

Coaches of Athletes with a Physical Disability: A Look at their Learning Experiences

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"Do not let what you cannot do interfere with what you can do"

-John Wooden

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Abstract

Although coaching has become a popular area for research, little is known about coaches of athletes with a disability (Cregan et al., 2007; DePauw & Gavron, 1991, 2005). The purpose of this study was to explore how disability sport coaches learnt to coach and, more specifically, how they learnt through interactions. Recent disability sport research has revealed that coaches work with their athletes to enhance their learning (Cregan et al., 2007; O'Neill & Richardson, 2008); as such, athletes also participated in this study. Data collection included 20 semi-structured interviews and 14 non-participant observation sessions with five coach-athlete dyads. A thematic analysis was conducted (Braun & Clarke, 2006), which revealed that coaches from various backgrounds commonly learnt through informal learning situations, most frequently through interactions with others. It is suggested that organizations nurture these informal situations and offer more disability-specific nonformal and formal situations to enhance coaches' learning opportunities.

Introduction

In current sport research, attention is increasingly being paid to coach learning, showcasing different pathways and experiences for developing into a sport coach. Researchers have highlighted many different experiences as influential, across diverse levels of sport, from recreational to high performance contexts. One area that has yet to receive much attention however, is the disability sport setting. As previous literature has identified, there are almost no empirically based studies on coaches in disability sport (Cregan, Bloom, & Reid, 2007; DePauw & Gavron, 1991, 2005). Furthermore, there is a lack of information available regarding the selection and training of these coaches and how they develop and learn (DePauw, 1986; DePauw & Gavron, 1991, 2005). Researchers have also suggested there is a need to investigate the demographics of disability sport as a whole, including its coaches (Cregan et al., 2007; DePauw, 1986; DePauw & Gavron 1991, 2005; Reid & Prupas, 1998).

Of the few studies that have been conducted in disability sport, a common finding is that coaches lack knowledge (DePauw & Gavron, 1991, 2005; Liow & Hopkins, 1996; Robbins, Houston, & Dummer, 2010; Sawicki, 2008; Sherrill & Williams, 1996). The Canadian Sport Policy, developed in 2006, identified the need for well-trained disability sport coaches (Canadian Heritage, 2006). To develop coaches' knowledge some researchers in the area of disability sport have suggested including more disability sport-specific material in coaching courses and develop a mentoring component in coach education programs, as well as supplementing able-bodied sport training with general knowledge on disability sport (Dorogi, Bognar, & Petrovics, 2008; Sawicki, 2008). Research has also noted that specific coaching manuals need to be developed and clinics and workshops need to become more available in order to better develop disability sport coaches (Cregan et al., 2007).

A large percentage of the Canadian population, 12.4% or 3.6 million Canadians, have disabilities related to activity and functional limitations (Canadian Heritage, 2006). However, “the membership of persons with a disability in national sport organizations [is] less than 1%” (Canadian Heritage, 2006, pp. 6-7). It is well known that sport can be an excellent venue for developing a healthy lifestyle, both physically and mentally. Unfortunately, society appears to have created social prejudices against individuals with a disability engaging in physical activity (Eminović, Nikić, Stojković, & Pacić, 2009). It is possible that this prejudice is also present in the coaching field, creating an environment where individuals may be hesitant to coach disability sport (DePauw & Gavron, 1991). Such a lack of coaches has led to many athletes with a disability being self-trained and self-coached (Bradbury, 2001). Canada’s Sport Policy has called for “barriers to participation in sport to be identified and eliminated, making sport more accessible to all” (Canadian Heritage, 2006, p. 9). Barriers include minimal financial resources, low levels of awareness, lack of specialized coaching and adapted equipment, and few competitions (Canadian Heritage, 2006).

Given the lack of specialized coaching in disability sport, it is not surprising that there is little knowledge regarding how one learns to coach. As a result, the specific educational needs of disability sport coaches must be identified. Due to the dearth of research specific to disability sport, this study will primarily be informed by work in able-bodied sport. Recognizing that coaches in disability sport require a similar skill-set to coaches in able-bodied sport, and that many disability sport coaches are in fact able-bodied with experience coaching able-bodied athletes (Cregan et al., 2007; DePauw & Gavron, 1991, 2005), we feel the link can be made to that context. Thus, the purpose of this study is to explore how disability sport coaches learn to coach in each of their varying sport contexts. Ultimately, we hope our findings can contribute to

the literature in the field of disability sport and better inform coaches, their sport governing bodies, and coach educators on disability sport coaches' learning.

Coach Development

Coach development is an encompassing term that includes the different pathways and experiences that influence a coach's overall growth and learning (Mallett, Trudel, Lyle, & Rynne, 2009; Mallett, 2010; Trudel, Gilbert, & Werthner, 2010). More specifically, researchers have discovered that coach learning situations fall into four types: formal (e.g., coaching courses), nonformal (e.g., coaching clinics), informal (e.g., looking up drills on the Internet) (Nelson, Cushion, & Potrac, 2006), and internal (e.g., journaling) (Werthner & Trudel, 2006). We will now further expand upon each situation.

Formal. Formal learning situations are graded and hierarchically structured opportunities that take place in an institution (Nelson et al. 2006); a common example is Canada's National Coaching Certification Program (NCCP). Formal learning situations are generally conducted infrequently over a short period of time, and often fail to account for each individual's specific coaching context(s) (Cushion, Armour, & Jones, 2003; Lemyre, Trudel, & Durand-Bush, 2007; Mallett et al., 2009; Nelson et al., 2006). As such, there has been discrepancy in research as to the perceived importance of formal learning situations (Erickson, Bruner, MacDonald, & Côté, 2008; Lemyre et al., 2007; Mallett et al., 2009; Nelson et al., 2006; Wright, Trudel, & Culver, 2007). A main concern is that coaches spend relatively little amount of time in formal coach education in comparison to their day-to-day coaching (Gilbert, Côté, & Mallett, 2006). In addition, at the time of writing this paper, coach education in disability sport is not yet mandatory (or necessarily available) in Canada (Coaching Association of Canada, 2011). Nonetheless, formal coach education provides a venue for coaches to build a knowledge

foundation, and with some advancements made, it could be very beneficial for disability sport coaches.

Nonformal. Nonformal learning situations provide a halfway point between formal and informal learning situations. Nelson and colleagues (2006) defined nonformal learning situations as: “any organized, systematic, educational activity carried on outside the framework of the formal system to provide select types of learning to particular subgroups in the population” (p. 252). Working with particular subgroups, nonformal learning situations have the opportunity to be more unique and contextualized, yet they can also suffer from a lack of quality control, direction, and innovation. Coaches may also have difficulty accessing such opportunities if their governing sport structures do not make them available (Mallett et al., 2009). Little research on nonformal learning situations and their impact has been conducted, especially in a disability sport-specific context.

Informal. Informal learning is unstructured. It occurs through one’s daily experiences, with the learning being primarily initiated by the learner (Mallett et al., 2009; Nelson et al., 2006). Informal learning can include learning through day-to-day experiences (e.g., when coaching, or related to sport, family, and work), through past experiences (e.g., as an athlete), seeking extra resources, observing and interacting with others, and mentoring (Bloom, Durand-Bush, Schinke, & Salmela, 1998; Cushion et al., 2003; Erickson et al., 2008; Gilbert & Trudel, 2001; Werthner & Trudel, 2006, 2009; Wright et al., 2007). Research has shown that day-to-day experiences are considered one of the most valuable methods for learning how to coach (Erickson et al., 2008; Gilbert, Gallimore, & Trudel, 2009; Gilbert & Trudel, 2001; Lemyre et al., 2007; Wright et al., 2007). Researchers have also noted that a sport background is beneficial, but not essential (Carter & Bloom, 2009; Werthner & Trudel, 2009). One informal learning

situation, interacting with others, is a focus of this study. As such, we would like to briefly expand upon the different types of interactions that coaches may engage in, before turning to internal learning.

Research has identified four types of interactions with others: communities of practice (Wenger, 1998), informal knowledge networks (Allee, 2003), networks of practice (Nichani & Hung, 2002), and dynamic social networks (Mallet, 2010). A *community of practice* (CoP) has been defined as “a group of people who share a common concern, set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis” (Wenger, McDermott, & Snyder, 2002, p. 4). Members exchange information, ideas, and help each other solve problems. A community of practice must include three dimensions: a joint enterprise (i.e., a group goal and purpose for being together), mutual engagement (i.e., the ‘practice’ or engagement in group activities), and a shared repertoire (i.e., common language and rituals) (Wenger, 1998). Of the four types of interactions, this one is arguably the largest time commitment for those choosing to engage. In the sport setting, CoPs have been researched as a ‘coaches’ community of practice’, or CCoPs, which appear beneficial to coaches’ knowledge development; however, some barriers have been identified. It appears that coaches are hesitant to interact with others outside of their immediate club due to the competitive nature of sport, where coaches would rather protect their ‘secrets’ than share knowledge with others (Culver, Trudel, & Werthner, 2009; Culver & Trudel, 2006, 2008; Lemyre et al., 2007; Wright et al., 2007).

In the second type of interaction, *informal knowledge networks* (IKNs), people usually know one another and exchange information, but such discussions are loose as no joint enterprise holds them together (Allee, 2003). IKNs are more informal than CoPs, and have prevailed quite

well in a sporting environment, where coaches can easily phone an old colleague or specialist when in need of further information (Culver & Trudel, 2006, 2008). Seeking others for advice is also characteristic of the third type of interaction, *networks of practice* (NoPs); here however, individuals generally do not know one another (Nichani & Hung, 2002). As such, this type of interaction readily adapts to the Internet with its wide reach to many individuals across diverse areas, but can also lead to little reciprocity (Brown & Duguid, 1998; Duguid, 2005).

Finally, *dynamic social networks* (DSNs) are interactions that have been explored specifically in a sporting environment. These interactions occur with a limited number of trusted and respected individuals (Mallett, 2010). Such individuals are often significant others or experienced coaches who become confidantes. One's DSN changes frequently since coaches' needs continuously adapt in accordance with the complex and dynamic coaching environment (Mallett, 2010). Taking all four types of interactions into consideration, "coaches would certainly maximize their learning if they could use the full potential of each" (Culver & Trudel, 2006, p. 111). This also holds true for each of the four learning situations (i.e., formal, nonformal, informal, and internal) (Werthner & Trudel, 2006, 2009).

Internal. In 2006, Werthner and Trudel coined the term 'internal learning situations' based on Moon's (1999, 2004) network of ideas. Through a constructivist view, the network of ideas concept explores how a learner makes sense of his or her environment. At the center of this is one's cognitive structure: a sum of one's prior experiences and what is known by the learner at any point in time (Moon, 1999, 2004). In an internal learning situation, Werthner and Trudel (2006) contend that there is a "reconsideration of existing ideas in the coach's cognitive structure" (p. 201). In other words, the coach is reflecting. Situations where internal learning might occur could be through journaling, through taking time alone to think, or even through

reflecting on work with others. Literature has shown that reflection is a means for coaches to develop their knowledge, leading to more self-aware coaches who better understand their own values and beliefs regarding their practice (Stephenson & Jowett, 2009). To demonstrate how this may occur, Gilbert and Trudel's (2001) study explored how model youth sport coaches used reflection to learn through experiences, which as they acknowledge, can be influenced by the coaches' "access to knowledgeable and respected coaching peers" (p. 32). Such peers can facilitate the reflective process and expand one's own views when trying to solve an issue (Anderson, Knowles, & Gilbourne, 2004; Gilbert & Trudel, 2001; Knowles, Gilbourne, Borrie, & Nevill, 2001).

After exploring the four different learning situations it becomes apparent that there are many ways in which a coach can develop. Coaches can access coach education opportunities (formal), coaching clinics or seminars (nonformal), or can utilize reflective practice (internal). In addition, they can experience a plethora of informal learning situations, including learning from past experiences, day-to-day learning, mentoring, observing, seeking extra materials, and interacting with others (i.e., through CoPs, IKNs, NoPs, and DSNs). It is important to understand *how* one may learn from these various situations, which we will now explore in the theoretical frameworks on human learning.

Human Learning

When exploring human learning, we have chosen to use the work of Peter Jarvis (2006, 2009), whose comprehensive material on learning informed this project as the main theoretical framework. In addition, our work has been influenced by Jennifer Moon (1999, 2004) and Etienne Wenger (1998), whose works will briefly be expanded upon.

Jarvis' theory of human learning. Jarvis' theory of human learning (2006, 2009)

explains how a person learns over his or her lifetime within society. There are many aspects of learning that are highlighted in his work, four of which we will expand upon: a person's biography, his or her experiences, types of learning, and the individual's life-world (or social context). It is important to note that learning can be regarded as a cyclical process (Jarvis, 2006), and as a result, we will revisit the person's biography towards the end of this discussion to show how an individual can be changed or more experienced after learning.

Biography. A biography is the sum of one's life's experiences; it is who a person is at any point in time. As such, a biography is "an unfinished product constantly undergoing change and development" (2009, p. 25). For example, a student may attend a lecture on coaching; if she learns a new concept related to training during that class, her biography will be different after that lecture having been updated by the new learning material. However, a biography does not only include a frame of mind or cognitions; there are also bodily (genetic, physical, and biological) and emotive elements (Jarvis, 2006). All of these components combine to shape one's perception of any given circumstance; "Meaning resides in those who construct meaning and use it to interpret their experiences of the world" (2009, p. 74). In other words, one's biography is strongly tied to one's perception (and what he or she perceives to be meaningful), and all of this will act as a filter for selecting different learning situations. Back to the previous example, an alternative outcome could have been that the student did not perceive the day's material as important such that no learning occurred at that point in time. Thus, the biography is a very important concept that shapes how one perceives an experience and what one may ultimately select as a viable learning opportunity.

Experience. An experience starts with one or more of an individual's six senses (i.e., sight, sound, smell, taste, touch, and feel). In the perception stage, sensation is filtered by the aforementioned biography. It is through perception that "the world meets our mind" (Jarvis, 2009, p. 91), and the way we have sensations is by being open to the external world. As Jarvis (2006) explains, "our experience is not a mirror image of the external world; we perceive the world and thereby select from it those things that are relevant to our biographical development" (p. 72).

According to Jarvis (2006, 2009), there are two forms of experience: primary and secondary. A primary experience is something that one experiences directly, it is living and doing; as such, individuals acquire and exercise many skills throughout the course of daily living (Jarvis, 2006). A secondary experience is something that is mediated to the learner (e.g., by a teacher, colleague, or the media), and he or she only learns later on from the internalization or reflection of that experience (Jarvis, 2009). For example, when learning to ride a bike, a child may decide to learn by getting on his bike and riding it (i.e., a primary experience).

Alternatively, his mother could hop on her bike to demonstrate riding *to* her son, whereby the son could think about the demonstration (i.e., a secondary experience), and then try riding. Both types of experience occur during what Jarvis (2009) terms the three learning situations: formal, nonformal, and informal; concepts previously discussed in relation to coaching (Nelson et al., 2006). Formal and nonformal learning situations are usually secondary experiences; whereas informal learning situations are self-directed, and thus entailing a primary experience. It is important to note however, that this is not always the case (Jarvis, 2009). For example, one could learn 'informally' from others at a 'nonformal' coaching conference, blurring the lines between learning situations and the type of experience.

Finally, experiences include two concepts integral in the process of learning: disjuncture and harmony. Disjuncture is the stimuli for learning (Jarvis, 2009); it occurs when one becomes aware of a gap between one's biography and the perception of the situation at hand:

We come across a situation in which we are not sure how to act, or even when we experience a 'magic moment' that just stops us in our tracks. It is something out of the normal...and gives rise to astonishment, wonder, or some other emotion. It is at times like this that we become aware of our world. (2009, p. 20)

Harmony occurs when 'times flies' and an individual is taking his or her world for granted. This can occur when one learns without awareness, when one ignores a situation, or once one has learnt and satisfyingly returns to harmony (Jarvis, 2009). In other words, the biography is in harmony with the situation being experienced. These concepts will be discussed in further detail as we explore Jarvis' (2006) three types of learning: non-learning, non-reflective learning, and reflective learning.

Types of learning. Jarvis (2006) presents three different examples of non-learning: (a) presumption, (b) non-consideration, and (c) rejection. In presumption, the individual is in harmony; "for as long as we can presume upon the world, we do not consciously affect it, nor do we consciously learn" (2009, p. 27). As Jarvis adds however, "we may be internalizing some information unconsciously" (2009, p. 27), which is important as it can make the study of learning quite difficult. In non-consideration and rejection, the individual is in disjuncture but does not seek to rectify it immediately; the individual does not learn at that point in time (Jarvis, 2006). Thus, in non-learning, one can be unaware of the sense experience (presumption), enter disjuncture and ignore the experience (non-consideration), or can reject the disjuncture all

together (rejection). Regardless, at the end of these three types of non-learning, the individual is in harmony and his or her biography is relatively unchanged (Jarvis, 2006).

