

‘How I Teach and Coach’: The Epistemological Beliefs of Teacher-Coaches

James Foley, B.PhEd, B.Ed

Submitted in partial fulfillment of the requirements for the degree of

Master of Arts in Applied Health Sciences

(Health and Physical Education)

Faculty of Applied Health Sciences, Brock University

St. Catharines, Ontario

© December 2019

Abstract

Epistemological beliefs (EB), or beliefs about knowledge and learning, help to inform teaching and coaching practices, and may have significant learning and developmental outcomes for students. Therefore, the purpose of this grounded theory study was to better understand the EB of high school physical education (PE) teacher-coaches as it relates to the sources and simplicity of games knowledge and how those beliefs inform their instructional practices when teaching games or coaching extracurricular sports in schools. In-depth semi-structured interviews were conducted with 6 secondary school PE teacher-coaches from south-central Canada. Teacher-coaches believed that games knowledge in both PE and extracurricular sports originate from a variety of internal and external sources, portray games knowledge as both simple and complex, associate PE and extracurricular sports with different knowledge or learning processes, and differentiate their instructional strategies more in PE compared to their coaching practices. This research study has theoretical and practical implications for enhanced teaching and coaching practices, as well as teacher education and coach-training programs, with the ultimate aim of enriching students' learning experiences in physical education and interscholastic sport.

Acknowledgements

Thank you to my committee members, Dr. Dawn Trussell and Dr. Tim Fletcher.

Dawn: I am grateful for your input and support which had a profound impact on my thesis. Your expertise in qualitative research and guidance throughout this process encouraged me to truly emerge myself in my research project. Thank you for believing in me, challenging me to set high expectations for myself, and pushing me to strive for excellence.

Tim: I am grateful for the many years I was able to learn from you as a teacher and mentor. I associate so much of my development as a student, academic, and professional to learning experiences under your guidance. This project would not have been possible without your knowledge, feedback, and positive encouragement.

A special thank you to my supervisor, Dr. Ken Lodewyk.

Ken: I am grateful for your unwavering support. Thank you for your ongoing reassurances, patience, trust, and positive feedback as I navigated through my research. I am appreciative of you sharing your knowledge and a countless amount of your time preparing and guiding me through every step of this process. I also have you to thank for many of the positive academic and professional opportunities that helped shape my experience in graduate studies. As I move forward to the next stage of my life, I will carry with me everything you taught me as a teacher, supervisor, and person. I truly value your mentorship and all you have done for me in support of my education and professional career.

Thank you to the 6 teacher-coach participants who contributed to my thesis by lending their time, knowledge, and experiences. I learned a great deal from our shared discussions, and I hope that you found value in participating in this study.

Finally, thank you to my family for supporting me in everything that I do and continually acknowledging my accomplishments along the way. A special thank you to my partner, Emily, for always believing in me and inspiring me to achieve my goals.

Table of Contents

Abstract	ii
Acknowledgements	iii
Table of Contents	iv
Chapter 1: Introduction	1
Chapter 2: Review of Literature	6
Introduction.....	6
What are EB?.....	6
Conceptualizations of EB.....	7
Epistemology as a developmental model.....	8
Epistemology as a system of independent beliefs.....	9
Epistemological resources.....	10
Epistemological theories.....	11
<i>Sources of knowledge</i>	12
<i>Simplicity of knowledge</i>	14
Domain-General vs. Domain-Specific EB.....	15
The Epistemological Chain.....	16
EB and Students.....	17
EB and PE students.....	19
EB and Teachers.....	20
Teachers' EB and instruction.....	22
EB and PE teachers.....	24
EB and Coaches.....	26

Games Instruction.....	27
Direct instruction.....	29
Indirect instruction.....	30
Chapter 3: Research Design.....	32
Introduction.....	32
Role of the Researcher and Researcher Positionality.....	32
Theoretical Perspective.....	34
Constructivism.....	34
Why Qualitative Research?	35
Methodology.....	36
Grounded theory.....	36
Constructivist-grounded theory.....	36
Data Collection Procedures.....	37
Participants.....	37
Sampling strategies.....	38
In-depth semi-structured interviews.	39
The interview process.....	40
Reflexive Journaling.....	41
Theoretical saturation.....	42
Data Analysis.....	42
Transcribing.....	43
Initial coding.....	43

Focused coding.....	44
Theoretical coding.....	45
Constant comparative analysis.....	46
Representation of Data.....	47
Trustworthiness.....	48
Member checking.....	48
Thick descriptions.....	49
Ethical Considerations.....	49
Informed consent.....	49
Confidentiality and anonymity.....	50
Conclusion.....	50
Chapter 4: Findings.....	51
Introduction.....	51
Teacher-coaches' EB on the Sources and Simplicity of Games Knowledge.....	51
Sources of Knowledge.....	51
<i>Learning in action</i>	52
<i>Constructing knowledge</i>	53
<i>Teacher-coach as an expert</i>	55
<i>Learning from peers</i>	57
Simplicity of Knowledge.....	58
<i>Knowing in games as simple</i>	59
<i>Emphasizing participation and inclusion</i>	61
<i>Acknowledging complex aspects of games</i>	63

Comparing Teacher-coaches' EB in the Context of Teaching and Coaching Games.....	66
Developing the whole person.....	67
Learning complex movement skills.....	69
Learning advanced tactics and strategies.....	71
Teacher-Coaches' EB and Teaching and Coaching Instruction.....	72
Differentiating instruction in PE.....	72
Using indirect approaches in PE.....	73
Drilling as coaching.....	74
Core Theme: Beliefs and Practices as a Reflection of Social Learning Environments.....	76
Conclusion.....	81
Table 1 Summary of findings.....	83
Chapter 5: Discussion	84
Introduction.....	84
Teacher-coaches' EB on the Sources and Simplicity of Games Knowledge.....	85
Sources of knowledge.....	85
Simplicity of knowledge.....	88
Teacher-coaches' EB in the Context of Teaching and Coaching Games.....	92
Teacher-Coaches' EB and Teaching and Coaching Instruction.....	96
Research Limitations.....	100
Sample size.....	100
Interviews as the sole form of data collection.....	101
Interpretive nature of the data analysis.....	101
Conclusion.....	102

References.....	105
------------------------	------------

Appendices

Appendix A.....	122
Appendix B.....	123
Appendix C.....	125
Appendix D.....	128
Appendix E.....	129

Chapter 1: Introduction

The health benefits of regular physical activity for children and youth are well established in the medical, physical education (PE) and sport literature (Warburton, Nicol & Bredin, 2006; Bailey et al., 2009). Furthermore, educational outcomes related to the physical (e.g., motor skills), social (e.g., healthy relationships), cognitive (e.g., problem solving), and affective (e.g., enjoyment) development of children, while not fully understood, have all been linked to physical education and school-based sport (see Bailey et al., 2009 as a review). The factors that contribute to participation and positive engagement in physical activity both during and beyond the school years, including aspects such as motivation and meaningfulness, continues to be a topic of academic discourse. However, it is clear that teachers and coaches, by extension of the decisions they make related to planning, instruction and assessment, play a key role in how students perceive their experiences in physical education and interscholastic (school) sport. As such, research that examines what actually informs teaching and coaching practices, including teacher and coach belief systems, have significant learning and developmental outcomes for students.

Epistemological beliefs are a fundamental component of an individual's belief system. Grecic and Collins (2013) define epistemological beliefs (hereafter referred to as EB) as "beliefs about knowing and learning that reflect views on what knowledge is, how it is gained, and the limits and criteria for determining knowledge" (p. 152). Studies examining the EB of teachers and prospective educators have received considerable attention in educational literature since Perry's (1970) seminal study on the EB of students at different stages of their post-secondary education. These studies include investigations into the EB of teachers, pre-service teachers and students (Bendixon & Feucht, 2010), how EB develop and change over time (Beuhl & Fives, 2009; Hofer & Pintrich, 1997; Kardash & Scholes, 1996), and in the case of teachers, how their

EB effect the epistemic development of their students (Buehl & Fives, 2009; Hofer, 2001; Muis & Duffy, 2013) and inform aspects of their teaching practice such as instruction (see Olafson & Schraw, 2010). The literature on teachers' EB have provided key insights into teaching and learning and brought attention to the importance of reflecting on and challenging current beliefs related to knowledge construction in schools.

However, considering the significance of teachers' EB on teaching and learning, certain aspects related to this phenomenon remain understudied (Hofer, 2001; Roth & Weinstock, 2013). Roth and Weinstock argued, "most research on teachers' epistemologies has focused on teachers or student teachers as learners...without looking directly at how those teacher epistemologies might influence actual teaching behaviors...[and] despite the strong assumption that teachers' epistemological beliefs should influence their teaching" (p. 404-5). Furthermore, the various conceptualizations of EB without a consensus on fully understanding their complex nature (Bendixon & Feucht, 2010; Hofer, 2001, 2002a; Olafson & Schraw, 2006) and the notion of EB that are specific to certain disciplines or fields of study (see Muis, Bendixon, & Haerle, 2006), provide the opportunity to examine EB from a multitude of theoretical and domain-specific perspectives. This includes studies that focus on the EB of teachers and their specific academic subject, or in the case of the current study, the distinctive domains of teaching and coaching.

Within the education literature, a majority of the research conducted to date has centred on the EB of teachers that teach 'traditional' subjects in 'traditional' classrooms and there are few studies that have examined the EB of PE teachers (Lodewyk, 2011) or coaches (Grecic & Collins, 2013; Edwards, Jones, & Viotto Filho, 2016). Lodewyk and Gao (2013) contend that "compared to most educational domains, physical education (PE) has a rather distinct and interrelated body of knowledge...and ways of knowing that includes important knowing-related

experiences like sensory-motor experiences” (p. 3). Games, as a common and integral component of most PE programs, share much of this body of knowledge, as it relates to motor-skills, fitness, tactics and strategic problem-solving, and interpersonal skills, for example, and represent the subject-matter of common extracurricular sports in schools. However, teaching and coaching are different enterprises (Drewe, 2000; Richards & Templin, 2012).

Many PE teachers also undertake the responsibilities of interscholastic sports coach. PE teachers that assume the dual-role of both teacher and coach (hereafter referred to as teacher-coaches) will often teach one way and coach very differently (Drewe, 2000), perhaps explained by different views concerning the purposes of PE compared to the aims of extracurricular sports. This tension is further complicated by notions that some teachers enter the field because of their desire to coach (Lawson, 1983), while others coach because of perceived expectations that they have both the knowledge and passion to attend to both roles (Drewe, 2000). This raises important philosophical questions such as how do teacher-coaches reconcile these differences? Are the EB of teacher-coaches compatible in both roles? These types of questions have been proposed as a means of understanding this role conflict and reviving research on teacher-coaches (Richards & Templin, 2012).

Few studies have investigated the EB of physical education teachers (Lodewyk, 2011) and even fewer have examined coaches’ beliefs (Edwards et al., 2016). There are currently no known studies that have explored EB through the lens of teacher-coaches and how those beliefs may influence their instructional practices in both domains. To explore this phenomenon, a qualitative approach to research was adopted using grounded theory methodology and coinciding methods of data collection and analysis.

Investigations into teachers' EB have commonly been studied using quantitative methods (Hofer, 2001). As such, there have been repeated requests to examine this phenomenon qualitatively (Buehl & Fives, 2009; Kardash & Scholes, 1996), with claims that "a construct as intellectually complex and rich as one's personal epistemology cannot presume to be fully captured by people's responses to a set of normative statements" (Kardash & Scholes, 1996, p. 370). Qualitative studies give voice to the participants, promote an in-depth analysis of the phenomenon under study, and allow for an understanding of the complex nature and richness of human existence (Creswell, 2013; Jones, Torres, & Arminio, 2014). In the case of research on teachers' beliefs, Rovegno (2003) stated "one of the goals of qualitative research is to share teachers' stories in the hope of opening new possibilities of change for other teachers" (p. 305). With the research aims of exploring and understanding teacher-coaches' EB and how they inform their teaching and coaching practices, a grounded theory methodology was used to make sense of the participants' beliefs and develop a theory that was 'grounded' in my interpretation of their stories.

Therefore, the purpose of this grounded theory study was to better understand the EB of high school PE teacher-coaches and how those beliefs inform their teaching and coaching instructional practices in schools. The research questions that guided my study were: (1) what are the epistemological beliefs of PE teacher-coaches in terms of the sources and simplicity of games knowledge?; (2) how are PE teacher-coaches' epistemological beliefs related to teaching and coaching games similar or different, and in what ways?, and (3) how do PE teacher-coaches' epistemological beliefs inform their teaching and coaching instructional practices?

This research contributes to the existing literature by advancing the knowledge of physical education teacher-coaches' EB and how those beliefs inform their teaching and

coaching instructional approaches. A better understanding in this topic area has theoretical and practical implications for enhanced teaching and coaching practices, as well as teacher education and coach-training programs, with the ultimate aim of enriching students' learning experiences in physical education and interscholastic sport.

Chapter 2: Review of Literature

Introduction

This chapter provides a review of the relevant literature on EB, with a particular focus on research related to teachers and within the field of education. The chapter begins by defining EB and continues with an overview of the various conceptualizations of EB, including the model of epistemological theories. The concept of epistemological theories, along with the ideas of domain-general versus domain-specific EB and the notion of an epistemological chain, helped shape my theoretical framework and guide my study on teacher-coaches' EB. As this study adopted a constructivist-grounded methodology (see Chapter 3), a conceptual framework was developed not as a means of applying existing concepts to my research project or the findings of this study, but instead to acknowledge my previous engagement with the relevant literature and research that reflects my views on knowledge and learning. As commonly quoted in regards to this type of approach, "there is a difference between an open mind and an empty head" (Dey, 1999 in Charmaz, 2014, p. 117). Furthermore, this theoretical framework has been presented against a number of differing and valuable theories or perspectives on EB as a means of maintaining a critical and analytical lens. Following an examination of the main concepts related to EB, I provide an analysis of the literature related to the EB of teachers and students, as well as the limited research on PE teachers and coaches. The chapter will end with a brief outline of games instruction.

What are EB?

The philosophical study of epistemology is concerned with the "origin, nature, limits, methods, and justification of human knowledge" (Hofer, 2002a, p. 4). Epistemology represents an area of particular research interest within the field of education because our

conceptualizations of knowledge and knowing processes are developmental in nature and influence what and how we learn. Beliefs about what knowledge is, where it resides or how it is attained, for example, shape how we engage in and make meaning of our learning experiences. As such, epistemological beliefs are an essential component of an individual's belief system and fundamental to how we view and understand the world.

Grecic and Collins (2013) describe EB as “beliefs about knowing and learning that reflect views on what knowledge is, how it is gained, and the limits and criteria for determining knowledge” (p. 152). EB are a set of beliefs about knowledge or aspects of knowledge that composes an individual's personal epistemology (Olafson & Schraw, 2010). This includes beliefs about how we define, construct, evaluate, and justify knowledge (Hofer, 2002a). A multitude of terms – personal epistemology, epistemological beliefs or theories, ways of knowing, or epistemic cognition – have been used to define this area of study since Perry (1970) initially tracked the epistemic development of college students through their higher-education years. Since then, various conceptualizations of EB have been developed to explain and understand this phenomenon (Bendixen & Feucht, 2010; Hofer, 2001, 2002a). Furthermore, these concepts have been applied as a means of understanding and enhancing teaching, and to a more limited degree, coaching practices.

Conceptualizations of EB

Beyond long-standing philosophical questions and debates of knowledge and truth (Kardash & Scholes, 1996), Bendixen and Feucht (2010) and Hofer (2001, 2002a) categorized modern epistemological conceptualizations into frameworks that viewed personal epistemology as (1) a developmental model, (2) a system of independent beliefs, (3) epistemological resources, and (4) epistemological theories.

Epistemology as a developmental model. Within educational research, personal epistemology as a developmental model places research subjects (teachers, pre-service teachers, students, etc.) within a stage of development based on their beliefs about knowledge and knowing (Bendixen & Feucht, 2010; Hofer, 2001, 2002a). Although researchers have used various terms and criteria to identify and assess the level of epistemological development, these stages are often organized along a continuum of simple to more complex, and thus desired, epistemologies (Hofer, 2001).

For example, Perry's scheme (1970) uses the four stages of *dualistic perspective*, *multiplism*, *relativism*, and *commitment within relativism* to show how individuals move from basic to more complicated views and ideas about knowledge, including how knowledge is created, constructed, developed, valued and perceived (Chinn, Buckland & Samarapungavan, 2011; Kuhn, Cheney & Weinstock, 2000). Individuals that carry EB that reflect a dualistic perspective view knowledge as an absolute truth. On a basic level, individuals within this stage of development may adopt a linear or convergent approach to learning (Chinn et al., 2011), where there is only a single correct answer, and knowledge (for example, the answer to a question) is regarded as either right or wrong. Where multiplism recognizes and acknowledges different perspectives as equally valid and thus introduces some level of uncertainty, individuals categorized as relativists evaluate knowledge based on a number of contextual learning factors, such as the source of the information. The final stage of commitment within relativism is characterized by justification and upholding those beliefs, even in the wake of contradictory evidence (Hofer, 2001).

These higher stages of EB are often associated with constructivist views on teaching and learning (Green & Hood, 2013) and are not inherently achievable (Hofer & Pintrich, 1997).

Nevertheless, much of the generated theory has demonstrated that as individuals age, graduate to higher levels of education and gain valuable life experiences, they develop more complex epistemologies (Hofer & Pintrich, 1997; Schommer, 1993). Developmental models that evolved from initial research into EB have examined diverse participant samples but demonstrated similar progressions and patterns in terms of epistemic development (Hofer, 2001). Contextual factors have been studied to better understand their influence on EB, including the link between gender and “Women’s Ways of Knowing” comprising of the developmental stages of *silence*, *received knowing*, *subjective knowing*, *procedural knowing*, and *constructed knowing* (Hofer, 2001). Other developmental models have emphasized the shift from naïve to more sophisticated thinking processes by focusing on the idea of reasoning or knowledge construction through reflection (Hofer, 2001; White, 2000;). Without a consensus on a unified model for understanding EB as a developmental model (Olafson & Schraw, 2006), research has more recently theorized EB as a system of independent beliefs.

Epistemology as a system of independent beliefs. Schommer (1990) proposed a system of relatively independent beliefs related to specific dimensions of knowledge. These dimensions include (1) the *structure of knowledge* (i.e., is knowledge simple or complex?); (2) the *stability of knowledge*; (i.e., is knowledge stable or ever-changing?) (3) the *source of knowledge* (i.e., where does knowledge come from?) (4) the *speed of learning* (i.e., is knowledge acquisition slow or quick?); and (5) the *ability to learn* (i.e., is learning fixed or malleable?). Beliefs about knowledge related to these dimensions were thought to fall along a continuum, but were shown to be less predictable compared to the sequential stages of the developmental models (Bendixon & Feucht, 2010). However, both the speed of learning and the ability to learn dimensions have been challenged and proposed to be more related to intelligence or an individual’s capacity to

learn rather than their beliefs about knowledge (Buehl, Alexander & Murphy, 2002; Hofer & Pintrich, 1997). Still, Schommer's contribution to the study of EB includes a widely adopted questionnaire for measuring specific components of EB that allowed researchers to begin plotting the beliefs of teachers and students alike, and has demonstrated the overall complex nature of EB, including the notion of asynchronous development (Bendixon & Feucht, 2010). The work of Schommer was further developed by Hofer and Pintrich (1997) with their concept of epistemological theories; however, for the purpose of readability, I will first review the epistemological resources model.

Epistemological resources. Hammer and Elby (2002, 2010) proposed that personal epistemology is comprised of epistemological or cognitive *resources* that are activated (or not) depending on the learning context or environment. This perspective on personal epistemology was theorized in conjunction with an understanding of cognitive development based on research in child psychology and development, and thus, has implications for understanding students' cognitive functioning, ideas and behaviour in the classroom (Bendixon and Feucht, 2010; Hammer & Elby, 2010). This framework includes resources children use for understanding (1) *the nature and source of knowledge*, (2) *epistemological activities*, (3) *epistemological forms* and (4) *epistemological stances*. The authors suggest the nature and sources of knowledge, or where knowledge originates, may include resources such as direct perception (e.g., observation) or propagation (e.g., information passed from an authority figure). Epistemological activities could include formulating ideas (e.g., brainstorming) or fact checking, whereas epistemological forms include representations of knowledge such as lists or stories. Finally, examples of epistemological stances could include acceptance, doubting or puzzlement; however, none of these resource examples are meant to be exhaustive. According to Hammer and Elby (2002,

2010), students may activate multiple resources within or across these categories as a means of developing understanding within a specific learning context.

Furthermore, this framework is founded on the idea that epistemological resources are “smaller and more general than theories...that can accommodate contextual dependence” (Hammer & Elby, 2002, p. 176), allowing researchers to better explain why students can hold what appears to be contradicting beliefs concerning certain dimensions of knowledge. For example, students may believe that witness testimony is an accurate and acceptable source of knowledge as a historical primary resource, yet simultaneously hold beliefs that personal accounts are greatly subjective in a scientific experiment without other forms of supporting evidence. As will be discussed later, this framework ties into research on epistemology and the notion of domain-specific and domain-general EB.

Epistemological theories. Hofer and Pintrich (1997) refined Schommer’s (1990) conceptualization of epistemology theorizing that EB include four dimensions associated with the *nature of knowledge* and the *processes of knowing*. The nature of knowledge includes the degrees to which one believes knowledge is (1) certain or uncertain (e.g., is knowledge constant, stable or contextual?) and (2) simple or complex (e.g., is knowledge isolated bits of information or correlated concepts?). The processes of knowing, or how one comes to know (Hofer, 2001), includes views related to the dimensions of (3) the source(s) of knowledge (e.g., teacher/coach as authority?) and (4) the justification of knowledge (e.g., how do we know we know?). An individual’s beliefs concerning these four dimensions of knowledge are posited to represent a belief distribution (Buehl & Fives, 2009). The epistemological theories perspective of personal epistemology allows researchers to view and examine EB as both developmental and theoretical. Furthermore, the individual dimensions of EB provide the opportunity to examine and

understand EB in greater depth (Muis & Foy, 2010). Like Schommer's concept of EB, these constructs are thought to be independent of each other (Bendixon & Feucht, 2010; Hofer & Pintrich, 1997; Schommer, 1990), suggesting that an individual can hold naïve beliefs related to the nature of knowledge and sophisticated beliefs about learning processes, for example.

Furthermore, like developmental models of EB, factors such as education are not a precondition for a sophisticated belief system. For instance, White (2000) found that a majority of pre-service teachers held what was classified as underdeveloped beliefs concerning the certainty and simplicity of knowledge when presented with case studies of various teaching-related scenarios. These teacher candidates viewed classroom problems at a very basic level and relied heavily on past experiences to provide resolutions, rather than viewing the classroom as a complex environment of different learners wherein the perspectives of the students, their families, teachers, or school staff may be a valuable resource for solving classroom issues (Brownlee & Berthelson, 2006). Nevertheless, these four dimensions of knowledge have been repeatedly assessed in teachers and widely acknowledged as forming a basis for understanding personal epistemology (Buehl & Fives, 2009). Furthermore, teachers' beliefs as it relates to these constructs help to define their worldviews on knowledge and learning.

For the purpose of managing research do-ability, this inquiry was limited to teacher-coaches' EB on the source(s) of knowledge and the simplicity of knowledge in teaching PE and coaching school-based sports. These constructs are highly relevant within the context of PE, games and sport and their influence on instructional practices (Lodewyk, 2011) and amending the research scope allowed for greater depth of inquiry.

Sources of knowledge. The sources of knowledge include where knowledge originates from and the process of how individuals learn (Muis, Bendixen & Haerle, 2006). Chinn et al.

(2011) outlined four main sources of knowledge: sensation, memory, introspection and reasoning. Testimonial knowledge, or knowledge acquired from others, has also been established as a valid source of learning (Chinn et al, 2011). Beuhl and Fives (2009) identified common internal (e.g., self-reflection) and external (e.g., text materials) sources of teaching knowledge in both prospective and practicing teachers, noting that EB about the sources of knowledge are generally associated with the degree to which the individual believes knowledge is internally constructed or externally communicated (Beuhl & Fives 2009; Hofer & Pintrich, 1997; Lodewyk & Gao, 2013). For example, Green and Hood (2013) suggest that a single source of knowledge should be evaluated “as an array of evidence potentially varying in the quality, support for or against a proposition and explicability” (p. 169). As such, if a student believes that games knowledge generally comes from external authorities, they may place more value on expert sources of knowledge such as the teacher or skilled peers as they make sense of new information. Likewise, a teacher with similar beliefs may adopt more teacher-centred approaches to instruction such as modelling.

