional knowledge (including beliefs and values) constitute much of what is studied under the rubric of teaching expertise' (p. 159).

Studies in physical education have investigated the relationship between teaching expertise and teachers' knowledge (Graber, 2001). This has identified that expertise is context specific, experience is an essential but not sufficient condition for expertise, and that in-depth subject matter knowledge and skilfulness are properties of expertise (Tsangaridou, 2006). For example, Schempp et al., (1998) researched the role subject-matter knowledge plays in teachers' expertise. They found significant differences in teachers who were teaching subjects in which they had expertise, and teaching subjects in which they had little or no expertise. Chen and Rovegno (2000) compared expert and novice teachers' approaches to teaching and found the experts better able to facilitate student self-responsibility and critical thinking, link new learning to prior knowledge and facilitate student cooperation and interaction. Tan (1997) and Manross and Templeton (1997) identified characteristics of expertise applied to teachers, and argued that expertise comes from a set of stable characteristics and grows with experience and practice. Bell (1997) also identifies characteristics of expertise for teachers and suggests that beginners should be given guiding principles, and that work experience is more important than verbal information. Also, it is important to understand the learners' level and give them opportunities to progress. Bell also proposes mentoring to facilitate this. All of this research shares the common assertion that by identifying, formulating and developing elements of expertise in their own professional practice, teachers and coaches can become more expert.

Swap et al., (2001) consider the wider expertise literature and apply this to a business context. They used Ericsson and Charness' (1994) review and argued that expertise is developed by learning through doing, and is characterised by pattern recognition based on experience. They cite Ericsson and Charness (1994) in stating that these two characteristics take 10 years to develop and this time constrains the ability to transfer knowledge from experts to novices, especially its tacit dimensions. Swap et al. (2001) argue that the transfer of tacit knowledge is possible through internalisation, which relates to embodying explicit knowledge into tacit knowledge and is similar to learning by doing. They also suggest that socialisation is a process through which sharing experiences and creating tacit knowledge occurs. This type of learning they argue occurs largely through informal processes, and the authors again propose mentoring as a mediator to help novices interpret events.

Swap et al., (2001) propose that all experts pass through levels of knowledge acquisition. In order for information to become knowledge, the learner must share some context and some meaning with the one imparting the knowledge. Lacking that shared contextual base means that messages will be extrapolated to individuals' own idiosyncratic experiences and memories (Swap et al., 2001). Therefore, the authors argue that providing actual learning experiences is crucial in the development of expertise and the enhanced ability to recognise patterns. They propose that the mentor can assist with meta-cognition and self-monitoring, helping the learner to reflect on answers, give feedback that focuses the learner on the task, and act as an example for observational learning (Swap et al., 2001).

Swap et al., (2001) suggest that the critical skills of expertise, including deep knowledge of a content domain, require formal learning approaches, with explicit and unambiguous means of communication. From this they suggest seven principles of learning:

1. Principles of learning (Swap et al., 2001):
2. Active engagement in one's own learning impacts learning.
3. Lack of receptors (knowledge base) makes it difficult for inexperienced people to learn.
4. Self-monitoring and self-reflection on one's own progress leads to better learning.
5. People learn from observing models of behaviour particularly admired or powerful models. Learning may be informal and teaching may be unintentional.
6. Developing expertise takes time and practice.
7. Hallmark of expertise is the ability to recognise patterns and draw inferences from them.
8. If information is expressed in a memorable form it will more likely influence attitudes and behaviour.

Cited extensively by Swap et al., (2001) and other studies, Ericsson and Charness' (1994) extensive review on expert performance draws on literature from a range of domains. The authors argue that expertise is structured through deliberate practice, the acquisition of skills and characteristics and an individual's developmental history and training methods. They argue that experts have a predisposition towards engaging in deliberate practice and that expertise requires the mastery of all of the relevant knowledge and prerequisite skills. Perhaps most interestingly for coaching, Ericsson and Charness (1994) assert that stable expert performance is typically restricted to standardised situations in a domain. They go on to say that the domain specificity of superior performance is striking and is observed in many different domains of expertise (Ericsson and Charness, 1994). The interesting challenge for coaching is the question of whether coaching domains are defined clearly enough to identify the relevant knowledge and requisite skills. For example, Trudel and Gilbert (2006) argue that different contexts require different knowledge and competences. The number and type of context varies widely: 'the lack of a common typology of coaching contexts hinders the organization of coaching research into a meaningful framework that can be used to inform coach learning' (Trudel and Gilbert, 2006, p. 520). Arguably, Lyle's (2002) typology is the most thoroughly described and grounded in a discussion of the coaching process, and is most consistent with empirical research on stages of athlete development (eg Côté et al., 2003); participation, development and performance (Trudel and Gilbert, 2006).