When one learns non-reflectively or reflectively, one transforms an experience (cognitively, emotively, or practically). In non-reflective learning, an individual enters disjuncture and has three ways of learning: (d) pre-consciously, (e) through practice, and (f) through memorization. First, pre-conscious learning is when an individual experiences situations with a low awareness (not really considering the situation), but has learnt something. This is one of the most frequent forms of learning in the process of becoming a person, such that individuals often learn day-to-day without realization (Jarvis, 2009). Second, an individual can learn through practice, which would be similar to copying another's approach, or performing an activity without thought. Third, memorization entails memorizing information, seen commonly when university students cram last-minute for exams. Non-reflective learning takes a surface approach to learning, (further explored in Moon's (1999, 2004) work), leaving the biography minimally changed (Jarvis, 2006). Nonetheless, harmony is re-entered after learning an external fact, action, value, or belief (Jarvis, 2006).

The final type of learning is reflective learning, where one transforms an experience through a deeper approach. Once again, Jarvis provides three examples of how the individual may learn at this stage, through (g) contemplation, (h) reflective practice, or (i) experimental learning. In all of these examples, the individual reflects upon a situation and either accepts or changes it (contemplation), conforms or innovates it (reflective practice), or agrees or disagrees with the experience (experimental learning). Reflective learning allows us to arrive at new knowledge that will then be integrated into our biographies. Furthermore, it leads to deeper meaning before returning to harmony, resulting in a changed person and biography (Jarvis,

2006). The outcome of each of the three types of learning is an impact on one's biography (from none, to low, to high), which is why it is important to revisit the concept of biography.

Biography revisited. Through different experiences and the resulting types of learning, we have shown that individuals' biographies are changed to different degrees. As such, it is especially important for a study on coaches' learning where growing and becoming more competent may be coaches' developmental goal. Therefore, how does this occur? To begin, the cyclical process of learning is revealed in Jarvis' (2009) definition of learning, being:

The combination of processes throughout a lifetime whereby the whole person – body (genetic, physical, and biological) and mind (knowledge, skills, attitudes, values, emotions, meaning, beliefs and sense) – experiences social situations, the content of which is then transformed cognitively, emotively or practically (or through any combination) and integrated into the individual person's biography resulting in a continually changing (or more experienced) person. (p. 25)

Having already presented the main concepts in this definition it is important to focus attention upon becoming a “more experienced” person – the outcome of learning. After encountering numerous learning situations and experiences, one may become an expert. However, “for some people 25 years of practice is one year of learning since they have been ritualistic in their practice, whereas for others it is 25 years of learning: this is the distinction between innovative and ritualistic action” (Jarvis, 2009, p. 150). Innovation is a reflective process, closely aligned to experimental learning (seen in the three *types of learning*), where an individual may use trial-and-error to test out a new idea. Indeed, individuals:

May reach the stage that they have to innovate within their own practice or, in other words, they have to create new knowledge and new ways of doing things and their expertise means that they also need to be creative – they become experts. (2009, p. 151)

Creativity is an especially important concept to this study, because able-bodied coaches in disability sport have been found to exercise creativity (Cregan et al., 2007; O'Neill & Richardson, 2008) to compensate for their lack of primary experiences of having a disability. Jarvis (2009) demonstrates how creativity and expertise can develop. In order to exercise this creativity, learners must be in social conditions where creativity is encouraged; that is, where the social structures which inhibit innovation are lowered so that the social norms of behaviour are weakened (Jarvis, 2009). To better understand this notion, we will now further explore the life-world.

Life-world. The learning process does not occur in isolation; rather it occurs within a social context, which Jarvis (2006, 2009) terms the life-world; “Learning is always about ‘being’ and ‘becoming’: it is ontological and it occurs within the context of the life-world” (2009, p. 25). Life-worlds consist of a unique combination of culture, space, and time. Culture includes all of the knowledge, skills, attitudes, beliefs, values and emotions that society has created and that influence an individual’s biography (Jarvis, 2006). Space can be physical space (where one is situated locally) or social space. For Jarvis, “social space is culturally meaningful and we interpret our experiences of social space from the perspective of our own cultural understanding, which, in turn means that our learning from our experience of social space is never free of social implications” (2006, p. 65). As we can see from these two concepts, it is impossible to separate ourselves from either culture or space. Similarly, time, (‘being’ automatically implies existence in time), is “something that knows no boundaries and in which there is always emergence of

newness – a sense of becoming” (2009, p. 21). When ‘time flies’, one’s biography is in harmony with the situation; it is when one becomes aware of the passing time that one enters disjuncture. Thus, all of these elements combine to form the life-world, which is also contained within the wider society and impacted by social forces and globalization (Jarvis, 2006). Society is ever-changing and appears to be creating more and more situations of disjuncture, yet individuals seem to have less time to learn (Jarvis, 2009). Similarly, social structures impact individuals in a variety of ways, such as through procedures (e.g., funding for coaching courses), social norms (e.g., is creativity encouraged?), and the opportunities they may or may not have access to (e.g., sport-specific clinics).

In exploring the process of learning, we have highlighted a few important concepts: biography, experiences, types of learning, and the life-world, in addition to many concepts embedded within these four (e.g., primary and secondary experiences, disjuncture, and harmony). With the perception of experiences being filtered through one’s biography it is the biography that determines what (or if) an individual learns from an experience, all of which occurs within the life-world. Finally, highlighting culture, space, and time, we can see the influence that the context of disability sport, specific sports, and governing structures can have on an individual’s learning, a crucial part of understanding how coaches learn to coach in disability sport. As such, it is now important to further explore human learning from the perspectives of Moon (1999, 2004) and Wenger (1998).

Moon’s network view of learning. Moon (1999, 2004) introduces a generic view of learning, outlining the various processes involved in everyday learning. Within this generic view of learning, she introduced two metaphors: the brick wall and the network of ideas, followed by three approaches to learning: deep, surface, and strategic. In explaining these metaphors and

approaches to learning, Moon (1999, 2004) introduces new terminology throughout, distinguishing early on between material of learning and material of teaching, that is, what is learnt by the learner, and taught by the teacher, respectively. It is important to make this distinction in order to fully understand each individual's role in learning, the various situations that they can encounter, and the differing experiences that they can undergo in the complex process of learning.

Although the brick wall metaphor is useful in formal learning situations, it “does not deal helpfully with the vast majority of human learning situations – which is everyday learning with no act of active teaching involved” (2004, p. 16). Furthermore, because this study uses a constructivist view, the network of ideas concept is more applicable as it explores the learner making sense of his or her environment (i.e., through the aforementioned cognitive structure). This concept of the cognitive structure is similar to Jarvis' (2006, 2009) ‘biography’, and also includes the body and emotions, in addition to cognitions. The cognitive structure also filters learning opportunities:

The state of the cognitive structure at a given time facilitates the selection and assimilation of new material of learning. In other words, it guides what we choose to pay attention to, what we choose to learn and how we make meaning of the material of learning or how we modify what we know or feel already. (Moon, 2004, p. 17)

Many factors can affect the material of learning and therefore, the learner's resulting knowledge. For example, learners can be affected by their emotions, the material of teaching, the learning context, and the state of their cognitive structure. Learning involves a change in the learner's cognitive structure, comparable to Jarvis' (2006) concept of transformation. For Moon (1999, 2004), this occurs through two processes: assimilation and accommodation. Assimilation is the

intake of information from the environment, and accommodation is the modification of what is already known by the learner (i.e., cognitive structure) in light of the new learning (Moon, 2004).

In the 'network of ideas' metaphor for learning, there exists external and internal experiences. An external experience focuses on the environment; it is the material of learning when we are learning about something outside of ourselves (e.g., an object, image, or idea). In contrast, the internal experience involves the individual; it is "the experience that the learner brings to the learning situation from her current cognitive structure" (2004, p. 23). The extent to which a learner tries to understand the material presented is greatly affected by his or her approach to learning: surface, strategic, and deep. These approaches somewhat parallel Jarvis' (2006) three types of learning: non-learning, non-reflective learning, and reflective learning, respectively; resulting in similar outcomes to one's cognitive structure or biography.

In taking a deep approach to learning, the learner's intention is to fully understand the material. This is done by assimilating the new material and allowing the cognitive structure to be altered with the accommodation of the new material. Crucial to this approach is the use of reflection. A surface approach does not involve reflection (Moon, 1999). Here the learner's intention is to cope without attempting to understand the material in a way that would alter their current state of knowledge. Lastly, the strategic approach to learning is evident when there are assessment tasks, seen mainly in a formal setting when trying to achieve the highest grades possible (Moon, 2004). The more the learner wishes to understand the material, the deeper the approach will be; thus, utilizing more accommodation in response to the new learning (Moon, 1999).

As previously identified, the network view of learning has been applied to the coaching environment by Werthner and Trudel (2006, 2009) to explain its usefulness for seeing "coach

development from the coach's perspective" (2006, p. 209). These authors point out that this view helps explain the idiosyncratic pathways to becoming a coach. Also, as advocated by these two authors, Moon's (1999, 2004) work on reflective practice demonstrates the importance of coaches utilizing reflection to either bring external experiences to their cognitive structure, or reaffirm what is already known (Werthner & Trudel, 2006). Finally, similar to a biography, one's cognitive structure and surrounding context can also determine what material of learning is important enough to understand (Moon, 1999, 2004; Werthner & Trudel, 2006, 2009). Once again this reaffirms the importance of observing coaches' sporting contexts, as further explored in Wenger's (1998) theory of social learning.

Wenger's theory of social learning. Wenger's (1998) work focuses on learning in the context of social participation. This theory has four premises: we are social beings (i.e., we are becoming); knowledge is a matter of competence with respect to valued enterprises (i.e., belonging); knowing is a result of actively engaging in the world (i.e., doing); and meaning is ultimately what learning is to produce (i.e., through experiencing) (Wenger, 1998). In other words, participation entails being actively engaged with others in communities. From this notion, Wenger (1998) goes on to explore communities of practice. He proposes, "As we engage together, we interact with each other and with the world and we tune our relations with each other and with the world accordingly. In other words, we learn" (p. 45). Wenger (1998) contends that what one learns is ongoing and occurs as we are engaged, similar to Jarvis' (2006, 2009) notion that learning is continuous and occurs as we live and experience. Although Wenger (1998) discusses the importance of the social contexts of learning, similar to the previous two works shown here, his main influence for this study involved how learning occurs with others.

As these three theoretical frameworks have shown, learning is not solely an individual process; learning also occurs within a social context or life-world. Therefore, to effectively research coach learning in disability sport, we observe and familiarize ourselves with each of the sporting contexts and the individuals within those contexts, to better uncover and comprehend their different learning environments. As previous research in disability sport has recognized, athletes appear to be effective resources for a coach's learning (Cregan et al., 2007; O'Neill & Richardson, 2008). Select able-bodied sport researchers have also acknowledged that coaches can learn from their athletes (Galipeau & Trudel, 2006). Thus, to better uncover learning in disability sport coaching, we felt it was important to include athletes in our study.

Research Design

There are three fundamental aspects of a research design: the epistemology, methodology, and methods, which will provide the design for this study. The epistemology used in this study was constructivism, which has been defined as “[an individual’s] way of making sense of the world” (Crotty, 1998, p. 58). Given that this is a study on learning, it is appropriate that this constructivist view is also shared by this study’s theoretical frameworks. As Moon (2004) explains, “A learner learns from experience...experience is likely to be thoroughly mediated by social influences and modified by other factors within the individual (p. 21). Thus, it is a combination of both the individual and their environment that shapes their knowledge. Furthermore, each individual has a unique biography or cognitive structure that filters learning opportunities, selecting what the individual sees as viable or meaningful. Moon (1999, 2004) describes meaning as an individual judgment; it is something determined by the learner. She further explains that “meaningfulness is an expression of the relationship between the material of learning and the learner’s existing understandings” (p. 106). Constructivism entails that the

individual steers the construction of their knowledge, as filtered by their cognitive structure and surrounding environment (Moon, 1999, 2004).

The methodology in this study utilized Merriam's (2002) basic interpretive qualitative methodology (BIQM) to "understand how participants make meaning of a situation or a phenomenon" (p.6). As recently addressed, determining meaning and perceiving things are close to the essence of constructivism. Perception is important in research; not only for how participants perceive questions and respond, but also for the selection of information as a researcher. Using a research design that includes constructivism and BIQM allows us to better understand human learning in the context of disability sport, as will be further explored in the methods of this study.

Methods of Participant Selection

This project was part of a larger study on coach learning in disability sport at the University of Ottawa, which was approved by the University of Ottawa's Research Ethics Board. Participants were selected using purposeful sampling (Patton, 2002), as well as maximal variation (Creswell, 2007), to help ensure variety between gender, age, sport, and background. Participants were contacted through the sport clubs and venues where the athletes trained, as well as through email with various sport representatives. In addition, convenience snowball sampling was used (Miles & Huberman, 1994), asking participants if they knew of any other coaches or athletes who may be interested in participating, keeping participant variation in mind (e.g., looking for coaches with more or less experience). There were no further requirements necessary for the coaches to participate.

Our study was divided into three different phases (see Appendix A). All phases were interconnected and utilized similar methods; however, each phase had a distinct purpose. This

study included 20 semi-structured interviews and 14 non-participant observation sessions; both centered on coach learning from the perspectives of the five coaches and their five athletes.

Once we made contact with a coach, we explained the protocol in greater detail, such that he or she fully understood the commitment. Upon receiving informed consent, we reviewed the practice schedule to find an appropriate time to commence the first non-participant observation. In that time period, the coach chose an athlete that he or she felt was appropriate for the study. We asked that this athlete be representative of their team or program, with any level of experience, as long as the athlete and the coach had a working relationship and understood the demands of the research protocol. In total, there were five coaches (2 female and 3 male), and five athletes (2 female and 3 male), forming five coach-athlete dyads. Sports included adapted water skiing, wheelchair basketball, paraswimming, wheelchair rugby, and wheelchair tennis. See Appendices B and C for further breakdown of participants.

Methods of Data Collection

Throughout the three phases, the purpose was to better understand coach learning within the various sport contexts. As Jarvis (2006) explains, people often have difficulty describing how they learn due to the implicit nature of learning. Similarly, Polkinghorne (2005) notes, “Because experience is not directly observable, data about it depend on the participants’ ability to reflectively discern aspects of their own experience and to effectively communicate what they discern through symbols of language” (p. 138). With this in mind, a combination of field work and interviews allowed for better access to identify such learning, while helping participants reflect on their experiences. The field work and interviews were conducted by the lead researcher, apart from the last athlete interview which was conducted by the second author.

Each phase started with a non-participant observation session that was followed by a semi-structured interview. The interview guides were designed with strategic questions to probe and encourage more detail, including two coach interview guides, one athlete interview guide, and one joint interview guide. After an initial analysis, minor questions were added to each interview guide to better prepare the researcher with adequate probes. The interviews lasted an average of 61 minutes for the first coach interview, 21 minutes for the second coach interview, 18 minutes for the athlete interview, and 18 minutes for the joint interview. It was the participants' decisions as to whether the interviews were conducted face-to-face or over the phone, in order to maximize convenience for each individual or dyad. Ten were conducted face-to-face and 10 were conducted over the phone. In addition to the interviews, 14 non-participant observation sessions were conducted at the dyad's practices, approximately 27.5 hours in total. Each observation lasted, on average, two hours. The fifth dyad did not have a third observation due to scheduling constraints. At these observations, our initial goal was to familiarize ourselves with the sport setting, while observing the coach's style and relationship with his or her athlete. Most importantly, we observed throughout the observation process for on-site actions related to learning that were probed for further understanding in the next interview.

Phase one. The purpose of the first phase was to meet the coach and familiarize ourselves with the sport context. This phase included the first non-participant observation session and an in-depth interview on the coach's background, to better understand his or her biography. In these interviews, coaches were asked questions about their coaching career and learning situations they had encountered. Such questions included: How did you begin coaching? What is your level of coach education? What is your own sport experience? What problems have you

faced and how did you resolve them? With whom do you interact? Please see Appendix E for a complete interview guide.

Phase two. The second phase began at the second non-participant observation session. Here the focus was to meet the athlete and observe his or her interactions with the coach. Two interviews were conducted in this phase: a follow-up with the coach and an interview with the athlete to briefly understand his or her biography, overall experiences with the coach, and discuss his or her perspectives of their coach's learning opportunities. See Appendices F and G for the second coach interview and the athlete interview guides, respectively.

Phase three. The final phase began with the last non-participant observation session. After having met and interviewed both the coach and athlete, this observation allowed the researcher to zone in on the learning that might be occurring specifically within the coach-athlete relationship, focusing on their interactions. Thereafter, the dyad met with the researcher for a joint interview, where again, their relationship and interactions were the focus. See Appendix H for a complete interview guide.

Data Analysis

Data analysis was ongoing throughout the multiple phases of data collection and utilized Braun and Clarke's (2006) five stages of thematic analysis. All interview audio recordings and field notes were transcribed verbatim, yielding 199 single-spaced pages. During the transcription process, notes were created to identify potential themes, codes, and general ideas (Braun & Clarke, 2006). All transcripts were sent to the participants for member checking (Lincoln & Guba, 1985), where they were encouraged to revise the transcripts and add in any new material; apart from minor clarifications, no changes occurred.

Upon familiarizing oneself with the data, the transcripts were then explored using NVivo9 software (Qualitative Solutions and Researching, 2010, version 9) to help organize, code, and interpret the large amounts of information. Deductive analysis was guided by the study's research questions, as well as the theoretical frameworks: Jarvis' (2006, 2009) theory of human learning (primarily Article One) and Wenger's (1998) social theory of learning (primarily Article Two). Analysis was also conducted with coach development literature in mind, as well as Moon's (1999, 2004) network of ideas. The coded data was sorted into initial themes (e.g., coaching experience and learning with others), and then later re-read to ensure themes were related to the coded data. To facilitate this process, multiple thematic maps were constructed to visually demonstrate patterns among different themes and sub-themes. Finally, the data and themes were reviewed again looking for any information that may have been overlooked, while further defining the themes to fully understand the 'essence' of what each one was about (Braun & Clarke, 2006).