More recently, Quennerstedt (2013) studied the acquisition of knowledge through the notion of practical epistemologies, or how teachers and students interact and learn from each other in PE. Students were observed performing movement skills, observing, copying and cooperating with others, listening to feedback, among other learning actions. In this sense, practical epistemologies and the sources of knowledge were highly associated with instructional approaches. Furthermore, these actions were viewed as valid sources of knowledge construction because they were practiced and acknowledged by both teachers and students as ways of learning through social interactions and had real and meaningful learning outcomes. However, it is unclear how teachers' EB influenced these instructional environments and which sources of

knowledge teachers believe provided the greatest learning benefits to students. Furthermore, how do these practical epistemologies translate in a coaching setting? As such, one of the purposes of this study was to explore what teacher-coaches view as valid sources of knowledge, where they intersect in their teaching and coaching practices, and how they are prioritized in PE and extracurricular sport settings.

Simplicity of knowledge. The simplicity of knowledge relates to beliefs about whether knowledge is viewed as simple or complex. Naïve or underdeveloped beliefs about this construct view knowledge as “relatively clear, uncomplicated, factual, and isolated” (Lodewyk, 2015, p. 679) and are associated with lower levels of academic achievement, self-regulation and surface-level approaches to learning such as fact memorisation (Green & Hood, 2013). Contrarily, more sophisticated beliefs situate knowledge as complex, contextual and ever changing, and often transferrable to other domains or learning environments (Lodewyk, 2015).

Unfortunately, knowledge of games is often tarnished by the low status of PE as an academic school subject (Johns & Dimmock, 1999; Bleazby, 2015). According to Bleazby (2015), knowledge that is acquired through experiential subjects such as PE is undervalued and not prioritized because of an apparent lack of abstractness and cognition, among other factors. While certain elements of games knowledge such as equipment, rules or the technical aspects of basic movement skills may seem rather straightforward, researchers have noted that other aspects of games offer the opportunity for students to acquire complex, contextual knowledge such as advanced tactical problems and solutions, combination motor skills (Olsin & Mitchell, 2006) and the application of the movement concepts of body and space awareness, relationships and effort.

As such, teacher-coaches’ beliefs about the simplicity of knowledge may influence their instructional approaches in both PE and extracurricular sport settings. Like beliefs about the

sources of knowledge, this dimension has been demonstrated to influence both teaching practices and student learning (Lodewyk, 2009, 2011). Furthermore, both of these constructs have been studied across a multitude of school subjects and learning domains to determine whether EB are best described as domain-general or domain-specific.

Domain-General vs. Domain-Specific EB

This study was also guided by evidence that EB are both domain-general and domain-specific (Buehl & Fives, 2009; Olafson & Schraw, 2006). Muis, Bendixen, and Haerle's (2006) review of the educational literature supports that individual' beliefs about knowledge comprise of both domain-general and domain-specific representations. EB that are domain-general remain fairly consistent or universal in all learning circumstances or environments, whereas EB that are domain-specific vary by discipline and context. Within the education literature, these differences have often been studied by examining teachers' or students' EB across different school subjects. For instance, domain-general EB could be represented by the belief that knowledge is absolute in both math and history, or all subjects for that matter. On the other hand, the belief that knowledge is absolute in math but more subjective in history, for example, is more suggestive of domain-specific EB. Several researchers (see Muis & Duffy, 2013) have submitted that holding sophisticated EB may not be advantageous within certain domains or learning situations. For example, the belief that knowledge is uncertain and ever changing may not be beneficial in "hard" sciences such as mathematics, where some knowledge has been and will continue to be fixed (e.g., operations of arithmetic). Additionally, there may be some situations where reliance on a single authority source of knowledge is warranted (Muis & Duffy, 2013). As such, classifying pre-service or in-service teachers' EB as generally naïve or sophisticated may be problematic.

Various factors effect domain-general and domain-specific EB, including the amount of perceived structure within the discipline or field and the reliance on the instructor as the authority or expert figure (Hofer, 2000). As previously indicated, games in a teaching and coaching context may share a similar body of knowledge (Lodewyk & Gao, 2013); however, the EB of teacher-coaches and the knowledge acquisition processes of student athletes within these distinctive learning environments are not fully understood. Continued research into the “domain specificity issue is necessary to understand the nature of the construct and to improve our investigations of relationships between personal epistemology and learning” (Muis et al., 2006, p. 14). Therefore, of partial interest to this study were findings related to whether teacher-coaches carry EB that are specific to the role they are attending to (teaching or coaching) or whether they apply their general beliefs about knowledge and learning to both their teaching and coaching instructional practices.

The Epistemological Chain

Finally, this research study will be informed by the assertion that there is a connection between teacher-coaches’ beliefs and their teaching practice, including their implementation of instructional approaches. For instance, researchers have found correlations between EB and preferred instructional models (i.e., more direct- vs. indirect-teaching methods) in both pre-service (Lodewyk, 2015) and practicing (Lodewyk, 2011) physical education teachers. Grecic and Collins (2013) defined this relationship in reference to coaching as “the link between a coach’s philosophy, beliefs about knowledge and learning, and demonstrated behavior” (p. 153) and proposed the epistemological chain as a conceptual framework to better understand coaches’ planning, instruction and reflection practices. However, research has also shown that an individual’s behaviours, actions and ontological beliefs do not always match their EB (Olafson &

Schraw, 2006). Rather, EB are extensive, multi-dimensional and complex (Schraw & Olafson, 2006). Furthermore, Buehl and Fives (2009) noted that pre-service teachers held different EB depending on whether they focused on themselves as the teacher or the learner. In other words, they may prefer to teach one way but learn in an entirely different manner.

As such, it is recommended that researchers clearly define “the body of knowledge that is to be considered” (Buehl & Fives, 2009, p. 370). In the case of the current study, it is important to distinguish that this inquiry focused on teacher-coaches’ EB about knowledge and learning in PE and the respective sport they coach, rather than their beliefs about essential teaching and coaching knowledge. Thus, this study was not looking to determine what teachers and coaches need to learn in order to be effective instructors, but rather what they believe helps their students or athletes learn best, although these pedagogical stances may be closely related. Therefore, the purpose of this study, in part, was to explore how – if at all – the epistemological chain manifests in terms of teacher-coaches’ EB and the instructional methods they use in their teaching and coaching practices. Due to the limited amount of research related to EB and coaches (Grecic & Collins, 2013), the concept of the epistemological chain can primarily be found in research on the connection between teachers’ EB and their teaching practice. However, the links between students’ EB and other multidimensional constructs related to learning has also received considerable attention in the education literature.

EB and Students

Until recently, research concerning personal epistemology has often overlooked the EB of young learners (Wildenger, Hofer, & Burr, 2010), leaving some questions about the origins of EB development (Buehl et al., 2002; Hofer, 2001; Wildenger et al., 2010). However, research on the EB of children generally supports the progression from a simple and absolutist perspective to

more complex, contextualized beliefs about knowledge consistent with theories of cognitive and EB developmental models (Wildenger et al., 2010). As the focus of this study was the EB of teacher-coaches, this is by no means meant to be a comprehensive review of studies related to the EB of students in the classroom. However, the alignment (or misalignment) between students' and teachers' EB represents an area of research interest related to EB (Hofer, 2001) and has important implications for student learning.

In students, availing EB are associated with higher levels of academic achievement (Lodewyk, 2007, 2009; Schommer, 1993, 1997), motivation for learning (Beuhl & Fives, 2009), self-regulated learning (Muis, 2007), comprehension (Schommer, 1990; Hofer, 2002) and problem-solving capabilities (Kardash & Scholes, 1996). For example, Schommer (1993, 1997) found that students with more sophisticated EB attained higher grades across all school subjects, even after factoring in the effects of intelligence. Mason and Bromme (2010) discussed the links between students EB' and conceptual change both directly through cognitive functioning and indirectly via other constructs such as motivation and metacognitive processing, such as planning how to complete a learning task. The relationship between students' EB and learning has led researchers to ask whether epistemic development should be explicitly taught in schools (Hofer, 2001). However, Muis and Duffy (2013) demonstrated that even through relatively short-term interventions where teachers adopted more constructivist teaching strategies, students showed a positive shift toward more complicated beliefs about the certainty, simplicity and source of knowledge, as well as improved critical thinking skills and self-efficacy. Other factions of researchers are interested in studying students' domain-specific EB (Muis et al., 2006), including within fields of study such as PE.

EB and PE students. In the few studies that have examined the EB of PE students, Cothran and Kulinna (2006) reported that middle school-aged students held a wide range of beliefs, specifically related to the source of knowledge in PE. Some students held absolutist views that the teacher alone was responsible for knowledge transmission and disapproved of more indirect teaching approaches where the teacher was not portrayed as an expert in the content knowledge. Although the teacher or coach are often viewed as the main source of knowledge acquisition in games or sports-based programs (Byra, 2006), this is potentially problematic when considering the reliance on a single authoritative expert has shown to be less beneficial to student learning in terms of motivation, engagement and the development of critical thinking skills (Lodewyk, 2009). At the other end of the spectrum, some students demonstrated more independent and contextual beliefs that knowledge in PE could be extracted through independent thinking and peer learning experiences. The varied EB of students could be explained by the overall developmental differences in students that can be observed at this age.

Lodewyk and Gao (2013) found that secondary PE students held relatively naïve beliefs regarding the simplicity and stability of various health- (i.e., cardio-respiratory endurance, muscular strength and endurance, flexibility) and skill-related (i.e., speed, agility, power, balance, reaction time, coordination) components of fitness. These students failed to see the complex and changing nature of fitness concepts and how they relate to the overall goals of a healthy, active lifestyle. Furthermore, they viewed fitness concepts and PE in general in isolation and disconnected from other disciplines (e.g., math, science, etc.) that have implications for learning in PE. These results were in contrast to previous findings by Bonello (2008), who reported that students actively made connections to different sources of knowledge within and outside of PE to develop and change their understanding of fitness concepts. This demonstrates

the need for continued domain-specific research in PE, including students' beliefs about other movement forms such as games, gymnastics, and dance. Perhaps more importantly, these inconsistencies in students EB in PE may be the result of differences in the teachers' EB and how content in PE is presented (Lodewyk & Gao, 2013). If PE teachers believe that knowledge in PE is "complex, integrated, evolving, and useful" (Lodewyk & Gao, 2013, p. 9) and implement instructional approaches that promote higher-order thinking skills and deep learning, students may perceive knowledge in PE accordingly. The overall lack of research within the field of PE and sport will be further discussed below.

EB and Teachers

Teachers' EB represents a fairly robust area of study within the education literature. Studies examining the EB of teachers frequently focus on what EB teachers or teacher candidates actually hold, the various factors that influence those EB and the practical implications of those EB in the classroom (Bendixon & Feucht, 2010). The EB of teachers are linked to the academic achievement of students (Buehl & Fives, 2000; Muis & Duffy, 2013), students' motivation to learn (Kuhn & Park, 2005), and the EB and epistemic development of students in the classroom (Buehl & Fives, 2009; Hofer, 2001; Hofer & Pintrich, 1997; Muis & Duffy, 2013). Moreover, investigations into the EB of teachers provide insights into teaching and learning and research related to teachers' beliefs in general remains a significant component of developing and improving teaching practices and teacher education programs (Soleimani, 2018; Tsangaridou, 2006a). In fact, it has been suggested that rather than focusing solely on the development of teachers' practices in teacher education programs, teacher candidates should be taught to reflect on and cultivate the belief systems that actually *inform* those practices (Tsangaridou, 2006a). As noted by Soleimani (2018), "studying EB has been recognized to be the first step toward

triggering changes into teacher education programs and...the teaching profession” (p 48). This includes explorations into the nature of and factors that inform teachers’ EB.

Teachers’ or teacher candidates’ beliefs are said to be influenced by various factors including gender (Er, 2013, Yalcin & Yalcin, 2017), academic domain or subject area (Beuhl & Fives, 2009; Yalcin & Yalcin, 2017), level of teaching experience (Aslan, 2017; Er, 2013; Yalcin & Yalcin, 2017) and cultural norms (Chan, 2011). For example, researchers have reported that female and upper-year teacher candidates held more sophisticated EB than their male and lower-year counterparts. Teachers’ own learning experiences, particularly in their subject domain (Tsangaridou, 2006a) and teacher education programs (Tanase & Wang, 2010) also help to shape their EB and overall views of learning. The malleability of teachers’ EB, or how those beliefs change over time, also remains an important area of study within teachers’ EB research (Beuhl & Fives, 2009; Kardash & Scholes, 1996). For instance, teachers interviewed about their epistemological and ontological development pointed to the importance of mentoring and collaboration with other teachers, formal and informal professional development, and personal reflection as important experiences that helped form and define their beliefs (Olafson & Schraw, 2010). Furthermore, research supports that pre-service teachers’ EB are easier to influence and in-service teachers’ EB are relatively hard to change, yet both often revert back to older, more established beliefs about knowledge and learning (Buehl & Fives, 2009; Lodewyk, 2015; Muis, 2007; Olafson & Schraw, 2010; Tanase & Wang, 2010). Another subset of research studying teachers’ or teacher candidates’ EB have focused on how those EBs actually inform their teaching practice.

EB are thought to influence numerous aspects of teaching practice including content selection and curriculum application (Hofer & Pintrich, 1997; Prawat, 1992), learning

environment (Muis & Duffy, 2013), instruction (Lodewyk, 2011; Olafson & Schraw, 2006, 2007; Tsai, 2007), classroom management techniques (Soleimani, 2018) and assessment orientations (Ismail, 2017). For example, Soleimani (2018) found that teachers that believed students were active contributors to knowledge construction in the classroom and that knowledge was contextual in nature involved students in decision-making related to classroom management techniques and adapted different strategies depending on the specific students or situation. Unsurprisingly, language teachers that held relatively naïve EBs adopted more surface-level measures in their assessments (Ismail, 2017). Teachers that believed language knowledge was certain, fixed and un-changing, tested more stable components of language studies such as grammar, rather than deeper approaches to language processing such as communication in a real-world context (Ismail, 2017). Overall, teachers' EB "underpin what teachers do and how they behave in the classroom" (Soleimani, 2018, p. 47), including their preferences toward various instructional approaches.

Teachers' EB and instruction. According to Muis and Foy (2010), numerous studies have suggested the connection between teachers' EBs and their instructional approaches but few have demonstrated this relationship empirically. One such empirical study found that in-service high school teachers that believed knowledge in science was more stable and certain implemented more teacher-centred instructional strategies and emphasized the importance of test scores and examinations (Tsai, 2007). Contrarily, teachers that held more constructivist beliefs about science knowledge utilized more student-centred teaching methods such as inquiry- and discussion-based learning. Similar results were found when studying mathematics teachers and their instructional approaches (Beswick, 2012; Garegae, 2016); however, both of these studies focused on teachers' beliefs about the nature of mathematics as a school subject rather than their

EB. Furthermore, in the case of Beswick' (2012) study, the participants included only one novice and one more experienced teacher.

Olafson and Schraw (2010) examined the relationship between teachers' epistemological worldviews, which include both beliefs about individual dimensions of knowledge (e.g., source of knowledge) and overall personal epistemology, ontological worldviews and their preferred instructional methods. Ontological beliefs – beliefs about the nature of reality or being – were included within the study as views about what it means to be a teacher (e.g., authority of knowledge vs. facilitator of learning) hold epistemological assumptions and influence how you teach. A majority of the teachers identified as epistemological and ontological relativists who believed in the co-constructed and interpretive nature of knowledge, adopting more student-centred approaches such as group projects and self-directed learning. These teachers were also more cognizant of individual student differences and needs in the learning process, supporting other findings that teachers' epistemological relativist orientations are a strong predictor of teacher autonomy support as a means of encouraging student motivation, decision-making, and meaningfulness (Roth & Weinstock, 2013). While the current study did not explore teacher-coaches' ontological beliefs or worldviews, they are closely associated with EB and instructional approaches.

Conversely, several studies have actually reported a disparity between teachers' EB and their instructional approaches (Lodewyk, 2011; Olafson & Schraw, 2002, 2006, 2010; Roberts, Baker & Goossen, 2016). Administrative factors such as mandated curriculum and teaching strategies, funding, testing and teacher accountability impact how content is delivered (Olafson & Schraw, 2010). Time constraints and teacher experience also influence instruction as many teacher candidates or novice teachers unassumingly struggle to put their beliefs into practice and

often revert back to the way they were taught (i.e., more traditional methods of instruction such as direct instruction) based on familiarity. Similar results have been reported in studies investigating the links between PE teachers' EB and their instructional preferences.

EB and PE teachers. A majority of the research on teachers' EB has centred on the EB of teachers that teach 'traditional' subjects in 'traditional' classrooms and there are few studies that have examined the EB of physical education teachers (Lodewyk, 2011). However, Lodewyk and Gao (2013) contend that "compared to most educational domains, physical education (PE) has a rather distinct and interrelated body of knowledge...and ways of knowing that includes important knowing-related experiences like sensory-motor experiences" (p. 3). Games, as a common and integral component of most PE programs, share much of this body of knowledge, as it relates to motor-skills, fitness, tactics and strategic problem solving, and interpersonal skills, for example. Even within the limited focus of games, Canadian PE curricula incorporate a wide range of learning objectives across the physical, cognitive and social domains. As such, physical education offers a unique perspective for examining teachers' EB.

Like other studies on the EB of practicing or pre-service teachers, investigations into the EB of prospective PE teachers (see Lodewyk, 2010, for example) have often focused on their beliefs as learners, rather than as teachers (Roth & Weinstock, 2013). However, Lodewyk's (2015) study on pre-service PE teachers demonstrated that there are certain EB that tend to align with the different instructional approaches for teaching games. For instance, prospective physical educators that believed knowledge in games were simple and unchanging preferred direct instruction methods. Contrarily, relativist epistemological worldviews that knowledge is complex and contextual were more common among pre-service teachers and linked with more indirect approaches or models such as Teaching Games for Understanding (TGfU) or Sport

Education (Lodewyk, 2015). Compared to their pre-service counterparts, high-school PE teachers held similar epistemological worldviews and beliefs about the simplicity and stability of knowledge in PE, yet still reported an inclination toward direct instruction methods (Lodewyk, 2009), again demonstrating that the epistemological chain does not always emerge in a linear relationship. Furthermore, as previously noted, Lodewyk and others (Butler, 2005; Olafson & Schraw, 2006;), pre-service teachers' beliefs do not always translate to their teaching practice, and many teachers revert back to more traditional instructional methods regardless of their training due to familiarity and time constraints, among other factors.

There are no other identified studies that explored the epistemological beliefs of PE teachers. One of the explanations for the limited research on PE teachers' EB is the notion that PE teachers value educational outcomes such as physical fitness and character development over epistemic aims such as knowledge and skill acquisition (Lodewyk, 2009). Kulinna and Silverman (2000) found similar results, reporting that PE teachers across all grade levels held value orientations that favoured and thus emphasized physical activity and fitness domain outcomes over self-actualization (e.g., self-esteem and enjoyment), motor-skill and social development in their teaching. Finally, teacher-coaches perceived that the purpose of extracurricular sports was to promote health and physical activity, academic achievement and school community (Lacroix, Camiré & Trudel, 2008), without making reference to knowledge or learning in games. Notwithstanding, knowledge and understanding has been recognized in the literature as an essential component for developing physical literacy, a widely accepted goal of many quality PE programs, by “providing the foundation for knowing what to do and how and when to perform” (Cale & Harris, 2018, p. 280) various movement tasks, as well as understanding the principles of movement. Overall, the paucity of research related to PE

teachers' EB supports that there might be underlying ontological beliefs that influence what and how games are taught. Research related to the EB of coaches is also limited but has recently begun to permeate the sport and coaching literature.

EB and Coaches

Few studies have examined the epistemological beliefs of coaches (Edwards et al., 2016). When proposing the epistemological chain as a framework for examining coaching practices, Grecic and Collins (2013) noted that the relationship between coaches' beliefs and their coaching decisions have not been fully explored within the coaching or sporting literature. Only one empirical study was found that specifically focused on the EB of coaches. In this study, expert adventure sport coaches were determined to have discernable and complex EB that held practical implications in their instruction, primarily through the use of constructivist methods (Collins, Collins, & Grecic, 2015). These coaches adopted experiential, learner-centred and reflective approaches to their teaching, all of which were underpinned by their beliefs about knowledge and learning. Although beyond the scope of this research, the authors acknowledged the need to investigate how these coaches' EB actually influence student performance in their sport.

While the scarcity of research on elite sport coaches' EB is at least fathomable (due to factors such as the over-competitive nature, focus on non-epistemic aims, difficulty rolling out interventions, etc.), its absence is a bit more perplexing within educational settings and the context of developmental sport, yet may be partially explained by historical views on the roles of coaches and games more generally. Coaching has traditionally been viewed as a simple and technical profession, where proficiency in motor skills is the primary performance objective for athletes (Edwards et al, 2016). This approach often ignores the importance of holistic learning and knowledge development opportunities that games, particularly in the form of team sports,

can provide (Mandigo, Butler, & Hopper, 2007). However, Edwards et al. (2016) noted that coaching is being “increasingly recognised as a social, non-linear process, replete with issues of contextual contestation and negotiation” (p. 201) requiring coaches to be competent and adaptive in their planning and instructional methods (Grecic & Collins, 2013). In the wake of calls for a shift in sport coaching approaches based on evidence-based research (see Trudel & Gilbert, 2006), understanding the EB of coaches is now being proposed as a means of assessing and developing coaching practices.

This paradigm shift in coaching coincides with developments in coaching training programs. Where teacher education and PETE programs have actively emphasized reflection in terms of philosophical beliefs about knowledge, pedagogy and learning (Pike & Fletcher, 2014; Tsangaridou & O’Sullivan, 1997), notions of coaches critically examining their own practice are only now gaining traction in the scope of coaching development (Christian, Berry & Kearney, 2017). This was illustrated by Olsson, Cruickshank and Collins (2017), who recently recommended a framework for coach mentoring programs grounded in deliberate reflection on coaches’ EB. Nevertheless, Winchester, Culver and Camiré, (2011) point out that despite the fact that teacher-coaches in Canada often coach multiple sports and may have limited or no experience in the sport(s) they coach, they are not required to complete the training programs mandated for other developmental coaches, such as regional club sport coaches.

Understanding coaches’ beliefs about knowledge and learning is particularly relevant within the context of games that are developmental in nature, including extracurricular sport. There are currently no studies that have investigated the EB of teacher-coaches in schools, including teacher-coaches that teach PE. While it was anticipated that PE teacher-coaches may hold similar EB to those that do not coach as a result of similar learning experiences and training

(e.g., as PE students, within PETE programs, professional development, etc.), PE teacher-coaches also provide a different perspective because of the coaching context in which they facilitate the understanding of games knowledge. Additionally, this study was interested in how PE teacher-coaches' EB play out in terms of instruction when teaching and coaching, as well as how PE teacher-coaches justify similar or different instructional approaches in both roles from an epistemological or ontological standpoint.

Games Instruction

Rather than being concerned merely with the structure, sources, and justification of knowledge, epistemology now includes the individual and social processes by which knowledge is produced (Chinn et al., 2011; Quennerstedt, 2013). "A growing number of epistemologists have argued...that knowledge production is an ineliminably social enterprise...[and] regard knowledge as created and justified through social and institutional processes involving testimony, expertise, disagreement, and consensus-making (Chinn et al., 2011, p. 15)." This supports research related to teaching, coaching, and PE that the knowledge aims of learning games are not achieved through a singular, one-dimensional method of teaching or coaching (Byra, 2006) where knowledge is transmitted to passive learners as absolute truth (Prawat, 1992). Rather, instruction consists of complex social interactions (Trudel & Gilbert, 2006) involving multiple ways of knowing and constructs of learning such as EB. Again, how one makes meaning from or values these interactions are mediated by a number of factors including EB (Green & Hood, 2013). This serves to show the connection between elements of epistemology such as the beliefs about the sources and simplicity of knowledge and instruction.

Hofer (2001) outlined the links between epistemology and instruction by summarizing that both education and EB are developmental in nature and that EB, among other factors, guides

the learning environment in which the instructor (i.e., teacher or coach) creates. Muis and Duffy (2012) referred to this environment as the epistemic climate of a classroom, where the pedagogical methods, ways of teaching or instructional strategies that teacher-coaches adopt are at least partially informed by their EB and influence student learning. Instructional approaches in physical education and coaching sport-based games, like other educational curriculum content, fall along the continuum of direct or indirect (Byra, 2006; Lodewyk, 2015).

Direct instruction. Direct instruction is a conventional method of instruction characterized by the teacher or coach providing cues or tasks, which are followed by the student response (Rink, 2012). Through highly structured learning activities, student performance is refined through numerous practice trials. The key element to direct instruction is that the teacher or coach, rather than the student or athlete, is placed at the centre of the learning (Byra, 2006; Rink, 2012). Direct instruction has shown to be an effective and efficient method of teaching highly technical skills because it is often associated with large-group delivery whereby tasks can be broken down into manageable parts, clearly communicated and modelled, and refined immediately through observation and feedback (Rink, 2012).

