Training, Barriers, and Self-Efficacy to Physical Education Instruction

Stephanie Truelove, The University of Western Ontario

Supervisor: Tucker, Trish, The University of Western Ontario
A thesis submitted in partial fulfillment of the requirements for the Doctor of Philosophy degree in Health Promotion
© Stephanie Truelove 2020

Follow this and additional works at: https://ir.lib.uwo.ca/etd

Part of the Health and Physical Education Commons

Recommended Citation
https://ir.lib.uwo.ca/etd/7138

This Dissertation/Thesis is brought to you for free and open access by Scholarship@Western. It has been accepted for inclusion in Electronic Thesis and Dissertation Repository by an authorized administrator of Scholarship@Western. For more information, please contact wlsadmin@uwo.ca.
Abstract

The overall purpose of this dissertation was to explore the physical education (PE) training that generalist and PE specialist elementary school teachers receive during their pre-service programs across the province of Ontario, and the differences between these two types of teachers regarding barriers faced and self-efficacy in instructing PE. Using an online survey, Study 1 aimed to examine and compare the PE teaching self-efficacy of generalist and PE specialist elementary teachers across Canada and the barriers to instruction faced. Study 2 qualitatively explored the experiences of elementary school generalist and PE specialist teachers when instructing PE, and the perceived barriers and facilitators that influence teaching practices. Study 3 sought to summarize the PE training (i.e., extent [hours], and content) pre-service teachers receive at Faculties of Education across Ontario, and compare the differences in training between generalist teachers, and those specializing in PE as a teachable subject.

Study 1 revealed that elementary school PE specialist teachers’ self-efficacy ($n = 296$) was significantly higher ($p < .05$) than that of generalist teachers ($n = 818$) across all subscales of the Teaching Efficacy Scale in Physical Education. Gender was found to predict teachers’ self-efficacy, with female generalists reporting lower scores. Of the 11 barriers listed, generalist teachers reported 9 barriers as significantly more inhibitory ($p < .05$) than specialist teachers.

The results of Study 2 identified that elementary school generalist and specialist teachers perceive different factors to influence their PE teaching practices. Generalist teachers noted perceived lack of time, inadequate facilities and equipment, insufficient
training, lack of knowledge, and low self-efficacy as barriers teaching PE. Conversely, specialists noted that their advanced training, professional development opportunities, high self-efficacy, and use of technology positively supported their teaching practices.

Finally, Study 3 results suggest that generalist teachers at Faculties of Education across Ontario receive approximately 35 hours less PE training compared to their specialist counterparts. When reviewing the PE course syllabi at each institution, it was noted that PE specialist teachers receive additional training regarding developing their students’ motor skills, integrating technology into lessons, locating resources, and developing a personalized teaching philosophy for PE instruction.

*Keywords*: physical education, teacher, self-efficacy, education, training, barriers
Elementary physical education (PE) is taught by two types of teachers: 1) generalist teachers (i.e., those who are not specially trained in PE during pre-service teacher education and are responsible for teaching multiple subjects) and PE specialists (i.e., those who are trained in PE as a teachable subject during pre-service teacher education). These teachers have a strong influence on the PE experience of their students, and their confidence to teach has been found to be related to their quality of instruction. The overall aim of this dissertation was to explore: 1) the confidence and barriers faced by these two types of teachers when instructing PE; and 2) the PE training generalist and PE specialist teachers receive during their pre-service programs across the province of Ontario. These two objectives were divided into three research studies.

Study 1 compared the confidence and barriers faced by generalist and PE specialist teachers across the country using an online survey. Overall, specialist teachers’ confidence was significantly higher than that of generalist teachers. When comparing gender differences, female generalist teachers reported much lower confidence in comparison to male generalist teachers, and male and female specialists. Generalist teachers also reported 9 out of the 11 listed barriers as more substantial compared to their specialist counterparts.

Study 2 involved interviewing generalist and PE specialist teachers across the country to explore their experiences when instructing PE. Generalist teachers noted perceived lack of time, inadequate facilities and equipment, insufficient training, lack of knowledge, and low self-efficacy as barriers to instructing high-quality PE class.
Conversely, PE specialists noted that their advanced training, professional development opportunities, high self-efficacy, and technology use positively supported their teaching practices.