Credibility

In qualitative research, credibility refers to the merit or trustworthiness of one's work (Maxwell, 2005). One aspect that challenges credibility in any project is reactivity, which refers to the influence that the researcher has on participants. This can be due to the researcher's presence, or even the wording of a question (Maxwell, 2005). Hammersley and Atkinson (1995) refer to this as "reflexivity" in interviews, describing it as a powerful and inescapable influence, because the informant is always influenced by the interviewer. In order to deal with this issue, an open environment was created to help the participants feel as comfortable as possible, while being conscious of wording and body language, properly utilizing probes and questioning strategies (Rubin & Rubin, 2005). Furthermore, the multiple phases of data collection allowed

the researcher and participants to build a relationship, which helped the individuals to share information, further enriching the quality of the data. As Creswell and Miller (2000) reveal, repeated observations allow researchers to find “gatekeepers” for enhanced access to people and sites, while building trust and rapport with participants such that they become more comfortable disclosing information. Such observations allowed us to meet others who were close to the participants, as well as find further individuals who were interested (i.e., snowballing our sample (Miles & Huberman, 1994)).

To further prevent threats to the credibility of this study, we utilized different modes of triangulation. These included multiple methods (i.e., interviews, field notes, and non-participant observation), different types of participants (i.e., coaches and athletes), and a lengthy time period for data collection (i.e., prolonged engagement) (See Appendix D for timeline). These various means allowed us to check participants’ responses, gather rich data, and create a thicker description. Furthermore, we also sent participants a copy of their transcript to provide them with an opportunity for feedback and/or clarification (Lincoln & Guba, 1985). This bias was examined with the help of others.

Article 1

Coaches of athletes with a physical disability: a look at their learning experiences

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Coaches of athletes with a physical disability: A look at their learning experiences

Literature has shown that research on coaches of athletes with a physical disability is lacking (DePauw and Gavron 1991, 2005, Cregan *et al.* 2007). The purpose of this study was to examine the learning experiences of coaches in disability sport. Five coaches participated in this study. Data included two semi-structured interviews and two non-participant observation sessions with each coach. Thematic analysis (Braun and Clarke 2006) was employed using Jarvis' (2006, 2009) theory of human learning as a theoretical framework. Results indicated three main themes influencing the coaches' learning and development: (a) their biographies, (b) how they chose to learn (i.e., through formal, nonformal, and informal learning situations), and (c) the learning opportunities provided by their sport. The coaches noted the usefulness of varied learning situations, and identified a lack of resources and few nonformal and formal learning opportunities specific to disability sport.

Keywords: Disability sport; coach learning; development

In recent years, there has been increased research on coach learning and development. One exception however, is research within the disability sport setting. There are almost no empirical-based studies on coaches in disability sport (DePauw and Gavron 1991, 2005, Cregan *et al.* 2007). More than 20 years ago, DePauw (1986) highlighted seven research priorities within disability sport, more recently identified as still relevant today (DePauw and Gavron 2005). Three of these priorities are pertinent to this study: discovering the background and training of coaches, developing certification standards for coaches, and determining the effectiveness of coaches' training programs. Researchers have also added the need to investigate the demographics of disability sport and its coaches (DePauw 1986, DePauw and Gavron 1991, 2005, Reid and Prupas 1998, Cregan *et al.* 2007).

More specifically, several studies have noted a lack of knowledgeable coaches in disability sport (DePauw and Gavron 1991, 2005, Liow and Hopkins 1996, Sherrill and Williams 1996, Robbins *et al.* 2010). A recent reflection on the Beijing Paralympics Games from a Canadian perspective identified a need for coach development and suggested that there be more disability sport-specific material in formal coach education courses (Sawicki, 2008). As well, less formal opportunities, such as coaching clinics and seminars have been identified as scarce in disability sport (Cregan *et al.* 2007), leaving many coaches of athletes with a disability turning to informal opportunities for knowledge acquisition. For example, a common informal opportunity includes interacting with the athlete to better understand his or her disability (Doll–Tepper 1994, Cregan *et al.* 2007, O’Neill and Richardson 2008). The purpose of this study is to explore how disability sport coaches learn to coach. Recognizing the dearth of research in disability sport (DePauw and Gavron 1991, 2005, Cregan *et al.* 2007), this study will also be informed by the coach development research in able-bodied sport.

Coach Development

Coach development refers to the process of leading towards enhanced expertise. Recent studies have shown that different background experiences and pathways influence coaches’ development (Mallett *et al.* 2009, Mallett 2010, Trudel *et al.* 2010). The majority of this section will draw on the coach development literature in an able-bodied sport setting, across formal, nonformal, and informal learning situations (Nelson *et al.* 2006).

Formal learning situations take place in an institution, are graded and hierarchically structured (Nelson *et al.* 2006), and are generally conducted over a short period of time with each course often taken months or years apart. Typically there is minimum follow-up and there are few opportunities to facilitate the integration of new knowledge into coaching practice (Nelson *et*

al. 2006). Due to the amount of attendees and the range of background experiences, formal learning situations often fail to account for each individual's specific coaching context(s) (Cushion *et al.* 2003, Nelson *et al.* 2006, Lemyre *et al.* 2007, Mallett *et al.*, 2009). With these factors in mind, the impact of formal learning situations has been scrutinized, specifically when comparing the amount of time coaches spend in coach education versus their day-to-day learning experiences (Gilbert *et al.* 2006). Additionally, at this point in time formal coach education courses in Canada are not universally required for disability sport coaches, nor are they necessarily available (Coaching Association of Canada 2011).

Less formal coaching development opportunities are offered through nonformal learning situations: organized educational activities such as coaching clinics carried on outside the framework of the formal system and provided to select subgroups (Nelson *et al.* 2006).

Compared to standard formal learning situations, nonformal learning situations can be more authentic and contextualized, yet can also suffer from a lack of quality control, feedback, and innovation. Coaches may also have difficulty accessing such opportunities due to the lack of coach education structures in their sport governing organizations (Mallett *et al.* 2009). Little research on nonformal learning situations and their impact has been conducted.

Informal learning is a "lifelong process by which every person acquires and accumulates knowledge, skills, attitudes, and insights from daily experiences and exposure to the environment" (Nelson *et al.* 2006, p. 253). In the literature on coach development, informal learning includes a wide variety of learning situations such as previous athletic experiences, practical coaching experience, mentoring, resources of information (e.g., the Internet), and interactions with others (Nelson *et al.* 2006, Wright *et al.* 2007). Clearly the opportunities for informal learning are wide-ranging and will vary considerably from coach to coach. For

example, many authors have emphasized the importance of past athletic experience as one of the keys to coach learning and development (Gilbert *et al.* 2006, Nelson *et al.* 2006, Erickson *et al.* 2007, Lemyre *et al.* 2007, Stephenson and Jowett 2009), and yet it should be noted there have been exceptions, with some coaches reaching an elite level having never participated in sport (Carter and Bloom 2009, Werthner and Trudel 2009). Interacting with others, such as other coaches, has been recognized as a preferred source of coaching knowledge (Erickson *et al.* 2008); however, such interactions have been shown to diminish outside of one's club due to the competitive nature of sport (Culver and Trudel 2006).

Several authors have suggested utilizing all three types of learning situations (i.e., formal, nonformal, and informal) for ensuring a more holistic development of coaches (Nelson *et al.* 2006, Werthner and Trudel 2006, 2009, Wright *et al.* 2007, Mallett *et al.* 2009, Mallett 2010, Trudel *et al.* 2010). One theorist who has examined human learning in a very comprehensive manner is Jarvis (2006, 2009). Using Jarvis' theory as a framework allows us to think more deeply about coach learning.

Human Learning

Jarvis' theory of human learning (2006, 2009) takes an existentialist approach to explain how a person learns in society over his or her lifetime. Over numerous volumes of work, Jarvis has combined multiple theories to comprehensively explore learning. For this study we focus on three specific aspects of learning: a person's biography, his or her primary and secondary experiences, and the social context in which the learning takes place.

Jarvis' (2006, 2009) concept of biography is who we are at any one point in time; "an unfinished product constantly undergoing change and development" (2009, p. 25). One's biography encompasses more than simply cognition; there are also physical and emotive

elements that shape us as human beings, involving one's knowledge, skills, beliefs, values, attitudes, and senses (2006). All of these components combine to shape how one perceives meaning in any given circumstance. Thus, a person's biography shapes how he or she perceives an experience and deems it as meaningful or not, ultimately influencing the selection of viable learning opportunities.

According to Jarvis (2006, 2009) there are two essential forms of experience: primary and secondary. A primary experience is experienced directly, it is living and doing; as such, one acquires and exercises many skills throughout the course of daily living (2006). A secondary experience is mediated (e.g., by a teacher, colleague, or the media). Both these forms of experience occur in any, or all of the three types of learning situations: formal, nonformal, and informal. Formal and non-formal learning situations are usually but not exclusively secondary experiences; whereas informal learning situations are self-directed, and thus entail a primary experience. Skill sets may be similar when comparing coaches in able-bodied sport and disability sport, considering many coaches in disability sport are able-bodied and have able-bodied coaching experience (DePauw and Gavron 1991, 2005). However, given that athletic experience is a frequently noted source of coach learning (Gilbert *et al.* 2006, Nelson *et al.* 2006, Erickson *et al.* 2007, Lemyre *et al.* 2007, Wright *et al.*, 2007), it is important to note that able-bodied disability sport coaches will not have primary experience as an athlete with a disability.

As well, experiences, whether primary or secondary, occur within a social context. These social contexts, which Jarvis (2006, 2009) calls life-worlds, consist of a unique combination of culture, space, and time, and are subject to the forces inherent within the wider society. Social structures have an impact on the individual in a variety of ways, such as through procedures (e.g., funding), social norms (e.g., is creativity encouraged?), and the opportunities to which he

or she may or may not have access (e.g., coaching clinics or courses) (Gilbert and Trudel 2001, Cushion *et al.* 2003, Mallett *et al.* 2009). Disability sport is seen as an impoverished social context when it comes to funding and providing coaches with specific disability sport learning opportunities (DePauw and Gavron 1991, Sherrill and Williams 1996, DePauw and Gavron 2005). Therefore, the purpose of this study was to explore how five coaches learnt to coach in their respective disability sport contexts.

Research Design

The epistemology used in this study was constructivism which adopts a holistic approach, extending beyond the mind to include the body and all of its senses (Light 2008). It is: “[an individual’s] way of making sense of the world” (Crotty 1998, p. 58). Using Merriam’s (2002) basic interpretive qualitative methodology to “understand how participants make meaning of a situation or a phenomenon” (p. 6), this research design allows not only a better understanding of human learning, but also learning within disability sport, since interpretivism reveals “the experience and meaning of disability in our culture in richer terms than normally achieved” (Ferguson *et al.* 1992, p. 7).

Participant Selection and Data Collection

Upon receiving approval from the researchers’ university Research Ethics Board, potential participants were contacted via athletic venues and various local sport representatives. Thereafter, participants were selected using purposeful sampling (Patton 2002), and maximal variation (Creswell 2007) via snowball sampling (Miles and Huberman 1994) to help ensure variety between coach backgrounds (e.g., gender, age, sport, and experience). The participants were five coaches; two female and three male. This study had two phases; each began with a non-participant observation of a coaching session, followed by an interview with the observed

coach. The purpose of the first observation was to meet the coach and get familiar with the sport context. Thereafter, the interview expanded upon the coach's biography and their different learning experiences. The second observation allowed the researcher to further understand the sport context and observe any occurring learning experiences, which were further probed in the second interview.

The interview guides were semi-structured, with questions designed to encourage discussion and reflection on the participants' development as a coach. The interviews lasted an average of 61 minutes for the first interview, and 21 minutes for the follow-up interview. The non-participant observation sessions lasted approximately two hours, where the researcher became familiar with each sport context and made field notes throughout. For each coach, the data collection process took place over a period of approximately two months.

Data Analysis

Data analysis was ongoing throughout the two phases of data collection (Coffey and Atkinson 1996) and was conducted using Braun and Clarke's (2006) five stages of thematic analysis. All audio recordings were transcribed verbatim, yielding 130 single-spaced pages. During transcription, notes were created to identify potential themes, codes, and ideas (Braun and Clarke 2006). All transcripts were sent to the respective participants for revisions or additions (Lincoln and Guba 1985); one coach suggested minor grammatical revisions.

NVivo9 software (Qualitative Solutions and Researching 2010) was employed to help organize, code, and interpret the information. Deductive analysis was guided by Jarvis' (2006, 2009) theory of human learning. The coded data was sorted into initial themes (e.g., coaching experience and learning with others), and then later re-read to ensure themes were related to the coded data. To facilitate this process, multiple thematic maps were constructed to visually

demonstrate patterns among different themes. The data and themes were reviewed again for any information that may have been overlooked, while further defining the themes to fully understand the ‘essence’ of each theme (Braun and Clarke 2006).

Credibility

In trying to understand human behaviour, data undoubtedly become contaminated by the researcher’s thoughts and actions (Freeman *et al.* 2007). In an effort to minimize researcher bias (Maxwell 2005), a journal was kept to log research activities, detailing the non-participant observation sessions and interviews, with more general memos on ideas and reflections. In addition, two researchers within our research lab provided feedback throughout the project, particularly during analysis.

In order to manage reactivity (Hammersley and Atkinson 1995), an open environment was created to help the participants feel as comfortable as possible during interviews, while the researcher remained aware of wording and body language, and the proper use of probes and questioning strategies (Rubin and Rubin 2005). The multiple phases of data collection allowed the researcher and participants to build a relationship, which helped the individuals share information, further enriching the quality of the data (Creswell and Miller 2000).

Trustworthiness was augmented through multiple methods of data collection, prolonged engagement, and member checking, allowing the researcher to create an in-depth understanding of the coaches’ learning processes.

Results

The results, which are informed by the non-participation observations, field notes, and the coach interviews, are presented in two sections. We will first look at the coaches’ biographies, followed

by their learning situations and elements of the contexts in which their learning took place. Each participant was assigned a unique code (C1-C5).

Coach Biographies

This section explores the coaches' demographics and biographies (see Table 1). The five coaches ranged in age from 24 to 60 years of age. They coached athletes in the sports of adapted water skiing, paraswimming, and wheelchair basketball, rugby, and tennis at levels from recreational to elite sport. All five of the coaches had extensive backgrounds as athletes, three as able-bodied athletes, and two as athletes with a disability. All five coaches had started or completed a post-secondary degree. One of the coaches was paid full-time, and one was paid part-time, but worked full-time running her program. The five coaches had all attended coach education courses; four of the five also received training specific to disability sport. Three coaches had been coaching athletes with a disability for between 12 and 30+ years (C1, 3, and 5). The other two coaches had only been coaching in disability sport for two-three years (C2 and C4). These two coaches were also the only two coaches with a disability, resulting (coincidentally) in two groups of participants: experienced coaches who were able-bodied and inexperienced coaches who had a disability.

[Table 1 near here]

The two coaches with a disability were asked to coach while still being athletes. After participating locally for many seasons as an athlete, one coach explained how his organization recruited him to coach:

The people running the organization came to me because I was playing on the national team and because I knew everyone [in the organization]. Every practice I was talking to people and helping them out with training anyway, so I figured I might as well take on some coaching. (C2)

The other coach with a disability was in the process of retiring from his sport and many of his teammates asked him to stay involved. He agreed, realizing “the game is so great and it’s done so much for me that I just wanted to be able to stay in the game and help the players” (C4). The other three coaches began their coaching careers in able-bodied sports, and then switched to disability sport. One coach explained, “It was one of the able-bodied sport instructors who let me know of the program for disabilities. He said, ‘you’re going to like this kind of coaching’” (C1). This coach began coaching adapted skiing after one year with able-bodied skiing, and has, for over 30 years, been running summer and winter programs for athletes with a disability. Another coach began her career as a teenager coaching the local able-bodied swim team, but (as encouraged by her mother) had volunteered extensively with people with a disability from the age of ten. When asked how she became interested in coaching athletes with a disability she responded:

I started working with people with disabilities when I was young. I saw their potential where others saw the roadblocks. It was what I wanted to do....there are so few people who have any experience working with people with disabilities. It has become a passion of mine. (C3)

The final able-bodied coach also started coaching as a teenager, giving lessons at her tennis club, and that evolved into coaching high performance wheelchair tennis athletes (C5). Initially this coach was hesitant, saying “At the start, I didn’t know anything about coaching wheelchair tennis”, but she found she loved it, and soon after one of the athletes asked her to be his personal coach. Within her first year of coaching athletes with a disability she attended Nationals, the World Team Cup, and the Paralympics.

Jarvis (2006) notes that an individual’s biography is the sum of their different primary and secondary experiences. As noted earlier, a number of studies on coach development have

pointed out the importance of athletic experiences for able-bodied sport coach learning. This study looked at how the lack of athletic experience, particularly for the three coaches who did not have a disability, would influence disability coach learning.