In looking at the business domain, Herling (2000) considered definitions of expertise for human resource practice. He argued that a section of the literature proposes expertise as cognitive; experts know more, use the information differently and solve problems faster (Kuchinke, 1997). This cognitive approach focuses on what was required to be an expert, and is seen most commonly in the coaching and education literature. However, Herling (2001) also discusses an alternative theoretical approach: knowledge engineering; expertise as a thinking process with heuristic models, deep models, implicit

models, competence models and distributed models. Heuristic models focus on the acquisition of knowledge about a specific domain. Deep models were explained in terms of how the domain-specific knowledge was organised in hierarchical relationships, causal models and schemata that supported advanced problem solving (Herling, 2000). The implicit models that followed attempted to explain expertise by differentiating between implicit knowledge and explicit knowledge. Explicit knowledge was seen to encompass the known facts of a specific domain while implicit knowledge represents the difficult-to-articulate experience-based knowledge that enables a skilled expert to solve tasks (Herling, 2000). The competence models made a distinction between domain knowledge (static knowledge) and task knowledge (action knowledge); the implication being that expertise is a competence-level term denoting the potential for doing something (Herling, 2001). He suggests that these models recognise that experts know a great deal about a specific domain and use this knowledge to solve problems. This task knowledge is gained from the practice of domain specific behaviours (Herling, 2000). Lastly, the author describes the underlying assumption of distributed models is that the expertise to solve complex problems is distributed among many individuals. Thus, distributed models equate expertise as a combination of domain knowledge, task knowledge and cooperative knowledge (Herling, 2000). Herling (2000) argues that research shows, through a lack of consensus, that human expertise cannot be defined by a process alone. However, all of the literature has shared elements:

1. Expertise is a dynamic state.
2. Expertise is domain specific.
3. Basic components of expertise can be identified as knowledge, experience and problem solving.

The term knowledge appears in every reviewed theory of expertise. In every case it was either descriptively different or multiple types of knowledge were identified. Despite these differences, the domain specificity of knowledge remains. The nature and construction of knowledge is hugely contested and is an area of enquiry in its own right (for in-depth discussions and reviews see inter alia; Moon [2004], Tsangaridou [2006], Cassidy et al., [2009], Jarvis [2004]). In the coaching literature a number of conceptions or frameworks for knowledge are used, drawn particularly from the physical education literature (eg Cassidy et al., 2009). These tend to divide knowledge into pedagogical knowledge 'how to coach' aspects of teaching and learning and content knowledge and subject matter that is both theoretical and practical.

In considering developing knowledge and expertise as part of coach learning, we should be mindful of Foucault (1972) who regarded knowledge as discourse, and in these terms is ideological. Indeed, knowledge that becomes public or popular is never value free and inherently its perpetuation furthers the cause of some groups or others (Jarvis, 2004). The expertise literature pertaining to coaching assumes the novice-expert continuum and a predominantly cognitive/acquisition metaphor. That is: 'the language of knowledge acquisition and concept development makes us think about the human mind as a container to be filled with certain materials, and about the learner as becoming owner of these materials' (Sfard, 1998, p. 5). In other words, there is a body of coaching knowledge and coaches will accumulate the coaching concepts as they progress along the continuum (Trudel and Gilbert, 2006). For coach learning this has resulted in

knowledge gained from 'expert coaches' and sport science disciplines being packaged into a curriculum and disseminated to coaches hoping they will acquire this material and transfer it to their day-to-day coaching activities (Trudel and Gilbert, 2006). The discourse of knowledge in coach learning is bio-scientific and disciplinary rather than integrated and based on a technocratic-rationality (Cushion, 2008) on an assumed novice-expert continuum. As Trudel and Gilbert (2006) suggest this perspective is pervasive in coach learning where the view of novices is as beginner experts and will progress to expert or master coach. These assumptions need to be researched and evidenced.

Some recent research around coaching knowledge assumes a cognitive, acquisition metaphor and approaches coaching and its knowledge from a disciplinary base. Abraham et al., (2006) recently developed a schematic illustrating those elements contributing towards coaches' decision-making processes and behavioural outputs. In an attempt to empirically support their model of the coaching process, Abraham et al., (2006) interviewed 16 expert coaches from a range of individual and team sports. The coaches were asked to describe their roles, processes and understandings, which offered information that implicitly supported their schematic. Each of the coaches were also asked to comment upon the model's ability to depict the process of coaching. The coaches provided support for its illustrative representation. While Abraham et al.'s (2006) schematic is not a model of coach learning per se, elements are arguably worthy of consideration within this area of inquiry. The schematic has suggested, for example, that the cognitive and behavioural aspects of coaching practice are fundamentally underpinned by a typology of coaching knowledge: 'ologies' (eg biomechanics, exercise physiology, motor control, nutrition, organisational psychology, sociology, and sport psychology), pedagogy (eg coach behaviour, critical thinking, motor and cognitive learning) and sport specific (eg tactics and techniques). Future coach learning research should consider this typology as a potential analytical tool, at the same time the discourse that underpins it should also be considered.