In physical education and coaching, direct instruction remains the most commonly utilised method of teaching games (Byra, 2006; Singleton, 2009). Among other factors (see below), this predisposition is compounded by the notion that many physical education teacher education (PETE) (Butler, 2006) and coaching preparation programs (Olsson, Cruickshank & Collins, 2016) rely heavily on direct instruction when training teachers and coaches. Part of the rationale for the use of direct instruction to teach games is that students and athletes need to learn specific skills in isolation through drills and practice before they can apply their learning in a game situation (Light & Harvey, 2017). However, direct instruction has also been linked to

student disengagement due to factors such as limited social interaction with the teacher and peers and lack of meaning, particularly for students who demonstrate a disconnect with specific games (Lodewyk, 2015) or are of lower skill level (See Ennis, 2000; Kirk & MacPhail, 2002). As a result, there is a growing amount of research that supports more indirect approaches to games instruction.

Indirect instruction. Indirect instructional methods tend to be more student-centred and are generally grounded in constructivist approaches to learning, where learners actively construct or share in the construction of knowledge (Rink, 2012). Compared to direct methods of teaching, indirect approaches are less structured and place more emphasis on the process rather than the product (i.e., performance) of learning (Rink, 2012). As such, effective instructors that implement more indirect approaches still must create an environment that facilitates learning. Proponents of indirect methods of instruction in PE report student learning is deeper and more meaningful because their needs, interests and learning preferences receive substantial consideration throughout the learning process (Kirk & MacPhail, 2002).

Indirect approaches to teaching games include teaching strategies such as peer teaching, and cooperative and self-directed learning (Rink, 2012). Internationally, the Teaching Games for Understanding (TGfU) model has received considerable attention as an effective teaching method that exemplifies an indirect approach to instruction by placing games into specific categories (target, striking and fielding, net-wall and invasion/territory games) based on their tactical problems and solutions (Mandigo et al., 2007). Within the TGfU model, students learn the necessary skills and strategies by participating in games (rather than learning them first and then playing the game) whereby the principles of sampling, game representation, exaggeration and tactical complexity (Mandigo et al., 2007) are applied to a semi-structured learning

experience. TGfU and other indirect instructional approaches have been shown to improve student motivation, engagement and knowledge and skills of games (Oslin & Mitchell, 2006). Within the physical education literature, there has also been an increase in the number of research interventions and overall adoption of the Sport Education and Teaching Personal and Social Responsibility teaching models as methods of games instruction; however, compared to TGfU, these models are generally more adaptable to either direct and/or indirect approaches. Although there is a plethora of research that focuses on the beliefs, utilisation and effectiveness of various instructional approaches of teachers and coaches (see Byra, 2006), few studies have examined instruction through the specific lens of epistemological beliefs.

Therefore, the purpose of this grounded theory study was to better understand the epistemological beliefs of high school PE teacher-coaches and how those beliefs inform their teaching and coaching instructional practices in schools. The research questions that guided my study were: (1) what are the epistemological beliefs of PE teacher-coaches in terms of the sources and simplicity of games knowledge?; (2) how are PE teacher-coaches' epistemological beliefs related to teaching and coaching games similar or different, and in what ways?; and (3) how do PE teacher-coaches' epistemological beliefs inform their teaching and coaching instructional practices?

Chapter 3: Research Design

Introduction

This chapter outlines the research design implemented to conduct my study on the EB of teacher-coaches. I will begin by outlining my role as the researcher, and then turn my attention to my theoretical perspective and a justification for adopting a qualitative research approach and grounded theory methodology. Aligned with a grounded theory methodology, I will continue by providing a descriptive overview of my chosen data collection procedures, including sampling strategies, recruiting participants and interviewing as my primary method of data collection. I will then summarize my data analysis procedures, which were guided by my theoretical perspective and methodology. I will conclude by discussing my data representation approaches, trustworthiness strategies and essential ethical considerations for my research project.

Role of the Researcher and Researcher Positionality

I preface this chapter with my positionality statement, as an understanding of my role as the researcher is crucial in contextualizing my entire research design. I believe that acknowledging my positionality through personal, interpersonal and social reflexivity (Jones, Torres, & Arminio, 2014) is the starting point for this inquiry and has implications for how the knowledge and meaning yielded by my research is constructed and perceived. This begins with an awareness of myself as the researcher.

As a researcher, I am conscious of the beliefs and assumptions that have shaped my research exploration. While I may share some educational, teaching and coaching experiences with my participants, much of what I believe about physical activity has been cultivated by my own experiences and learning as a student in PE at all stages of my educational career. This includes my undergraduate and teacher education program at Brock University, as well as an

athlete on school- and community-based sport teams in both elementary and secondary school. I appreciate the value of physical activity and sport, and the associated positive outcomes, many of which I have personally experienced. Furthermore, through my educational training to become a certified PE teacher, I have developed beliefs related to the importance of student-centred approaches to learning and continued professional growth through reflective practice.

Certainly, my positionality (Jones et al., 2014) as a white, middle-class, male have also influenced the researcher-participant relationships that I developed during my fieldwork. Many PE teachers share these social identities (Douglas & Halas, 2013; Flintoff, Dowling & Fitzgerald, 2015) and the homogenous nature of teachers' social identities (e.g., ethnicity, class, gender, etc.) has been discussed as contributing to the perseverance of dominant norms and valued forms of knowledge in education (see Picower, 2009, for example). In the case of my research, this may have provided me with the ability to develop a rapport or strong relationship with the participants, which allowed them to be open and provide rich data. However, it is also important to note that a conscious effort was made to avoid making assumptions about participants in terms of perceived shared and oppositional identities, and instead encourage participants to share their knowledge and experiences. Where traditional positivist approaches view the roles of researcher and participant as clearly defined and hierarchical, I have adopted a constructivist perspective (see next section below) in an attempt to ensure participants feel they were actively involved and critical to the research process (Daley, 2007). The complex nature of shared, diverse and intersectional social identities, as well as the inherent power structures that exist within a researcher-participant relationship (Jones et al., 2014; Glesne, 2015) were important considerations throughout the research process.

Finally, although the significance of my research beyond my personal academic goals is clearly evident, an inquiry into the EB of teacher-coaches is personal to me in terms of understanding my own teaching and coaching practices, my potential position in this dual-role as a prospective educator, and my beliefs as a teacher, coach and researcher. To understand the lives and realities of my participants, I adhered to Glesne's (2015) recommendation to adopt the position and mindset of the researcher as a learner. As such, I have attempted to repeatedly acknowledge my role in the research process throughout this document, starting with my theoretical perspective or beliefs concerning the nature of research knowledge.

Theoretical Perspective

Crotty (2003) describes a researcher's theoretical perspective as "the philosophical stance informing the methodology and thus providing a context for the [research] process and grounding its logic and criteria" (p. 9). Often labeled and described as worldviews, paradigms or interpretive frameworks, theoretical perspectives carry certain beliefs and assumptions that a researcher brings to any scientific inquiry, including views related to ontology, epistemology and methodology (Creswell, 2013). Establishing and reflecting on my theoretical perspective is an important step in the research design process and represents one means of "situating the research" (Jones et al., 2014, p. 1). In that light, my research study was guided and shaped by my constructivist worldview.

Constructivism. Constructivists believe that individuals construct knowledge and meaning in their lives through social interactions, acknowledging that constructed realities are both subjective and interpretive in nature (Creswell, 2013). Creswell (2013) explains that these meanings are "varied and multiple, leading the researcher to look for the complexity of views" (p. 24), which is relevant to my study given the wide array of belief systems that individuals

possess and the complex nature of EB (Buehl & Fives, 2009). Furthermore, Creswell (2013) notes that constructivist “seek understanding of the world in which they live and work” (p. 8) and in the case of my research, provided the lens through which I positioned myself as the researcher, including negotiating my role as a co-constructor of knowledge in this shared meaning-making process. As such, a constructivist view allowed me to come to understand how teacher-coaches construct their perceptions, beliefs and justifications on epistemology in their teaching and coaching practices, while recognizing the social contexts in which this shared understanding was created.

Why Qualitative Research?

Within the education literature, much of the research on teachers’ EB has been conducted using quantitative methods (Hofer, 2001). As such, there have been repeated requests to examine this phenomenon qualitatively (Buehl & Fives, 2009; Kardash & Scholes, 1996), with claims that “a construct as intellectually complex and rich as one’s personal epistemology cannot presume to be fully captured by people’s responses to a set of normative statements” (Kardash & Scholes, 1996, p. 370). Qualitative studies give voice to the participants, promote an in-depth analysis of the phenomenon under study, and allow for an understanding of the complex nature and richness of human existence (Creswell, 2013; Jones et al., 2014). In the case of research on teachers’ beliefs, Rovegno (2003) stated “one of the goals of qualitative research is to share teachers’ stories in the hope of opening new possibilities of change for other teachers” (p. 305). With the research aims of understanding teacher-coaches’ EB and how they inform their teaching and coaching practices, a grounded theory methodology was used to make sense of participants’ beliefs and develop a theory that was ‘grounded’ in my interpretation of their stories.

Methodology

Grounded theory. As previously noted, I adopted a grounded theory methodological approach for this qualitative inquiry. Grounded theory is a “systematic, inductive, and comparative approach for conducting inquiry for the purpose of constructing theory” (Jones et al., 2014, p. 76). The grounded theory methodology is most notably characterized by the phases of data analysis wherein the theory is generated *from* the data, rather than being applied *to* the data, but has implications for the entire research process including sampling, data collection methods and representational strategies (Sparkes & Smith, 2014).

Grounded theory is an appropriate methodological choice when there is a paucity of research on the phenomenon under study or when the theoretical concepts developed to comprehend the phenomenon are not fully understood (Patton, 2002), as is the case in terms of research on both EB in general (Hofer, 2001) and in reference to teacher-coaches. As such, grounded theory supported my research aims to understand and develop concepts which may help to explain the EB of teacher-coaches and the influence on their instructional methods. More specifically, I assumed a constructivist-grounded theory methodological approach to my research on the basis that it aligns with my theoretical perspective.

Constructivist-grounded theory. Grounded theory as a methodology stems from post-positivist origins in which the experimental and systematic aspects of quantitative research were applied to qualitative inquiry (Charmaz, 2014; Creswell, 2013; Glesne, 2015). Through a post-positivist lens, grounded theory (now objectivist-ground theory) was initially developed as a means of conducting qualitative research objectively following strict rules for collecting and analysing data to develop theory related to the phenomena under study (Jones et al., 2014). While maintaining certain elements of previous conceptualizations of grounded theory,

constructivist-grounded theory has emerged as a methodology consistent with constructivist worldviews that acknowledges the interpretive nature of qualitative research (Charmaz, 2014; Creswell, 2013).

Constructivist-grounded theory “emphasizes diverse local worlds, multiple realities, and the complexities of particular worlds, views and actions”, (Creswell, 2013, p. 87) rather than a single ‘truth’ as voiced by the researcher as authority (Jones et al., 2014). Moreover, Charmaz’s (2006) approach views the systematic methods associated with Glaser and Strauss’ grounded theory as guidelines, rather than strict rules, placing more emphasis on the beliefs, assumptions and ideologies of both the participants and the researcher that inform the co-construction of knowledge and shared meaning-making experiences of qualitative inquiry through a constructivist paradigm (Creswell, 2013). Nonetheless, although data collection procedures and data analysis are presented as separate phases of the research design, I followed the process of analysis where these two phases occurred simultaneously, as is central to grounded theory (Sparkes & Smith, 2014). Furthermore, constructivist-grounded theory still advocates for conventional grounded theory strategies related to sampling, data collection and analysis (Creswell, 2013), which were adhered to as part of my research design.

Data Collection Procedures

Participants. As this study focused on the EB of teacher-coaches, it stands to reason that teacher-coaches themselves would be best suited to provide insights into their personal belief systems and instructional practices. Participants of this study were 6 secondary school PE teachers (3 females, 3 males), representing 4 schools from 2 different school boards located in south-central Canada. At the time of the study, each participant was also coaching at least one interscholastic team sport at his or her school. Teacher-coaches that coach team-based sports

were selected because of the similarities between teaching a PE class and coaching a team, rather than an individual-based school sport. Furthermore, secondary teachers were preferred as they were more likely to be specialist (vs. generalist) with specific educational, training and teaching experiences, which I believe had EB implications specific to PE and sport. There were no limitations concerning gender or other demographic factors, age, or level of experience; however, a broad range of participants was desired in terms of gender and teaching and coaching experience. The average age of the participants was 41 and their experience ranged from 3 to 23 years of teaching and coaching (average number of years PE teaching and coaching was 16). Participants were representative of all secondary grade levels (9-12) and the most common sports coached at some point in their careers were basketball (4 out of 6 participants) and volleyball (3 out of 6 participants).

Sampling strategies. Aligned with a constructivist-ground theory approach (Charmaz, 2014), purposeful sampling was used to select the participants in this study. Purposeful sampling, as described by Merriam (2001), “is based on the assumption that the investigator wants to discover, understand and gain insights and therefore must select a sample from which the most can be learned” (p. 61). It is this intentional selection of participants that leads to what Glesne (2015) refers to as information-rich cases, wherein the participants have much to offer in terms of experience and knowledge related to the phenomenon under study and my research aims. However, convenience sampling was also utilized to initially recruit participants through personal contacts via their publically accessible email addresses. From these contacts, snowball sampling was used to garner interest in the study and recruit further teacher-coaches.

Given the prior relationship with the initial participants, the existing power relationship associated between research and participants, and as a means of mitigating any possible feelings

of obligation or coercion to participate, all participants were reminded that involvement in the study was completely voluntary and their participation alone would not limit my ability to complete the research project. Furthermore, at no point in the study did I get the sense that I was in a position of power or authority as it relates to the relationship with these participants and they were afforded the same rights as all participants in terms of informed consent and the right to withdraw from the study at any time. Instead, many participants articulated the benefits of participating in the study, as is consistent with teacher research wherein participants are asked to reflect on their beliefs and practices as a means of critically examining their practice, improving as educators, and developing professionally (Rovegno, 2003). Furthermore, interviewing (as discussed in the following section) may be viewed as a form of reflective practice (Tsangarido, 2006), providing participants the opportunity to better understand themselves as teacher-coaches and be valuable contributors to research knowledge construction. Consequently, I am hopeful that through this research process I was able to achieve a sense of research beneficence and reciprocity (Jones et al., 2014).

In-depth semi-structured interviews. The primary form of data collection used in this study was in-depth semi-structured interviews. The decision to conduct semi-structured interviews reflects my own epistemological beliefs on how I view research knowledge to be constructed. As noted by Glesne (2014), “with the research goal of interpreting the social world from the perspectives of those who are actors in that world, it follows that the research methods include interacting with people...and talking with them about their perceptions” (p. 9). Semi-structured interviews allowed this dialogue to be created, including providing me the opportunity to probe and question for deeper meaning patterns (Glesne, 2015), while ensuring that the

guiding questions elicited responses that addressed the central research aims and questions of my study.

Following her study on differences in disciplinary EB in teachers, Hofer (2001) acknowledged the position held by others that interviewing is the ideal method of data collection for obtaining the rich, thick descriptions needed to better understand the complexities of teachers' EB and desired as a qualitative researcher. According to Creswell (2013), interviewing is the most common method of data collection adopted by grounded theorists, including conducting interviews as a means of constant comparative analysis. Rather than observing the teaching and coaching practices of my participants to make inferences about their epistemological beliefs, I wanted to hear and unpack teacher-coaches' voices as they share and make sense of their beliefs, and reflect on their instructional practices by telling their stories of experience (Glesne, 2015). Of course, as the researcher, I did not assume a passive role in this meaning-making process, and acknowledge that my interview questions, my positionality, and even subtleties such as the language I used or the interview environment I created shaped the entire interview process (Glesne, 2015) and thus, the data that was developed.

The interview process. The interviews lasted between 45 minutes to 1 hour and were recorded using an audio-recording device. The interview guide (see appendix E) included open-ended questions designed to (1) develop rapport with the participant as a means of building a relationship of trust where the teacher-coach feels comfortable in sharing their knowledge and beliefs (Glesne, 2015) and; (2) prompt teacher-coaches to reflect on their EB and the ways in which they teach and coach. Open-ended questions were preferable in obtaining rich-descriptions as they allowed participants to reflect on and flesh out their beliefs through open dialogue (Creswell, 2013). Lastly, this initial protocol was recognized as a fluent interviewing tool that

was refined and adapted based on the quality of the data collected and the emerging findings throughout the research process. Following each interview, I also engaged in reflective journaling, which served as an important instrument for researcher reflexivity and an additional method of data collection.

Reflexive journaling. Reflexive journaling is a necessity in qualitative research (Jones et al., 2014; Glesne, 2015) and recommended by Charmaz (2014) when adopting constructivist-grounded theory as a research methodology to begin formulating relevant concepts. Furthermore, as noted by Glesne (2015),

when you track your emotions, you learn more about your own values, attitudes, beliefs, interests, and needs. You learn that your history and experiences are the basis for your behaviors and interpretations and thus for the story that you are able to tell. (p. 150)

Journaling as I conducted my fieldwork allowed me to consider my pre-conceived beliefs and assumptions, reflect on my perceptions during the interviewing process, and mediate my role in the constructed data (Glesne, 2015). Furthermore, reflexive journaling on the context in which the data was collected and my subjectivity as a researcher provided greater interpretive openness and deeper insights as I moved to my data analysis (Jones et al., 2014).

Although I have included reflexive journaling within my data collection procedures, for ease of reading I will also discuss the important role of this process in my data analysis and representation. Given the importance of researcher reflection and the constant comparative nature associated with grounded theory as a methodology (Sparkes & Smith, 2014), I also engaged in reflective journaling during data analysis. When analysing the data, I used my journal entries to show the evolution of my interpretive thinking in terms of emerging themes and

categories, which I believe allowed me to create a robust, descriptive analysis and served as a method of research trustworthiness (Glesne, 2015). Although, my reflexive journal does not appear in my final write up, it was a valuable tool for moving from my initial and focused codes to constructing the conceptual categories that formulated my main findings (Charmaz, 2014) and documenting the research journey that I engaged in. Furthermore, it is important to note that reflexive journaling was not done as a means of separating my beliefs or assumptions from the data and findings, nor as a form of self-indulgence (Glesne, 2015), but rather to acknowledge my ever-present role throughout the research process.

Theoretical saturation. Finally, the sampling technique of theoretical saturation often cited by grounded theorists was adopted to justify when to stop sampling (Jones et al., 2014). Researchers that employ this technique continue to collect and analyze data “to the point of redundancy” (Jones et al., 2014, p. 114) where participants’ stories persistently reflect the emerging themes, categories and theory. As such, theoretical saturation through constant comparative analysis was also viewed as a strategy for trustworthiness (Glesne, 2015) in the form of checking my interpretation of the existing data against the experiences and perceptions of future participants. Although I initially aimed a sample size of approximately 8-10 participants, which is consistent with similar studies of this nature (Collins, Collins & Grecic, 2015), I believe that the 6 participants provided sufficient coverage (Glesne, 2015) to explore the “richness of anticipated responses” (Collins et al., 2015, p.227) and examine teacher-coaches’ beliefs in-depth.

Data Analysis

Consistent with my grounded theory methodology, a series of data analysis procedures were completed following the interviews, highlighted by initial, focused and theoretical coding.

The research questions that guided the study were also used as an organizational framework for my analysis of the data. Although the codes and themes generated through these analysis procedures were inductive in nature, once developed, they were organized (and presented in Chapter 4) within this framework based on their explanatory power (Glesne, 2015; Jones et al., 2014) in answering my research questions.

Transcribing. Immediately after each interview, the interviews were transcribed verbatim from the audio-recording device. Contextual elements of the dialogue (e.g., long pauses, vocal emotional responses, etc.) that were relevant to the data were included. Each transcript was then read multiple times to generate an overall sense of the discourse and further familiarize myself with the data (Glesne, 2015). Each transcription was then re-read and a general thematic analysis was conducted by searching for and writing down emerging themes and patterns. This coding was later used to compare and contrast with the themes generated through initial, focused, and theoretical coding (Charmaz, 2014).

Initial coding. Initial coding was completed by reading the transcripts and generating phrase or incident codes (Charmaz, 2014). Originally, I began by conducting line-by-line codes but transitioned to incident coding early in the process, noting that many of the line-by-line codes were irrelevant to the purpose of my investigation and lacked the context of my participants' views. These initial codes were in the form of action words and were written *in vivo*, or in the words of the participants (Glesne, 2015). For instance, when teacher-coaches were asked questions about their views on the simplicity of knowledge, their responses led to initial codes such as *making it simple*, *scaling back*, *having base knowledge*, *transferring skills*, *developing spatial awareness*, and *teaching general strategies*. Furthermore, my initial coding served the purpose of providing early themes and reducing the data to manageable amounts to generate

categories or patterns of meaning that emerged from the data (Creswell, 2013). This process allowed me to analyse the fine details by “unloosening the data” (Jones et al., 2014, p. 165) and aided in developing and comparing the larger concepts. Essentially, these early-developed codes formed the foundation upon which my conceptual theory of teacher-coaches EB emerged through further interpretive analysis (Sparkes & Smith, 2014). The participants’ words were used to capture teacher-coaches’ meanings and experiences (Charmaz, 2014) and as a means of increasing the trustworthiness that the theory truly emerged from the data (Glesne, 2015), although additional trustworthiness strategies will be discussed later. Further data analysis was required to reduce and refine the initial themes, which was accomplished through focused coding.

Focused coding. Focused coding involved generating overarching themes or categories from similar initial codes established from each transcript, not on the basis of quantity, but rather founded on theoretical and explanatory power (Glesne, 2015; Jones et al., 2014). Although this technique is outlined as separate from initial coding, my focused coding process occurred almost simultaneously as I began to see the connections between the properties of my initial codes. Compared to my initial coding, the focused codes generated were more conceptual in nature and were analysed against the current literature (Jones et al., 2014). Moreover, in the case of many of the codes generated through my initial analysis, “focused coding simply meant using certain initial codes that had more theoretical reach, direction, and centrality and treating them as core” (Charmaz, 2014, p. 141) when reviewing the relevant literature. For example, the first theme presented in my findings (*learning in action*) was an initial code elevated to a focused code or theme because it encapsulated views of games knowledge being constructed through movement and relates to the concept of situated learning in games (Harvey & Jarrett, 2014; Kirk &

MacPhail, 2002; Mandigo et al., 2007). Additionally, as part of my focused coding process, definitions of meaning for each theme or category with relevant sub-themes and codes that inform and justify the developed themes were created. Finally, each transcript was re-read from the perspective of the emerging themes to test the developing concepts, examine the data through a different lens and add depth to the analysis (Sparkes & Smith, 2014). The final step of the data analysis was theoretical coding.

Theoretical coding. My theoretical or selective coding involved linking the focused codes (themes) and sub-themes as a means of developing a theoretical model that can be supported by the data and existing literature (Sparkes & Smith, 2014). For example, the focused codes of *transferring knowledge and skills*, *integrating health knowledge*, and *applying knowledge beyond the gymnasium* were interpreted as being associated with rather complex EB based on previous conceptualizations of views on the simplicity of knowledge, including in PE (see Lodewyk & Gao, 2013, for example). Thus, these focused codes, along with my interpretation of how teacher-coaches presented their views related to the simplicity of games knowledge, evolved to the final theme of *acknowledging complex aspects of games*. Although the literature was used to explain certain focused codes that emerged, I also attempted to make clear connections with the raw data by ensuring that the codes still reflected the experiences and meanings described by my participants (Charmaz, 2014). Consistent with my grounded theory methodological approach, theoretical coding was therefore used to enrich and refine the themes, sub-themes, and concepts that emerged during my data collection and analysis.

The final phase of data analysis also brought together the focused codes to provide theoretical conclusions that sought to demonstrate how they were interrelated (Charmaz, 2014) and explain how teacher-coaches' EB and their instructional approaches are understood through

my interpretive lens. This challenging process led to the development of my core theme of *beliefs and practices as a reflection of social learning environments* (see Chapter 4), which reflected the common thread of how the context of social learning environments influences the teaching and coaching beliefs and practices of participants as interpreted through my developed themes. Finally, this strategy involved re-analyzing the data with the emerging themes and theory in mind, as a means of adding depth to the inquiry and ensuring that the theory truly ‘emerged’ from the data, as opposed to applying existing theories that fit the data (Charmaz, 2014). As noted by Charmaz, this is often one of the challenges associated with theoretical coding and grounded theory more generally, and for me, demonstrated the importance of returning to the data and in particular some of the initial codes that informed my overall themes. Although presented as a separate stage of my data analysis, I will now discuss how constant comparative analysis was utilized as consistent with constructivist-grounded theory.

Constant comparative analysis. Constant comparative analysis refers to the notion that data collection and analysis occur simultaneously (Sparkes & Smith, 2014). Therefore, although the data collection and the above data analysis steps have been presented as separate phases of the research design, I did employ this constant comparison technique. Constant comparative analysis is substantiated by grounded theory in that it allows the theory to emerge and build from the data as it is collected, leading to theoretical sampling to refine and deepen the theory throughout the research process (Sparkes & Smith, 2014). In the case of the present study, this was achieved by engaging in data analysis as each interview was completed and conducting each subsequent interview with the emerging themes in mind. Continued engagement in the literature was an additional element of constant comparison that I adopted during the data collection and analysis phases of my study. This served to produce a more layered analysis wherein the data

was viewed from various theoretical perspectives (Jones et al., 2014). Lastly, my writing process also involved a level of constant comparison as I returned to my literature review as a means of considering how my findings are explained by existing research, or how my theory contradicts or builds on previous findings (Charmaz, 2014). The themes, categories and theory that emerged from my data analysis procedures are represented in my findings and discussion chapter.