All of the coaches spoke of the importance of their primary experiences of being an athlete. For example, in terms of technical knowledge, one coach felt her able-bodied athletic experience helped her adapt quicker when she first began coaching in disability sport: “I was taking in a lot of information at first, but I quickly realized that my knowledge of the sport meant I could bring them to another level” (C5). The wheelchair basketball coach, whose physical disability had progressed over time, explained:

I’ve gone through so many physical changes since I started playing basketball that I’ve had to adjust the way I do a lot of things as an athlete, like the way I push. So I have some experience helping athletes with those technical aspects. (C2)

This coach was later observed helping his athlete who had difficulty with her chair stroke. The paraswimming coach used her experience as a marathon swimmer to understand the many aspects of coaching athletes with a physical disability:

As a marathoner swimmer, I understand how to deal with things when you’re at your lowest. And I understand that a lot of the kids that I work with come to swim practice from school having had a horrid day because they couldn’t do what they needed to do or because they were being bullied. (C3)

The coaches also indicated that there were different ways they learnt through secondary experiences. They spoke of good communication with their athletes, especially for the three able-bodied coaches, as this increased their confidence to adjust training and innovate when dealing with the limitations related to their athletes’ disabilities. The paraswimming coach, referring to

the example mentioned above, explained how communication helped her to learn from her athletes:

You've got to know what your athletes are thinking and feeling, and adjust accordingly... Often times when I walk out onto the pool deck, I can get an inkling. You see the kids and realize the work-out is not going to work for them, and I'm quite open to changing it and giving them what they need for the day; I can adjust it later. (C3)

Another coach explained how she combined her athlete's knowledge with her knowledge, learning through secondary and primary experiences: "The way I approached the athlete was 'give me information, and with that I'm going to be able to do what I think is good'. So the good thing was with the communication between us, we were two" (C5). This coach was observed to frequently 'check in' with the athlete throughout their practice sessions, verifying his understanding and how the workout was going. A third coach spoke of transferring knowledge from his post-secondary education and resulting career to disability sport coaching:

I worked as an engineer using new technologies all the time. I think there's a strong correlation between that and the adaptive world where everything you do is observation and analysis; you try something and it doesn't work – then you try something else. (C1)

However, the two coaches with a disability believed that their primary athletic experience in disability sport was not a necessity. As one coach said:

You don't necessarily need to have a disability to [coach athletes with a disability]. Because wheelchair basketball is so similar to stand-up basketball, I think able-bodied basketball coaches can transfer what they know and just learn the more specific aspects of wheelchair basketball later. (C2)

The wheelchair rugby also did not believe it was mandatory to have the primary experience of being an athlete with a disability in order to coach. He spoke of one new able-bodied coach who

had been an avid fan of the sport for a number of years. While having no primary athletic experience, the fan began coaching with considerable knowledge about the game.

Coach Development

This section explores the coaches' learning situations (i.e., formal, nonformal, and informal), as well as how certain elements of the social context influenced their learning opportunities.

Formal

All five of the coaches had access to coach education in disability sport at a general level, providing introductory information on coaching athletes with a disability. The provision of coach education by the coaches' sport organizations facilitated disability coach learning. Several sport organizations provided financial support for coach education. Two of the sport organizations stood out when it came to sport-specific coach education. Wheelchair rugby took the initiative to create its own sport-specific coach education program when discovering that the NCCP was too general: "NCCP's basics of how to run a practice are good, but needed to be a bit more sport-specific, and that's what [wheelchair rugby is] doing" (C4). And, as the wheelchair tennis coach explained: "coach development became our number one priority 10 years ago, so it has been implemented everywhere". This coach did her coach education through the able-bodied levels, which included a formally organised apprenticeship:

Tennis Canada now has a 6-hour certificate for new coaches to get the minimum knowledge about the sport, the disability, the chair ... We always brought a new coach with us at the World Team Cup, we always had someone that came in and observed what we were doing, so for coach education we did a good job. (C5)

As a result, these two coaches highly valued their formal coach education experiences, whereas the remaining three coaches felt that changes needed to be made to increase its value.

The two main themes that emerged regarding the development of formal learning situations included course structure and course content. Coaches' opinions differed according to their level of coach education and the sport. The main comments regarding course structure related to the cost and time involved, and that most other coaches attending the courses were able-bodied (to be further discussed in regards to the social context). The three coaches who had only taken Level 1 of the NCCP found the content rudimentary and would have preferred that it was more specific to their sport. As one coach explained, "If someone wanted to be an adaptive coach and they had no other skills, they might have difficulty coaching with only Level 1" (C1). He added that he would like to see more hands-on application and skill development within the courses. Interestingly, the adapted waterskiing, paraswimming, and wheelchair tennis coaches in this study had been asked to facilitate or develop course materials for their organization. Having had the opportunity to facilitate a Level 3 disability component, the paraswimming coach said that although a lot of disability sports are similar to their able-bodied counterparts, it is important to incorporate the differences that do exist into the content, such as understanding the technical issues of the wheelchair, athlete differences in mobility, and information about the specific disabilities. Similar incorporations were also suggested by the tennis coach.

Nonformal

All coaches spoke of valuing nonformal learning situations (i.e., clinics and conferences). Each coach discussed the different objectives of their national sport organizations, which facilitated access to clinics and training camps for several coaches, including paraswimming, wheelchair rugby, and tennis. For example, the coach in wheelchair rugby said:

The national program is doing the right things – developing players, bringing in coaches. Everything that I've had access to and still have access to will help me out. I'm doing this clinic with Team Canada's National Coach, so I'm going to be a sponge there. (C4)

He later addressed the value of nonformal opportunities: “I’m looking forward to [the upcoming clinic]. It’s hands-on; it’s not in a classroom...I think that’s the biggest thing I would try to encourage for a new coach” (C4). Some coaches also mentioned the excitement of working with others at the clinics: “I get so hyped because you’re talking to coaches who are doing exactly the same thing as you, and I’ve developed relationships with a number of them” (C3). Clearly, those who had attended were pleased with their experiences. The remaining two coaches did not have as much access to these opportunities, but desired them:

I think the clinics could be really beneficial. I feel getting that hands-on experience...that’s the way that I like to learn...Having the experience, just getting out there and doing it, for me, would be the best way of becoming a better coach. (C2)

Informal

The informal learning situations that the five coaches spoke about included: seeking out resources (e.g., the Internet, books, DVDs), observing other coaches, being or having a mentor, and interacting with others. The Internet was a utilized resource with all five coaches, yet they noted a lack of specific aspects for disability sport. One coach spoke of several sport-specific books he referenced and the use of game tapes (C4). Another coach was observed videoing his athletes in training and then analyzing their development (C1).

Observing others started when the coaches were athletes, and evolved into watching other coaches and athletes:

Going on tour was the *best* experience; we went on site and watched the athletes...my purpose was to be with my athletes, but I could also talk to the coaches, look at their matches, their teams, and I learnt *a lot* from that. (C5)

Each of the coaches spoke of the mentoring process as a way of helping them develop. Some were mentors, and others had a mentor who guided their development. The paraswimming coach mentored new coaches, providing them with information on specific disabilities and resources that would help get them started. The wheelchair basketball coach said he had a mentor who helped him in his first year: “He was huge in helping me figure stuff out and giving me ideas” (C2), especially regarding practice content and managing time.

Interactions with others were another commonly cited informal learning situation. The five coaches all reported learning through interactions with specialists, personnel from other programs, athletes, and other coaches. Each coach was able to identify at least one learning experience where he or she had learnt through working with a sport organization member and/or specialist. The wheelchair tennis coach said she was fortunate to work at a training centre which afforded her proximity to international able-bodied sport coaches and specialists, such as physiotherapists. As for exchanges with other disability sport coaches, there appeared to be a collegial attitude where coaches were very open to helping each other:

I’ve relied a lot on debriefs after practices, tournaments, and games, and asking other coaches questions...[Our wheelchair rugby organization] is really focused on their vision and what they want to accomplish in the next 10 years, and they are really trying to put everybody on the same page to work towards that. (C4)

Regarding interactions with athletes, all five coaches strove to develop solid relationships with their athletes. They felt this helped them understand each athlete’s specific disability and better prepared them to effectively coach the individual.

These findings include a number of issues related to coach learning that appear unique to disability sport, including the small size of communities (i.e., few coaches and athletes), minimal time for actual coaching, few resources, and lack of appropriate facilities. The small number of

coaches working in disability sport was noted as a barrier specifically for coach learning in formal situations. Two of the participants mentioned how all of the coaches in the courses were from able-bodied sport:

A lot of the coaches of able-bodied athletes do not relate at all. I think the coaches who see athletes with disabilities on the pool deck on a regular basis are starting to get it, but I haven't really stayed in contact with a lot of those [fellow NCCP] coaches. (C3)

With such a small community of coaches, many coaches were taking on more: balancing different teams, running programs, and catering to different levels of athletes (i.e., ages, disabilities, levels of play), with only one of the five coaches having an assistant. As the newer wheelchair basketball coach explained:

I find it really hard to manage time, especially with the different skill levels of the athletes I coach. With these five athletes we can get a drill done in five minutes, but with these three athletes it will take us three times longer for them to understand that drill. (C2)

Juggling different athletes and multiple roles influenced the available time for other things, such as coach education: "It's hard to find time to take a break, let alone to take a course! I've done some investigating on what's available, but it depends on the financial situation as well as the time" (C3). As this coach identified, there were minimal resources in disability sport; three of the five participants were not paid for their time. In addition to little time and money, lack of resources also included few disability-specific materials (e.g., workbooks and websites) and infrequent nonformal and formal events. In terms of facilities, practices that involved gymnasiums often had late-night practices and/or inappropriate locations. The researcher observed that one of the gymnasiums had doors that were too narrow for wheelchairs to fit through, so athletes had to disassemble their wheelchairs each time they wanted to enter or exit

the gym. Coaches learning experiences were negatively influenced by such deficiencies in the training environment.

Discussion

The purpose of this study was to examine the learning experiences of five coaches in disability sport. Using Jarvis' (2006, 2009) theory of human learning, we completed a deductive analysis that examined the coaches' biographies, the coaching contexts, and their various learning experiences.

The wheelchair rugby and wheelchair tennis coaches had sport-specific formal learning opportunities and found these advantageous, with more hands-on and detailed application – an approach advocated in both able-bodied and disability sport research (Bloom *et al.* 1998, Goodwin *et al.* 2006). For the other three coaches, disability sport-specific coach education was not available, resulting in introductory coaching courses that were decontextualized (Cushion *et al.* 2003, Nelson *et al.* 2006, Lemyre *et al.* 2007, Mallett *et al.* 2009). The coaches who were at Level 1 felt the content was rudimentary, and often focused on able-bodied sport settings. Thus, for the two sports that provided access to proper formal education, the coaches found it to be effective. The remaining three coaches whose sports did not offer the same opportunity did not find formal learning opportunities to be as valuable. Luckily, some of the difficulties with formal learning situations can be dealt with in nonformal opportunities, such as specificity, authenticity, and contextualization (Mallett *et al.* 2009). However, Mallett and colleagues also recognized that some coaches might have difficulty accessing these opportunities, which was certainly the case in our study. Although the opportunities were sparse, all of the coaches desired nonformal learning situations, especially for the disability-specific content and hands-on experience.

There were a variety of informal sources that the coaches in this study utilized and valued, similar to past able-bodied sport studies (Lemyre *et al.* 2007, Wright *et al.* 2007). One difference however, is the heavy reliance on informal learning situations for these five coaches. Given the general lack of formal and nonformal learning opportunities that were specific to disability sport, this is not surprising. However, this was also the case for coaches who had impressive formal education opportunities.

One of the informal learning situations, interactions with others, is of particular interest to this study, as it was the most utilized informal learning situation. In regards to these interactions, it is worth noting two particularities of the disability sport setting. First, the findings support Cregan and colleagues (2007) notion that coaches' interactions with athletes are a highly valued learning relationship that may be of unique significance to disability sport. Second, when talking about interactions with other coaches, the coaches in this study emphasized the openness of disability sport coaches in comparison to able-bodied sport coaches (Culver and Trudel 2006, 2008).

An interesting feature of this study was examining how able-bodied coaches learnt to coach without the primary experience of having been an athlete with a disability, thus learning to coach through secondary experiences (Jarvis 2006, 2009). Although primary experience was reportedly not a necessity, it did give coaches with a disability an advantage for understanding their athletes' capabilities and specific needs. To make up for this, able-bodied coaches utilized their primary experiences from being an able-bodied athlete, or other work-related experiences as reported in able-bodied coaching (Cushion *et al.* 2003, Werthner and Trudel 2009). In addition, they learnt through secondary experiences. This principally occurred through communicating with their athletes, as seen in Carter and Bloom's (2009) study on individuals

who coached beyond their athletic achievements. Initially, the lack of disability sport knowledge for able-bodied coaches was a hindrance; however, coaches realized they had to work harder to overcome these gaps, and also be creative (Cregan *et al.* 2007, O'Neill and Richardson 2008). Thus, although having a disability can be helpful for coaching athletes with a disability, it appears that it is not essential. All past experiences are beneficial and can play a part in becoming a coach, which is why different biographies (e.g., being an avid fan, an able-bodied coach, or a coach with a disability) are interesting and useful for bringing innovation to the sport.

Although the access to appropriate formal and nonformal learning situations is far from universal in disability sport, it is apparent that different learning situations and experiences were utilized, effective, and highly valued by these coaches. Thus, we would agree with previous research that one situation is not necessarily more influential or important than the other (Nelson *et al.* 2006, Werthner and Trudel 2006, 2009, Wright *et al.* 2007, Mallett *et al.* 2009, Mallett 2010, Trudel *et al.* 2010).

As Jarvis (2006, 2009) has identified, learning cannot occur without taking into consideration one's social context. Serving a marginalized population, the context of disability sport has a few unique characteristics compared to that of able-bodied sport. One example is adaptability. When asked about preparing for practice sessions, the paraswimming coach raised the issue of her athletes' morale after a day at school when they might have been bullied or frustrated by their limited ability to participate. This coach mentioned how important it is to be sensitive to the athletes' state upon their arrival for practice, and to be able to adjust the practice plan according. While this is also important for coaches of able-bodied athletes, the circumstances of athletes with a disability seem to augment the need for their coaches to be very adaptable. Other hindering characteristics include a lack of resources, a small population of

coaches, and fewer external opportunities (i.e., clinics, coach education, and online materials). Even though coaching athletes with a disability has been recognized as an activity requiring a similar skill-set as that for coaching able-bodied athletes (DePauw and Gavron 2005), disability sport continues to lack coaches (DePauw and Gavron 1991, 2005, Sherrill and Williams 1996, Sawicki 2008). As noted elsewhere, our study found coaches were working in multiple competitive contexts (Sawicki 2008), and that time and money was limited (Sherrill and Williams 1996, Sawicki 2008). Clearly, disability sport has many barriers to coach development. Governing structures (e.g., NCCP, disability sport, and national sport organizations) play a major role in enhancing coaches' learning opportunities at all levels of disability sport.

Conclusion

In terms of limitations for this study, it was quite difficult finding local coaches to participate in this study. Many programs are volunteer-run, and the lack of local level organizations made it hard to find contact information. Our sample may have included coaches associated with the more established programs, and therefore, the coaching context might be different, and likely more limited in terms of learning opportunities in more 'hard to reach' programs. Our sample was limited to five coaches due to the prolonged engagement for data collection. Thus we make no claim about this sample being representative of disability sport coaches across Canada. By chance, our participants were also divided between expert coaches who are able-bodied and novice coaches with a disability. It would be interesting to conduct future research that includes able-bodied coaches with little experience or experienced coaches with a disability to see if the trends we observed were consistent.

After spending time with and researching these coaches in the disability sport environment, we have a few suggestions for stakeholders and future researchers. Each coach had

a different pathway for learning how to coach in disability sport. Knowing that it is not a 'one-size fits all' approach, sport stakeholders should ensure that they provide coaches with multiple learning opportunities, as some learning situations will be more effective for some than for others. Suggestions for formal coach education include making courses exclusive to disability sport coaches (such that materials are specific and coaches can relate to other participants), or providing it in able-bodied sport training at all levels (Dorogi *et al.* 2008). The latter may be the more favourable option, since it would promote knowledge translation, make able-bodied sport coaches more aware of disability sport, and possibly help recruit new coaches. In addition, sport stakeholders need to work on funding so they can offer these learning situations (i.e., formal, nonformal, and informal) to allow coaches to benefit from them. Our findings would suggest making nonformal learning opportunities more prevalent, and mixing up the attendance: offering sport-specific clinics (e.g., only wheelchair rugby), combining able-bodied and disability sides of one sport (e.g., wheelchair and stand-up basketball), and putting on conferences for all disability sports. Given that our findings indicate that it is a relatively easy transition for able-bodied sport coaches to move to disability sport coaching, we advise coaches to start coaching an athlete with a disability. The gap in knowledge for coaching this athlete will create many new learning opportunities, allowing coaches to become more developed in all aspects of their practice (Cregan *et al.* 2007, O'Neill and Richardson 2008, Sawicki 2008).

Finally, the informal learning situations in this study have revealed an emphasis on interactions and reflection, which should be included in formal and nonformal situations by teaching coaches how to reflect and encouraging interactions with others (Trudel *et al.* in press). As such, governing structures (e.g., NCCP, disability sport, and national sport organizations)

play a major role in enhancing these opportunities for coaches at all levels by providing the right tools and opportunities for the coaches to develop.