5.0 Conclusion

5.1 Coach Learning

Coaches learn in a variety of ways from a number of informal, non-formal, and formal sources. However, the current literature suggests that informal learning through coaching experience and engaging with other coaches remains the dominant mode of learning engaged in, with mentoring playing a key role. Indeed, the experience of doing and observing coaching and interaction with other practitioners remains a recurring theme in the coach learning literature.

This has been due to the limitations of current formal provision, the lack of an overarching structure and issues around volunteerism, which combine to allow a negotiated and individual learning curriculum. Similarly, in education teachers have attempted to overcome the shortcomings of formal provision by engaging in informal self-selected learning. However, this curriculum is not unproblematic; it can ignore underlying power relations and can promote and reinforce certain ideological interpretations of knowledge and practice. In addition, coaches have often gained experience and perspectives about coaching while they were athletes. This experience may not always be positive or indeed useful, but will help create a lens through which new knowledge is viewed. Indeed, while coach education in the guise of training can indoctrinate coaches into a right way of coaching, informal learning can be equally as powerful in developing perspectives on coaching.

Experiential learning is defined as intentional and can be mediated or unmediated, and is different from learning from experience, which is largely unintentional. The existing coaching literature does not clarify the extent to which coaches intentionally seek learning experiences. Future research should identify what learning experiences coaches are seeking experientially while identifying the unintentional learning from experience. Such knowledge would enable judgements to be made about how these experiences might be incorporated into planned coach learning episodes, rather than be left uneven in quality and to chance.

- It is unclear to what degree coach experiential learning is intentional or unintentional, and a clearer understanding would inform what experiences could be incorporated into planned learning episodes.

A number of theories are presented that attempt to explain coaches' experiential learning. These include situated learning and reflection, and given the imbalance toward informal learning, have been the focus of recent research. These theories appear to have considerable potential in helping explain and develop coach learning. Reflection appears particularly important in framing coaches learning from experience. However, reflection is a skill that needs to be developed and supported. Without this, in reality, coaches may reflect in a superficial and descriptive way, which is largely inadequate because it lacks critical thinking and, indeed, actual reflection. There is a depth dimension to reflection and coaches need to be supported and allowed time to move toward deep critical reflection and away from shallow and meaningless description.

The nature of support is highlighted in developing reflection, and this support is an important determinate of experiential and informal learning more broadly. In this respect mentoring is cited as a key method of offering such support. Moreover, situated collaborative reflection within a mentoring relationship has potential to develop practice. However, the research in coaching supporting these approaches is limited, with a small number of empirical studies having been carried out. The majority of the research is an argument for their use, rather than evidence of their use.

- Reflection and situated learning can structure learning, but each of these is not without their own issues. They require time and effort to develop and become embedded into coach learning. They need research evidence linking them to changes in coaching practice.
- Mentoring plays a key role in informal and formal learning. Mentoring can be experienced both positively and negatively, and needs more research evidence to identify its impact on practice. The role of mentors' content knowledge on the process and impact of mentoring remains unknown.

Formal mediated modes of learning are important to coach learning. However, existing provision is criticised as being of low impact and inadequate, and the issues with existing provision need to be addressed. To this end, the ongoing development and implementation of the UKCC is seen as a means to do this. Other research cites approaches from adult learning as a means for addressing the issues in formal provision; these include, for example PBL. However, a PBL approach requires time for participants to define the nature of the problem and how they can deal with it using a variety of resources (Jarvis et al., 1998). If participants are encouraged to work in small groups it is important to give them time to develop trust and rapport (Trudel and Gilbert, 2006). The limited amount of time that coaches have to invest in their preparation has been noted (Abraham and Collins, 1998) and the appropriateness of weekend education programmes is questionable if we want to facilitate coach learning and development by taking their experience into account (Trudel and Gilbert, 2006). With changes to provision and alternative approaches, as with coach learning more broadly, there is currently no evidence that evaluates the impact of these.

Overall, while much material exists about learning, it is difficult, if not impossible, to be prescriptive about a specific, optimal mix thereof. An important observation is that coach learning should be a mix. The research conducted within coaching and from other domains is consistent in suggesting learning is optimised with both informal and formal learning and an interaction of the two. Indeed, Colley et al., (2003) point out it is often the blending of learning types that is significant; not their separation. Research considering the balance of learning and its variability appropriate to developmental stages of the coach is required.