Representation of Data

Since the writing of my thesis is the culmination of this research project, my theoretical perspective and methodology undoubtedly influenced how I chose to represent my findings. Creswell (2013) argues that grounded theory research must “go beyond description” (p. 83) to provide a theoretical representation of the reality as constructed by the participants. This will be accomplished thematically by presenting the major themes and categories as developed during my data analysis. Furthermore, it is recommended that grounded theorist ‘show’ rather than ‘tell’ how the theoretical understanding was constructed as a means of demonstrating that the theory did indeed emerge from the data (Glesne, 2015). This was accomplished by including direct quotes from my participants alongside my interpretation as the researcher. This interweaving of the participants’ voices as insiders (emic) and my interpretive illustrations as the researcher (etic) also reflects the idea that the findings were co-constructed through our shared social interactions. This allowed me to honour my participants’ beliefs about teaching and coaching while also acknowledging my role in conceptualizing this phenomenon. Finally, as is the case with most qualitative research, the purpose of the findings was not to generalize across all teacher-coaches. As noted by Jones et al. (2014), “knowledge and meaning are always partial, conditional and perspectival” (p. 16) and readers should take away from my participants’ stories their own meaning and consider that meaning within their own social contexts.

Trustworthiness

Even though my constructivist worldview acknowledges and accepts research subjectivity, it was important that as a researcher I took intentional steps to ensure research quality (Glesne, 2015). My positionality statement is intended to make readers aware of the subjectivity in my research as evident by my experiences, beliefs and assumptions, and thus, may be viewed as a form of trustworthiness. Likewise, I have hinted at theoretical saturation and reflexive journaling as potential trustworthiness strategies forming part of my research design; however, I will use this section to mainly discuss member checking and thick description as trustworthiness approaches that were implemented to assure research quality throughout my project.

Member checking. Rather than sending full transcripts to participants to review for accuracy in data collection, member checking was used as outlined by Glesne (2015) to involve participants in the interpretive process by sending each participant a draft of the initial themes generated from the interviews. These themes were accompanied with explanations supporting the major findings based on my interpretation of their data. Not only was this less time consuming for participants, it achieved the same purpose in terms of verifying the correctness of the data collection and providing insights into my ability to suspend judgement, interpret the data and ensure the findings are inductive in nature as is essential in grounded theory (Glesne, 2015). Moreover, the intent was to use the responses from the participants in terms of confirmations, clarifications and further explanations as an additional level of data analysis. Unfortunately, only 2 of the 6 participants chose to participate in this phase of the research and little could be attained in terms of additional analysis from the feedback that was received. Both participants that responded indicated that the interpreted findings were an accurate reflection of their responses to

the interview questions and had no further clarifications to add. Therefore, this feedback provided some validity to the overall findings of the study from the perspective of the participants.

Thick descriptions. Thick descriptions enhance research credibility by providing “detailed, expressive and explicit explanations of [the] phenomenon” (Jones et al., 2014 d, p. 36) under study. As outlined in my data representation section, information-rich quotes in the words of my participants and descriptive elements of the emerging categories do form a part of the research written representations. These thick descriptions permit the reader to determine the ‘transferability’ or meaning of the research outcomes based on the clear overview of the social context in which the findings were constructed (Creswell, 2013), which I have attempted to foreshadow throughout this chapter. Finally, where appropriate, negative case analysis was included as a means of trustworthiness by presenting opposing views and perspectives as it relates to my interpretations (Jones et al., 2014), which I trust revealed the complex nature and multiple ways of understanding teacher-coaches’ epistemological views.

Ethical Considerations

Researchers should aim to develop two qualities when faced with ethical dilemmas; “the sensitivity to identify an ethical issue and the responsibility to feel committed to acting appropriately in regard to such issues” (Eisner & Peshkin, 1990, p. 244 in Jones et al., 2014). To ensure I exhibited these attributes, the Research Ethics Board of Brock University approved my research.

Informed consent. As previously noted, participation in this study was completely voluntary. All participants signed a consent form (Appendix D) outlining the research purpose, what was involved in the research process, their rights as participants – including their right to

withdraw at any time without consequences – and my responsibilities as a researcher (Jones et al., 2015). These responsibilities included making my participants aware of any potential risks of participation. I believe it was important to explicitly affirm that the purpose of my study was not to criticize their beliefs and instructional practices. As a certified teacher, my participants are essentially my colleagues and to do so would be unprofessional and in violation of my teaching association's ethical standards. Rather, the purpose was to explore, critically examine, and in certain cases, challenge their beliefs and practices, as a means of better understanding the many factors that influence their teaching and coaching. Finally, my responsibility as a researcher also extended to ensuring confidentiality and anonymity.

Confidentiality and anonymity. Care was taken to ensure that confidentiality was maintained throughout the research process by keeping what was shared during my fieldwork between myself and the individual participants (Glesne, 2015). All data was kept on a password-protected personal computer and any hard copy documents (e.g., consent forms) were kept in a locked storage cabinet where only I was able to access them. Furthermore, anonymity was addressed by using pseudonyms for my participants and removing any descriptive identifiers (Glesne, 2015) from my research journal and final write up.

Conclusion

Overall, the research design decisions as noted above were guided by my theoretical perspective, methodology, and central research aims and questions. Specifically, the selected methods of data collection and analysis, trustworthiness strategies, and representation decisions were consistent with my constructivist-grounded theory approach, as well as my goals of understanding and unpacking teacher-coaches' EB and their instructional practices. The following chapter outlines the main findings of the study.

Chapter 4: Findings

Introduction

This chapter consists of the main findings of the study resulting from my analysis of the data collected during the interviews of teacher-coach participants. The chapter has been organized into three main sections intended to address each of my three research questions. As a reminder, the research questions that directed my study were: (1) What are the epistemological beliefs of PE teacher-coaches in terms of the sources and simplicity of games knowledge?; (2) are PE teacher-coaches' epistemological beliefs related to teaching and coaching games similar or different, and in what ways?; and (3) how do PE teacher-coaches' epistemological beliefs inform their teaching and coaching instructional practices? The sub-headings within each section represent the central themes that emerged from my initial and focused coding analysis and are supported with thick descriptions from the raw data for trustworthiness as outlined in Chapter 3. The core theme developed as part of my grounded theory methodology is then presented followed by a summary and comparison of the main findings which can be found in Table 1 located at the end of this chapter. It is important to reiterate that these findings signify my interpretation of the data and the purpose of this study was not to generalize teacher-coaches' EB. Rather, these findings are meant to provide insights into the complex nature of teacher-coaches' beliefs within the specific contexts of their experiences and contribute to an understanding of the factors that influence teacher-coaches' teaching and coaching practices.

Teacher-coaches' EB on the Sources and Simplicity of Games Knowledge

Sources of knowledge. One of the purposes of this study was to determine what teacher-coaches believe are the sources of games knowledge. Again, it is important to distinguish that this inquiry relates to where teacher-coaches believe *students'* knowledge of games originates

and not where teacher-coaches think knowledge concerning teaching and coaching games comes from. The findings of this study suggest that teacher-coaches rely on a variety of sources of knowledge in both their teaching and coaching of games. As previously discussed, EB concerning the sources of knowledge are often associated with the extent to which one believes knowledge is internally constructed or externally conveyed (Beuhl & Fives 2009; Hofer & Pintrich, 1997; Lodewyk & Gao, 2013). Teacher-coaches in this study believe that games knowledge derives from both internal and external sources, including the student themselves via internal construction, as well as external sources such as the teacher-coach and student peers.

Learning in action. Internally, teacher-coaches place emphasis on the role of movement experiences and the body as a valid source of knowing through participation in games. Scott described the importance of being a *“kinaesthetic learner who is okay being put in that situation where they are learning from their physical mistakes”*, suggesting that engaging in movement provides students with feedback knowledge (i.e. knowledge of results or knowledge of performance) as a means of, for example, refining and improving movement skills. Similarly, Brendan outlined how he uses game play to facilitate learning, stating, *“there is a lot of the learning happening [through] actual play and movement.”* From the students perspective, he noted, *“you’re thinking, your brain is working, you’re reading stuff, you’re picking up movements and you don’t even realize your learning”*, indicating that this type of learning allows students to acquire relevant games knowledge through their sensory-motor experiences. For example, the idea of *“picking up [the] movements”* of other players through game play could potentially provide students with information related to the tendencies of teammates or opponents and lead to more effective decision-making in games. The notion of engaging in game scenarios and providing opportunities for students to both acquire knowledge and apply that

knowledge in a game situation is consistent with the concept of situated learning (Harvey & Jarrett, 2014; Kirk & MacPhail, 2002; Mandigo et al., 2007). Jeff further illustrated this idea noting that even in a case where specific knowledge may originate from himself as an external source, student participation is required to solidify their learning. In the case of teaching students movement skills in PE, he stated, *“I think I will often introduce [a skill] but it’s from them participating and doing the skill where they learn and they pick up on it.”* Furthermore, Scott discussed how he promotes *“learning in action”* or *“learning while [students] are playing”* in the context of his coaching practice. Perhaps more so than other disciplines, teacher-coaches believe experiential learning is relevant to teaching and coaching games, which is reflected in their instructional approaches as will be reviewed later. Within the context of experiential learning, teacher-coaches also believe that students internally construct knowledge within the framework of their existing games knowledge.

Constructing knowledge. Teacher-coaches carry the mindset that *how* students construct knowledge internally is impacted by their existing games knowledge. When discussing how he might introduce a new game to his PE classes, Brendan indicated he uses the common teaching strategy of a diagnostic assessment or pre-test (Colquit, Pritchard, Johnson, & McCollum, 2017), wherein he initially determines *“if the game can be played fairly successfully”* to establish an appropriate entry point for learning. He indicated, *“we might start off with a game and then analyze the game, and look at what we need.”* Likewise, Jillian specified that she would often *“discuss [with students] what they know about the sport first.”* She goes on to say, *“I want to get to know, what kind of background we’re dealing with here”* and *“to kind of see where they’re all coming from”*, noting that students enter the high school level with a wide range of games knowledge and skills. Charlotte described this process as looking for *“a gap in understanding”*

and Scott spoke about the importance of assessing and *“building off previous knowledge.”* These findings are consistent with constructivist views on learning that theorize students actively ‘fit’ and make sense of new learning experiences within the context of their current knowledge (Light, 2008). Beyond EB, teacher-coaches believe there are other factors that influence knowledge construction and learning in games.

This constructivist view of learning was also evident in teacher-coaches beliefs that perceptions of learning are shaped by previous experiences in games. Karen described this as the *“psychology that a student is bringing into a classroom...based on their past experiences.”* When comparing students in his PE class against those that tend to participate in extracurricular sports, Scott noted that students on school sport teams tend to have more experience playing games and perhaps a more positive outlook on sports, which may be influenced by factors such as parental perceptions of physical activity, among other influences. He explained:

So for me, when I’m coaching, especially a more competitive team, I understand that these kids already participate and play in sports outside of the classroom. So these are kids who have grown up being active. These are kids who have grown up and obviously somebody in their lives, whether it be a parent or guardian or mentor, has already kind of emphasized the importance of movement and activity to them.”

Additionally, Jeff suggested that students *“who have not had a good experience in PE often don’t want to try or put the effort in”*, inferring that motivation and attitude toward physical activity may also be influenced by previous experiences in games participation and can impact student learning. As such, teacher-coaches consider both the nature and extent of those experiences (e.g., amount of time participating in specific sports), as well as how students perceive those experiences (i.e., positively or negatively) when evaluating how students form

knowledge. Additionally, part of the participants' teaching role is to provide learning experiences that may transform students' perceptions of games or PA more generally. Findings of this study also suggest that knowledge in games derives from external sources that are shared with students through various learning experiences. Examples of external sources of games knowledge as identified by teacher-coaches included the teacher-coach themselves and student peers.

Teacher-coach as an expert. Previous studies confirm that the teachers and coaches are often regarded as the main source of games knowledge when it comes to student learning (Byra, 2006, Lodewyk, 2015). Teacher-coaches in this study concurred that their role as a teacher or coach is characterized by being an authority of games knowledge. For example, when discussing skill development in games, teacher-coaches made reference to “*modelling*” (Jillian), “*showing*” (Scott) and “*demonstrating*” (Jeff) as a means of teaching movement skills to students. In particular, Jillian felt that the teacher's ability to perform movement skills and participate in games with students during PE was important for demonstrating teachers “*have the knowledge*” and “*proving yourself*” to students. She recalled that during her experiences as a PE student, “*I didn't have teachers able to do that...[and] always felt like, why are we doing it?*” (emphasis added).

One of the main ‘types’ of knowledge that teacher-coaches disseminate to their students and athletes are refining cues (Rink, 2012) or feedback related to the performance of movement skills. This was particularly relevant in the context of coaching where teacher-coaches noted many students already have a foundation of game-specific knowledge and skills, and their function as a coach is to offer “*little adjustments*” or “*correct the little things*” (Jeff) to improve performance and game play. Karen provided the example of “*working on technique*” when teaching students how to strike the ball in field hockey, noting that she might tell students “*if you*

step this way [or] change this up your hit is going to be stronger". Brendan indicated his approach to providing this type of feedback in PE would be to *"talk to everybody"* about *"separating their hands or softening their hands"* when teaching basketball shooting (i.e., rather than *"singling [individual] students out"*); whereas Scott believed that coaching extracurricular sports provided more opportunity for *"individual feedback"* and *"one-on-one interactions"*. As will be discussed later, teacher-coaches preference toward direct instruction when coaching also supports that participants viewed themselves as an authority of knowledge in the context of extracurricular sports, given that this instructional method is often more teacher-centred (Rink, 2012). Importantly, as it relates to the where knowledge originates, teacher-coaches recognized that they are not the *only* source of knowledge for teaching and coaching games.

For example, Scott provided insights into a learning progression he implements during basketball practices to teach students about specific offensive strategies or plays. *"We write it on the white board, we show it to them, we actually physically stand on the court, have guys do movement without defense first, then add in the defense second...and just kind of repetition over and over."* This illustrates that although Scott may view himself as a primary source of knowledge and understanding initially, he then sequences tasks requiring students to apply that knowledge and as discussed in the previous section, learn through participating in game-like situations. Similarly, when Jeff was asked directly whether games knowledge comes from 'experts' like him (as the teacher) or is constructed by the students themselves, he summarized:

*I think it comes from both...It's like a jump shot in basketball or a golf swing, right?
Everyone has their own little parts to it. So I can show you the basics but you are, as a participant, going to fine-tune that on your own, through participating in the sport and*

the activity. And everyone develops their own sort of slight variations and it's not to say that one is more right than another.

The above comment also signifies rather complex EB related to the simplicity of knowledge (to be discussed later), revealing that there are multiple ways of 'knowing' in games. Furthermore, learning and knowledge acquisition is a complex social process requiring students to analyze, evaluate and make sense of information from a multitude of sources (Green & Hood, 2013). This view that games knowledge should be developed from multiple sources was also evident in teacher-coaches beliefs that students that participant in PE and interscholastic sports derive knowledge from their peers.

Learning from peers. Participants also acknowledged student peers as a recurring source of knowledge when teaching and coaching games. For teacher-coaches, this is achieved by providing various peer teaching, mentoring and leadership opportunities for students during both PE lessons and team practices.

Charlotte provided an example of a project in her PE class where students are "*given different parameters, pair up, and have to create a game.*" This requires that students have an understanding of various types of games or game categories, and corresponding rules, skills and tactics common to games within those categories (Mandigo et al., 2007). In this instance, learning from peers also occurs when "*the kids get to direct the lesson*" and the other students in the class get the chance to "*play some of those games.*" Karen referenced providing students with opportunities "*where they're a coach*", such as a peer-teaching movement analysis exercise she incorporates into her PE classes. She explained, "*they take video of other students doing a good skill, they give feedback [and are] involved in the process of the learning and the teaching.*" Similarly, Brendan described appointing students on school sport teams as

“captains” or *“assistant coaches”* in his sport-focused PE class who are then responsible for *“taking direction of the class”* including *“initiating the warm-up”*, *“[running] drills with their teams”*, *“helping [other students] out with rules”* and *“organizing their own games.”* In this example, students that participate in extracurricular sports are asked to take on a leadership role and apply some of their learning and sport-specific experience in the PE class setting.

In extracurricular sports, teacher-coaches implement similar strategies that promote learning from peers. Karen indicated she would *“get senior students to take part”* in providing feedback and refining movement tasks as a means of mentoring younger students when practicing in field hockey, for example. Charlotte discussed an interaction wherein a student on the rugby team *“spent some time with another teammate and came up with four drills she wanted to do”* during practice that focused on areas the student felt the team could improve. She went on to say that she told her *“I guess you’re running practice on Monday”* and noted that this type of approach was an effective means of *“giving her that voice and giving her that time and opportunity.”* In the case of both teaching and coaching, the way in which teacher-coaches utilize peers as a source of learning in games appears to be more about providing students with purposeful and meaningful social interactions, and engaging in the learning process collectively (Cox, Duncheon, & McDavid, 2009), rather than what individual students may have to offer in terms of knowledge. However, data from this study supports that teacher-coaches create ‘epistemic climates’ (Muis & Duffy, 2013) or learning environments that facilitate knowledge construction and holistic development through these sources. These learning environments are also influenced by teacher-coaches beliefs about the simplicity of knowledge.

Simplicity of knowledge. This study also sought to determine if participants believe games knowledge is simple or complex in the context of teaching and coaching. Teacher-coaches

portrayed learning in PE and through interscholastic sports as easy, and more specifically games knowledge as simple, but concurrently describe rather complex beliefs including how games knowledge is integrated, contextual and transferrable within and outside of a movement setting. Furthermore, teacher-coaches views about the simplicity of knowledge may be confuted by an emphasis on inclusion and participation in both PE and extracurricular sports and beliefs that all students should be provided the opportunity to partake in games regardless of skill, ability or other participation factors. As such, there are other teaching and coaching dynamics that influence whether teacher-coaches engage students in the complex aspects of games, including their beliefs about the purpose or aims of PE and extracurricular sports.

Knowing in games as simple. Participants viewed certain components of games as simple including “*basic functional movements*” (Scott), “*basic rules*” (Jeff) and “*general strategies*” (Jeff). Brendan was fairly blunt when discussing the skill level of students in his grade 9 PE class, stating many “*show up who can’t run, and they can’t throw, and I think those are basic things.*” Jillian indicated that from the “*average*” high school student’s viewpoint, learning in PE is “*something they are used to [and] are comfortable with*” and with the right “*positive energy, I think they find it easy to learn*”, again implying that teacher-coaches EB are at least partially informed by other factors that influence learning, including students’ attitudes toward games participation. Jeff concurred noting that even in the case of unfamiliar games, students “*generally pick up things quite easily*” and “*pick up on it quickly*” but again noted that these beliefs are dependent on the individual student. Although there is some debate in the literature about whether the speed of learning represents a component of EB (see Chapter 2), this adds to the data supporting that teacher-coaches, at least on the surface, view certain aspects of games knowledge as less ambiguous and more simple.

Moreover, when Charlotte was questioned about her preferred instructional methods when both teaching and coaching the game of rugby at the high school level, she was quoted as trying to “*make it very simple*”, going as far as running “*basic drills...[including] stuff that they do with 6-year olds.*” Scott indicated he adopts a similar approach by “*trying not to be too in-depth with it...and scaling back a little bit in PE class just to give them (students)*” a “*base knowledge.*” While these teaching strategies are practical in terms of breaking down learning tasks into manageable parts (Rink, 2012) and aligning your instructional approach with the needs and abilities of your students, there was very little discussion about challenging students and engaging into deeper learning experiences in games, particularly in the case of PE. Only Karen indicated that she implements a TGfU instructional approach in which she organizes lessons designed to progress “*from simple, to moderate, to complex [games] strategies by the end of the semester.*” As will be discussed below, teacher-coaches do acknowledge there are complex aspects of games, which leads to questions of why PE teachers portray games knowledge as simple and teach and coach accordingly.

These views on the simplicity of knowledge may be a reflection of teacher-coaches years of teaching, coaching, training and participating in various games and physical activities; to them, knowledge acquisition in games may be easy. Furthermore, these PE teachers themselves may be skilled and experienced game players. However, the data collected also points to a few possible explanations. Brendan alluded to the comprehensive nature of the Ontario Health and Physical Education curriculum as a limitation, with so many important (but different) learning outcomes making it difficult to teach relatively in-depth aspects of games. He advised, “*the broad curriculum hurts...because you’re just so expansive you kind of wish-wash between everything*”, which may lead to a more ‘superficial’ knowledge when teaching games.

Furthermore, beliefs about the simplicity of knowledge may be influenced by strong views that participation and inclusion in both PE and extracurricular sports should be prioritized over knowledge construction in the 'traditional' sense of academics.

Emphasizing participation and inclusion. Beliefs related to the simplicity of knowledge could be explained by the emphasis on student participation and views that all students should be provided the opportunity to participate in a variety of physical activities or games regardless of skill, ability or other participation factors. Scott confirmed that at his present school, "*we try to focus more on the aspect of participation*" and "*stress participation so much*" in PE. When Karen was asked how she knows students in her PE are learning, she replied, "*they are participating*" and that she "*want[s] to see positive approaches to participating*" to know they are engaged in the learning process. Jeff noted that to be successful in PE, students must, "*be here, be active, be nice. Those are my three keys in PE. You got to be in attendance, you got to participate, and treat others the way you want to be treated.*" This raised the question of whether learning in PE should be associated with students simply 'showing up' and 'moving' during the lesson. Scott was asked whether there is an *over*-emphasis on participation that contributes to views of knowledge in games as simple and overall perceptions of PE as an 'easy' or 'non-academic' course:

So I do think that that plays into it (PE) being considered a bird course. I think that the participation is something that kind of hinders it a little bit, but at the same time, it's also that aspect and idea of we'd still like them to be physically active, and so you don't want to go too much in the other direction where they are so against sports and games and activities that they don't even bother signing up for the course. So I understand there is a balance, but I do think it's tipped a bit too much in participation's favour at this point."

The above quote seems to suggest that holding beliefs that games knowledge is complex and teaching in a way that reflects those views would somehow contradict what students often perceive as positive attributes of PE such as fun and enjoyment (O'Reilly, Tompkins, & Gallant, 2001). Nevertheless, it is also important to understand that in the context of the Ontario HPE curriculum there are many learning outcomes that are associated with simply participating in games (Ontario Ministry of Education, 2015). Furthermore, it could be argued that curriculum expectations are satisfied with students demonstrating a 'basic' understanding of game rules, skills, and strategies, for instance. Teacher-coaches beliefs about the importance of inclusion was also evident as it relates to their coaching and were associated with their views on the purpose and aims of extracurricular sports.

Prioritizing participation was also important for teacher-coaches in the context of their coaching roles. For example, both Charlotte and Karen indicated that they do not make 'cuts' for players trying out for sport teams as a means of promoting inclusion and providing physical activity opportunities for all students even in an extracurricular setting. In regards to her rugby team, Charlotte explained, *"I am very adamant about inclusion...my belief is, show up, get fit, and what's so awesome about rugby is that it doesn't matter your size or your shape or your ability, there's a position for you on the field."* She added: *"I never cut. And I have had so much flack from my colleagues, why are you taking eighty kids [on a team]? I'm just adamant. Let them do what they want to do, have choice and learn something new."* Brendan took a similar position, stating that the *"goal of extracurricular [sports] is fun participation."* In reference to restricting sport opportunities on school teams to elite athletes he said, *"I think it's limiting... I believe our gym should be open after school every day and we can provide different opportunities for [students] to play every day, after school, so any kid that wants to be active can*

be.” As currently constructed, he held strong beliefs that interscholastic competition leaves “*too many kids without access to sport.*” This is in stark contrast to Scott’s outlook that extracurricular sports should primarily “*focus on the aspect of winning and actually having a team that is built and essentially made for competition.*” He verified that, “*there are tryouts, which means not everybody makes it. It really is more for elite level athletes in those particular sports and the competition is really what they are there for.*” Overall, these differences in opinions can influence participants approach certain aspects of their teaching or coaching, including knowledge acquisition.