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Table 1

Coach Demographics

Coach	M/F	Age	PWAD	Coaching Context		Years Coaching		Athletic Experience	Degree	Coach-Ed		Position
				Sport	Level	AB	AWAD			Level	DS	
C1	M	67	No	Water Skiing*	Rec. to Nat.	1	30+	Nat. Water Skier	Engineering	Level 1	Yes	Volunteer
C2	M	24	Yes	WC Basketball	Rec. to Dev.	0	3	Nat. WC Basketball	Leisure	Level 1	No	Volunteer
C3	F	49	No	Paraswimming	Rec. to Int.	30	20	Int. Swimmer	Psychology	Level 3	Yes	Part-time
C4	M	44	Yes	WC Rugby	Rec. to Nat.	0	2	Int. WC Track, Rugby	Business	Level 1	Yes	Volunteer
C5	F	39	No	WC Tennis	Nat. & Int.	22	12	Nat. Tennis	Phys-Ed	Level 4	Yes	Full-time

Note. A/PWAD = Athlete/Person with a Disability; WC = Wheelchair; AB = Able-Bodied Sport; DS = Disability Specific Component; Rec. = Recreational; Dev. = Developmental; Nat. = National; Int. = International; Water Skiing* = Adapted water skiing

Article 2

Coaches of Athletes with a Physical Disability: Learning through Interactions

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Abstract

The purpose of this study was to examine how coaches learn through interactions in disability sport. Research in able-bodied sport has identified learning through interactions as influential for coaches' knowledge development, identifying four types of interactions: informal knowledge networks (IKNs), dynamic social networks (DSNs), communities of practice (CoPs), and networks of practice (NoPs). Due to a lack of research on coaches in disability sport, it was important to understand if these interactions were occurring within that context, and if so, were they influential learning situations. Furthermore, research has acknowledged the importance of interacting with the athlete, and thus the role of athletes in coach learning (Cregan et al., 2007; Stephenson & Jowett, 2009) was also explored. Five coach-athlete dyads participated in this study; data were collected through four semi-structured interviews and three non-participant observation sessions per dyad. A thematic analysis revealed two types of interactions currently in existence (IKNs and DSNs), and two with future potential (CoPs and NoPs). IKNs and DSNs occurred both with other coaches and with athletes, particularly for the purpose of sharing information regarding the athlete's disability. With additional resources from sport organizations, there is potential for the development of CoPs and NoPs.

Coaching has been identified as a complex, dynamic, and ever-changing task (Cassidy & Rossi, 2006; Jones, Armour, & Potrac, 2004; Mallett, 2010). As a result, coaches have to constantly adapt and learn new strategies. Some researchers have argued that formal coach education has failed to fully recognize these complexities (Cushion, Armour, & Jones, 2003; Lyle, 2002). Different sources of learning have been identified in the sporting literature as influential for coaches' development (e.g., Wright, Trudel, & Culver, 2007). Interactions with others have been noted as a helpful strategy for coaches to prepare for the ever-changing environment of coaching (Cushion, 2004; Cushion et al., 2003; Nelson, Cushion, & Potrac, 2006). This literature review explores the use of interactions in coaches' development, mainly surrounding four different types of interactions to demonstrate how learning can occur in different sport contexts.

Research has revealed coaches utilize interactions with others as a source of learning (Gilbert & Trudel, 2001; Lemyre, Trudel, & Durand-Bush, 2007; Mallett, 2010; Werthner & Trudel, 2009). Other coaches have been revealed as a primary group for such interactions (Gilbert & Trudel, 2001; Lemyre et al., 2007; Stephenson & Jowett, 2009; Werthner & Trudel, 2009). Indeed, it has been noted that other coaches in a similar environment can be beneficial to talk to, can facilitate reflection, and are also helpful for problem-solving and broadening one's view (Anderson, Knowles, & Gilbourne, 2004; Gilbert & Trudel, 2001; Knowles, Gilbourne, Borrie, & Nevill, 2001). It is important to note however, that the competitive nature of sport often makes interactions with other coaches problematic (Barnson, 2010; Culver, Trudel, & Werthner, 2009; Culver & Trudel, 2006, 2008; Lemyre et al., 2007; Trudel & Gilbert, 2004; Wright et al., 2007). With coaches recently adopting a more athlete-centred approach to coaching, interactions with athletes has also been identified in the literature as a source of

learning (Carter & Bloom, 2009; Lemyre et al., 2007; Stephenson & Jowett, 2009; Werthner & Trudel, 2009). Communicating with athletes is helpful to better understand their thoughts and to overcome any gaps in knowledge, such as not having achieved the same level of athletic experience as the athletes being coached (Carter & Bloom, 2009). Finally, coaches have also been reported to interact with sport scientists (Werthner & Trudel, 2009), generally when seeking advice or specific knowledge.

In the disability sport literature, interactions are not as well-researched. However, there are a few studies that have recognized interacting with others as important (Cregan, Bloom, & Reid, 2007; O'Neill & Richardson, 2008; Williams & Taylor, 1994). In disability sport it may be more common for the coach and athlete to have a shared relationship, especially if the coach is able-bodied and relies on the athlete to convey information about his or her disability (Cregan et al., 2007; O'Neill & Richardson, 2008). It is also important for coaches to form relationships with their support staff, such as occupational therapists, to have a more comprehensive understanding of their athletes' disabilities (Cregan et al., 2007). Finally, other coaches have been shown to be useful references, as coaches together can discuss "information coming from other athletes, personal trial and error experiences, as well as experiences and knowledge offered at specific training camps or workshops" (Doll-Tepper, 1994, p. 59). Researchers have suggested that enhanced interactions amongst all key stakeholders can advance knowledge and ultimately aid in the development of disability sport (Doll-Tepper, 1994; Vanlandewijck, 2006). It is important to now address how learning within these interactions might occur.

Learning through Interactions

One way to look at interactions is as four different types: communities of practice (Wenger, 1998), informal knowledge networks (Allee, 2003), networks of practice (Nichani &

Hung, 2002), and dynamic social networks (Mallett, 2010). Learning theorists Lave and Wenger (1991) originally coined the term communities of practice, which Wenger (1998) later expanded upon in his social theory of learning. In this theory he places learning in the context of the lived experiences that one participates in daily; learning occurs as the result of social participation. When one participates or engages in activities with others, one participates in the practices of social communities and eventually constructs an identity in relation to those communities (Wenger, 1998).

A *community of practice* (CoP) is defined as “a group of people who share a common concern, set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis” (Wenger et al., 2002, p. 4). Group members act as resources: exchanging information, making sense of situations, and sharing new ideas. Learning in or from this community is not static, but ongoing, occurring throughout the process of being engaged and participating with others (Wenger, 1998). Such learning can be the reason the community is initially formed, or can be an incidental outcome for one member, realized years after disbanding (Wenger, 2006). Crucial to a CoP and the resulting learning are three characteristics: joint enterprise, mutual engagement, and shared repertoire. A joint enterprise is the group’s goal of pursuit that implies a commitment, distinguishing the members from other people (e.g., coaches promoting holistic athlete development). Mutual engagement entails members engaging in joint activities to commit to that enterprise, negotiating with one another (e.g., a team’s staff having regular coach meetings to discuss athlete development). Membership is what defines the community (Wenger, 1998). Through engagement and practicing with others, members develop a shared repertoire of resources, such as jargon, tools,

routines, and so forth (e.g., coaches sharing vocabulary related to athlete development). Building this repertoire takes time and sustained interaction (Wenger, 2006).

The community of practice concept has been taken up widely in various domains (Barton & Tusting, 2005). This includes the sport literature, where it is the most researched of the four types of interactions (e.g., Culver & Trudel, 2006; 2008; Galipeau & Trudel, 2006; Lemyre et al., 2007; Mallett, 2010). Findings from these studies indicate that communities of practice, or coaches' communities of practice (CCoPs), can be useful for coach learning, yet obstacles seem to prevail. It appears that coaches are hesitant to interact with others outside of their immediate club due to the competitive nature of sport, which constrains the sharing of knowledge that is part of a CoP's negotiation of practice (Culver et al., 2009; Culver & Trudel, 2006, 2008; Lemyre et al., 2007; Wright et al., 2007). For this reason, a trusted and respected individual is beneficial to lead or facilitate a CCoP (Culver et al., 2009; Culver & Trudel, 2006, 2008; Gilbert, Gallimore, & Trudel, 2009); and having a clubhouse or venue for the coaches to meet seems to be a necessity (Culver & Trudel, 2006). A healthy CoP helps increase knowledge within a group, gives voices to different members, decreases learning curves for novices, and provides a sense of community for members (Allee, 2003).

Informal knowledge networks (IKNs) are another powerful vehicle for creating and sharing knowledge with others. Similar to CoPs, most individuals are involved in at least one, and can be a part of several networks at any given time (Allee, 2003). The difference from CoPs, however, is that individuals more often discuss one-on-one and as opposed to in large groups. In fact, the boundaries of IKNs are less clear (Allee, 2003). The relationships in IKNs are more informal than CoPs, and the connections are always shifting and changing; "the primary purpose of informal networks is to collect and pass along information. There is no joint enterprise that

holds them together...they are just a set of relationships” (Allee, 2003, p. 115). In the sport literature, IKNs have been acknowledged by several researchers as a common type of interaction in sport due to their informal and flexible nature (Culver & Trudel, 2006, 2008; Sage, 1989). As Culver and Trudel (2006) explain, coaches often call up ex-coaches, colleagues, and/or sport specialists when looking for information to solve coaching issues.

In *networks of practice* (NoPs), “most members are unknown to one another...the members hardly meet face-to-face, yet they contribute and help each other out regularly. This type of community readily adapts to the Internet and other communication technologies” (Nichani & Hung, 2002, p. 50). One of the Internet’s greatest assets is that it is interactive, with potential to foster knowledge and learning; however, its broad reach also can lead to relatively little reciprocity across networks (Brown & Duguid, 1998; Duguid, 2005). Nonetheless, since the use of the Internet as a learning resource is on the rise (e.g., Wright et al., 2007), NoPs are becoming an increasingly viable way for coaches to interact and learn with others, such as through coach chat groups. The Internet also facilitates the ability to interact and access those who might be in the other types of networks (i.e., IKNs, CoPs, and DSNs) (Wenger, 2006).

Finally, in *dynamic social networks* (DSNs), Mallett (2010) has suggested that coaches learn from significant others. These individuals are often other experienced coaches or confidantes who the coach may confide in when asking for help on an issue. DSNs take time to evolve and unfold, and are dynamic as coaches seek appropriate others to assist in their problem-solving according to demands (Mallett, 2010). DSNs have been researched specifically in a high performance context, where coaches seek others as they develop their expertise. This context generally inhibits the development of other social networks (i.e., CoPs, IKNs, and NoPs), often due to lack of time and coaches’ competing interests (Mallett, 2010).

Each context may have specific characteristics that prohibit or enhance coaches' ability to interact with others. Recently, the context of disability sport has revealed the influence of athletes on coaches' learning (Cregan et al., 2007; O'Neill & Richardson, 2008). As such, we felt it was important to include the athletes in this study. In addition, "Understanding *who is being coached* as well as *who is coaching* could help lead to better coaching practices, better athlete-coach relationships, increased satisfaction and ultimately better athletic performance" (Galipeau & Trudel, 2006, p. 91). Athletes can also bring another perspective to the research (McArdle, Martin, Lennon, & Moore, 2010), and can identify implicit learning that the coach may not recognize (Jarvis, 2006).

Method

Participant Selection

This project was part of a larger project on coach learning in disability sport at the University of Ottawa, approved by the University of Ottawa's Research Ethics Board. Participants were selected using purposeful sampling (Patton, 2002), as well as maximal variation (Creswell, 2007), to help ensure some variety between gender, age, sport, disability, and more specific to coaches, their coaching background. Coaches were contacted first through local clubs, and then convenience snowball sampling was used to see if coaches knew of any others who may be interested in participating (Miles & Huberman, 1994). Other than having varied backgrounds, there were no further requirements necessary for the coaches to participate. Once we made contact with the coaches, further explained the study and obtained informed consent, we asked them to choose an athlete who they felt was appropriate for the study, was representative of their team or program, and with whom the coach had a working relationship.

In total, there were five coaches (two female and three male), and five of their athletes (two female and three male) who participated in this study, forming five coach-athlete dyads. Sports included adapted water skiing and paraswimming, as well as wheelchair basketball, rugby, and tennis. Two of the coaches had a disability; one of these two coaches had been an athlete and the other was still competing. These two coaches were also the least experienced coaches. The remaining three coaches started coaching in able-bodied sport and then switched to disability sport. These three coaches were experienced with between 12-30 years of coaching athletes in disability sport. All of the athletes, at a minimum, competed regionally, and each athlete had been with their coach for at least two years. Please see Tables 1 and 2 for further detail on these participants.

Data Collection

This study was divided into three different phases, with a total of 20 semi-structured interviews and 14 non-participant observation sessions over the course of these phases. Please see Table 3 for further breakdown of each phase and its purpose. Overall, the purpose throughout these phases was to understand if and how coaches learnt through interactions with others. Three non-participant observation sessions were conducted at each dyad's practices, approximately two hours in length, which allowed researchers to observe any interactions occurring, and to probe these interactions in the following interviews. Dyad 5 did not have a third observation due to scheduling conflicts.

In total, there were four interviews per dyad: two coach interviews, one athlete interview, and one joint interview (with the coach and athlete together). The interviews lasted an average of 61 minutes for the first coach interview, 21 minutes for the second coach interview, 18 minutes for the athlete interview, and 18 minutes for the joint interview. The participants chose whether

they wanted the interviews conducted face-to-face or over the phone in order to maximize convenience for each participant; 10 were conducted face-to-face and 10 were conducted over the phone.

Data Analysis

Data analysis was conducted using Braun and Clarke's (2006) stages of thematic analysis. To start, all interview audio recordings and field notes were transcribed verbatim, with a total of 199 single-spaced pages. During this transcription process, notes were created to identify potential themes, codes, and general ideas (Braun & Clarke, 2006). Transcripts were then sent to the corresponding members for checking (Lincoln & Guba, 1985), where they were encouraged to revise the transcripts and add in any new material; only minor clarifications were made. The transcripts were then explored using NVivo9 software (Qualitative Solutions and Researching, 2010, version 9). Deductive analysis was guided by the study's research questions, as well previous research on the four types of interactions that have been identified in sport (i.e., IKNs, DSNs, CoPs, and NoPs.). The coded data was divided by type of interaction, and further subdivided by the individual with whom the interaction occurred. Further themes were also revealed, such as on coach-athlete relationships and their communication. All themes were later re-read to ensure their relation to the coded data (Braun & Clarke, 2006).

Results

The results are presented in two parts: interactions that were already in existence (i.e., IKNs and DSNs) and interactions that have potential to be implemented in the future (i.e., CoPs and NoPs). This division is based on observations of the coaches' utilization of interactions, as well as information from each of the interviews. Thereafter, a brief section on reflection is included, to explore the coaches' use of reflection with others.

Analysis of the data showed interactions occurred with four types of individuals: coaches, athletes, specialists, and members of other programs; but most commonly with other coaches and athletes. Due to the uniqueness of having frequent interactions with athletes, these interactions will be focused on more heavily than those with other individuals. Throughout this results section we will touch upon the impact of the coaching contexts on coaches' interactions and learning. Coaches and athletes were assigned codes; see Tables 1 and 2 for further details.

Interactions Already in Existence

There were two types of interactions that were already in existence for these five coaches: informal knowledge networks and dynamic social networks. Each will be explored separately to help differentiate the interactions and the type of individual with whom they occurred (i.e., athletes, coaches, specialists, or program members).

Informal knowledge networks. Informal knowledge networks (IKNs) are informal and flexible interactions that commonly occur when coaches are looking for quick advice. In this study, IKNs were the most frequently reported interaction, occurring most often with athletes and coaches, but also with specialists and program members. All coaches interacted with their athletes and appeared to learn from them, some more so than others. Able-bodied participants recognized the importance of learning from their athletes, especially in terms of the athlete's disability:

I can usually look at a swimmer, identify what's going on, and come up with a solution. But it's not always me; it's talking to the swimmer and knowing what to ask them... You need to be able to adjust the technique to fit with how it works for them, especially in sport for the disabled. (C3)

Another coach added, “The way I entered this was ‘I’m going to learn from [the athletes], I’m not there to impose, or say this is how you do things’” (C5). The coaches with a disability also interacted with their athletes, and instead, tended to depend on IKNs a bit more: “I rely on the feedback from the athletes a lot. I ask them all the time what they need from me and what they think I can change” (C4). The other coach with a disability added:

If [the athletes] have suggestions I’m always willing to change things up if it makes more sense on their end. [One of my athletes] would give me some tips here and there when I first started...so it’s nice to have people who can help me when I’m still learning. (C2)

Athletes were a common reference, obviously being experts on their own disability.