More broadly from the review, it is possible to draw some inferences regarding the development of coach learning moving forward:

- Learners come with a range of experiences. Experience has a subjective nature and only becomes useful to the learner when they attach meaning to it in a process of reflection and change. Coaches need to understand and build on their existing

knowledge and experience. Existing knowledge base will be a limiting factor in learning.

- Domains need robust definitions with knowledge and skills identified from these to inform curricula.
- Learning needs to be facilitated by an appropriate environment. Knowledge needs to be contextualised and the mode of learning and the environment should align; for example, reflection and PBL are not developed in short, superficial learning episodes.
- Active engagement impacts learning.
- Coaches need to engage in practice and this needs to be supported. This type of learning as well as other experience needs to allow meaningful reflection.
- Learning is largely an individual experience; however, there is currently insufficient evidence to warrant learning styles as a key tenet of coach learning. Indeed, the complexity of this is highlighted by Coffield et al., (2004a) who propose that 'previous learning experiences and other environmental factors may create preferences, approaches or strategies rather than styles, or that styles may vary from context to context or even from task to task' (p. 2).
- Learning takes time.

5.2 Theory Methodology and Research

The coach learning literature, as well as learning literature from other domains, suffers from being of mixed quality. The research often lacks a developed theoretical position, or approaches coaching and learning with implicit assumptions. Often studies have been undertaken in education with students, rather than with coaches, and are often cross-sectional perception/satisfaction studies. The research rarely sets a conceptual boundary for coaching or the domain researched. This means, inevitably, that the findings need to be stretched in some way to fit all coaching domains or are highly context specific. Meaningful research is often precisely that: highly context specific, and is often conducted outside of the UK coaching and sporting context. We must be cautious in assuming transcontinental validity with research findings. It is difficult to find longitudinal, empirical evaluation of any of the modes of learning that coaches undertake.

- The literature investigating learning in the coaching domain and across other domains is highly variable in terms of quality and scope. More longitudinal research is required that provides evidence of implementation and impact.

Rink (2001) argues that all pedagogy has its 'roots in particular learning theory' (p. 112). Theories such as behaviourism reduce learning to a simple linear process, while cognitive approaches take an impersonal view of learning as knowledge acquisition. The discourse of behavioural and cognitive approaches can be seen to dominate current coach education. More constructivist approaches are reflected in recent research with concepts such as communities of practice and reflection frequently discussed. However, the research area, while still emerging, has largely developed serendipitously, and is

driven by individual research interests and such work often cites in-vogue theories or has a particular theoretical agenda.

In responding to issues raised in coach learning, it is perhaps tempting to bring new theories to coaching that are, in fact, recycled learning approaches and theories from other domains. This approach brings with it the danger of simply compounding perhaps already limited thinking from other domains. Coach learning needs to develop its own learning theories that have critically considered the central tenets that underlie them. Indeed, while there is considerable support from the literature for adult learning approaches such as reflection, mentoring and PBL, the transfer directly to coaching is neither neat nor unproblematic. The research to date has been unable to link these to effective practice across domains, not just in coaching, and this needs to be addressed.

- Coaching needs to critically engage with the central tenets behind the theories and alternative approaches to learning to specifically develop coach learning theory. As with a number of domains, there is a tendency to look at second order research that has taken ideas from first order research. Uncritically recycling theory and learning approaches into coaching, runs the risk of compounding limited thinking.
- Theoretical eclecticism is preferable to the only (perfect) way. But coach learning needs to be explicit about the assumptions informing it, how these relate to an understanding of how people learn and align with the objectives of a programme.

Learning is complex, not linear and difficult to quantify. There are a myriad of variables that impact learning that can make measuring in experimental or causal studies problematic. However, coach learning needs to be evaluated beyond cross-sectional, self-report or 'opinionaire' type studies.

- There has been scant systematic research on the effects of coach learning on improvements in coaching practice or on athlete outcomes. Coach learning needs effective longitudinal evaluation without which it is impossible to determine what works, why and for whom.
- There is a relative absence of empirically informed research into coach learning.
- The research currently gives us little appreciation of the teaching and learning preferences and needs of coaches across coaching domains and within the developmental spectrum.

To develop coach learning it is important to recognise the complexity of the enterprise. In doing so, the separation of learning from practice is a false dichotomy; learning and practice need to be conceptualised as a single activity. Evaluation of all approaches and methods is essential and how these link to changes in practice and learning needs greater understanding. While the coaching environment is a place of learning for both coach and athlete, coach educators must also be recognised along with their developmental and learning needs.

6.0 References

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