Acknowledging complex aspects of games. Beliefs regarding the simplicity of knowledge are also associated with views on how games knowledge is integrated, contextual and transferrable, including how it relates to other health-related concepts and learning beyond the school environment. Participants discussed the importance of making connections *within* games, such as the ability to understand and perform “*transferrable skills that they can use across [different] games*” (Scott). Similarly, Jeff proposed that successful students in PE “*can easily transfer the skills and strategies from a racquet sport like badminton to tennis*”, for example. Participants also recognized the link between games and other domains related to movement studies such as fitness (Charlotte on French cricket: “*I was watching their ability to be agile and their quick reaction time*”) and other disciplines or fields such as science (Karen on teaching hits in field hockey: “*We work on [the] biomechanics of using your stick properly*”). And while not directly related to knowledge, Charlotte believed that the ability to transfer “*the skills that they learn in PE, things like teamwork, communication and organization, are obviously applicable to other aspects of school*” and can thus contribute to students’ academic success (Whittle, Telford, & Benson, 2019). Finally, she also described how knowledge related to movement concepts such

as spatial awareness, including reading the physical environment and decision-making, are developed through the contextual nature of games. She explained how this might be implemented in rugby and other games:

I can see them [students] looking for holes, I can see them making decisions. Making the right decisions, based on what is presented in front of them. And that's what's important. You can teach anybody how to pass a basketball or shoot a basketball, but is it actually the right thing to be doing in that sense.

This quote aligns with beliefs that games knowledge may not be entirely factual and cannot simply be memorized by students. Particularly in the case of high level sports, game play can necessitate that students have an in-depth understanding of different movement concepts (body awareness, spatial awareness, effort and relationships) and provide repeated opportunities to apply knowledge in different game situations. The contextual nature of games was also evident in Jeff's beliefs that games knowledge can be disputed, rather than simply accepted from knowledge authorities such as a coach. He stated, *"I give them suggestions and my take on it. It doesn't mean that they're always going to listen. I can say your elbow comes out on your jump shot, but will they take that advice? Well maybe, maybe not."* As will be discussed in the next section, it is through extracurricular sports that these complex aspects of games appear to be more of a priority for teacher-coaches. Views on the integration of games knowledge with other health-related topics also provide some insights into teacher-coaches' EB related to the simplicity of knowledge.

Despite being advised that this study focused on games, many participants associated learning in PE with the comprehension of general health knowledge. When asked what the important knowledge that students take away from participating in PE classes, participants

identified health topics such as “*nutrition*” (Charlotte), “*mental health*” (Jillian), “*making healthy choices*” (Karen), “*sexual health*” (Brendan) and “*drug [substance] use*” (Jeff). However, teacher-coaches held diverse beliefs in terms of how games knowledge can be integrated with these health areas. For instance, the view of games knowledge as ‘isolated’ was evident in Jillian’s response, “*So, are we talking in health or are we talking in gym class? Are we talking the physical part or the mental part?*” Comparatively, Scott articulated a more integrated perspective of games knowledge and health, suggesting “*there is obviously a connection of understanding your body, understanding that physical activity is good for your body...as a whole, including your mind and everything like that.*” Overall, there is research supporting that PE teachers have difficulty making connections between PA components of PE and learning associated with health-related knowledge (Lodewyk & Gao, 2013). Moreover, in the case of research related to EB, practicing and prospective PE teachers often hold a wide range of beliefs (Lodewyk, 2011, 2015). In the case of this study, teacher-coaches beliefs about the importance of students transferring knowledge from games to aspects of their lives beyond school are much clearer.

For teacher-coaches, knowledge construction in the traditional sense of academics may be less of a focus when teaching games compared to the notion of providing positive learning experiences that will encourage students to live healthy, active lives during and beyond their school years. As such, teacher-coaches felt that participating in games through PE or extracurricular sports at the high school level encouraged students to participate in some form of PA as adults, regardless of whether they attained or demonstrated a deep level of understanding. Jeff cemented the idea that even having a “*basic knowledge*” of games is sufficient for students to feel “*comfortable playing or participating as an adult*” and allowed students to “*go and*

easily pick up and participate in other sports and activities after high school.” Karen agreed that one of her aims of teaching games was for students *“to feel like, even when they’re older, they go out to do something and they’re like, hey I know how to do that!”* Furthermore, she proposed the relationship between participating in games and the notion of overall well-being, which has positive outcomes beyond school. She stated, *“It doesn’t matter if they’re not the elite athlete or if they are...they can be active. They’re bodies were made to move and moving is actually a good thing, and they feel good and they’re happy [when moving].”* When teacher-coaches are able to tie games knowledge with broader educational aims, and explicitly make students aware of these connections, they promote and foster positive youth development that can impact students’ health beyond the school environment (McKenzie & Lounsbery, 2013). While the above outlines teacher-coaches general EB related to games knowledge, the following section provides key similarities and differences concerning those beliefs within the context of either teaching or coaching.

Comparing Teacher-coaches’ EB in the Context of Teaching and Coaching Games

This section builds on the data revealing teacher-coaches EB concerning the sources and simplicity of games knowledge and outlines how those beliefs take shape or manifest in their roles as either a teacher or a coach. Generally, what constitutes or is justified as knowledge in these two different settings is regulated by teacher-coaches’ beliefs about the purpose or aims of PE versus interscholastic sports. As such, regardless of the context, participants viewed knowledge and learning to be developmental in nature and multidimensional in the sense that they focus on holistic learning. Additionally, when compared to teaching PE, participants believed that coaching was the role that they could delve into the complex aspects of games

including more advanced movement skills and team concepts such as offensive and defensive strategies.

Developing the whole person. Teacher-coaches' beliefs that knowledge in games originates from a number of different sources appears to be regulated by their views that development in both PE and extracurricular sports should occur across multiple learning domains (i.e. physical, social, cognitive, affective). It stands to reason that social development in PE, for example, requires opportunities for students to interact with and learn from both their teacher and student peers.

According to teacher-coaches, social outcomes were key aims of games participation in both PE and extracurricular sport environments. "*Socialization*" (Jillian) was identified as one of the main purposes of PE and interscholastic sports, and developing "*student-teacher and peer-to-peer relationships*" (Scott) was an important priority for "*building teamwork, communication*" (Charlotte) and "*people skills*" (Jillian). Brendan has contemplated "*getting rid of movement competencies*" as an assessment component in PE to focus entirely on "*how you (students) work together, as a group, and group cohesion.*" When discussing the objectives associated with extracurricular sports, participants used parallel descriptors such as "*teamwork*", "*camaraderie*" (Jillian), "*team-bonding*", "*team synergy*" (Karen), "*working as a team member*" (Jeff), "*cooperation*" and "*collaboration*" (Brendan).

In terms of physical development, teacher-coaches emphasize that students in PE learn "*coordinated movements*" (Brendan) and "*physical skills*" (Jillian). Karen indicated that part of her coaching role is to teach students "*proper technique*" for hitting the ball in field hockey, for example, and Scott noted the importance that his basketball team develops their fitness. He said that to begin a practice he would ask his athletes to "*run the stairs 5 times [because] if you guys*

want to make OFSAA, you have to be in good shape. You have to be able to have that stamina and endurance.” Jeff believed that “you should be able to throw a baseball” and “should know how to hold a hockey stick” as “it’s important to have those physical skills.” Still, his view on the significance of holistic learning was clearly captured when he said, “we know that people who live healthy, active lives will benefit mentally, they’ll benefit physically, emotionally, spiritually, all of those things. So that’s why it’s (physical activity) so important.”

Furthermore, teacher-coaches believed that participating in extracurricular sports in particular had a number of benefits connected to students’ affective development. Teacher-coaches described sport experiences as teaching students to “cope with emotional regulation” (Charlotte), “handle adversity” (Scott), “handle some of the pressures” (Karen) associated with competitive sport, “deal with the highs and lows of being on a team” (Charlotte), and “learn how to win and lose properly” (Jeff). This is consistent with overall findings of the study that participating and learning through extracurricular sports is more about character development and a different set of broader educational goals beyond knowledge acquisition, such as teaching students important values and developing a sense of school and social connectedness.

Comparatively, Brendan advised he prioritized cognitive development in his approach to coaching boys’ basketball, saying, “I get these guys moving fast and making decisions quick for themselves. And when they do that, they take ownership of their learning and they know the game better [and] are faster thinkers.” Although he did not view team success as the ultimate goal of extracurricular sport participation, even when discussing his team selection process he acknowledged that a student “might have [the] individual skills, they might be a better shooter, they might have better dribbling, but in the end...you can’t win without brains.” This perspective corroborates research over the past 20 years that has argued that PE teachers need to emphasize

the cognitive aspects of games over ‘traditional’ skill development and has led to the renewal of the TGfU model and similar tactical approaches to teaching games (Harvey & Jarrett, 2014). However, in the case of this study, teaching advanced movement skills is still a relevant component of coaching.

Learning complex movement skills. For teacher-coaches, the coaching role affords the opportunity and appropriate setting to explore more complex aspects of games with students, including knowledge related to advanced movement skills and more sophisticated offensive and defensive game tactics.

Jillian and Jeff teach at the same school and justified that most students enrolled in PE at their school would not benefit from learning complex movement skills because their overall skill level is too low. Jillian implied that she teaches “*a higher level of skills*” in extracurricular sports but “*would not be able to do those [same skills] in a regular PE class.*” She noted that, “*the skills would not be the same*” in PE because she “*couldn’t get away with that.*” Jeff concurred suggesting that, “*it’s not that they (movement skills) can’t be complex but in PE, we don’t really, maybe, get into it too much*” as students “*will definitely struggle because of their lack of skill.*” Other participants also identified a lack of skill as a deterrent for teaching complex movement skills in PE. Scott specified he does not “*expect [his] class to be high performing athletes*” and Brendan stated many students in his grade 9 PE “*really have no skills coming in [and] half my class is so poor in any kind of physical skills.*” As such, teacher-coaches consider numerous aspects of the learner or knower when making teaching and coaching decisions, which again represents a more contextual worldview (Lodewyk, 2011) about knowledge and learning.

Furthermore, the level of complexity in skills that teacher-coaches choose to teach students or athletes on their teams may be associated with beliefs that PE should “*develop*

physical literacy” (Charlotte) and expose children “*to a variety of different games and activities*” (Jeff). Brendan stated he “*want[s] to teach the students to have confidence in their body*” and “*be able to move and feel comfortable*” in many diverse movement settings “*whether it’s a big hike or bike ride....or whether it’s some sort of coordinated movement [or] sport-based movement competency....[and to] go out there and play a sport if the opportunity arises.*” On a related note, Scott suggested that teacher-coaches “*diversify the activities*” in PE as a means of hopefully “*spiking a life-long interest*” or as Jeff put it, “*find something they will continue to pursue after high-school*”, again implying that participation in games or other forms of PA beyond high-school is an important student outcome.

On the other hand, extracurricular sports allow teacher-coaches to focus almost entirely on skills specific to the sport they are coaching, and thus provides more opportunity and time to develop more complex knowledge. Charlotte illustrated this in the exchange below when comparing how she approaches rugby skill development when teaching versus coaching:

Researcher: Would you get into more complex skills with your teams?

Charlotte: Absolutely.

Researcher: Yeah? Why do you think that is?

Charlotte: Absolutely, you have to.... I mean, in rugby there’s a provincial rule that you have to have eight contact practices before you can play in a game, right? And that’s at minimum. So I think we probably had fifteen practices before our first game, I would guess. So, it’s a lot more time on a sport than if, in gym class, I spend 3 hours on it (rugby) total. So you can go a lot deeper. And you have to go a lot deeper.

The lack of time in PE would be further compounded by games comprising only a portion of students’ movement experiences in PE, along with other movement forms such as dance, fitness

and gymnastics. Moreover, teachers have repeatedly identified time constraints as a factor that often inhibits putting their EB into practice (Olafson & Schraw, 2006). Extracurricular sports also afford teacher-coaches the opportunity and appropriate setting to explore more complex qualities of games such as advanced offensive and defensive tactics that involve knowledge related to key movement and team concepts.

Learning advanced tactics and strategies. A base knowledge of sport-specific movement skills, which students on those team sports often have, appears to be a springboard for engaging in more complex tactics and game strategies. Karen alluded to interscholastic sports as the appropriate platform to *“advance in the strategies and in the skills that you might do, so team plays and some of those thing that you wouldn’t necessarily do in the classroom.”* When discussing how she might practice with her girls’ field hockey team, she said she would allocate *“more time on how can we defend this and get some good plays and how we can score and...move the ball. It’s expanding on the concepts of open space, and the stuff I’m doing with teaching...but it’s more complex I think.”* Similarly, Scott discussed going deeper into team concepts and strategies with his basketball team:

By no means am I going to be teaching them the basics of basketball, right? My assumption is that you already know how to play basketball. If we want to win, we have to be a unit. So our very first practice, what’s our defensive strategy? What zones are we setting up? How are we playing these zones? I need to make sure every body understands it. So that’s where for me, the in-depth strategy aspect is very much hammered into them.

Overall, knowledge related to advanced tactics and strategies seem to be more important to teacher-coaches in the context of their coaching role. As will be discussed later, Scott’s choice in using the word “hammered” in the above excerpt appears to align with his preferred direct

instructional approach when coaching consisting of drills and repetition, which actually contrasts his teaching philosophy. The following section will examine how these types of beliefs manifest in teacher-coaches instructional practices.

Teacher-Coaches' Epistemological Beliefs and Teaching and Coaching Instruction

A majority of participants indicated that they did not teach the same way they coach. However, there is some overlap in how teacher-coaches approach each role because the knowledge subject matter (games or sports) remains the same in both contexts. Teacher-coaches also describe bringing the same *"personality"* (Brendan) to teaching and coaching and *"being the same person"* (Karen). However, there were some key differences in how participants approach instruction in both settings. The findings of this study suggest that teacher-coaches differentiate their instruction in PE more so when compared to their coaching, wherein they rely almost entirely on direct instruction. Therefore, in the case of PE, teacher-coaches beliefs that games knowledge derives from multiple sources appears to align with their use of many different instructional methods. Conversely, participants also reported a disconnect between their beliefs and their instruction practices, and identified various constraints that influenced their teaching and coaching decisions.

Differentiating instruction in PE. Compared to their coaching instruction, teacher-coaches differentiate their teaching strategies more regularly in their classroom settings. Jillian indicated she was *"open to almost any way to teach"* and Scott spoke about *"diversifying my style of teaching"* and making *"direct versus indirect instructional changes."* He noted that he diversifies his instructional method primarily in response to *"understanding there are different types of learners in the classroom"* and to avoid *"being repetitive in the games and activities that I use in PE"* as a means of keeping students engaged each time they come to class.

Similarly, Jeff repeatedly discussed the need to consider students' interests, motivations and learning needs and "*adjust your [teaching] strategy accordingly.*" For Jeff, his instructional methods during PE "*depend on who you have and who you're teaching and sort of tailoring your style to your students.*" Compared to her coaching approach, Karen also explained that, "*in PE class I try to make it a bit more individualized*" and she provides "*way more choice in the PE program*" to allow all students to be successful. Additionally, Brendan noted that when teaching net-wall games in PE, for example, "*games are extremely modified just so that we can get good rallies*" to maximize opportunities for students to get "*contact with the ball.*" As such, it became clear that instructional decisions teacher-coaches make are less about the product of knowledge (e.g., game performance) but instead focus on engaging students in the learning process.

Using indirect approaches in PE. Participants' beliefs that there are a variety of games knowledge sources in PE appears to be reflected in their use of a multitude of instructional approaches. Instructional methods for teaching games tend to be categorized as either direct or indirect (Byra, 2006; Lodewyk, 2015). In the case of this study, the participants referenced numerous indirect instructional approaches such as "*self-directed learning*" (Brendan) and "*inquiry-based learning*" (Scott). As previously discussed, teacher-coaches also create peer teaching and cooperative-learning opportunities for students when teaching games in PE. Furthermore, teacher-coaches referred to their role as a facilitator for student learning, rather than an authority of knowledge and expertise. When describing their instructional approaches to teaching games in PE, participants used descriptors indicative of more indirect approaches such as being more "*hands-off*" (Scott), "*passive*" (Brendan) and encouraging students to "*take ownership*" (Karen) of their learning. Furthermore, participants suggested their function was to simply place students at the centre of the learning environment and "*let them figure it out on*

their own” (Scott) while they (the teacher) “*guide[s] the ship*” (Brendan). However, these same teachers also incorporate direct teaching into their PE instruction, noting that they often fall back on a more traditional and familiar style of teaching. For example, Brendan explained that “*there are too many days where you’re just too tired...and you just kind of, you know, here’s a game, get going....or rely on old-school things and just give them a drill.*” This is consistent with research that suggests indirect approaches often require more planning (Casey & Dyson, 2009) and that PE teachers specifically often revert to more traditional teaching methods regardless of their beliefs or overall teaching philosophy (Lodewyk, 2011). Similarly, Scott outlined how certain aspects of teaching supersede putting their beliefs into practice such as student safety (“*the practice of using them [more indirect approaches] day to day, doesn’t always apply based on the safety of the students in the classroom*”) and classroom management (“*Students show up at the beginning of class, you notice they’re rambunctious because they had a supply teacher the class before and if you just give them the ball and say go play, it’s not going to end well*”). However, in the case of coaching, teacher-coaches rely almost exclusively on direct instruction.

Drilling as coaching. When teacher-coaches were asked to describe a typical practice for their school sport teams they all described learning processes as being “*drill-based*”, as is consistent with a direct instruction coaching method (Ennis, 2000; Kirk & MacPhail, 2002). In comparison, Karen suggested that if she was teaching the same sports that she coaches, her PE lessons would be “*more game-based*”. However, as previously discussed, participants still incorporated game play and “*scrimmages*” into their team practices as a means of experiential learning and understanding “*how to control different [game] scenarios*” (Karen), rather than learning rules, skills and strategies in isolation. Furthermore, teacher-coaches used formal games as an assessment tool for identifying team strengths and weaknesses that subsequently informed

the content of team practices. Jeff advised that, *“sometimes the drills are generic drills, but then we’re going to do drills that obviously focus on a weakness that we may have had in a recent game.”* For example, in basketball *“if we didn’t rebound well, ok, we’ve got to work on some rebounding drills”* or *“if we’re not setting screens correctly, we’ve got to go over that.”* Jillian adopts a similar methodology, noting that her practices consists of *“getting into what our problem areas were and try to kind of fix those using specific drills”*. As such, teacher-coaches believed that *“putting in the time and doing the repetitions”* (Jeff) is an important aspect of coaching student athletes.

In the case of a propensity for direct instruction and repetition, teacher-coaches indicated they were not concerned about boredom or lack of engagement often associated with direct instruction (Ennis, 2000) as students on extracurricular teams *“want to be there”* (Jillian). Karen agreed that students *“are volunteering, just as I am, to spend their time doing that extracurricular piece”* and that in terms of her more direct instructional approach, students are aware that, *“this is what we have to do. If you want to be on the field, work on it until you can do it.”* Relatedly, Scott implied that the approach of repetition through drilling was effective for learning, indicating that he *“practice[s] a zone defense for like five or six practices in a row until everybody knows it 100%.”* He too was *“not worried about them being bored, because it’s a team that I’m competing against other schools and so I need to know that they are ready to go”*, again reinforcing the idea that extracurricular sports, in his view, is about competing at a high level.

Nevertheless, previous findings of this study confirm that teacher-coaches still rely on many of the same sources of knowledge when coaching games and even within the context of coaching, participants indicated they adjust their approaches based on student input and team

goals. Karen suggested that the decision to “*take things to the competitive level*” is a “*choice you make as a team*”. Jeff concurred and explained that he’s coached teams that “*just kind of want to be there to have fun*” and “*other times.... you want to push them harder as they want to win and that’s their focus and you sort of have to adapt to that style.*” He went on to clarify that “*specific teams have different goals and objectives*” and his overall coaching philosophy is often dependent on what students are looking to get out of their sport experiences. This adds to the data supporting that there are many factors beyond EB that influence how teacher-coaches provide instruction that can contribute to a disconnect between EB and actual practice. Consistent with my grounded theory methodology, the above themes will now be discussed in reference to the development of my core theme theorized to better understand the EB and teaching and coaching practices of PE teacher-coaches.

Core Theme: Beliefs and Practices as a Reflection of Social Learning Environments

As a means of linking the above themes, the core theme of *beliefs and practices as a reflection of social learning environments* was developed to explain and understand teacher-coaches’ views on games knowledge and how they approach their teaching and coaching. In general, this core category reflects the common thread of how social context influences the beliefs and practices of participants as interpreted through my developed themes. That is, teacher-coaches do not think about their beliefs about games knowledge and instruction in isolation, but rather within the complex social context and environments in which learning occurs. Specifically, this idea emerged by analysing how teacher-coaches justify their beliefs about both the sources and simplicity of games knowledge, and the instructional decisions they make in both PE and extracurricular sport based on a number of epistemic and non-epistemic factors. Although a number of factors that contributed to teacher-coaches’ EB and instructional

strategies have been addressed within the previously presented themes, additional data examples and some of the corresponding themes will be further discussed below. These factors can generally be categorized into views about their students, the content being delivered, and related beliefs about themselves as teachers and coaches in both PE as a school subject and extracurricular sports as an alternative movement setting in which learning occurs.

Firstly, as evident by the data presented within my developed themes, teacher-coaches acknowledged the role of their students in shaping the learning environment, and thus their beliefs about games knowledge and teaching and coaching practices. For instance, although the themes of *knowing in games as simple* and *acknowledging complex aspects of games* revealed that teacher-coaches hold beliefs that games have both simple and complex representations, they justified that PE was the appropriate setting for learning more basic game rules, skills, and strategies because of the overall lower skill level of the students compared to those that participate in extracurricular sports. Moreover, when describing their beliefs about the simplicity of knowledge, and ultimately, how they approach teaching and coaching, participants made continued reference to their perceptions of students' learning preferences (*"It probably depends on their learning style as an individual."* – Scott), motivations (*"[Students on sport teams] are often the kids who are already hooked in, right?"* – Jeff), experiences (*"Usually the field hockey team, they're somewhat athletic already, and they have some experience in sport, so I try to, you know, just use transferrable skills or knowledge from one sport to another."* – Karen), and thus, their students' capacity to participate in games successfully and acquire new knowledge and skills (*"If you have really high-achieving kids who want to learn and want to be there, of course you're going to give them more. Absolutely, you're going to give them more because they can handle it and they want it."* – Jeff). As such, certain beliefs did not preclude teacher-coaches

from dismissing a teaching or coaching instructional strategy, for example, if they felt justified that it was appropriate within a specific learning context based on factors such as their perceptions of student ability. In reflecting on the role of students in the context of various learning environments, Karen surmised, *“if you are just like I’m going to teach them (students) some skills and sports, that’s different than I’m going to teach this person (emphasis added), who’s coming into my classroom with different abilities and experiences.”* Furthermore, this idea of previous experiences in sport and various games demonstrates that the games content itself is an important factor in determining how teacher-coaches think about knowledge, the instructional strategies they implement, and the overall learning environment that they help to create.

The themes developed through my analysis also point to how the content itself, and by association teacher-coaches’ content knowledge, influence their EB and teaching and coaching practices. The findings of the current study support previous research that content is one of the factors that helps to shape the PE learning environment (Ward, 2013) and thus, was a component of learning that participants evaluated when rationalizing their beliefs and practices. In the case of teacher-coaches in this study, this was primarily evident by participants reflecting on the actual games being taught to their students. For instance, Jillian indicated she may *“spend more time with skills”* or lean towards using a direct instruction method and *“spend more time learning how to hold the stick and doing shots and things like that”* when teaching a technical sport like hockey. She added that she may focus more on specific strategic knowledge when teaching a game like tchoukball as a result of its unique rules and *“because students’ automatic response is to catch your own ball after a deflection.”* Jeff added that in some cases content such as game rules may present challenges for students, such as *“all of the complex goaltending rules in basketball”* or *“baseball where there’s tons of rules [that] I don’t even know”*, whereas for

other games, it may be the movement skills involved. *“Lacrosse is another one. It’s difficult to throw and catch the ball. And it’s not the understanding of the rules of the game that prevents students from playing [successfully], it’s their skill level.”* Overall, teacher-coaches felt that different games presented different knowledge that they believed was important when justifying their viewpoints and teaching and coaching philosophies.

Furthermore, teacher-coaches didn’t just think about content from their students’ perspectives, but also how their own familiarity and experiences in sport influenced their teaching and coaching decisions. As previously discussed, participants’ views of knowledge as simple may be a reflection of their own knowledge, ability, and familiarity in various games. Similarly, Brendan questioned whether his own content knowledge impacted his decisions to rely on self-directed learning and student peers as a source of knowledge in his coaching. In comparing unfamiliar track and field events and a sport like volleyball that he has been coaching for many years, he noted, *“I don’t have the knowledge-base in track so maybe that affects it too. If I went back to volleyball would I do it like that? It would be interesting, I might not.”* Again, this demonstrates that teacher-coaches’ beliefs and practices are somewhat fluid, context-specific, and influenced by a number of environmental factors including content knowledge.