In terms of interactions with other coaches, one athlete remarked how his coach learnt from others at a competition:

When we went to Worlds she spoke with a bunch of coaches to figure out how she could make our practices better. She would talk to them and figure out what they were doing, key sets that they did, so that she could get better. (A3)

That athlete’s coach added: “I find disability sport coaches are very open to sharing; they take the time” (C3). Furthermore, when asked what she felt a coach new to disability sport needed, she replied: “Contact names and numbers of other people in the area that are working with athletes with disabilities; right off the bat”. This openness showed that disability sport coaches were willing to share information, and to learn from one another. The wheelchair tennis coach also supported this, “Because [Tennis Canada is] so inclusive, everyone talks with each other. Anytime there’s a wheelchair athlete on the court, they’re asking me questions and I’m talking about my athlete, so that community is really good” (C5). It was also noted however, that disability sport coaches make up a small community, which limits the opportunities for such

interactions. As a result, these five coaches often turned to other coaches (i.e., those not in disability sport), such as able-bodied sport coaches:

I learn a lot from them also, because they've come from the able-bodied stream. So I'm looking at them to see how to coach an athlete, and we're learning together on how to work with an athlete with a disability. (C3)

This same coach later added, however, that it can sometimes be difficult interacting with able-bodied sport coaches, as some of them “do not relate at all” (C3). In terms of interacting with other coaches, one participant was able to recall learning from a coach with another unique background: “Other people bring some interesting things to the table. Like one of our coaches, he was introduced to the game in 2002 as a spectator...and he brings some really interesting things to the sport”. Finally, acting as a player-coach allowed the wheelchair basketball coach to have some advantages when it came to his network:

Because I play, I have friends all over the country that I email all the time. It helps having other veteran players that I can talk to when it comes to coaching...There are a few guys in particular who are good to go to. (C2)

All coaches were confident they could call up these other coaches when they had an issue or something to discuss about their coaching practices.

Engaging in IKNs that included program members and specialists were often correlated; the opportunity to interact with a specialist usually arose because it was supported and offered by one's organization. Coaches reported examples of exposure and connections with specialists, with their sport organizations offering experts in nutrition, physiology, and physiotherapists. Coaches acknowledged that each disability is unique, and as a result, most coaches (able-bodied

or not) interacted with specialists for more advice and information. The location of the wheelchair tennis coach's office created opportunities for such exchanges:

Here is great. There are many international coaches and we have a great chemistry with everybody. Sometimes I'll go to the physical trainer and say, "I'm trying something with [A5], what do you think?", or "what did you do with [your athlete] in this instance?" (C5)

This coach worked at a high performance training centre (for both able-bodied and disability sports) where she could interact with many different individuals. As observed, all staff members appeared to be open with one another, discussing their athletes, unafraid to ask questions.

Dynamic social networks. Dynamic social networks (DSNs) are similar to IKNs; however, they occur with a limited amount of individuals with whom the coach has established, over time, a trusting relationship. This type of interaction was evident for all the coaches, specifically with other coaches and athletes. 'Other coaches' most often included individuals from the coaches' lives as an athlete, such as previous coaches. Former coaches were utilized by three coaches (C2, C4, and C5). One coach explained why she went to these individuals: "Three coaches were really mentors as I was growing up as an athlete, and are mentors now as a coach. Now that I'm on the other side I'm able to see what they did well and what they gave me" (C5). When the wheelchair basketball coach started his position, he also worked closely with his former coach: "I go to him with stuff if I'm curious or if I need something, just because he passed it down to us. Especially in the first year, he helped me figure out new drills" (C2). After this first year, he said that his interactions with this former coach occurred less often; as observed, their interactions were infrequent and mainly surrounded topics of program management, such as athlete attendance. This decrease in their frequency of interactions also shows the dynamic evolution of coaches' social networks. In addition to former coaches, four of

the coaches reported frequent interactions with individuals at the head of their sport organization (i.e., often at the national level): “if I have questions I go directly to them” (C3). Alternatively, as the coach and coordinator for his adapted water skiing program, the remaining coach stayed in close connection with another coach and program coordinator from the same program nearby. This allowed them to discuss many administrative tasks; however, it also opened the door to discuss “how to handle certain situations and challenges” when it came to coaching (C1).

All coaches had a strong working relationship with their athletes, especially the wheelchair basketball, rugby, and tennis coaches (C2, C4, and C5). After looking at their reported interactions, it became apparent that these coaches had interactions with their athletes that went beyond IKNs, revealing a confiding, knowledge-creating relationship that was more characteristic of a DSN. As a newer coach explained:

When it comes to coaching, there are a few good friends on the team who I go to who have better problem-solving skills...[A2 is] very level-headed and she problem-solves extremely well. She’s my go-to person if there’s a problem; I just ask her what she thinks.
(C2)

His athlete, (A2), later substantiated that she was able to be open about her opinions: “Last year we had a discussion and one of the things I had to say was ‘you don’t have to be the nice guy. There are times when you have to kick our butts’”. She further added that her coach was experiencing “a learning curve, because it’s one thing to be an athlete and another to be a coach. He is also very young” (A2). As observed, this coach was quite amicable with his athletes, and his approach to practices involved a very cooperative style of coaching. This was similar to the other novice coach, who explained that he also frequently looked to his athletes for advice, especially (A4): “He’s had a lot of coaches and played hockey so he’s good at reading plays. He

is really good to bounce things off of...I've got a playbook that I was just asking if he thought it would be worth trying" (C4). When discussing their relationship a bit further, he added: "In the coach-athlete relationship you coach each other and share information...That's what you do, you learn from each other a lot" (C4). His athlete further contextualized their relationship:

We were teammates before he was coaching, and when I started playing he was helping me out a lot, because we were training together. We go handcycling, so if we want to talk about rugby we can talk almost every day...We're friends too, so it's really easy for me to talk to him. If there's something on my mind I'll let him know and I think most of the time he listens to me [laughs], so it's good. (A4)

The wheelchair tennis coach included her athlete in her DSN, and had done so with previous athletes, who had introduced her to the sport and the level. Crucial to this however was the value she placed on proper communication with her athlete: "I think coaches that do not have good communication skills will not be able to coach wheelchair athletes. You need to have those qualities and understand that those qualities will make the success of the athlete" (C5). She needed this interaction especially when it came to understanding the athlete's disability:

It's really more about the communication, it's not one-way, it's two-ways, because I'm not in the chair, I don't have the disability, so I need to ask a lot of questions. That's where it's really a team progression, because he cannot do this on his own, and I cannot do it without him. (C5)

Her athlete further discussed the coach's ability to communicate and how it benefited their coach-athlete relationship:

She knows about human beings in everyday wheelchairs. She knows what to say and what not to say...We both respect each other and our opinions and I think that's why

we're both not afraid to say what we think, whether it's good or bad; I think that's what makes us great. (A5)

Data from the joint interviews in particular revealed that each coach-athlete dyad had strong communication skills and found this to be a strength of their relationship: "When you get to know somebody, you're able to actually have a conversation and understand them better" (A1). Select dyads (2, 4, and 5) used this strong communication as a way to exchange knowledge, with effective two-way communication between the coach and athlete. Although the remaining two coaches had a close relationship with their athletes (i.e., C1 and C3), their interactions were more one-way (from the coach), and not characteristic of a DSN. These athletes (A1 and A3), who were young adolescents, were not individuals that the coach appeared to trust in the sense of obtaining information.

Potential Interactions for the Future

This section includes the final two types of interactions: communities of practice and networks of practice. These two seemed to be desired forms of interaction, but were under-developed and hence reported here as "potential interactions".

Communities of practice. Communities of practice (CoPs) are groups of individuals who meet on a regular basis to discuss a shared goal or interest, and learn through their ongoing interactions. Although coaches engaged in meetings with others, (usually with the goal of improving their athletes' performance), most meetings were not ongoing and did not have the creation of knowledge as the main focus. Two possible exceptions surfaced in the interview data, but were not verified through observation. These two learning situations, where coaches were able to create or participate in something similar to a CoP with other coaches and athletes, will

be presented first and will be followed by more general comments related to the coaches' learning in CoPs.

For the two team sport coaches, the structure of their sport organizations seemed to provide the potential for CoPs to exist within and between them. Coaches from team sports had a lot of collegiality within their coaching staff, from local to national levels:

Part of Wheelchair Basketball Canada's philosophy is that it's not a team, it's a program, and there are probably six or seven program coaches...so I've had many coaches to learn from, with many different styles and philosophies of how to coach and different ways to approach athletes...You get good ideas from all of them; it's not one person but a collective group of people that I've seen and deal with on a weekly basis. (C2)

With such a structure, these coaches had the opportunity to be influenced by numerous coaches within their programs, on a regular basis.

Also for the novice team sport coaches (C2 and C4), a potential community of practice involved their athletes. They were very open to hearing their athletes' opinions:

I encourage the guys to say what's on their mind, and if I need something I'll ask; I really encourage a lot of talk. If you include someone in the decision, that alone makes the guy feel like he's part of the team – everyone has their own opinion. (C4)

As recent or current players, these coaches had their athletes' respect and a close relationship with them.

Finally, the adapted water skiing program introduced an interesting CoP possibility, which they termed an *Après-Ski*. At the end of their day of skiing, the instructors, volunteers, athletes, and sometimes parents would gather at a local restaurant to catch up on the day's events. As he described, this helped everyone discuss issues and reflect on them: "We can help

each other just by describing our challenges and asking as many questions as we can to walk each other through it until we find the answer we need". This facilitated the learning (and self-awareness) for both the coaches and their athletes.

All the coaches (apart from C5), when asked if they would be interested in monthly coaching meetings, appeared open to trying them if the opportunity arose: "I think there is a need for coaches to have time to sit around and chat. I think [others] would definitely be on board" (C4). Another coach was also eager; however, there were only two other coaches in the area (C2). They all already worked together twice a week, but like most of the other sports they had neither a clubhouse nor a venue that could facilitate such meetings. To help build a potential community of coaches, he suggested, based on his experience with one able-bodied sport coach, that able-bodied sport coaches would be an interesting addition to such groups:

He's been a coach for so long and I get so much good stuff from him, because he's such a good coach with so much experience. So I think that would be a really neat, because all the knowledge is so transferable to wheelchair basketball...It would be really nice to just get together with basketball coaches and see what ideas they have. (C2)

The wheelchair tennis coach (C5) was the sole participant who did not show an interest in the meetings, mentioning time as a barrier. Other coaches also mentioned time as an obstacle, so they desired to meet less frequently: "I think getting together once or twice a year with really intensive goals in mind is when I'm most excited about going to something" (C3). All the coaches had many responsibilities such as running their programs or being the sole coach (i.e., no assistants). This undoubtedly affected the amount of time they had, limiting their time to interact on a regular basis with others.

Networks of practice. Networks of practice (NoPs) are interactions that occur between individuals who often do not know each other, commonly adapting to online technologies. The coaches in this study noted a lack of opportunities on the Internet for disability sports, such as lack of websites and coach chat groups. As such, NoPs were not very frequent in this study as those types of opportunities were not readily available. Coaches added that they also preferred to “go directly to the source” (C4), phone others, or talk face-to-face; therefore, networks with unknown people and often slow response rates were not as appealing. One coach discussed setting up a national website between adapted water skiing programs (with his connection from the nearby program) (C1). The idea behind it was to help link the programs and provide up-to-date information; it would also create a venue for coaches to chat amongst each other, discussing issues or new ideas.

Results show that the five coaches are currently utilizing informal knowledge networks and dynamic social networks in their coaching practices. At this point in time, communities of practice and networks of practice appear not to be thoroughly developed, but initial foundations appeared in the results, indicating potential for these interactions in the future. Overall, interactions occurred with athletes, other coaches, specialists, and other program members. The frequency of interactions with athletes appeared rather unique for a sport environment, with coaches consistently showing the value they placed on these interactions: “If you don’t learn something every day from one of your athletes, you’re missing out” (C3). Furthermore, data from these coaches suggests that organizations have a role to play in facilitating coaches’ interactions; organizations govern coaches’ access to websites, clinics, and even formal training where coaches are able to build their contacts, interact with others, and ideally increase their knowledge. As one athlete advised:

I think new coaches have to realize that learning to coach is more than just taking a weekend course. It really means working in sort of an apprenticeship-type situation, where you're working with a coach who has the experience and the knowledge, and working with players and gaining experience before stepping out on your own. (A2)

Reflection

To conclude this results section, it is also important to mention the use of reflection for these coaches. All five coaches said that reflection, individually or with others, was important for their learning, and was used often to solve problems. For example, the wheelchair basketball coach said: "To solve a problem I think about what my coach would have done if he were in the same situation to figure out what I could do" (C2).

Of greater pertinence to this article however, is the use of reflection that resulted from interactions with others (e.g., spouses, fellow coaches, and athletes) to correct a situation or brainstorm new ideas: "When the national coach left on Thursday, he left me with so many new ideas and things I could try, and you spend the weekend sort of mulling it all over, and come Monday you're ready to put it together" (C3). As previously mentioned, one coach created the "Après Ski" session, which for some became a valuable learning experience and stimulated further thought: "Quite often when describing [something] to others you see it in a different light and realize what you could have done differently, or somebody else will point it out" (C1). Engaging in reflection allowed these coaches to further develop their coaching practices. One coach felt that coaches should reflect regularly:

I want [all coaches] to be open to taking on an athlete who has a greater disability, and they will find when they work with that athlete that their skills as a coach will improve.

Not just emotional and communication skills, but also their technical skills will improve, because they'll need to stop and think about what they're teaching. (C3)

In relation to the four types of interactions, the data about the use of reflection points to the interactions that are characteristic of an IKN or a DSN. It should be noted that through interviews, informal conversations, and observations, it became apparent that reflection was practiced more often by the most experienced coaches, C1 and C3.

Discussion

The purpose of this study was to explore how disability sport coaches learn to coach through engaging in interactions with others. Previous coach development literature has identified learning with others as beneficial for coaches' learning (Lemyre et al., 2007; Mallett, 2010; Nelson et al., 2006; Wright et al., 2007). Researchers have examined four types of these interactions (Culver & Trudel, 2006, 2008; Mallett, 2010), including: informal knowledge networks (Allee, 2003), dynamic social networks (Mallett, 2010), communities of practice (Wenger, 1998), and networks of practice (Nichani & Hung, 2002). With the existing literature and the four types of interactions in mind, we completed a deductive analysis that revealed themes surrounding each type of interaction. Results showed that all types of interactions were present at varying degrees, and that they occurred with many different stakeholders as governed by their sport context. As such, results were grouped into two sections: types of interactions that already existed and those with potential for development. The analysis also revealed the contribution to coach learning of reflection with others, in the different types of interactions.

In line with the existing able-bodied sport literature, informal knowledge networks (IKNs) were the most frequent type of interaction as observed or as reported by these coaches. To start, these interactions occurred with other coaches (Culver & Trudel, 2006, 2008; Mallett,

2010); however, our coaches did not face the competitive barriers reported in able-bodied sport research (Barnson, 2010; Culver, Trudel, & Werthner, 2009; Culver & Trudel, 2006, 2008; Lemyre et al., 2007; Trudel & Gilbert, 2004; Wright et al., 2007). Participants found disability sport coaches were more open and willing to share information. Coaches also interacted with program members and specialists. It should be noted however, that if the organization did not provide access to these individuals, then it was difficult for coaches to find them, despite the fact that specialists are important for disability-specific knowledge (Cregan et al., 2007). One coach's work environment showed enhanced connections with others (C5), suggesting that facility structures could improve coaches' abilities to interact with others.

One difference to previous able-bodied sport literature was the prevalence of IKNs with one's athlete(s). Our able-bodied participants commonly discussed topics with their athlete surrounding the athlete's disability; whereas our coaches with a disability relied more frequently on their athletes' more general advice. This is likely due to our coaches with a disability being newer coaches, and with assistant coaches being a rarity. Nonetheless, turning to athletes as a commonly used source of knowledge for all coaches appears not to have been documented in the existing able-bodied sport literature. However, previous disability sport research has acknowledged that coaches who are transferring to disability sport from able-bodied sport rely on their athletes to help inform them of the specifics of disability coaching (Cregan et al., 2007; Doll-Tepper, 1994; O'Neill & Richardson, 2008).

Coaches engaged in dynamic social networks (DSNs) with other coaches and athletes. These other coaches were often former coaches (i.e., from the coaches' athletic pasts), or those close to the organization. The regular contacts that the coaches reported shows the evolution of these social networks (i.e., as coaches' needs changed, so did their regular contacts). Coaches

sought individuals they trusted and respected, and yet who also had the necessary ‘just in time’ information (Mallett, 2010). As such, former coaches were a viable option given that our coach participants had already formed a coach-athlete relationship with these former coaches in the past, and that they could build upon that foundation of trust. Similar to reported IKN interactions, athletes were also uniquely included in the coaches’ DSNs; particularly in this study with the wheelchair basketball, rugby, and tennis coaches who demonstrated effective two-way communication with their athletes. This could be due to the fact that two of these dyads included novice coaches (C2 and C4), and in the third dyad the athlete surpassed the coach’s own athletic level (C5) (Carter & Bloom, 2009). Communication was also frequent between the remaining two dyads, Dyads 1 and 3; however, it was more one-way, possibly due to the younger age of the athletes. Nonetheless, we uncovered the use of DSNs in disability sport at all competitive levels, whereas it has previously been observed only in the high performance able-bodied sport context (Mallett, 2010).