Study 3 explored the PE training teachers receive at Faculties of Education across Ontario, and compared the differences in training between generalist teachers, and those specializing in PE as a teachable subject. It was found that, on average, specialist teachers receive approximately 35 hours more of PE training than their generalist counterparts, specifically regarding developing motor skills, technology integration, locating PE resources, and developing a personalized teaching philosophy for PE.
Co-Authorship Statement

While the contents of this dissertation are my original work, I would like to acknowledge the contributions and collaborations of four co-authors. Firstly, thank you to my supervisor Dr. Trish Tucker who played a central role in the conceptualization, design, and implementation of all three studies. Next I would like to thank the members of my advisory committee, Drs. Andrew Johnson and Shauna Burke for their guidance as well as their analytical and editorial expertise for Studies 1 (AJ, SB), 2 (AJ, SB) and 3 (SB). Lastly, I would like to thank a fellow PhD student and lab mate Brianne Bruijns for her coding and editorial assistance for Study 2.
Acknowledgements

The completion of my Doctoral degree (which includes this thesis) would not have been possible without a number of important individuals. I would like to sincerely thank the following people for their ongoing support, encouragement, guidance, and mentorship over the past four years:

**Dr. Trish Tucker** for her continuous guidance, mentorship, and encouragement. It is because of her that I decided to continue my postgraduate work and pursue a Doctoral degree. Thank you for always supporting my academic and future career goals, and challenging me to grow as a student and as a person. You embody what it means to be a strong female leader, and I have learned many lifelong skills working under your supervision. I am proud of what I have accomplished under your guidance and I feel extremely fortunate to have had you as my supervisor. I could not have asked for a better mentor to guide me through my doctoral work, or a tougher competitor on the basketball court.

**Drs. Andrew Johnson and Shauna Burke** for serving as members of my advisory committee. Your statistical expertise, feedback, and mentorship greatly contributed to the successful completion of my Doctoral degree, and I am immensely thankful.

My examiners (**Drs. Jennifer Irwin, Jason Gilliland, Harry Prapavessis, and Nathan Hall**), for taking the time to review my dissertation and for providing me with valuable feedback throughout my defence.

To the numerous **teachers** across Canada who took part in my research and made my studies possible.

The **Ontario Graduate Scholarship (OGS)**, **Mitacs Accelerate Program**, and **The GoodLife4Kids Foundation** for funding my Doctoral work.

**My friends:** Thank you for making this journey so enjoyable. My lab mates, intramural friends, HRS family, and Chaos teammates have kept me smiling through the good times and the stressful moments.

**My family:** Thank you to my parents, sister and boyfriend for all you have done for me. Your ongoing support and encouragement over my LONG postgraduate career has been very much appreciated. I look forward to being called Dr. at all our family functions from this moment on.
# Table of Contents

Abstract ............................................................................................................................................................................ ii
Summary for Lay Audience .................................................................................................................................................. iv
Co-Authorship Statement .................................................................................................................................................. vi
Acknowledgements ........................................................................................................................................................... vii
Table of Contents ............................................................................................................................................................ viii
List of Tables ...................................................................................................................................................................... xii
List of Figures ..................................................................................................................................................................... xiii
List of Appendices .............................................................................................................................................................. xiv
List of Abbreviations .......................................................................................................................................................... xv

**Chapter 1: Introduction, Rationale, and Purpose Statement** ................................................................. 1

Canadian 24-Hour Movement Guidelines for Children and Youth (5-17 years) ....................... 2
Prevalence of Physical Activity and Sedentary Behaviours ................................................................. 3
The School Setting ............................................................................................................................................................ 4
Teachers’ Self-Efficacy ......................................................................................................................................................... 7
Teacher Education in Canada ................................................................................................................................. 10
Research Rationale .......................................................................................................................................................... 13
Purpose Statement ......................................................................................................................................................... 15
References ....................................................................................................................................................................... 16

**Chapter 2: Comparing Canadian Generalist and Specialist Elementary School Teachers’ Self-Efficacy and Barriers Related to Physical Education Instruction** 28

Methods ........................................................................................................................................................................... 33
Participants and Recruitment .............................................................................................................................. 34
Instruments ................................................................................................................................................................. 37
### Table of Contents

**TEACHING PHYSICAL EDUCATION**

- Participant characteristics................................................................. 37
- Teaching Efficacy Scale in Physical Education (TESPE) .................. 37
- Major barriers inhibiting the delivery of PE........................................ 39

**Data Analysis**.................................................................................. 40

**Results**............................................................................................ 41
- Generalists’ and Specialists’ Self-Efficacy Teaching PE..................... 41
- Perceived Strength of Barriers Teaching PE ....................................... 44