Finally, the findings of this study supporting that teacher-coaches’ hold both domain-specific and domain-general EB, and that in certain cases there was both an alignment and misalignment between their EB and instructional methods, suggests that there are other views that inform how teacher-coaches think about games knowledge and their teaching and coaching practices. This includes views about their role as an instructor and overall related beliefs about teaching and coaching, including pedagogical knowledge. For instance, similar to Quennerstedt’s (2018) “transactional understanding of epistemology” (p. 312), movement, internal construction,

teacher-coaches themselves, and student peers were viewed as valid sources of games knowledge because they are described by teacher-coaches as contributing to learning environments in both PE and extracurricular sport settings. In other words, because certain learning processes that integrate a variety of knowledge sources are ‘practised’ by teacher-coaches, they help shape their beliefs about where games knowledge originates. For example, Brendan linked his teaching approach to his beliefs that students themselves are a source of knowledge, noting *“the kids are the ones who are doing the hard work and they’ve got to self-learn. So, they’re teaching themselves. All you’re doing is sending them in the direction of what they need to do for self-learning.”* Comparatively, he believed that he was responsible for *“some dissemination of information”* but that student learning did not exclusively derive from *“showing them this is exactly how you move in this position”* and *“trying to break a skill down one step at a time for everybody.”* Again, this illustrates the connection between EB and pedagogical beliefs, and how they take shape together in practice.

Teacher-coaches EB and instructional practices were also depicted as working in conjunction with other instructor- and domain-related beliefs. As an example, the theme of *developing the whole person* outlined how certain EB were justified through beliefs about the shared and distinctive aims of PE and extracurricular sports, including ideas of emphasizing knowledge across a multitude of learning domains. For Jillian, this included knowledge connected to the development of important life skills in PE:

“The big picture really is socialization, teamwork, communication, and people skills.

We’re doing PE and fitness as, like an indirect route for teaching students’ perseverance.

And if they happen to feel like they’ve got more, you know, physical skills, then that’s a bonus.”

Other examples include teacher-coaches' views that PE knowledge and learning processes reflect more basic understanding ties into their promotion of physical literacy and introduction of a wide variety of games (as opposed to going more in-depth in fewer games), and beliefs that a foundation of cursory knowledge would still allow students to participate in games beyond the classroom as a means of living an active life. Furthermore, an emphasis on participation and inclusion or winning and competition were used to justify whether factors such as student performance were important and the implementation of more instructional strategies in PE (theme of *differentiating instruction in PE*) and direct instruction in extracurricular sports (theme of *drilling as coaching*). Undoubtedly, it was apparent that these related views created certain conditions that they believed altered their teaching and coaching practices and by extension, their students' experiences in PE and extracurricular sports. As such, reflecting on their overall teaching and coaching philosophies, lived experiences, and factors beyond just their EB informed how teacher-coaches viewed their role in both PE and interscholastic sport learning environments.

Conclusion

This chapter reviewed the main findings of the study including teacher-coaches' beliefs about the sources and simplicity of games knowledge, how those beliefs are viewed in the context of their teaching and coaching roles, and the influence of such beliefs as it relates to their instructional strategies when teaching or coaching. The main findings of this study are as follows: (1) teacher-coaches believe that games knowledge in both PE and extracurricular sports originate from a variety of internal and external sources; (2) teacher-coaches portray games knowledge and learning processes in PE and extracurricular sports as both simple and complex; (3) teacher-coaches emphasize knowledge construction across the physical, cognitive, and social

learning domains in both their teaching and coaching but associate PE and extracurricular sports with different knowledge or learning processes; and (4) teacher-coaches differentiate their instructional strategies more in PE compared to their coaching practice where they rely primarily on direct instruction. In addition, the core theme of *beliefs and practices as a reflection of social learning environments* was posited to explain how teacher-coaches view learning environments as complex social settings that inform the way they think about knowledge in the context of their teaching and coaching, and how they act (or don't) on those beliefs in practice and in conjunction with other learning factors. Although specific research has been cited in reference to the above results, the following chapter will provide further analysis of the findings in the context of the broader literature on EB, PE teacher-coaches and instruction.

Table 1	
<i>Summary of Findings from Analysis of Interviews with Participant Teacher-Coaches</i>	
Teaching Beliefs	Coaching Beliefs
<u>Sources of Knowledge</u>	
<ul style="list-style-type: none"> • Movement and the body as valid sources of games knowledge • Students actively constructed knowledge internally • Teacher-coach as an authority or expert of games knowledge • Student peers as a source of knowledge through mentorship and leadership opportunities 	
<u>Simplicity of Knowledge</u>	
<ul style="list-style-type: none"> • Games knowledge viewed as both simple and complex • Simple aspects: basic rules, skills, and strategies, knowledge as health-related topics, 'quick' learning • Complex aspects: complex rules, skills, and strategies, knowledge as integrated, contextual and transferrable within and outside of a movement setting • An emphasis on participation and inclusion may obscure inferring beliefs about the simplicity of games knowledge 	
<u>Domain-General and Domain-Specific Beliefs</u>	
<ul style="list-style-type: none"> • Knowledge extends across multiple learning domains (physical, cognitive, social) • Knowledge and learning processes reflect more skills and strategies 	<ul style="list-style-type: none"> • Knowledge extends across multiple learning domains (physical, cognitive, social) • Knowledge and learning processes reflect more complex skills and strategies
<u>Games Instruction</u>	
<ul style="list-style-type: none"> • More differentiated instruction • Direct and indirect strategies (self-directed, inquiry-based, cooperative/peer learning) • Teacher as a 'facilitator' of learning 	<ul style="list-style-type: none"> • Less differentiated instruction • Primarily direct approaches (drilling and repetition) • Teacher as an 'expert' of knowledge

Chapter 5: Discussion

Introduction

In this chapter, I will situate the key findings of this study in the broader context of the literature. This includes a return to some of the literature presented in Chapter 2, as well as additional research that may explain or expand on the data collected and analyzed as part of my research process. This chapter has been organized based on the main research questions that guided the study. Again, the main findings of this study are as follows: (1) teacher-coaches believe that games knowledge in both PE and extracurricular sports originate from a variety of internal and external sources; (2) teacher-coaches portray games knowledge and learning processes in PE and extracurricular sports as both simple and complex; (3) teacher-coaches emphasize knowledge construction across the physical, cognitive, and social learning domains in both their teaching and coaching but associate PE and extracurricular sports with different knowledge or learning processes; and (4) teacher-coaches differentiate their instructional strategies more in PE compared to their coaching practice where they rely primarily on direct instruction. The core theme of *beliefs and practices as a reflection of social learning environments* was also offered as a means of understanding that teacher-coaches think about their teaching and coaching beliefs and practices within the context of social learning environments that are also influenced by perceptions about their students, content, and other related teaching and coaching beliefs. Based on the present findings, recommendations for future research in the focus areas of study and research implications have also been proposed throughout the chapter. Finally, research limitations have been outlined as a means of positioning the potential research implications and as a continued effort to promote research transparency.

Teacher-coaches' EB on the Sources and Simplicity of Games Knowledge

Sources of knowledge. Teacher-coaches in this study held beliefs that games knowledge in the context of both their teaching and coaching emerges from a variety of internal and external sources, including the students as individual and co-constructors of knowledge, themselves as the teacher or coach, and 'expert' student peers. Each of these sources has theoretical underpinnings related to EB that knowledge is constructed through social interactions (Muis & Duffy, 2013) and linked to claims that multiple perceptions of knowledge can still be valid (Roth & Weinstock, 2013). This is consistent with previous findings that have examined the EB of teachers in other disciplines (Olafson & Schraw, 2006) and as explored in this study, promotes the use of a variety of instructional approaches, at least in the case of teaching PE, to facilitate learning *through* those sources (Cothran & Kulinna, 2006). Differentiating instructional strategies based on the content, learning environment and learners has been found to be beneficial in terms of addressing numerous curricular aims (Harvey & Jarrett, 2014), 'reaching' different types of learners (Colquitt, Pritchard, Johnson, & McCollum, 2017), and enhancing student understanding (Whittle et al., 2019). For example, beliefs that knowledge derives from multiple sources and implementing teaching strategies that support this notion promotes the development of higher order thinking skills as students evaluate and justify knowledge based on a number of factors (Green & Hood, 2013), including where knowledge comes from and the social processes through which it is constructed (Chinn et al., 2011; Quennerstedt, 2013).

Teacher-coaches beliefs that games knowledge is both subjective and co-constructed by teachers and learners also parallels Lodewyk's (2015) results wherein it was reported that pre-service PE teachers held primarily contextualist worldviews and corresponding EB. These prospective educators viewed games knowledge as more situational and uncertain, and were

linked to pedagogical methods that supported a more collaborative approach to learning. However, practicing PE teachers in Lodewyk's (2011) study supported a more relativist worldview, signifying their views that knowledge is formulated within the individual learner. Comparatively, in the current study, even in cases where teacher-coaches suggested that games knowledge can and should be observable and also originate from external authorities (e.g., themselves as instructors, 'expert' peers), they simultaneously acknowledged the constructivist nature of learning that is specific to the individual learner and the sociocultural context in which learning occurs. This includes assessing limitations of existing knowledge and understanding how experience shapes knowledge development (Green & Hood, 2013). As such, teacher-coaches recognize that student learning is a complex process that also involves a number of non-epistemic factors, including motivation (Kuhn & Park, 2005; Lodewyk & Gao, 2013; Muis & Foy, 2010) and self-efficacy (Muis & Duffy, 2013), and hold beliefs about the importance of adjusting their teaching practices based on how they perceive student attributes such as ability (Lodewyk, 2011), for example. This research also supports the development of the core theme which posits that teacher-coaches consider a number of learning environment influences when thinking about their beliefs about knowledge and teaching practices. The findings of the current study also support that these beliefs about knowledge and learning extend to the domain of coaching.

Participants' beliefs that student-athletes and their peers also represent valid sources of games knowledge within the context of their coaching was somewhat surprising in that coaching has traditionally been viewed as a very 'technical' profession, where the coach has been perceived as the authority knowledge expert (Edwards et al., 2016). Participants' reliance on students as a valuable source of knowledge may be an example of teacher-coaches' beliefs being

influenced by their specific PE training, education and teaching experience (Pierce, Erickson, & Dinu, 2019) or an application of general beliefs about teaching and constructivist learning (Olafson & Schraw, 2006). As it relates to specific training and experience in providing games instruction, Camiré, Rocchi and Kendellen (2017) found that PE teacher-coaches reported higher levels of coaching efficacy, or perceptions of their ability to carry out various coaching tasks, when compared to teacher-coaches that teach other academic subjects (non-PE teacher-coaches). As such, PE teacher-coaches' higher coaching efficacy may leave them more 'open' to relinquishing some authority as a knowledge expert, and focus on the learning processes of their student-athletes rather than their *own* coaching abilities (e.g., their *own* understanding of specific games content such as rules and strategies). Moreover, as previously outlined, the practice of peer-teaching in their coaching may be reflective of their beliefs about the importance of developing the social skills they associated with participating in extracurricular sports. As recommended by Camiré and colleagues (2017), future research should continue to investigate the coaching beliefs and practices of non-PE teacher-coaches as they represent a majority of teachers that coach in Canadian schools and may offer a different perspective than those trained in movement studies. For example, many disciplines rely on educational texts as a form of knowledge translation (Qian & Alvermann, 1995; Beuhl & Fives, 2009), which participants in the present study did not consider when discussing where games knowledge originates.

EB that perceive students as an essential source of knowledge have the potential to positively influence student learning for student-athletes participating in school sport as peers, for example, have been linked to students' conceptions of knowledge (Cothran & Kulinna, 2006) and improvements in both declarative and procedural knowledge in movement settings (Darnis-Paraboschi, Lafonte, & Menaut, 2005). Furthermore, peers are thought to be highly influential in

student attitudes toward physical activity and impact other factors related to learning including motivation and effort (Cox et al., 2009). Nevertheless, teacher-coaches propensity to adopt more direct instructional methods also suggests somewhat of a disconnect (Butler, 2005; Olafson & Schraw, 2006, Lodewyk, 2011) between their beliefs regarding the sources of games knowledge and their actual coaching practices, as will be discussed later. The findings related to participant's' views on the simplicity of knowledge also provide evidence of an alignment between beliefs and practices, as well as potentially counterproductive beliefs or a partial relationship in the epistemological chain.

Simplicity of knowledge. Part of the challenge in identifying teacher-coaches EB, and beliefs about the simplicity of games knowledge more specifically, is the difficulty in clearly defining *what* constitutes as knowledge in PE (Corbin, 1993) or similar physical activity settings such as extracurricular sports. The issue of establishing a clear and defined body of knowledge has plagued researchers for some time as they have attempted to validate PE as an academic discipline and school subject, determine the learning that should be prioritized in PE classrooms (Kretchmar, 2005), and expand on previous conceptualizations of knowledge and types of intelligence. Indeed, participants in this study associated knowledge in PE with various health-related topics (e.g., nutrition, substance abuse, etc.) and therefore through the conventional and narrow lens of knowledge as information processing that occurs only in the mind (Quennerstedt, 2013), yet also acknowledged the cross-disciplinary nature of PE as a field (Corbin, 1993) and complex aspects of games knowledge that extend across multiple learning domains (Light & Fawns 2003; MacPhail, Kirk, & Griffin, 2008). Additionally, teacher-coaches' articulations of games knowledge as both simple and complex aligns with prior research that demonstrated individuals can hold what appears to be opposing EB depending on the learning context (Beuhl

& Fives, 2009). Teacher-coaches beliefs that games knowledge and learning processes in PE reflect more ‘basic’ rules, skills, and strategies (when compared to their coaching EB) will be reviewed in the next section; however, participants’ views of games knowledge as ‘simple’ warrants some discussion.

As currently constructed, teacher-coaches’ *portrayal* of games knowledge as simple, particularly in the case of their teaching practices, may have an adverse effect on student learning. As discussed in Chapter 2, the epistemic climate that an instructor creates includes the manner in which “the nature of knowledge and knowing is portrayed” (Muis & Duffy, 2013, p. 214) through their beliefs and actions, and how students subsequently perceive such teaching behaviours. The learning environment that teachers create is also impacted by specific “classroom structures and practices” (p. 214) that have epistemic underpinnings, such as instruction. Thus, if teacher-coaches describe games knowledge as simple (even if this may not be a full representation of their EB), or implement teaching strategies that are linked to more superficial learning (Rink, 2012), this may influence students’ EB and how they view knowledge and learning in PE (Muis et al., 2006). This is particularly relevant as there is evidence that aside from parental influence, teachers and coaches have the greatest impact on students’ beliefs (Smokowski, Reynolds, & Bezruczko, 1999). Furthermore, prior PE research supports that some PE students already hold inauspicious views that games and the manner in which they are taught are repetitive, over-emphasize competition and ability (Smith & Parr, 2007), and somewhat meaningless in the context of their everyday lives (Garn, Cothran, & Jenkins, 2011). In 2013, results from surveys of over 500 grade 9 and 10 Ontario students revealed that, “students are often not aware of the value of fitness knowledge, its complexity and malleability relative to overall health and well-being” (Lodewyk & Gao, 2013, p.9). Therefore, teacher-coaches should

be mindful of how learning in both PE and extracurricular sport is portrayed and presented to their students (Lodewyk, 2013). Findings of this study support that teacher-coaches acknowledge complex aspects of games and it may be more beneficial to student learning to highlight these beliefs in their teaching and coaching practices.

Participants in this study referenced relatively complex aspect of games, including beliefs that games knowledge is integrated, contextual and transferrable to other learning domains. For instance, the belief that games knowledge is tied to other areas of important health-related learning such as nutrition and mental health aligns with the structure of Ontario's integrated curriculum (Ontario Ministry of Education, 2015) and promotes opportunities for students to make connections across various aspects of active living. In other words, students are encouraged to expand their knowledge related to important health, fitness, movement and recreation concepts, rather than viewing games knowledge as simple, isolated, and unrelated to other disciplines. Moreover, it has been suggested that an integrated approach to curriculum and instruction that encourages transferrable skills and participation in physical activity beyond the classroom, something that PE teachers often fail to do, closely aligns with public health aims in terms of the purpose of school-based physical activity and sport (McKenzie & Lounsbery, 2013). Active participation by students in both class-based PE and interscholastic sport was another key outcome identified by participants in the present study.

Teacher-coaches' emphasis on participation in both PE and extracurricular sports is encouraging in terms of supporting inclusion for all, particularly as it relates to students that are often marginalized in PA settings (see Coates & Vickerman, 2010, for example), and promotes movement time as a key element of providing students with the health benefits of regular PA. However, numerous studies support that 'incidental learning' and positive youth development

are not inherent with merely participating in games (Holt et al., 2017; Pierce et al., 2019; Placek & O'Sullivan, 1997) and teachers and coaches need to actively implement strategies that foster important developmental outcomes and evaluate whether program aims are being met.

Furthermore, an over-emphasis on participation is reminiscent of the 'busy, happy and good' approach that has been heavily criticized in the PE literature (Quennerstedt, 2013) and teacher-coaches should not lose sight of knowledge and learning as a key outcome of games participation, particularly in the educational and developmental context of PE and school-based sports.

Moreover, it has been argued that focusing primarily on outcomes such as movement time and physical health suggest that games and other forms of PA simply represent a 'means to an end', implying that *how* an individual attains a healthy, active lifestyle is meaningless (Kretchmar, 2005). This is consistent with pedagogical approaches where movement is 'prescribed' in exercise doses for the sole purposes of combating sedentary behaviour and adverse health effects such as the onset of chronic diseases and obesity (Beni, Ní Chróinín, & Fletcher, 2019). Contrarily, games knowledge and skills represent worthy intrinsic aims in and of themselves and are often what draws students back for repeated experiences in their pursuit of learning (Kretchmar, 2005), which in turn will naturally lead to a healthier lifestyle. Similarly, Parviainen and Aromaa (2015) describe the importance of viewing the body as a source of 'formulating knowledge' and movement as 'intelligent practice', contending that:

the inherent value of forming bodily knowledge is neither linked to improving one's own movement skills or physical fitness, nor to legitimize physical activity in the name of healthy living or any other personal development. Instead, we argue that bodily

knowledge can cultivate individuals to trust their own body awareness and embodied responses, to take more responsibility for their own physical exercise. (p. 481)

As such, teacher-coaches should continue to reflect on the extent to which they prioritize various PA outcomes through games and how students can find meaning in their movement experiences, including PE and extracurricular sports, without precluding other aspects of teaching and coaching games that they view as important such as participation, inclusion and enjoyment. Although PE and school-based sports may have differing objectives, the pursuit of knowledge and learning are essential to many key educational outcomes in both settings. The following section will discuss how participants' EB relate to their specific roles as either a teacher or a coach.

Teacher-coaches' EB in the Context of Teaching and Coaching Games

Findings from this study support that there are EB and learning processes that teacher-coaches deem applicable to games in both PE and extracurricular settings, and other beliefs about knowledge and knowing that are specific to the teaching or coaching context. For example, beliefs about the roles of the learner, instructor, and peers as important sources of games knowledge was evident in participants' articulations when discussing both their teaching and coaching philosophies and practices. Furthermore, participants recognized the importance of developing the whole person and holistic learning in both movement settings, inferring the overall domain-generality of certain beliefs related to knowledge construction in games. Contrarily, teacher-coaches believed that learning complex movement skills and advanced game tactics were more fitting for school sport teams, while PE practices emphasized simpler aspects of games knowledge such as basic rules and movement proficiencies. Although these examples provide evidence that constructs of personal EB are independent of each other (Schommer, 1990;

Hofer & Pintrich, 1997), conclusions that teacher-coaches hold general beliefs about the processes of knowing and more domain-specific beliefs about the nature of knowledge (Hofer & Pintrich, 1997) cannot be drawn. This is mainly because participants also illustrated consistent beliefs about learning processes (Olafson & Schraw, 2006) and contradictory beliefs within the simplicity dimension, including the notion that games knowledge can reflect both simple and complex representations. Furthermore, such generalizations would undoubtedly require empirical evidence detailing teacher-coaches' viewpoints on the dimensions of EB that were not examined as part of this study (certainty of knowledge; justification of knowledge).

Similarities between participants' teaching and coaching beliefs and practices were somewhat expected in the sense that the content (games or sports) – and thus at least some of the body of knowledge – transcends both the teaching and coaching domains. Additionally, this body of knowledge is comprised of parallel epistemic characteristics including the extent to which games are perceived as structured, contextual and applied (Muis et al, 2006) that make certain views, such as the significance of procedural knowledge and situated learning (Harvey & Jarrett, 2014; Kirk & MacPhail, 2002; Mandigo et al., 2007), compatible in both roles. However, factors such as the diversity of students in PE as it relates to past games experience, existing knowledge and physical ability, compared to a more homogenous group of learners that generally participate in extracurricular sports, also influenced participants' teaching and coaching practices. For instance, in their teaching practice, participants indicated that PE was the appropriate environment for *introducing* students to basic sport-specific movement skills, whereas their coaching role was more conducive to *refining* those same skills.

Furthermore, beyond the characteristics of students in both settings, teacher-coaches considered the specific content or game being taught, as well as their own influence on the

learning environments they create. This parallels research supporting that content itself, and teachers' content and pedagogical knowledge influences their teaching practices (Tsangaridou, 2006b; Ward, 2013). Although this research did not examine the EB of participants as it relates to teaching and coaching knowledge, these beliefs are closely linked and in the case of the present study, influenced how teacher-coaches justified their viewpoints and reflected on their experiences. Additionally, as consistent with previous findings, teachers and coaches' beliefs and practices also appear to be regulated by a number of other non-epistemic factors or external constraints including curriculum and time limitations (Schraw & Olafson, 2002), and in the case of extracurricular sports, the value that is placed on winning and competition (Lacroix et al., 2008). Indeed, Hofer & Pitrich (1997) outline academic and extracurricular pursuits as one method of defining and differentiating between learning domains. Notably, participant's beliefs in the current study were also regulated by their overall viewpoints about the aims or goals of PE compared to those of extracurricular sports (promoting a healthy, active lifestyle in PE and emphasizing more character development and social integration in extracurricular sports), as well as reflecting on the types of learners they interact with in either a teaching or coaching context.

Teacher-coaches cited students' lack of physical skills as one of the main deterrents for moving beyond basic movement skills and more complex aspects of games knowledge in PE. These findings point toward the need to continue to review what and how games are being taught at lower developmental levels including elementary-based PE. As early movement experiences have a profound influence on students' views of PA and engagement in PA across the lifespan (Kirk, 2005), future research should investigate the EB and instructional practices of teachers and coaches who interact with children in the earlier stages of their development and across a variety of movement forms. Although not presented in the findings of this study, a few

participants proposed that PE at all levels should be taught by PE specialists, a common recommendation that can be found in the literature (Rink & Hall, 2008).

Assessing students' skills and abilities suggests that PE teachers understand the importance of employing developmentally appropriate tasks, but may also imply views of intelligence as fixed (rather than a growth mindset) (Wang, Chatzisarantis, Spray, & Biddle, 2002), particularly if skill is perceived as a type of knowledge that encourages students to be successful, creative and expressive when participating in games (Kretchmar, 2005). As noted by Jayantilal and O'Leary (2017), "research indicates that effective use of instructional models is often inhibited by PE teachers' negative beliefs about their students" (p. 396). As effective teaching is highly associated with student achievement and prior student learning cannot be modified retroactively (Whittle et al., 2019), secondary PE teachers should continue to internally reflect on ways they can improve student skill and promote the "belief that ability is changeable through learning" (Wang et al., 2002, p. 442). Furthermore, one of the shared complaints by many students in PE is that they learn the same 'basic' games and skills each and every year, which can lead to boredom, disengagement and negative perceptions about games and physical activity in general (Ennis, 2000). As such, when students reach the high school level, this may be the opportunity to teach 'new' and more complex aspects of games knowledge (such as advanced skills), optimally challenge students, and not limit these aspects of learning to students that participate in school sports. Finally, research supports that alternative instructional models or strategies for teaching games place less emphasis on skill (Mandigo, Butler, & Hopper, 2007) and offer similar or greater improvements in skill development as traditional or 'technical' approaches (Harvey & Jarrett, 2014), among other benefits, as will be discussed in the next section.

Teacher-Coaches' EB and Teaching and Coaching Instruction

One of the main findings from this study was the notion that teacher-coaches differentiate their games instruction by utilizing a variety of instructional strategies, particularly in the case of their teaching practice. As it relates to epistemology, this approach aligns with their EB that games knowledge is constructed through a multitude of sources. Additionally, teacher-coaches' interview responses suggest an understanding that differentiated instruction goes beyond adopting and implementing various instructional strategies, and includes aspects such as assessing student readiness and modifying the learning process and environment to promote student success. As such, differentiated instruction is viewed as a teaching 'philosophy' rather than a series of actions or behaviours enacted by a teacher (Colquitt et al., 2017). However, classifying large groups of students (i.e. an entire class) as low-skilled and teaching only basic games knowledge and skills in PE, for example, indicates that participants' teaching practices may benefit from further evaluation of individual student needs. As noted by Colquitt and colleagues (2017), differentiated instruction does not mean that students should not "master the requisite [knowledge], concepts, and skills" (p. 45) or that content and knowledge should be altered for an entire class. Instead, PE teachers need to consider ways of providing all students 'access' to the same knowledge or learning outcomes, even if that knowledge is complex and student skills may require further development. As previously recommended, students may benefit from a similar approach being applied to the coaching of games wherein they implement more of a variety of instructional methods.