At this point, DSNs are relatively unexplored in the literature; however, we feel that our results reveal DSNs as having aspects of both CoPs and IKNs. On one hand, IKNs involve information exchange between individuals seeking advice or answers to a particular question; this generally occurs one-on-one. On the other hand, CoPs entail knowledge creation amongst a group of individuals with a common practice. With DSNs involving the building of trust over time with select individuals, Mallett (2010) reported that the communication itself is often one-on-one. In DSNs our coaches appeared to be engaging in in-depth interactions going beyond information exchange, and actually creating knowledge related to a wide range of coaching topics. Thus, like IKNs, our coaches’ DSNs were generally a one-on-one interaction, and yet similar to CoPs, they involved knowledge *creation* as opposed to simply information *exchange*.

Communities of practice (CoPs) and networks of practice (NoPs) were the two types of interactions with potential for future development. At this point in time, communities of practice seem a less feasible type of interaction in disability sport. Although coaches were interested in attending coach meetings, communities of practice entail a deeper commitment than mere attendance at meetings, especially with their ongoing nature and the goal of knowledge creation. The coach who did not seem to desire these meetings mentioned time as a constraint (C5). Observations revealed however, that she had the best access of all five participants to other coaches in her immediate work surrounding, making CoPs less necessary.

With the lack of online opportunities specific to disability sport, coaches had little to no access to NoPs. Coaches did mention the Internet as useful for emailing back-and-forth; however, that type of interaction was more characteristic of an IKN. In addition, our study's coaches often preferred to interact face-to-face, similar to able-bodied sport coaches (Wright et al., 2007). Thus, it is difficult to decipher if coaches simply did not value NoPs as a learning tool, or if it was more due to the lack of availability. Although NoPs have not been recognized as one of the more influential interactions in existing able-bodied sport literature (Culver & Trudel, 2006; Mallett, 2010), we feel it is important to at least make these opportunities available to disability sport coaches, in order to see if NoPs *could* be a viable learning opportunity.

Although interactions occurred with other coaches, program members, and specialists, the frequency of interactions with athletes appears most interesting and unique. It is possible that with the older average age of athletes in disability sport, coaches could form more collaborative relationships with them and trust their athlete's advice more commonly than coaches in able-bodied sport who might be developing younger, less experienced athletes. In able-bodied sport

literature, these interactions with athletes are not as common, often due to the differences of power (i.e., it is the coach controls who plays). As Galipeau and Trudel (2006) explain:

Two types of power in particular help in understanding the dynamics of the coach-athlete(s) relationship – expert power: power in a relationship based on the expertise as related to knowledge or skill possessed by the coach, and legitimate or positional power: empowers coaches based solely on their position within the social structure. (p. 80)

Since athletes in disability sport are the experts concerning their disability, they likely hold more expert power than able-bodied athletes at a comparable developmental level, which could help explain the heightened frequency of interactions. In addition, the more novice coaches in this study often held more collegial roles as coaches, demonstrating a decrease in their expert power as well, which could also explain why they interacted more often with their athletes.

Nonetheless, further research on coach-athlete dynamics in disability sport is necessary to fully understand these relationships and how coaches' learning benefits from them.

Finally, it is important to revisit the concept of reflection. In Gilbert and Trudel's (2001) study of how model youth sport coaches resolved coaching challenges, advice seeking and joint construction were reflective strategies used with others. These two strategies were used often in our study, with coaches commonly debriefing before or after a game, or getting a different perspective on a particular issue (Anderson et al., 2004; Gilbert & Trudel, 2001; Knowles et al., 2001). The participants in this study who appeared to be the most reflective were also both able-bodied and the most experienced. It is possible they used these strategies to overcome their lack of primary experience as athletes with a disability. It is also possible that their level of expertise afforded them the ability to reflect more often (Jarvis, 2006, 2009), alone and with others. However, as Gilbert and Trudel (2001) concluded, this ability to reflect with others depends on

the coach's context and their access to peers. Research has also advised that restricting one's interactions to those within one's immediate grasp may limit one's coaching knowledge (Lemyre et al., 2007; Trudel & Gilbert, 2004). Due to the limited number of coaches in each sport, this is a possible threat for disability sport coaches. However, the lack of assistant coaches found in our study encourages coaches to obtain other perspectives, such as from their athletes, or those who frequently attend games and/or practices. Furthermore, with the demonstrated openness of disability sport coaches, we feel this may not be a threat to coach learning in disability sport at this point in time, so long as coaches are willing to contact individuals who they do not see on a regular basis.

Interactions and networks “are not self-contained entities; they develop in larger contexts – historical, social, cultural, institutional – with specific resources and constraints” (Wenger, 1998, p. 79). As such, researchers have advised the importance of understanding the social context of sport when identifying interactions (Cushion et al., 2003; Werthner & Trudel, 2009). The context of disability sport includes a few obstacles for the development of networks and interactions, not the least of which is the relatively few coaches to interact with and the wide geographic distance between them (Williams & Taylor, 1994). With the advancement of technology it is possible that coach interactions could be facilitated by the use of different online technologies, such as Skype; making frequent interactions possible. Due to the low number of disability sport coaches, able-bodied coaches were suggested as a way to increase the numbers for group meetings; a strategy which would also increase knowledge transfer and expose able-bodied sport coaches to the realm of disability sport (Sawicki, 2008). Finally, as Culver and Trudel (2006) identified, the lack of a clubhouse negatively affected the development of CoPs. In this study we observed that there were very few venues at training sites where coaches could

meet. Thus, not only is it important to understand these learning networks and their resulting impacts, but it is equally as important to understand the context of disability sport, and factors that may influence coaches' abilities to interact.

Conclusion

We did not attempt to cultivate any of these interactions in disability sport (e.g., Culver & Trudel, 2006); however, due to the prevalence of coaches learning through interactions, and the openness of coaches in disability sport, we believe them to be a logical and fruitful possibility for disability coach learning. Gilbert and colleagues (2009) suggested, "There is indeed potential and willingness for youth sport coaches to adopt coach learning communities as an effective way to nurture ongoing professional development" (p. 9). The current study indicates the same is true within the disability sport community. Engaging in these types of interactions could be an effective way for coaches to increase their networks, recruit able-bodied sport coaches, and facilitate entry for newcomers into disability sport (i.e., legitimate peripheral participation – Lave & Wenger, 1991). As Allee (2003) noted, "knowledge networks already exist in most organizations", so it is not surprising that they were common and have been found in past coaching literature (Culver & Trudel, 2006, 2008; Mallett, 2010). Allee further added, however, "the first step is not to create them but to simply find them and then make them visible to themselves, to others and the rest of the organization" (2003, p. 116). It is our hope that after identifying these types of networks, they will continue to be researched and made more visible for the benefit of all disability sport stakeholders.

Although we did not find the competitive barriers to interacting with others that have been identified in able-bodied sport research, it is possible that as disability sport progresses and becomes more competitive, this may become an issue. Disability sport and its sport organizations

have a unique, but potentially time-sensitive opportunity to build interactions among key stakeholders in each sport. Governing structures must ensure that they nurture coach learning communities, such as creating online CoPs or facilitating monthly CoPs in different regions, while striving to maintain members' engagement. Furthermore, these structures need to give coaches access to the various necessary resources (e.g., Internet chat groups, conferences, educational opportunities, and clinics) in order for coaches to build their networks and learn from one another.

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Table 1

Coach Demographics

Coach	M/F	Age	PWAD	Coaching Context		Years Coaching		Athletic Experience	Assistant	Position
				Sport	Level	AB	AWAD			
C1	M	67	No	Water Skiing*	Rec. to Nat.	1	30+	Nat. Water Skier	No	Volunteer
C2	M	24	Yes	WC Basketball	Rec. to Dev.	0	3	Nat. WC Basketball	Yes	Volunteer
C3	F	49	No	Paraswimming	Rec. to Int.	30	20	Int. Swimmer	No	Part-time
C4	M	44	Yes	WC Rugby	Rec. to Nat.	0	2	Int. WC Track, Rugby	No	Volunteer
C5	F	39	No	WC Tennis	Nat. & Int.	22	12	Nat. Tennis	No	Full-time

Note. A/PWAD = Athlete/Person with a Disability; WC = Wheelchair; AB = Able-Bodied Sport; Rec. = Recreational; Dev. = Developmental; Nat. = National; Int. = International; Water Skiing* = Adapted water skiing

Table 2

Athlete Demographics

Athlete	M/F	Age	Disability	Sport	Level of Competition	Years Experience		Years w\ Coach
						AB	AWAD	
A1	F	14	Transverse Myelitis	Water Skiing*	Reg.	10	3	3
A2	F	32	Paraplegia	WC Basketball	Reg. & Prov.	0	2	2
A3	M	17	Cerebral Palsy	Paraswimming	Int.	0	7	7
A4	M	26	Quadriplegia	WC Rugby	Reg., Prov., & Nat.	12	6	2
A5	M	30	Paraplegia - Lupus	WC Tennis	Nat.	20	2	2

Note. WC = Wheelchair; AWAD = Athlete with a Disability; AB = Able-Bodied Sport; Reg. = Regional; Prov. = Provincial; Nat. = National; Int. = International; Water Skiing* = Adapted water skiing

Table 3

Data Collection Phases and Purposes

Phase and Data Collection	Purpose
Phase One	
Non-participant Observation 1	Meet coach; familiarize with sport context
Coach Interview 1	Understand coach's biography and their various learning experiences
Phase Two	
Non-participant Observation 2	Meet athlete; observe for on-site learning; further familiarize with sport context
Coach Interview 2	Follow-up; probe learning experiences and briefly discuss athlete's biography
Athlete Interview	Understand athlete's experiences with coach and his/her role in coach's learning
Phase Three	
Non-participant Observation 3	Coach-athlete relationship and learning through interactions
Joint Interview	Coach-athlete relationship and learning through interactions

General Discussion and Conclusion

The overall purpose of this study, which resulted in two articles, was to reveal how coaches learn to coach in the context of disability sport. Our first article was an exploratory effort to understand more about these coaches and how they learn within each of their respective sport contexts. Our research revealed that coaches learnt predominantly from interacting with others. This became the focus of a second analysis and, as a result, a second article.

A stimulus for beginning this project came from the identified lack of research on disability sport coaches (Cregan et al., 2007; DePauw, 1986; DePauw & Gavron, 1991, 2005). As previously mentioned, the Canadian Sport Policy (Canadian Heritage, 2006) calls for barriers to participation in sport to be identified and eliminated, making sport more accessible to all. People with a disability are considered an under-represented community in the Canadian sport system and the lack of coaches for this population is an important barrier. Since our lab at the University of Ottawa focuses on coach education and learning primarily in able-bodied sport, we questioned in what ways the situation is similar or different in the disability sport context. Thus, a larger project on disability sport coaches' learning began at the University of Ottawa and soon after, this study was underway to better understand the learning processes of five select disability sport coaches.

The methods of data collection were similar for both articles, but the focus differed. Overall, data were collected through 20 semi-structured interviews with five coaches and five athletes. More specifically, data collection included two interviews with each coach, one with each athlete, and one joint interview with each coach-athlete dyad. In addition, there were 14 non-participant observations sessions conducted at the dyads' practices, approximately three per dyad. These observation sessions allowed us to become familiar with different disability sport

contexts, while observing coaches' styles, relationships with their athletes, and any on-site learning that we could further probe. For the first article, the emphasis was on the coach and his or her background and as such, results were obtained solely from analysis of the two coach interviews. After the prominence of learning with others was revealed, the second analysis zoned in on this further using results from all 20 interviews. This analysis allowed us to highlight the coaches' learning through interactions from their perspectives, as well as those of their athletes. Athletes were able to share with us the experiences they had with their coaches and any coach learning they perceived to have occurred through their coach-athlete interactions.

In order to have a broader understanding of these coaches' biographies (as much as was possible), we sought coaches who had varied backgrounds through purposeful sampling (Patton, 2002), maximal variation (Creswell, 2007), and snowball sampling (Miles & Huberman, 1994). We began by seeking coaches from different sports. Thereafter we tried to obtain an equal number of coaches who had a disability and who were able-bodied, in order to see how their experiences varied. Other factors we tried to account for were differences in gender, age, and level of coaching experience. Due to the limited amount of coaches in disability sport, and specifically in our local area, finding coaches who were able to participate (regardless of their backgrounds) was a difficult task. As a result, these five coaches were our best attempt to vary the group of participants among those who responded. We recognize that results may have fluctuated with different participants.

In addition to seeking a diverse sample we tried to obtain rich data and a thick description from our participants in different ways. To start, when obtaining informed consent, we ensured participants' confidentiality by providing each individual with a code (e.g., C1 or A3), to help them feel more comfortable and open with their responses. Similarly, they were each given a

copy of their respective transcripts to review and revise if they so desired (Lincoln & Guba, 1985). In the data collection itself, we utilized multiple methods of triangulation (i.e., different types of participants, multiple methods, and three phases of data collection), requiring us to be engaged for long periods of time with these coaches and athletes, allowing us to become familiar with their context, and making them more at ease during the interview process. The time between the interviews and observations also gave our participants the opportunity to reflect on the interviews, possibly enhancing the quality of their responses (Polkinghorne, 2005). Finally, throughout data collection and analysis, we had opportunities to debrief with peers in our research group, some of whom were familiar with the disability sport context and others who were familiar with the theoretical frameworks. With their insight, we were able to cross-examine our approach and strengthen our findings.

Before addressing the results of our study, we feel it is important to include how our sample may have affected our results. Our sample was interesting in the sense that the coaches who had a disability were also the only team sport coaches, and were the newest to coaching. The remaining three coaches were able-bodied, coached individual sports, and were more experienced coaches. Although we sought coaches with diverse backgrounds to help minimize our limitations, this clear division between these two groups of participants challenged our results in a few ways. Two main examples included: do coaches with a disability interact more with others because they were from team sports and were accustomed to working with others, or because they were newer coaches and sought more help? Secondly, do the able-bodied coaches utilize reflection more because they need to be innovative with their athletes (not having the primary experience of having a disability), or because they were experts, which Jarvis (2009) has shown is linked to creativity? Because of our divided sample, it is difficult to suggest if this use

of creativity and reflection was due to their years of experience, or if it was due to the wide range of experience in our participants. Nonetheless, our results have indicated that disability sport coaches are innovative in their coaching practice, and as such, it is something we feel should be researched further. In addition, future research should recruit coaches with a disability who have many years of experience and able-bodied coaches with few years of experience, to see if these different biographies are consistent with the learning of those in the current research.

To address the results of this study, we would like to start by reviewing the major findings and delve a bit deeper by incorporating the lenses of our theoretical frameworks. Thereafter we will conclude with suggestions for future research.

Responding to a suggestion by DePauw and Gavron (1991, 2005), our initial results revealed details about these coaches (i.e., demographics and their backgrounds), showcasing the different biographies of current disability sport coaches. Because we searched for varied backgrounds, we were able to learn about different sports and coaches' different biographies. We discovered they were open to interacting with others, and that they were passionate about their coaching careers. With this background information, we explored how they entered disability sport, revealing that two had athletic experience in disability sport, and the remaining three started coaching in able-bodied sport and switched over to disability sport. Two of those three enjoyed the particular challenges that coaching disability sport presented. All the coaches had extensive athletic experience, although the coaches did not unanimously feel it was a necessity, a finding that is similar to results of studies conducted in able-bodied sport settings (Carter & Bloom, 2009; Werthner & Trudel, 2009). In addition, all coaches had at least initiated a post-secondary education, and felt that the information they obtained from those careers or degrees

was beneficial, yet again not mandatory (Carter & Bloom, 2009; Werthner & Trudel, 2009).

With all of this, we were able to construct the pathways of five disability sport coaches.

At this point we were able to reveal similarities and differences between coach learning for coaches who had a disability, and those who did not; that is, we could compare primary and secondary experiences for coaches (Jarvis, 2006, 2009). We found that coaches who had a disability knew more about their athletes and their lifestyles, but still did not feel it was necessary to have a disability in order to effectively coach these athletes. To compensate for not having a disability, able-bodied coaches used information from their background experiences as athletes and/or their careers. More uniquely, they communicated more often with their athletes in order to get their perspective on how different movements or equipment felt, and any modifications that needed to be made. This finding was similar to Carter and Bloom's (2009) study, where coaches with less athletic experience needed effective communication skills, passion, and open-mindedness to make up for their lack of intuition and technical capabilities. Of course, these characteristics would certainly benefit any disability sport coach. Therefore, we concluded that although having a disability is helpful for coaches, it is not essential as able-bodied coaches can overcome the gap through effective communication with their athletes, and through reflective and adaptive coaching.

The concepts of primary and secondary experiences (Jarvis, 2006, 2009) become a focal point for this study when trying to contrast learning processes for coaches with and without a disability. When comparing each of the five coaches, it became apparent that the two most experienced coaches learnt less through secondary experiences, at least in this latest stage of their careers. This is something that Moon (1999, 2004) addresses in her approaches to learning: deep, strategic, and surface. Using a deep approach to learning, the learner can be at the stage of

working with meaning, and ultimately the transforming meaning stage (Moon, 1999). At these stages, the learner is not necessarily in contact with any new learning material, but their reflection results in further accommodation of the cognitive structure or biography (Moon, 1999). This might explain why these coaches were more able to be creative; rearranging through in-depth reflection the concepts of coaching that were already part of their cognitive structure. Jarvis (2006, 2009) recognizes that becoming an expert takes time. In terms of learning experiences, he says that an expert practitioner “continues to create his/her own disjuncture in the practice situation in order to enhance their expertise” (Jarvis, 2009, p. 7).