**Discussion**......................................................................................... 44
- Self-Efficacy Teaching PE................................................................. 47
- Gender ............................................................................................... 50
- Barriers Teaching PE ........................................................................ 51
- Limitations ......................................................................................... 53

**Conclusion**........................................................................................ 55

**References**.......................................................................................... 58

**Chapter 3: Factors that Influence Canadian Generalist and Physical Education**

**Specialist Elementary School Teachers’ Practices in Physical Education: A Qualitative Study**................................................................. 65

**Methods**............................................................................................. 69
- Participants and Recruitment .............................................................. 69
- Data Collection .................................................................................... 70
- Data Analysis ....................................................................................... 71

**Results**............................................................................................... 72
- Teaching Philosophy and Goals .......................................................... 72
- Barriers Faced When Instructing PE ..................................................... 75
List of Tables

Study 1

Table 1. Descriptive Characteristics of Generalist and Specialist Teachers \((n = 1,114)\) ... 36

Table 2. Self-Efficacy of Generalist and PE Specialist Teachers Assessed via the TESPE.. 42

Table 3. Medians, Mean Rank, and Mann-Whitney U of Additional Self-Efficacy Variables ................................................................. 45

Table 4. Medians, Mean Rank, and Mann-Whitney U for Perceived Strength of Barriers Experienced by Generalist and PE Specialist Teachers........................................ 46

Study 2

Table 1. Participant Characteristics of Elementary School Teachers \((n = 16)\) ............... 73

Table 2. Factors Influencing Generalist and Specialist Elementary School Teachers Instructing PE ........................................................................................................ 74

Study 3

Table 1. Hours of PE Training by Institution as Reported by Faculties of Education in Ontario ........................................................................................................................................ 111

Table 2. Content Included in PE Courses as Reported by Faculties of Education in Ontario ........................................................................................................................................ 114

xii
List of Figures

Study 1

Figure 1. Number of Participants (n = 1,114) Based on the Province/Territory in Which They Teach, Separated by Type of Teacher (Generalist vs. PE Specialist)........... 38

Figure 2. Profile Plots of Estimated Marginal Means of Self-Efficacy for: A) Motivation Subscale, B) Analysis of Skill Subscale, C) Preparation Subscale, D) Communication Subscale, E) Overall Teacher Efficacy Score............................... 43
List of Appendices

Appendix A: Letter of Information and Consent for Study 1 ........................................... 151
Appendix B: Ethics Approval for Study 1 and Study 2 ...................................................... 154
Appendix C: Participant Recruitment Poster for Study 1 and Study 2 .................................. 157
Appendix D: Email Script to Principals for Study 1 and Study 2 ....................................... 159
Appendix E: Email Script to Teachers for Study 1 and Study 2 ......................................... 161
Appendix F: Participant Demographic Questionnaire for Study 1 ................................. 163
Appendix G: Teacher Efficacy Scale in Physical Education for Study 1 ......................... 166
Appendix H: Major Barriers Questionnaire for Study 1 ...................................................... 169
Appendix I: Letter of Information for Study 2 ................................................................. 171
Appendix J: Verbal Script for Consent for Study 2 ............................................................. 174
Appendix K: Phone Interview Script for Study 2 .............................................................. 176
Appendix L: Data Extraction Table for Study 3 ................................................................. 180
List of Abbreviations

ANCOVA: Univariate Analysis of Covariance

MANCOVA: Multivariate Analysis of Covariance

METs: Metabolic Equivalents

MVPA: Moderate-to Vigorous-Intensity Physical Activity

OPHEA: Ontario Physical and Health Education Association

PE: Physical Education

SD: Standard Deviation

SPSS: Statistical Package for the Social Sciences

TESPE: Teaching Efficacy Scale in Physical Education
CHAPTER 1

Introduction, Rationale, and Purpose Statement

Engaging in regular physical activity is integral to the overall health, growth, and development of children and youth aged 5-17 years. Defined as “any bodily movement produced by skeletal muscles that requires energy expenditure” (Caspersen, Powell, & Christenson, 1985, p. 126), physical activity is associated with a plethora of health benefits, especially for children and youth (Poitras et al., 2016). Physiological health benefits include maintenance of a healthy body weight, stronger bones and muscles, enhanced motor skill development, better cardiometabolic biomarkers, and decreased risk of diabetes and insulin resistance (Poitras et al., 2016). Psychosocial benefits of engaging in physical activity include improved mood and reduced stress, as well as improved ability to cope with stress, higher self-esteem, improved body image, decreased symptoms associated with depression, and improved confidence in physical abilities (Nieman, 2002). Additionally, participation in physical activity in childhood can positively influence cognitive functions, such as: memory, attention, visual-spatial, executive functions, thinking, and language acquisition (Carson et al., 2016). In fact, research supports that physical activity is positively associated with cognition and overall academic performance in children (Álvarez-Bueno et al., 2017; Lima, Pfeiffer, Møller, Andersen, & Bugge, 2019; Singh et al., 2019).