Teacher-coaches propensity to utilize direct instruction almost entirely in their coaching role is consistent with other findings (Edwards et al., 2016; Trudel & Gilbert, 2006), but may be problematic in terms of student-athletes fulfilling their learning potential. Indeed, former elite

athletes have reported a coach's inability or unwillingness to individualize their instruction based on the needs and learning preferences of specific players as an indication of poor or ineffective coaching (Gearity, 2012). Furthermore, in the case of the present study, participants' emphasis on the importance of developing the whole person and broader educational goals such as social connectedness as a key outcome associated with extracurricular sport participation may align with more indirect approaches to coaching because they are more student-centred, are grounded in constructivist approaches to learning and shared knowledge construction, and include strategies such as peer teaching and cooperative learning (Rink, 2012). Lacroix et al. (2008) reported similar results from Ontario high school coaches, who believed that facilitating school integration was one of the main purposes of interscholastic sport, but were challenged when asked how they promoted this outcome in their coaching or believed that certain positive benefits were innate with participation. Pierce, Erickson, and Dinu (2019) conceded this is not an easy undertaking for teacher-coaches, and admittedly, participants in the current study suggested they do look for opportunities to build teacher-student relationships and implement peer and mentoring experiences as part of their coaching role. Continued efforts to emphasize constructivist approaches to knowledge acquisition in school-based sport may prove beneficial.

Additionally, as participants cited a general lack of skill and ability amongst high-school PE students, research supports that non-traditional instructional models or strategies for teaching games place less emphasis on skill (Mandigo et al., 2007) and have the potential to facilitate significant learning benefits. For example, the Sport Education instructional model has been linked to more in-depth learning because students spend more time on a single game within the context of an authentic sporting experience that often features practices, games, and tournaments (Lodewyk, 2015). Thus, students are able to develop skills in similar conditions they might

experience in actual game play (Araújo, Hastie, Lohse, Bessa, & Mesquita, 2019). Furthermore, students have reported being more engaged and taking greater ownership of their learning because of their increased responsibility and autonomy through different team roles and an overall student-centred approach (Hastie, 1998). Similarly, TGfU and other game-centred approaches (GCAs), at least as theoretically proposed in the literature, place more emphasis on tactical understanding and awareness, and position students at the centre of the learning process with learning tasks structured around individual needs and ability (Mandigo et al., 2007). Additionally, organizing games into categories based on similar tactical problems and solutions promotes the development of transferrable knowledge and skills as students learn how specific aspects of games translate between and across games through ‘situated learning’ environments (Harvey & Jarrett, 2014; Kirk & MacPhail, 2002; Mandigo et al., 2007). As participants’ beliefs clearly support the importance of utilizing game play and game scenarios to develop knowledge and skills in both PE and extracurricular sport settings, these practical applications may prove effective in negating what they perceive as an overall lack of skill in high-school students.

On a related note, teacher-coaches in this study believed that learning advanced game tactics and strategies were more appropriate in the context of extracurricular sports, yet almost exclusively employed direct instruction and more ‘traditional’ approaches to coaching games. This is potentially problematic in that one of the main criticisms of ‘traditional’ forms of teaching games wherein knowledge and skills are taught in isolation is that it produces players who are reliant on their coaches to make tactical decisions in games. These players may be highly skilled as a result of practice techniques such as drilling and repetition, but can also struggle with the dynamic nature of games resulting from a lack of experience in “interpret[ing] and adapt[ing] to a fluid and changing [game] environment” (Fawns & Light, 2001, p. 75).

While instructional models such as TGfU are intended to address these concerns by teaching movement skills, for example, within the context of games and *after* students have developed a sense of tactical awareness, questions remain about whether TGfU and similar instructional strategies are appropriate for elite athletes or higher levels of competition (Harvey & Jarrett, 2014) such as extracurricular school sports. Furthermore, numerous studies have reported the difficulty and in certain cases unwillingness of PE teachers to implement new teaching strategies that could lead to more widespread and sustained adoption. The few interventions that have attempted to implement GCAs such as TGfU in the coaching domain have been met with similar ‘resistance’ related to pedagogical and conceptual concerns, despite coaches recognizing the benefits of game-centred approaches grounded in constructivist learning (Harvey, Cushion & Massa-Gonzalez, 2010; Roberts, 2011).

Therefore, one recommendation as it relates to teacher-coaches in the present study is to borrow from their teaching philosophy in which it was more evident that they ‘blend’ teaching strategies from a multitude of pedagogical styles. This approach allows PE teachers to take the ‘best’ from each teaching method and in the case of their coaching practice, may offset some of the disadvantages associated with direct instruction. Cothran and Kulinna (2006) advocate for this approach to teaching PE as a means of increasing student success, with the added caveat that teachers also need to be aware of how their students perceive and respond to various instructional strategies. As a result, future research should examine what students that participate in extracurricular sports believe is the best way to learn and improve as game players and how those align with their coaches’ conceptions of knowledge and learning. Finally, as practicing teachers’ beliefs and behaviours are often well-established and difficult to alter (Lodewyk, 2015)

researchers and PETE programs should continue to engage in dialogue wherein pre-service teachers are asked to reflect on and challenge their beliefs about effective teaching and coaching.

Research Limitations

Although specific trustworthiness strategies were implemented in the research design (as discussed in Chapter 3), it is important to outline certain limitations that may influence how the reader interprets the findings of this study. The main limitations of this study were the relatively small sample size, the single method of data collection, and the interpretive nature of the data analysis. Each of these limitations will be addressed separately below.

Sample size. Although issues of sample sizes generally emerge from positivist perspectives on research design (Jones et al., 2014), it is worth discussing the number of teacher-coaches (6) that elected to participate in the study. Certainly, the inclusion of additional participants would have allowed for more raw data, and in the case of grounded theory methodology, greater opportunity to test the emerging themes and increase the trustworthiness of the research findings. However, in consideration of sample size, qualitative researchers must return to the purpose of the inquiry (Jones et al., 2014). As this study aimed to explore the *individual* beliefs and experiences of teacher-coaches, increasing the number of participants would not have altered the findings that emerged from the unique perspective of the initial 6 participants. Indeed, even in cases where participants worked at the same school (where it may be assumed they may adopt department or school board teaching and coaching ‘philosophies’), there were notable differences in their EB and approaches to instruction. Despite these individual differences, common and meaningful findings were developed during my data collection and analysis to the point where the argument for theoretical saturation can be supported.

Interviews as the sole form of data collection. The trustworthiness of the study may have also been enhanced with additional forms of data collection, including observing participants teaching and coaching practices as a means of verifying their preferred and implemented instructional strategies or viewing their beliefs ‘in action’. Instead, for the purposes of research opportuneness, open-ended questions were asked about the way in which participants teach and coach under the assumption that participants would use instructional methods that they believed reflected best practices as it relates to student knowledge acquisition and learning, and thus, get to the core of teacher-coaches’ EB. Future research related to teachers or coaches’ EB and their practices (planning, instruction, assessment, etc.) might incorporate other forms of data collection to increase the validity of the findings. Nevertheless, in this study, an understanding of the complex nature of EB was aided by rich descriptions and the dialogue that was developed with participants through the interview process. Furthermore, observing participants’ teaching and coaching practices would not have provided insights into what is actually informing their behaviours, which is particularly relevant given that this study confirmed that teaching and coaching are influenced by a number of dynamic circumstances (Olafson & Schraw, 2010) and non-epistemic factors. By engaging in an in-depth dialogue with participants, these findings were revealed and investigated.

Interpretive nature of the data analysis. The main findings of this study should also be comprehended with the understanding that they were developed within the context of my research design and through my interpretive lens in the role of the researcher. Although the findings were supported with raw data in the form of the participants’ voices, the interpretations of that data were undoubtedly influenced by my past experiences, positionality, and views on teaching, coaching, and learning, for example. Certainly, the meanings that I have applied to the

participants' stories may be very different from the perspectives of those within a different social context, including an association of certain words or phrases with certain EB. Nevertheless, all attempts were made to verify the validity of the data analysis and maintain the research methods set out in Chapter 3 as a means of shaping this interpretive, qualitative study.

Additionally, while the participants represented a wide range of teaching and coaching experience (including coaching a variety of extracurricular sports), my findings may not be generalizable across all secondary-school PE teacher-coaches. Instead, the purpose of this study was to better understand the common and diverse views that teacher-coaches hold as it relates to certain dimensions of EB and provide insights into how those EB, among other factors, may influence their instructional practices in both roles within the specific context of their school environment.

Conclusion

The findings of this exploratory study revealed that secondary school teacher-coaches carry a multitude of EB related to the sources and simplicity of games knowledge that often manifest differently in their teaching and coaching practices. This includes beliefs that the teacher-coach, student peers, and individual learners are valid sources of knowledge across both domains and somewhat opposing beliefs that games knowledge has both simple and complex representations. Although teacher-coaches believed that PE warranted more basic learning processes, whereas students in extracurricular sports were more prepared for learning the complex aspects of games knowledge, their instructional practices as described were not reflective of these views. Importantly, teacher-coaches reflected on their EB related to games knowledge and their teaching and coaching practices within the context of complex learning environments that are comprised of different learners, content, and instructor roles and related

beliefs. In this way, “knowledge, the knower, and the [learning] environment are mutually dependent” (Quennerstedt, 2013, p. 313). As outlined in Chapter 4, the core theme of *beliefs and practices as a reflection of social learning environments* proposed that teacher-coaches do not consider their EB and instructional methods in isolation because of this interdependence. Rather, teacher-coaches reflect on their beliefs and practices in combination with a number of other factors that they believe contribute to social learning environments because they take shape within “communities of practice that generate and sustain knowledge” (Kirk & MacPhail, 2002, p. 183) in which many of these factors are relevant, interrelated and experienced. It is through this lens that we can see how beliefs about knowledge, teaching, and coaching are dynamic, evolving, and at times counterintuitive, as well as cultivated and transformed through lived experiences and practices such as reflection.

This research contributes to the existing literature on teacher-coaches by offering insights into both teaching and coaching roles through the lens of EB. Teachers and coaches have a profound influence on students’ PA experiences in schools (Smokowski, Reynolds, & Bezruczko, 1999). Furthermore, teacher-coaches are in a unique position because of their increased social interactions with students both in and outside of the classroom setting (Camiré et al., 2017; Pierce et al., 2019), providing more opportunities to be a positive influence on student-athletes and promote the outcomes associated with PA participation and positive youth development (Holt et al., 2017). As such, teacher-coaches should be aware of the antecedents that inform their teaching and coaching practices, including their EB, and where possible, look to develop and cultivate beliefs that enhance student learning. Although epistemic convictions are often deeply rooted (Buehl & Fives, 2009; Lodewyk, 2015; Olafson & Schraw, 2010), these goals may be achieved by providing continued opportunities for teachers and coaches to reflect

on their views of knowledge and learning and support for implementing innovative, evidence-based instructional strategies that go beyond traditional forms of teaching and coaching games. In-service teacher support is particularly important as it relates to this study as many of the participants' EB as it relates to games knowledge were interpreted as being rather complex but this was not necessarily reflected in their views about learning processes and instructional practices. A similar approach can be adopted in PETE programs by bringing pre-service teachers existing beliefs to the forefront of their theoretical and practical learning experiences as a means of transforming practices that are counterproductive or reinforce the status quo in PE and coaching instruction.

Of course, as evident by the findings in this study, EB constitute only a part of what informs teaching and coaching practices, and their complex nature necessitates the continued need to understand and deconstruct teacher-coaches' EB and instructional approaches. As this study simply represents a snapshot of teacher-coaches' beliefs and practices, this would include the opportunity to assess teacher-coaches teaching and coaching philosophies over an extended period of time or through specific education and training interventions. These future research directions may provide further clarity into the complex phenomenon that is EB within the specific context of PE teaching and the coaching of interscholastic sports. Furthermore, it is important to reiterate that these findings signify my interpretation of the data and the purpose of this study was not to generalize teacher-coaches' EB. Rather, these findings are meant to provide insights into the complex nature of teacher-coaches' beliefs within the specific contexts of their experiences and contribute to an understanding of the factors that influence teacher-coaches' teaching and coaching practices.

REFERENCES

- Araújo, R., Hastie, P., Lohse, K. R., Bessa, C., & Mesquita, I. (2019). The long-term development of volleyball game play performance using Sport Education and the Step-Game-Approach model. *European Physical Education Review*, *25*(2), 311–326. DOI: 10.1177/1356336X17730307
- Aslan, C. (2017). Examining epistemological beliefs of teacher candidates according to various variables. *Eurasian Journal of Educational Research*, *67*, 37–50. DOI: 10.11114/jets.v5i10.2224
- Bailey, R., Armour, K., Kirk, D., Jess, M., Pickup, I., & Sandford, R. (2009). The educational benefits claimed for physical education and school sport: An academic review. *Research Papers In Education*, *24*, 1-27. DOI: 10.1080/02671520701809817
- Bendixen, L., & Feucht, F. (2010). Personal epistemology in the classroom: A welcome and guide for the reader. In Bendixen, L., & Feucht, F. (Eds.), *Personal epistemology in the classroom : Theory, research, and implications for practice* (pp. 3-28). Cambridge, UK: Cambridge University Press.
- Beni, S., Ní Chróinín, D., & Fletcher, T. (2019). A focus on the how of meaningful physical education in primary schools. *Sport, Education and Society*, *24*(6), 624–637. DOI: 10.1080/13573322.2019.1612349
- Beswick, K. (2012). Teachers' beliefs about school mathematics and their relationship to practice. *Educational Studies in Mathematics*, *79*, 127-147. DOI: 10.1007/s10649-011-9333-2
- Bleazby, J. (2015). Why some school subjects have a higher status than others: The

- epistemology of the traditional curriculum hierarchy. *Oxford Review of Education*, 41, 671-689. DOI: 10.1080/03054985.2015.1090966
- Bonello, M. (2008). Sixth grade students' mental models of physical education concepts: A framework theory perspective (Doctoral dissertation, University of Maryland, College Park). Retrieved from <https://drum.lib.umd.edu/bitstream/handle/1903/8834/umi-umd-5862.pdf?sequence=1&isAllowed=y>
- Brownlee, J., & Berthelsen, D. (2006). Personal epistemology and relational pedagogy in early childhood teacher education programs. *Early Years*, 26, 17-29. DOI: 10.1080/09575140500507785
- Buehl, M., Alexander, P., & Murphy, P. (2002). Beliefs about schooled knowledge: Domain specific or domain general? *Contemporary Educational Psychology*, 27, 415-449. DOI: 10.1006/ceps.2001.1103
- Buehl, M., & Fives, H. (2009). Exploring teachers' beliefs about teaching knowledge: Where does it come from? Does it change? *The Journal of Experimental Education*, 77, 367-408. DOI: 10.3200/JEXE.77.4.367-408
- Butler, J. (2005). TGFU pedagogy: Old dogs, new tricks and puppy school. *Physical Education & Sport Pedagogy*, 10, 225-240. DOI: 10.1080/17408980500340752
- Byra, M. (2006). Teaching styles and inclusive pedagogies. In Kirk, D., Macdonald, D., & O'Sullivan, M. (Eds.), *Handbook of physical education* (pp. 449-466). Thousand Oaks, CA: Sage.
- Cale, L., & Harris, J. (2018). The role of knowledge and understanding in fostering physical literacy. *Journal of Teaching in Physical Education*, 37, 280-287. DOI: 10.1123/jtpe.2018-0134

- Camiré, M., Rocchi, M., & Kendellen, K. (2017). A comparative analysis of physical education and non-physical education teachers who coach high school sport teams. *International Journal of Sports Science and Coaching*, *12*(5), 557–564. DOI: 10.1177/1747954117727629
- Casey, A., and B. Dyson. 2009. The implementation of models-based practice in physical education through action research. *European Physical Education Review*, *15*(2), 175–199. DOI: 10.1177/1356336X09345222
- Chan, K. (2011). Preservice teacher education students' epistemological beliefs and conceptions about learning. *Instructional Science*, *39*, 87-108. DOI: 10.14221/ajte.2004v29n1.1
- Charmaz, K. (2014). *Constructing grounded theory* (2nd ed.). Thousand Oaks, CA: Sage
- Chinn, C., Buckland, L., & Samarapungavan, A. (2011). Expanding the dimensions of epistemic cognition: Arguments from philosophy and psychology. *Educational Psychologist*, *46*, 141–167. DOI: 10.1080/00461520.2011.587722
- Christian, E., Berry, M., & Kearney, P. (2017). The identity, epistemology and developmental experiences of high-level adventure sports coaches. *Journal of Adventure Education and Outdoor Learning*, *17*(4), 353-366. DOI: 10.1080/14729679.2017.1341326
- Coates, J., & Vickerman, P. (2010). Empowering children with special educational needs to speak up: Experiences of inclusive physical education. *Disability and Rehabilitation*, *32*(18), 1517–1526. DOI: 10.3109/09638288.2010.497037
- Collins, L., Collins, D., & Grecic, D. (2015). The epistemological chain in high-level adventure sports coaches. *Journal of Adventure Education and Outdoor Learning*, *15*, 224–238. DOI: 10.1080/14729679.2014.950592
- Colquitt, G., Pritchard, T., Johnson, C., & McCollum, S. (2017). Differentiating instruction in

- physical education: Personalization of learning. *Journal of Physical Education, Recreation & Dance*, 88(7), 44–50. DOI: 10.1080/07303084.2017.1340205
- Corbin, C. (1993). The field of physical education - common goals, not common roles. *Journal of Physical Education, Recreation & Dance*, 64(1), 79-87. Retrieved from <http://proxy.library.brocku.ca/login?url=https://search-proquest-com.proxy.library.brocku.ca/docview/215764743?accountid=9744>
- Cothran, D. J., & Kulinna, P. H. (2006). Students' perspectives on direct, peer, and inquiry teaching strategies. *Journal of Teaching in Physical Education*, 25, 166-181. DOI: 10.1123/jtpe.25.2.166
- Cox, A. E., Duncheon, N., & McDavid, L. (2009). Peers and teachers as sources of relatedness perceptions, motivation, and affective responses in physical education. *Research Quarterly for Exercise and Sport*, 80(4), 765–773. DOI: 10.1080/02701367.2009.10599618
- Crotty, M. (2006). *The foundations of social research: Meaning and perspective in the research process*. Thousand Oaks, CA: Sage.
- Cresswell, J. (2013). *Qualitative inquiry & research design. Choosing among five approaches* (3rd ed.). Thousand Oaks, CA: Sage.
- Daly, K. (2007). Qualitative research and the art of learning to see. In *Qualitative methods for family studies and human development*, (pp. 1-17). Thousand Oaks, CA: Sage.
- Darnis-Paraboschi, F., Lafont, L., & Menaut, A. (2005). A social-constructivist approach in physical education: Influence of dyadic interactions on tactical choices in an instructional team sport setting. *European Journal of Psychology of Education*, 20(2), 171-184. DOI: 10.1007/BF03173506

- Douglas, D. & Halas, J. (2013). The wages of whiteness: Confronting the nature of ivory tower racism and the implications for physical education. *Sport, Education and Society*, 18(4), 453–474. DOI: 10.1080/13573322.2011.602395
- Drewe, S. (2000). An examination of the relationship between coaching and teaching. *Quest*, 52, 79–88. DOI: 10.1080/00336297.2000.10491702
- Edwards, C., Jones, R., & Viotto Filho, I. (2016). Activity theory, complexity and sports coaching: An epistemology for a discipline. *Sport, Education and Society*, 21, 200–216. DOI: 10.1080/13573322.2014.895713
- Ennis, C. (2000). Canaries in the coal mine: Responding to disengaged students using theme-based curricula. *Quest*, 52, 119-130. DOI: 10.1080/00336297.2000.10491705
- Er, K. (2013). A study of the epistemological beliefs of teacher candidates in terms of various variables. *Eurasian Journal of Educational Research*, 50, 207–226. Retrieved from <https://proxy.library.brocku.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1059930&site=eds-live&scope=site>
- Fives, H., & Buehl, M. (2008). What do teachers believe? Developing a framework for examining beliefs about teachers' knowledge and ability. *Contemporary Educational Psychology*, 33, 134-176. DOI: 10.1016/j.cedpsych.2008.01.001
- Flintoff, A., Dowling, F., & Fitzgerald, H. (2015). Working through whiteness, race and (anti) racism in physical education teacher education. *Physical Education and Sport Pedagogy*, 20(5), 559–570. DOI: 10.1080/17408989.2014.962017
- Garegae, K. (2016). Teachers' professed beliefs about the nature of mathematics, its teaching and learning: Inconsistencies among data from different instruments. *Philosophy of Mathematics Education Journal*, 30, 1–18. Retrieved from

<https://proxy.library.brocku.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eue&AN=118987367&site=eds-live&scope=site>

- Garn, A. C., Cothran, D. J., & Jenkins, J. M. (2011). A qualitative analysis of individual interest in middle school physical education: Perspectives of early-adolescents. *Physical Education and Sport Pedagogy*, 16(3), 223–236. DOI: 10.1080/17408989.2010.532783
- Gearity, B. T. (2012). Poor teaching by the coach: A phenomenological description from athletes' experience of poor coaching. *Physical Education and Sport Pedagogy*, 17(1), 79–96. DOI: 10.1080/17408989.2010.548061
- Glesne, C. (2015). *Becoming qualitative researchers: An introduction* (5th ed.). Boston, MA: Pearson.
- Grecic, D., & Collins, D. (2013). The epistemological chain: Practical applications in sports. *Quest*, 65, 151-168. DOI: 10.1080/00336297.2013.773525
- Green, H. & Hood, M. (2013). Significance of epistemological beliefs for teaching and learning psychology: A review. *Psychology Learning and Teaching*, 12, 168-178. DOI: 10.2304/plat.2013.12.2.168
- Hammer D. & Elby, A. (2002). On the form of a personal epistemology. In Hofer, B. & Pintrich, P. (Eds.), *Personal epistemology: The psychology of beliefs about knowledge and knowing* (pp. 169-190).
- Hammer D. & Elby, A. (2010). Personal epistemology in the classroom: A welcome and guide for the reader. In Bendixen, L. & Feucht, F. (Eds.), *Personal epistemology in the classroom : Theory, research, and implications for practice* (pp. 409-434). Cambridge, UK: Cambridge University Press.
- Harvey, S., Cushion, C. J., & Massa-Gonzalez, A. N. (2010). Learning a new method: Teaching

- games for understanding in the coaches' eyes. *Physical Education and Sport Pedagogy*, 15(4), 361–382. DOI: 10.1080/17408980903535818
- Harvey, S., & Jarrett, K. (2014). A review of the game-centred approaches to teaching and coaching literature since 2006. *Physical Education and Sport Pedagogy*, 19(3), 278-300. DOI: 10.1080/17408989.2012.754005
- Hastie, P. (1998). Applied benefits of the sport education model. *Journal of Physical Education, Recreation & Dance*, 69(4), 24–26. DOI: 10.1080/07303084.1998.10605530
- Hofer, B. (2001). Personal epistemology research: Implications for learning and teaching. *Educational Psychology Review*, 13, 353-383. DOI: 10.1023/A:1011965830686
- Hofer, B. (2002a). Personal epistemology as a psychological and educational construct: An introduction. In Hofer, B. K., & Pintrich, P. R. (Eds.), *Personal epistemology: The psychology of beliefs about knowledge and knowing* (pp. 3-14). Mahwah, NJ: Lawrence Erlbaum Associates.
- Hofer, B. (2002b). Dimensionality and disciplinary differences in personal epistemology. *Contemporary Educational Psychology*, 25, 378-405. DOI: 10.1006/ceps.1999.1026
- Hofer, B. & Pintrich, P. (1997). The development of epistemological theories: Beliefs about knowledge and knowing and their relation to learning. *Review of Educational Research*, 67, 88–140. DOI: 10.3102/00346543067001088
- Holt, N., Neely, K., Slater, L., Camiré, M., Côté, J., Fraser-Thomas, J., MacDonald, L., Strachan, L. & Tamminen, K. (2017). A grounded theory of positive youth development through sport based on results from a qualitative meta-study. *International Review of Sport and Exercise Psychology*, 10(1), 1–49. DOI: 10.1080/1750984X.2016.1180704
- Ismail, A. (2016). EFL teachers' epistemological beliefs and their assessment

- orientations. *International Journal of Applied Linguistics and English Literature*, 6, 99-114. DOI: 10.7575/aiac.ijalel.v.6n.1p.99
- Jayantilal, K., & O’Leary, N. (2017). (Reinforcing) factors influencing a physical education teacher’s use of the direct instruction model teaching games. *European Physical Education Review*, 23(4), 392–411. DOI: 10.1177/1356336X16652081
- Johns, D. & Dimmock, C. (1999). The marginalization of physical education: Impoverished curriculum policy and practice in Hong Kong. *Journal of Education Policy*, 14, 363–384. DOI: 10.1080/026809399286242
- Jones, S., Torres, V., & Arminio, J. (2014). *Negotiating the complexities of qualitative research in higher education: Fundamental elements and issues* (2nd ed.). New York: Routledge.
- Kardash, C. & Scholes, R. (1996). Effects of preexisting beliefs, epistemological beliefs, and need for cognition on interpretation of controversial issues. *Journal of Educational Psychology*, 88, 260–271. DOI: 10.1037/0022-0663.88.2.260
- Kirk, D. (2005). Physical education, youth sport and lifelong participation: The importance of early learning experiences. *European Physical Education Review*, 11(3), 239–255. DOI: 10.1177/1356336X05056649
- Kirk, D. & MacPhail, A. (2002). Teaching games for understanding and situated learning: Rethinking the Bunker-Thorpe model. *Journal of Teaching in Physical Education*, 21, 177-192. DOI: 10.1123/jtpe.21.2.177
- Kretchmar, R. S. (2005). *Practical philosophy of sport and physical activity*. Champaign, IL: Human Kinetics.
- Kuhn, D., Cheney, R., & Weinstock, M. (2000). The development of epistemological