Thereafter, we addressed how the different learning situations (i.e., formal, nonformal, informal, and internal) were viewed by each coach and his or her biography. We asked ourselves different questions, such as which learning situations did they value and prefer? Why did some coaches value online access to material whereas others did not? Did coaches have others that they could interact with, and if so, who were they? At that point in time, it became clear that there was a division between the five coaches’ years of experience and which learning situations they valued. This was especially revealed by how they solved disjuncture (Jarvis, 2006, 2009), such as through discussions with others, reflection, creativity, planning, and so forth.

As Gilbert and Trudel (2001) identified, issues (or disjuncture) serve as triggers for reflection, an internal learning situation. When revisiting Jarvis’ (2006) types of learning, reflective practice and experimentation were two main ways of learning for the more experienced coaches in this study; something that has been noted at the elite level in able-bodied sport (Trudel & Gilbert, 2006). In Gilbert and Trudel’s (2001) reflective conversation, creativity was most frequently cited by coaches’ engaged in strategy generation when reflecting alone. With the need to be creative so crucial for coaches in disability sport, it is not surprising that

creativity was a common way to solve disjuncture. When reflecting with others, coaches in our study were usually debriefing before or after a game or competition, or getting a different perspective on a particular issue (Anderson et al., 2004; Knowles et al., 2001). As Gilbert and Trudel (2001) concluded however, this ability to be reflective and creative depends on the coach's environment and their access to peers. In terms of experimentation, coaches employed a lot of trial-and-error to try new things and adapt, as seen in previous disability sport research (Cregen et al., 2007; Doll-Tepper, 1994; O'Neill & Richardson, 2008) and in Gilbert and Trudel's (2001) reflective conversation in the able-bodied sport context.

As mentioned above, the more experienced coaches tended to utilize internal learning situations, such as creativity and reflection, whereas newer coaches would rely on more immediate sources, such as interacting with others or looking up a drill online. It should also be noted that for some of the coaches in this study, the only learning situations they could access were informal ones. Two coaches had access to well-developed coach education programs and found them beneficial. Nonetheless, informal learning situations were the most prevalent for all coaches, including: mentoring, observing others, referring to resources, and interacting with others. Of these informal situations, interacting with others (including other coaches, athletes, and program specialists) was the most commonly referenced learning situation. As such, this highly recognized informal learning situation became the topic for the second article, which we will now focus on before returning to nonformal and formal learning situations.

In previous able-bodied sport research, four different types of interactions have been identified: informal knowledge networks (IKNs), dynamic social networks (DSNs), communities of practice (CoPs), and networks of practice (NoPs) (please see Article Two of this thesis for a description of each). These interactions appear beneficial for coaches' learning (Culver &

Trudel, 2006, 2008; Mallett, 2010). However, these same able-bodied sport studies have shown that interactions can be difficult with others since coaches are often more concerned with competing than sharing knowledge. To our knowledge, interactions as a learning situation have yet to be researched in disability sport. The frequent mention of interactions and the openness of coaches, both revealed initially in Article One, appear to have special significance for coach learning in disability sport. More specifically, since these coaches were more open to discussing coaching strategies and techniques with other coaches, our results suggest that this group of people had a unique opportunity for learning communities and networks.

Results showed two types of interactions already in existence for these five disability sport coaches (i.e., IKNs and DSNs), and two more that had potential for the future (i.e., CoPs and NoPs). Of the interactions currently in existence, all the coaches were members of various IKNs and DSNs, with different types of individuals (i.e., other coaches, athletes, program members, and specialists). Most interesting of these interactions however, was the emphasis on interactions with the athletes. All the coaches had formed a working relationship with the respective athlete, which was especially helpful when they needed to ask athletes questions regarding their disability. This is an example of information exchange with an athlete, such as would happen in an IKN. The three newest coaches had closer relationships with their athletes than normally seen in able-bodied sport, including their athletes as part of their DSN. Through these more in-depth interactions, the two novice coaches learnt from their athletes, relying on their athletes' advice when encountering disjuncture. In the final example of a DSN, the wheelchair tennis coach grew quite close to her athletes, and placed communication as one of her highest priorities. This meant that the athlete could communicate whatever he felt was necessary to improve the coach's practice. Finally, the two remaining and most experienced coaches also

communicated with their athletes; however, the content of these discussions was different to the previous three examples. These two coaches valued their athletes' opinions, but the power was not shared as mutually as with the previous three coaches and their athletes.

Returning now to the four learning situations, nonformal and formal learning situations were not highly emphasized in comparison to internal and informal ones. Although coaches were interested in these opportunities, especially nonformal ones, most sports did not provide them specific to disability sport. Also, at the time of writing this paper, formal coach education was mandatory for only one of the coaches, in wheelchair tennis (Coaching Association of Canada, 2011). In some sports, disability-specific material had yet to be designed. Wheelchair rugby and tennis were the two sports that offered sport-specific material, and these two coaches were impressed, finding the material tailored and beneficial to their needs. Thus, it is important to raise the following point: learning situations were selected by each coach (via his or her biography); however, governing structures, including each sport organization (e.g. Wheelchair Basketball Canada) and the overarching disability sport associations (e.g. Ontario Wheelchair Sports Association), were also influential in such selection. Clearly, these organizations controlled coaches' access to opportunities such as coaching clinics, coach education, and online tools. In comparison to able-bodied sport, these coaches' opportunities were impoverished; coaches did not have access to as many opportunities as they desired, which limited the situations they could learn from. Therefore, we cannot conclude that coaches would not have selected these opportunities had they been made available to them.

Since disability sport is still relatively young in the competitive atmosphere, new sports and disabilities will continue to be added to the Paralympics and world competitions. As such, coaches in disability sport have a unique opportunity to continually grow with the sport

movement, and consequently, enter many situations of disjuncture from which they can learn. Similarly, as shown in our findings, we would advise all coaches to consider taking on an athlete with a disability, to challenge their coaching practices. The gap in their knowledge for coaching this athlete will create many new situations of disjuncture, allowing them to become a more developed coach in all aspects of their practice (Cregan et al., 2007; O'Neill & Richardson, 2008; Sawicki, 2008). However, coaches are not the only stakeholders in this learning process; sport governing bodies also need to prepare for the future of disability sport and provide the right tools and opportunities for these coaches to develop. As Wenger (1998) advises:

We will have to make sure that our organizations are contexts within which the communities that develop these practices may prosper. We will have to value the work of community building and make sure that participants have access to the resources necessary to learn what they need to learn in order to take actions and make decisions that fully engage their own knowledgeability. (p. 10)

Based on our findings, we would strongly recommend that stakeholders offer opportunities for coaches to work with one another, building contacts, networks, and ideally communities of practice. If we expect coaches to learn from various types of learning situations and to challenge themselves regularly, sport organizations must be able to provide these coaches with the necessary tools for optimal learning and development.

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Appendix A

Data Collection Phases and Purposes

Phase and Data Collection	Purpose
Phase One	
Non-participant Observation 1	Meet coach; familiarize with sport context
Coach Interview 1	Understand coach's biography and their various learning experiences
Phase Two	
Non-participant Observation 2	Meet athlete; observe for on-site learning; further familiarize with sport context
Coach Interview 2	Follow-up; probe learning experiences and briefly discuss athlete's biography
Athlete Interview	Understand athlete's experiences with coach and his/her role in coach's learning
Phase Three	
Non-participant Observation 3	Coach-athlete relationship and learning through interactions
Joint Interview	Coach-athlete relationship and learning through interactions

Appendix B

Coach Demographics

Coach	M/F	Age	PWAD	Coaching Context		Years Coaching		Athletic Experience	Degree	Coach-Ed		Position
				Sport	Level	AB	AWAD			Level	DS	
C1	M	67	No	Water Skiing*	Rec. to Nat.	1	30+	Nat. Water Skier	Engineering	Level 1	Yes	Volunteer
C2	M	24	Yes	WC Basketball	Rec. to Dev.	0	3	Nat. WC Basketball	Leisure	Level 1	No	Volunteer
C3	F	49	No	Paraswimming	Rec. to Int.	30	20	Int. Swimmer	Psychology	Level 3	Yes	Part-time
C4	M	44	Yes	WC Rugby	Rec. to Nat.	0	2	Int. WC Track, Rugby	Business	Level 1	Yes	Volunteer
C5	F	39	No	WC Tennis	Nat. & Int.	22	12	Nat. Tennis	Phys-Ed	Level 4	Yes	Full-time

Note. A/PWAD = Athlete/Person with a Disability; WC = Wheelchair; AB = Able-Bodied Sport; DS = Disability Specific Component; Rec. = Recreational; Dev. = Developmental; Nat. = National; Int. = International; Water Skiing* = Adapted water skiing

Appendix C

Athlete Demographics

Athlete	M/F	Age	Disability	Sport	Level of Competition	Years Experience		Years w\ Coach
						AB	AWAD	
A1	F	14	Transverse Myelitis	Water Skiing*	Reg.	10	3	3
A2	F	32	Paraplegia	WC Basketball	Reg. & Prov.	0	2	2
A3	M	17	Cerebral Palsy	Paraswimming	Int.	0	7	7
A4	M	26	Quadriplegia	WC Rugby	Reg., Prov., & Nat.	12	6	2
A5	M	30	Paraplegia - Lupus	WC Tennis	Nat.	20	2	2

Note. WC = Wheelchair; AWAD = Athlete with a Disability; AB = Able-Bodied Sport; Reg. = Regional; Prov. = Provincial; Nat. = National; Int. = International; Water Skiing* = Adapted water skiing

Appendix D

Data Collection Information and Timeline

Code	Interview Date	F or P	Length (mins)	# of Pages*
Coach Interview 1				
C1	August 11th, 2010	P	69	19
C2	November 9th, 2010	P	64	25
C3	November 30th, 2010	F	52	20
C4	January 10th, 2011	P	70	17
C5	March 8th, 2011	F	51	16
		$\Sigma = 2F; 3P$	$M = 61.2$	$\Sigma = 97$
Coach Interview 2				
C1	September 4th, 2010	P	23	7
C2	December 1st, 2010	P	18	7
C3	December 16th, 2010	F	20	8
C4	February 4th, 2011	F	22	5
C5	May 25th, 2011	P	24	6
		$\Sigma = 2F; 3P$	$M = 21.4$	$\Sigma = 33$
Athlete Interview				
A1	August 14th, 2010	F	11	6
A2	November 26th, 2010	P	22	8
A3	November 30th, 2010	F	9	5
A4	January 14th, 2011	P	21	6
A5	September 15th, 2010	P	27	7
		$\Sigma = 2F; 3P$	$M = 18.0$	$\Sigma = 32$
Joint Interview				
C1 & A1	September 5th, 2010	F	13	6
C2 & A2	December 15th, 2010	F	35	14
C3 & A3	December 16th, 2010	F	14	7
C4 & A4	February 4th, 2011	F	17	6
C5 & A5	July 8th, 2011	P	13	4
		$\Sigma = 4F; 1P$	$M = 18.4$	$\Sigma = 37$

Note. * denotes single-spaced transcript pages; Σ = sum; M = mean

Appendix E

Coach Interview Guide 1

Researcher introduction; project introduction; consent form.

As specified in the consent form we are interested in discovering how coaches of athletes with a physical disability learn to coach. In this interview we are going to ask you to talk about your coaching experience and your background.

1. How many years of experience do you have as a coach?
 - a. Coaching athletes with a disability?
2. In what situation did you start to coach?
 - a. Coaching athletes with a disability?
3. How did you get the job as coach the first year?
4. Were you active in sports before becoming a coach?
 - a. What sport(s)? The most important and how many years, at what level?
5. From where does your interest in sport come?
 - a. What inspired this interest?
6. From where does your interest in coaching come?
 - a. What inspired this interest?
7. How did you start coaching athletes with a disability?
8. Before becoming a coach, did you follow any coach training?
 - a. Nature: number of hours; provided by who?(NCCP, association, etc.)
9. During your years as a coach have you followed any coach training?
 - a. Nature: number of hours; provided by who?(NCCP, association, etc.)
10. Have you followed any coach training specifically for athletes with a disability?
11. What is your opinion of these training courses?
 - a. Did you learn a lot?
 - b. Was the content useful for coaching your athletes?
 - i. Examples.
 - c. Have you kept in contact with the people who took the course at the same time as you did in order to exchange about your coaching problems?
 - d. Do you intend to follow further your coach training?
 - i. Which ones and why?
12. Please describe the current coaching situation.
 - a. Sport?
 - b. What ages are the athletes? Males / females?
 - c. Are there able-bodied athletes training with the disabled ones?
 - d. What level of competition?
 - e. How many times per week do they train?
 - f. What is the competition schedule?
 - g. How many coaches are involved?
13. Do you intend to keep coaching?
 - a. For how long?
 - b. At what level?
 - c. Why?

Experience:

14. When you first coached athletes with a disability, did you face any particular problem(s)?
 - a. What was the problem?
 - b. What did you do?
 - c. Did you have other problems that you can remember?
 - i. Do you think this is a coaching problem specifically related to coaching athletes with a disability?
15. In general, what is your approach to solving the coaching issues or problems?
 - a. Go back to your previous experiences?
 - i. As a player?
 - ii. As a coach?
 - iii. Training (for your work, for coaches)?
 - b. Invent a solution?
 - c. Consult
 - i. Books (bought or from courses),
 - ii. Internet,
 - iii. Watching sport on T.V.?
 - d. Consult an assistant?
 - e. Consult a member of your family?
 - f. Consult work colleagues, friends, players' parents?
 - g. Consult other coaches? (ex-coach or other coach in the same league)
 - h. Observe other coaches to 'steal' their way of doing certain things?
16. During or after the season, do you engage in a critical reflection of your coaching work?
 - a. Alone or with another person?
 - b. Could you provide an example of what type of thing you might have reflected on?
17. Are there a lot of interactions with the coaches of other teams in your organisation?
 - a. On what do these interactions focus? (exchanges about coaching or polite conversations)
18. Are there a lot of interactions with the coaches of other teams in your league?
 - a. On what do these interactions focus? (exchanges about coaching or polite conversations)
19. Is there a difference between how you solve the coaching issues related to coaching athletes with a disability compared to able-bodied athletes?

In retrospect,

20. Would it have been possible to better optimize your learning?
 - a. How?
 - i. Large-scale coach education programs?
 - ii. Coaching clinics?
 - iii. Formal mentoring?
 - iv. Books, videos/DVDs?
 - v. Experiences related to sport, family, work?
 - vi. Face-to-face interactions with other coaches?
 - vii. Websites,

1. Web sites with information?
 2. Web sites to communicate with others?
 3. E-learning?
- b. Which of these situations do you see as most viable?
- c. Given the opportunity, would you participate in coach meetings focused on learning once or twice a month? Do you think other coaches would be interested?

Appendix F

Coach Interview Guide 2

1. Tell me about your interactions with your athletes today?
2. Tell me about your interactions with your athletes in general?

About coaching Athlete A

3. Tell me about your interactions with Athlete A today?
4. How long have you coached Athlete A?
5. How often do you speak individually to Athlete A?
 - a. What is the nature of these conversations? (technical, tactical, physical, mental, social, other?)
6. What is the biggest challenge about coaching this athlete?
 - a. How do you deal with this challenge? (talk to athlete, parent, other coaches, other staff, books, Internet, your experience, etc)
7. Other challenges?
8. How do you deal with these? Examples.
9. Do you learn from your athletes?
 - a. What? Examples?
10. Do you learn from Athlete A?
 - a. What? Examples?

Appendix G

Athlete Interview Guide

Researcher introduction; project introduction; consent form.

As specified in the consent form we are interested in discovering how coaches of athletes with a physical disability learn to coach. In this interview we would like you to tell us about your experience as an athlete being coached.

1. What sport(s) do you play or participate in competitively?
2. How did you become involved in your sport?
3. Were you born with a physical disability?
 - a. If not, at what age did you become physically disabled?
 - i. How did you become involved in disability sport?
4. How long have you participated in your current sport?
 - a. As an athlete with a disability?
If appropriate:
 - b. As an able-bodied athlete?
5. What helps you get better in sport?
 - a. Probes: parents, friends, coach, other athletes
6. Tell me about your coach(es) / coaching situation?
 - a. Have you had many coaches?
 - b. How long have you had a coach?
 - c. How did you get connected with your coach(es)?
7. Have you had a particularly good coach?
 - i. What made the individual a good coach?
8. With regards to your present coach:
 - a. How long have you worked with him/her?
 - b. Did he/she become a better coach over time?
 - i. If yes, what do you think led to this change? Examples
 - ii. If no, why not? Examples
 - c. How is he/she different from other coaches that you have had?

Appendix H

Joint Interview Guide

Once again we are interested in discovering how coaches of athletes with a physical disability learn to coach. In this interview we would like to explore with you how your interactions with each other influence coach learning¹.

To athlete:

11. What do you think you learnt today? (technical, tactical, physical, mental?)
 - a. What helped you learn this?
 - b. Can you think of other recent examples of this type of learning?
 - c. Can you think of other recent examples of any *other* types of learning?
 - d. Do other people help you learn? Who? Example?

To coach:

12. Please comment
13. Tell me about your interactions with this athlete today?
14. Tell me about your interactions with this athlete generally?

To coach and athlete:

15. Can you talk to each other about what seems to work to help Athlete A's performance improve?

¹ This guide is unstructured as most of our questions will be drawn from our recent observation of your training session.