Equally important as engaging in regular physical activity is avoiding large amounts of time in sedentary pursuits. Sedentary behaviour is defined as “any waking behaviour that is characterized by an energy expenditure ≤ 1.5 metabolic equivalents
(METs), while in a sitting, reclining, or lying posture” (Tremblay et al., 2017, p. 9). In fact, sedentary behaviour has been identified to be a risk factor for poor health in children and youth (Carson et al., 2016) regardless of physical activity patterns (Mitchell & Byun, 2014; Salmon, Tremblay, Marshall, & Hume, 2011). Further, sedentary behaviour during childhood can impact health during adulthood by establishing poor lifestyle behaviours (Hirvensalo & Lintunen, 2011; Owen et al., 2011). Therefore, refraining from substantial amounts of sitting can reduce the risk of a multitude of short- and long-term negative health outcomes for children and youth, including obesity (Shields & Tremblay, 2008), diabetes, cardiovascular disease, and death (Wilmot et al., 2012).

**Canadian 24-Hour Movement Guidelines for Children and Youth (5-17 years)**

In order to reap these numerous health benefits of engaging in physical activity, the Canadian 24-Hour Movement Guidelines for Children and Youth (Tremblay et al., 2016), and many other guidelines around the world (e.g., Australia [Okely et al., 2012], United States of America [US Department of Health and Human Services, 2008], and World Health Organization [World Health Organization, 2010]) recommend that children and youth spend a minimum of 60 minutes each day in moderate- to vigorous-intensity physical activity (MVPA). MVPA is higher intensity activity which is heart-pumping in nature, for example, running, jumping, swimming, skating, and biking. Additionally, it is recommended that children and youth limit sitting for extended periods each day and spend no more than 2 hours per day in front of a screen (Tremblay et al., 2016). These guidelines are based on systematic reviews examining the relationship between physical
activity and health indicators in school-aged children and youth (Janssen & Leblanc, 2010; Tremblay, Colley, Saunders, Healy, & Owen, 2010).

Prevalence of Physical Activity and Sedentary Behaviours

Despite the large body of evidence that supports the health benefits associated with meeting these activity recommendations (Poitras et al., 2016; Strong et al., 2005) it has been estimated that 80% of youth worldwide are insufficiently active (Sallis et al., 2016). Additionally, the Global Matrix 3.0 on Physical Activity for Children and Youth, a recent report card released by the Active Healthy Kids Global Alliance comparing the physical activity trends in 49 countries from six continents on 10 physical activity indicators (i.e., overall physical activity, organized sport and physical activity, active play, active transportation, sedentary behaviours, physical fitness, family and peers, school, community and environment, and government), revealed that 75% of countries report failing physical activity grades for children (Aubert et al., 2018). In Canada, only 39% of children and youth aged 5-17 years are meeting the physical activity guidelines for their age group (ParticipACTION, 2020). Additionally, only 38% of children and youth in Canada are meeting the screen-time recommendations (ParticipACTION, 2020).

Developing appropriate movement behaviors during childhood is important as these behaviors will carry forward into adult years (Telama, 2009). Additionally, childhood behaviours are protective to adverse health risks and chronic disease (Poitras et al., 2016). Therefore, developing healthy physical activity habits and reducing sedentary behaviour (e.g., screen-time) during childhood is essential.
The School Setting