- understanding. *Cognitive Development*, 15, 309–328. DOI: 10.1016/S0885-2014(00)00030-7
- Kulinna, P. & Silverman, S. (2000). Teachers' attitudes toward teaching physical activity and fitness. *Research Quarterly for Exercise and Sport*, 71, 80–84. DOI: 10.1080/02701367.2000.10608884
- Lacroix, C., Camiré, M., & Trudel, P. (2008). High school coaches' characteristics and their perspectives on the purpose of school sport participation. *Journal of Sports Science & Coaching*, 2(2), 3-28. Retrieved from <https://www.researchgate.net/publication/256399904>
- Lawson, H. (1983). Toward a model of teacher socialization in physical education: The subjective warrant, recruitment, and teacher education. *Journal of Teaching in Physical Education*, 2(3), 3-16. Retrieved from <https://proxy.library.brocku.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=edb&AN=20751680&site=eds-live&scope=site>
- Light, R. (2008). Complex learning theory — its epistemology and its assumptions about learning: Implications for physical education. *Journal of Teaching in Physical Education*, 27, 21–37. DOI: 10.1123/jtpe.27.1.21
- Light, R. & Fawns, R. (2001) The thinking body: Constructivist approaches to games teaching in physical education. *Critical Studies in Education*, 42(2), 69-87, DOI: 10.1080/17508480109556385
- Light, R., & Harvey, S. (2017). Positive Pedagogy for sport coaching. *Sport, Education and Society*, 22, 271–287. DOI: 10.1080/13573322.2015.1015977
- Lodewyk, K. (2009). Fostering critical thinking in physical education students. *Journal of*

Physical Education, Recreation & Dance, 80(8), 12-18. DOI:
10.1080/07303084.2009.10598368

Lodewyk, K. (2011). An analysis of correlations among secondary school physical and health education teachers' beliefs and instruction. *Teaching and Learning*, 6, 62-73. Retrieved from
<https://journals.library.brocku.ca/teachingandlearning/index.php/home/article/view/384>

Lodewyk, K. (2015). Relations among epistemic beliefs and instructional approaches to teaching games in prospective physical educators. *The Physical Educator*, 72, 677-700. DOI:
10.18666/tpe-2015-v72-i4-6479

Lodewyk, K., & Gao Z. (2013). Fitness-specific epistemic beliefs, effort regulation, outcomes, indices of motivation in high school physical education. *Journal of Research in Health, Physical Education, Recreation, Sport & Dance*, 8(2), 3-11. Retrieved from
<https://proxy.library.brocku.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1034015&site=eds-live&scope=site>

Lodewyk, K. & Sullivan, P. (2010). Considering beliefs about epistemology, ability, and the need for cognition as achievement-related factors in university physical education students. *Phenex*, 2(2), 1-21. Retrieved from:
<http://ojs.acadiau.ca/index.php/phenex/article/view/146>

MacPhail, A., Kirk, D., & Griffin, L. (2008). Throwing and catching as relational skills in game play: Situated learning in a modified game unit. *Journal of Teaching in Physical Education*, 27(1), 100–115. DOI: 10.1123/jtpe.27.1.100

Mandigo, J., Butler, J., & Hopper, T. (2007). What is teaching games for understanding? A Canadian perspective. *Physical & Health Education Journal*, 73(2), 14–20. Retrieved

from

<https://proxy.library.brocku.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=sph&AN=27054205&site=eds-live&scope=site>

- Mason, L. & Bromme, R. (2010). Situating and relating epistemological beliefs into metacognition: Studies on beliefs about knowledge and knowing. *Metacognition and Learning, 5*, 1-6. DOI: 10.1007/s11409-009-9050-8
- McKenzie, T. L., & Lounsbury, M. A. F. (2013). Physical education teacher effectiveness in a public health context. *Research Quarterly for Exercise and Sport, 84*(4), 419–430. DOI: 10.1080/02701367.2013.844025
- Merriam, S. B. (2001). *Qualitative research and case study designs in education*. San Francisco, CA: Jossey-Bass.
- Muis, K. (2007). The role of epistemic beliefs in self-regulated learning. *Educational Psychologist, 42*, 174-190. DOI: 10.1080/00461520701416306
- Muis, K., Bendixen, L., & Haerle, F. (2006). Domain-generality and domain-specificity in personal epistemology research: Philosophical and empirical reflections in the development of a theoretical framework. *Educational Psychology Review, 18*, 3-54. DOI: 10.1007/s10648-006-9003-6
- Muis, K. & Duffy, M. (2013). Epistemic climate and epistemic change: Instruction designed to change students' beliefs and learning strategies and improve achievement. *Journal of Educational Psychology, 105*, 213–225. DOI: 10.1037/a0029690
- Muis, K. & Foy, M. (2010). The effects of teachers' beliefs on elementary students' beliefs, motivation, and achievement in mathematics. In Bendixen, L. & Feucht, F.

- (Eds.). *Personal epistemology in the classroom : Theory, research, and implications for practice* (pp. 435-469). Cambridge, UK: Cambridge University Press.
- Olafson, L. & Schraw, G. (2006). Teachers' beliefs and practices within and across domains. *International Journal of Educational Research*, 45, 71–84. DOI: 10.1016/j.ijer.2006.08.005
- Olafson, L. & Schraw, G. (2010). Beyond epistemology: Assessing teachers' epistemological and ontological worldviews. In Bendixen, L. & Feucht, F. (Eds.). *Personal epistemology in the classroom : Theory, research, and implications for practice* (pp. 516-552). Cambridge, UK: Cambridge University Press.
- Olsson, C., Cruickshank, A., & Collins, D. (2017). Making mentoring work: The need for rewiring epistemology. *Quest*, 69, 50–64. DOI: 10.1080/00336297.2016.1152194
- Ontario Ministry of Education. (2015). *The Ontario curriculum, grades 9-12 : Health and physical education 2015 (Revised)*. Retrieved from <http://www.edu.gov.on.ca/eng/curriculum/secondary/health.html>
- O'Reilly, E., Tompkins, J., & Gallant, M. (2001). 'They ought to enjoy physical activity, you know?': Struggling with fun in physical education. *Sport, Education and Society*, 6(2), 211-221, DOI: 10.1080/13573320120084281
- Oslin, J. & Mitchell, S. (2006). Game-centered approaches to teaching physical education. In Kirk, D., Macdonald, D., & O'Sullivan, M. (Eds.), *Handbook of physical education* (pp. 627-651). Thousand Oaks, CA: Sage.
- Parviainen, J., & Aromaa, J. (2017). Bodily knowledge beyond motor skills and physical fitness: a phenomenological description of knowledge formation in physical training. *Sport, Education and Society*, 22(4), 477–492. DOI: 10.1080/13573322.2015.1054273

- Patton, M. Q. (2002). *Qualitative research and evaluation methods*. Thousand Oaks, CA: Sage.
- Perry, W. G. (1970). *Forms of intellectual and ethical development in the college years: A scheme*. New York, NY: Holt, Rinehart and Winston.
- Picower, B. (2009). The unexamined whiteness of teaching: How white teachers maintain and enact dominant racial ideologies. *Race Ethnicity and Education, 12*(2), 197–215. DOI: 10.1080/13613320902995475
- Pierce, S., Erickson, K., & Dinu, R. (2019). Teacher-Coaches' perceptions of life skills transfer from high school sport to the classroom. *Journal of Applied Sport Psychology, 31*(4), 451-473, DOI: 10.1080/10413200.2018.1500402
- Pike, S. & Fletcher, T. (2014). A review of research on physical education teacher socialization from 2000-2012. *PHEnex Journal, 6*, 1-17. Retrieved from <http://ojs.acadiau.ca/index.php/phenex/article/view/1536/1275>
- Placek, J. & O'Sullivan, M. (1997). The many faces of integrated physical education. *Journal of Physical Education, Recreation & Dance, 68*(1), 20-24, DOI: 10.1080/07303084.1997.10604872
- Prawat, R. S. (1992). Teachers' beliefs about teaching and learning: A constructivist perspective. *American Journal of Education, 100*, 354–395. DOI: 10.1086/444021
- Qian, G. & Alvermann, D. (1995). Role of epistemological beliefs and learned helplessness in secondary school students' learning science concepts from text. *Journal of Educational Psychology, 87*(2), 282–292. DOI: 10.1037/0022-0663.87.2.282
- Quennerstedt, M. (2013). Practical epistemologies in physical education practice. *Sport, Education and Society, 18*, 311–333. DOI: 10.1080/13573322.2011.582245

- Richards, K., & Templin, T. (2012). Toward a multidimensional perspective on teacher-coach role conflict. *Quest, 64*, 164-176. DOI: 10.1080/00336297.2012.693751
- Rink, J. (2012). *Teaching physical education for learning*. New York, NY: McGraw-Hill.
- Rink, J. E., & Hall, T. J. (2008). Research on effective teaching in elementary school physical education. *Elementary School Journal, 108*(3), 207–218. DOI: 10.1086/529103
- Roberts, S. J. (2011). Teaching games for understanding: The difficulties and challenges experienced by participation cricket coaches. *Physical Education and Sport Pedagogy, 16*(1), 33–48. DOI: 10.1080/17408980903273824
- Roberts, R., Baker, M., & Goossen, C. E. (2016). The chasm between beliefs and practice: A case study of the epistemological positions of pre-service agricultural education teachers. *Journal of Agricultural Education, 57*, 172–186. DOI: 10.5032/jae.2016.02172
- Roth, G. & Weinstock, M. (2013). Teachers' epistemological beliefs as an antecedent of autonomy-supportive teaching. *Motivation and Emotion, 37*, 402–412. DOI: 10.1007/s11031-012-9338-x
- Rovegno (2003). Teachers' knowledge construction. In Silverman, S. & Ennis, C. (Eds.), *Student learning in physical education: Applying research to enhance instruction* (pp. 295-310). Champaign, IL: Human Kinetics.
- Schommer, M. (1990). Effects of beliefs about the nature of knowledge on comprehension. *Journal of Educational Psychology, 82*, 498-504. DOI: 10.1037/0022-0663.82.3.498
- Schommer, M. (1993). Epistemological development and academic performance among

- secondary students. *Journal of Educational Psychology*, 85, 406–411. DOI: 10.1037/0022-0663.85.3.406
- Schommer, M., Calvert, C., Gariglietti, G., & Bajaj, A. (1997). The development of epistemological beliefs among secondary students: A longitudinal study. *Journal of Educational Psychology*, 89, 37–40. DOI: 10.1037/0022-0663.89.1.37
- Smith, A., & Parr, M. (2007). Young people's views on the nature and purposes of physical education: A sociological analysis. *Sport, Education and Society*, 12(1), 37–58. DOI: 10.1080/13573320601081526
- Smokowski, P. R., Reynolds, A. J., & Bezruczko, N. (1999). Resilience and protective factors in adolescence: An autobiographical perspective from disadvantaged youth. *Journal of School Psychology*, 37(4), 425–448. DOI: 10.1016/S0022-4405(99)00028-X
- Soleimani, N. (2018). EFL teachers' epistemological beliefs and classroom management approaches: A case study. *Journal of Language Teaching & Learning*, 8(2), 45–60.
Retrieved from <https://proxy.library.brocku.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=ufh&AN=133549934&site=eds-live&scope=site>
- Sparkes, A. & Smith, B. (2014). *Qualitative research methods in sport, exercise and health: From process to product*. New York, NY: Routledge.
- Tanase, M., & Wang, J. (2010). Initial epistemological beliefs transformation in one teacher education classroom: Case study of four preservice teachers. *Teaching and Teacher Education*, 26, 1238-1248. DOI: 10.1016/j.tate.2010.02.009
- Trudel, P. & Gilbert, W. (2006). Coaching and coach education. In Kirk, D., Macdonald,

- D., & O'Sullivan, M. (Eds.), *Handbook of physical education* (pp. 516-539). Thousand Oaks, CA: Sage.
- Tsai, C. C. (2007). Teachers' scientific epistemological views: The coherence with instruction and students' views. *Science Education, 91*, 222–243. DOI: 10.1002/sce.20175
- Tsangaridou, N. (2006a). Teachers' beliefs. In Kirk, D., Macdonald, D., & O'Sullivan, M. (Eds.), *Handbook of physical education* (pp. 486-501). Thousand Oaks, CA: Sage.
- Tsangaridou, N. (2006b). Teachers' knowledge. In Kirk, D., Macdonald, D., & O'Sullivan, M. (Eds.), *Handbook of physical education* (pp. 502-515). Thousand Oaks, CA: Sage.
- Tsangaridou, N., & O'Sullivan, M. (1997). The role of reflection in shaping physical education teachers' educational values and practices. *Journal of Teaching in Physical Education, 17*, 2–25. DOI: 10.1123/jtpe.17.1.2
- Wang, C. K. J., Chatzisarantis, N. L. D., Spray, C. M., & Biddle, S. J. H. (2002). Achievement goal profiles in school physical education: Differences in self-determination, sport ability beliefs, and physical activity. *British Journal of Educational Psychology, 72*(3), 433–445. DOI: 10.1348/000709902320634401
- Warburton, D., Nicol, C., & Bredin, S. (2006). Health benefits of physical activity: The evidence. *Canadian Medical Association Journal, 174*, 801–9. DOI: 10.1503/cmaj.051351
- Ward, P. (2013). The role of content knowledge in conceptions of teaching effectiveness in physical education. *Research Quarterly for Exercise and Sport, 84*(4), 431–440. DOI: 10.1080/02701367.2013.844045
- White, B. (2000). Pre-service teachers' epistemology viewed through perspectives on

problematic classroom situations. *Journal of Education for Teaching*, 26, 279-305. DOI: 10.1080/02607470020004387

Wildenger, L., Hofer, B., & Burr, J. (2010). Epistemological development in very young knowers. In Bendixen, L., & Feucht, F. (Eds.), *Personal epistemology in the classroom : Theory, research, and implications for practice* (pp. 220-257). Cambridge, UK: Cambridge University Press.

Winchester, G., Culver, D., & Camiré, M. (2011). The learning profiles of high school teacher-coaches. *Canadian Journal of Education*, 34, 216–233. Retrieved from <https://files.eric.ed.gov/fulltext/EJ961498.pdf>

Yalcin, M., & Yalcin, F. A. (2017). The investigation of pre service science teachers' epistemological beliefs according to some variables. *Journal of Education and Training Studies*, 5, 207-217. DOI: 10.11114/jets.v5i10.2224

Appendices

Appendix A

Email Correspondence to Participants

Dear (potential participant),

Thank you for your interest in this research. I have attached a letter of invitation and the informed consent form. I would ask that you please read over both documents so that you are fully aware of what is involved in the research, your important role in this project, and my responsibilities as the researcher.

Should you agree to participate, please sign the informed consent and bring it with you for our interview session. Prior to beginning our interview, we will review the informed consent form together and address any questions.

Participation in this study is completely voluntary and will take approximately 45 minutes to an hour of your time. Together, we will conduct an interview which will be audio recorded.

Please provide me with some possible dates and meeting times that work for you so that we can arrange a mutually agreeable date and time to complete the interview session. I have access to an interview location at Brock University that will be ideal for completing the interview; however, please advise if this is not feasible for you and we can arrange a different interview location.

Thank you again for your interest and participation in this research. Your participation in this study is truly instrumental to me in fulfillment of my master's thesis project.

Should you have any further questions, please do not hesitate to contact me.

Kind regards,

James Foley

Appendix B

Letter of Invitation

[Date]

Title of Study: ‘How I Teach and Coach’: The Epistemological Beliefs of Teacher-Coaches

Principal Investigator: Dr. Ken Lodewyk, Associate Professor, Faculty of Applied Health Sciences – Department of Kinesiology, Brock University

Student Principal Investigator: James Foley, MA Candidate, Faculty of Applied Health Sciences, Brock University

I, James Foley, student principal investigator of the research project, from the Faculty of Applied Health Sciences at Brock University, invite you to participate in a research project entitled ‘*How I Teach and Coach*’: *The Epistemological Beliefs of Teacher-Coaches*.

There are two main purposes to this research project. The first purpose is to explore the epistemological beliefs (beliefs about knowledge and learning) of physical education teacher-coaches. The second is to investigate the influence of those beliefs on teacher-coaches’ teaching and coaching practices.

Participation in this study is voluntary. Should you choose to decline participation in the study it will not impact my ability to successfully complete the research or obtain my degree. Potential participants are by no means obligated to partake in the study and should you choose to withdraw at any time there will be no consequences.

Should you choose to participate, you will be asked to engage in a one-on-one interview in which you will be asked to discuss your beliefs about knowledge and learning in physical education and coaching, and provide details of your experience with teaching and coaching instructional approaches. Participants will be selected on a first-come first-serve basis.

The expected duration of your participation will include one interview (approximately 45 minutes to an hour) and the conversation will be audio recorded. A few weeks after the interview is completed, I will send you some of my preliminary findings upon which I would welcome your confirmation in terms of the accuracy of our conversation and provide you the opportunity to add or clarify any points that you wish.

This research and its findings offer the following benefits: First, the findings of this research will allow you to reflect on your teaching and coaching beliefs, philosophies and practices. Many educators find this to be a valuable experience of reflective practice and professional growth. Second, the important information that you will be able to provide in terms of knowledge and experience has the potential to make a contribution to the literature and has theoretical and practical implications for enhancing teaching pedagogy and coaching practices to enrich student learning.

If you have any pertinent questions about your rights as a research participant, please contact the

Brock University Research Ethics Officer (905 688-5550 ext. 3035, reb@brocku.ca)

If you have any questions, please feel free to contact me (contact information below).

Thank you,

Dr. Ken Lodewyk
Associate Professor
(905) 668 5550 ext. 5220
klodewyk@brocku.ca

James Foley, OCT
MA Candidate
(289) 929-5640
jf11oh@brocku.ca

Note: This study has received ethics clearance through Brock University's Research Ethics Board under File #: 18-261.

Appendix C

Informed Consent

Date: TBD

Project Title: ‘How I Teach and Coach’: The Epistemological Beliefs of Teacher-Coaches

Principal Investigator (PI): Dr. Ken Lodewyk
Associate Professor
Faculty of Applied Health Sciences – Department
of Kinesiology Brock University
905 668 5550 ext. 5220; klodewyk@brocku.ca

Student Principal Investigator (SPI): James
Foley, MA Candidate
Department of Applied Health Sciences
Brock University
(289) 929 5640; jf11oh@brocku.ca

INVITATION

You are invited to participate in a study that involves research. There are two main purposes to this research project. The first purpose is to explore the epistemological beliefs (beliefs about knowledge and learning) of physical education teacher-coaches. The second is to investigate the influence of those beliefs on teacher-coaches’ teaching and coaching practices.

WHAT’S INVOLVED

As a participant, you will be asked to engage in a one-on-one interview in which you will share your beliefs about knowledge and learning in physical education and coaching, and provide details of your experiences with teaching and coaching instructional approaches. The researcher has prepared questions that are meant to elicit responses that will allow you to tap into and reflect on your beliefs and real-life experiences in teaching and coaching. Furthermore, additional questions may be asked to examine deeper meaning and understanding as it relates to this phenomenon. Participation will involve one in-depth interview (approximately 45 minutes to an hour) and the conversation will be audio recorded. A few weeks after the interview is completed, you will be provided preliminary findings and provided the opportunity to confirm the accuracy of the data collected during the interview process and may add or clarify any points that you wish. With your agreement, you may be contacted at a later date for additional questions or clarifications. You may decide at that time whether you wish to continue participating in the study. Lastly, by signing this form you are agreeing that the data collected may be used in secondary studies examining similar research agendas.

POTENTIAL BENEFITS AND RISKS

This research and its findings offer the following benefits: First, the findings of this research will allow you to reflect on your teaching and coaching beliefs, philosophies and practices. Many educators find this to be a valuable experience of reflective practice and professional growth. Second, the important information that you will be able to provide in terms of knowledge and experience has the potential to make a contribution to the literature and has theoretical and practical implications for enhancing teaching pedagogy and coaching practices to enrich student learning. There are no known or anticipated risks associated with participation in this study.

Participants will be reminded that they may choose what to disclose to the researcher and any disclosures or decisions not to disclose will not affect the researcher-participant relationship.

CONFIDENTIALITY

The information you provide will be kept confidential. Your name will not appear in any thesis or report resulting from this study. Any identifiers that have the potential to breach this confidentiality will be removed; however, with your permission, anonymous quotations (through the use of a pseudonym) may be used. The information collected during this study will be stored on password-protected files on password-protected computers and backed up on a password-protected USB. Any hardcopy documents will be kept in locked offices on Brock University's campus. The data will be stored until the principal student investigator has defended their thesis and then will be kept for five years in order to produce further publications. After this point data will be destroyed (i.e. confidential shredding and deletion of electronic files). Access to this data will be restricted to the principal investigator and student principal investigator.

VOLUNTARY PARTICIPATION

Participation in this study is voluntary. Should you choose to decline participation in the study it will have no impact on the ability of the researcher to successfully complete the research project or obtain their degree. You are by no means obligated to partake in the study and should you choose to withdraw at anytime, there will be no consequences. Furthermore, you may decide what you choose to disclose to the researcher.

PUBLICATION OF RESULTS

Results of this study may be published in professional journals and presented at conferences. If you wish to receive a final report of this research, the principal student investigator will send you an electronic copy per your request.

CONTACT INFORMATION AND ETHICS CLEARANCE

If you have any questions about this study or require further information, please contact Dr. Ken Lodewyk using the contact information provided previously. This study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University [File #: 18-261]. If you have any comments or concerns about your rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca.

Thank you for your assistance in this project. Please keep a copy of this form for your records.

CONSENT FORM

I agree to participate in this study described above. I have made this decision based on the information I have read in the Letter of Invitation. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time.

Name: _____

Signature: _____ Date: _____

Appendix D

Interview Guide Draft

Thank you for agreeing to participate in this research. The interview should take approximately 45 minutes to 1 hour. Please feel free to skip any questions, return to any previous questions or answers and clarify your responses to previous questions at any time. What you choose to disclose to me during this interview is completely up to you. However, our discussion today will not be a sensitive or high-risk nature. Your name and any identifying information collected will be kept completely confidential. Your name will be replaced with a pseudonym, and any reference to institutions such as schools, school boards, and organizations will also be replaced. If you would like to take a 5-minute break at any time, please let me know. Before we begin, do you have any questions about the study, your rights as a participant or my responsibilities as a researcher?

1. To begin, I was wondering if you could tell me a bit about your teaching and coaching background?
2. What do you feel is the purpose of physical education/games and are the objectives or aims of interscholastic sports the same or different? Why do you think that?
3. Do you believe that teaching and learning in physical education/games is easy or difficult? Why do you think that?
4. Do you believe that coaching is easy or difficult? Why do you think that?
5. What do you believe is the important knowledge that students take away from participating in games during physical education? Is it the same or different from the knowledge gained by participating in interscholastic sports? Why do you think that?
6. Do you teach the same way you coach? Why or why not?
7. Can you describe a typical physical education/games lesson in your class?
8. Can you describe a typical practice in the sport you coach?
9. Do you ever reflect on your students' learning as you consider yourself in the role of a teacher and a coach? If so, what do you think about? Why?
10. How has your teaching or coaching philosophy changed (if at all) or developed since you began teaching/coaching? What are some factors that have lead to these changes?

Is there anything else that you would like to touch upon, clarify or add to? Is there anything that we have not discussed that you feel is relevant to your teaching and coaching experiences? Is there anything that you feel is important for other practicing teacher-coaches to know or learn about? Thank you for taking the time to speak with me today.

Appendix E**Questionnaire**

Name:

Gender:

Age:

1. What school(s) do you teach/coach at?
2. What grade(s) do you teach?
3. What course(s) do you teach?
4. What sport(s) do you coach?
5. How many years of teaching experience do you have?
6. How many years of teaching experience in PE do you have?
7. How many years of coaching experience in extracurricular sport do you have (please provide details of each sport and the number of years coaching each sport)?
8. Have you obtained any additional coaching credentials/certifications (if so, please provide details)?
9. Have/do you coach(ed) outside of school-based extracurricular sport (if so, please provide details)?
10. Please list any sports that you have previously participated in, how long you played each sport and the highest level you competed at for each sport (e.g. volleyball – varsity high school, soccer – community house league):