Given that children in countries with compulsory education attend school for a majority of their waking hours, this is a valuable setting to encourage regular physical activity and reduce sedentary behaviour (Pate et al., 2006). Unfortunately, children’s physical activity opportunities are restricted during the school day. Typically, at elementary school (i.e., Kindergarten to Grade 8 [ages ~5-13 years]) recess and physical education (PE) class are the only opportunities children have to be physically active. Across Canada, PE is a mandatory curriculum subject from Kindergarten through Grade 9, and in some provinces it is mandatory beyond Grade 9. Many studies support that children are significantly more active (and more likely to meet the physical activity recommendations) on days they have PE class compared to days without (Chen, Kim, & Gao, 2014; Cheung, 2017; Sigmund, Sigmundová, Hamrik, & Gecková, 2014). An international study of 9- to 11-year-olds from 12 countries (including Canada) found that PE class attendance was associated with more daily physical activity and less sedentary time on weekdays (Silva et al., 2018). Gao and colleagues (2017), explored the contributions of PE, active video games, recess, lunch break, and after-school time segments to children’s daily physical activity and sedentary behaviours, and found that overall, PE was more effective in generating MVPA and reducing sedentary time than other segments over the school day. While recess and after-school time provide children with a chance to engage in unstructured play, PE is a core curriculum subject, allowing for regular and structured opportunities to be active. As such, maximizing this time
during the school day to be active is imperative to improve the health and wellbeing of children and youth.

To support high levels of activity during PE, The Centre for Disease Control and Prevention (US Department of Health and Human Services, 2010) and the United Kingdom’s Association for Physical Education recommend that elementary school children engage in MVPA for at least 50% of PE time (Association for Physical Education, 2013). This can contribute to children meeting the physical activity guidelines put forth in Canada (Tremblay et al., 2016), and by the World Health Organization (World Health Organization, 2010). To date, three reviews have been conducted that explored physical activity levels of children during elementary school PE lessons (Fairclough & Stratton, 2006; Hollis et al., 2016; Truelove, Bruijns, Johnson, Gilliland, & Tucker, 2020).

Fairclough and Stratton (2006; n = 44 studies) reported that students participated in MVPA for 34.2% of lesson time; Hollis and colleagues (2016; n = 13 studies) found that students spent 44.8% of time engaged in MVPA; and Truelove et al. (2020; n = 42 studies) reported children spent 33.0% of their PE class spent in MVPA, and were sedentary for 35.9%. While these reviews all had the same objective, the most recent review conducted by Truelove and colleagues only included articles which measured physical activity and sedentary time via accelerometry, the gold-standard for capturing movement behaviours, and incorporated sedentary time. As evident in all three reviews, physical activity levels are below the recommendations for PE lessons, and more focus should be placed on getting children active in this setting.
In addition to accumulating minutes of physical activity, PE is an opportune time for children to become physically literate (Whitehead, 2007). Physical literacy is defined as the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engagement in physical activities throughout life (Whitehead, 2010). PE class provides an authentic learning environment for individuals to gain and practice new skills in a closed atmosphere before integrating them into other more advanced movements and settings (Boyce, 1992). Mastering fundamental movement skills, such as throwing, catching, running, jumping and balancing, and developing confidence performing these skills during PE is vital for current and future participation in physical activity (Gallahue & Donnelly, 2007). Children who develop these skills in childhood are more confident and competent executing them and are more likely to remain active throughout their lives (Whitehead, 2010) compared to children who are not physically literate. Systematic reviews conducted by Holfelder and Schott (2014; n = 23 studies), and Logan and colleagues (2015; n = 13 studies), suggest a positive relationship between fundamental movement skill competence and physical activity levels in childhood, continuing throughout adolescence. Acknowledging the importance of developing these skills early in life, as they can predict future activity participation, it is vital that children are provided with a quality PE program in order to develop these skills throughout their elementary school years. According to Physical Health and Education Canada (2020), a quality physical education program is one that ensures that all children who receive it have the opportunity to develop the knowledge, skills and habits that they need to lead physically active lives now, and just as
importantly, into the future. Quality programs include: well-planned lessons incorporating a wide range of activities; a high level of participation by all students in each class; an emphasis on fun, enjoyment, success, fair play, self-fulfillment and personal health; appropriate activities for the age and stage of each student; qualified and enthusiastic teachers; and creative and safe use of facilities and equipment (Physical Health and Education Canada, 2020).

**Teachers’ Self-Efficacy**

The task of creating a learning environment conducive to the development of knowledge, confidence and competence, executing skills and engaging in activity rests heavily on the talents and self-efficacy of teachers. According to Social Cognitive Theory (Bandura, 1997), self-efficacy is defined as people’s beliefs about their capabilities to produce designated levels of performance that exert influence over other events that affect their lives (Bandura, 1997). More specifically, teaching efficacy has been defined as “the extent to which the teacher believes he or she has the capacity to affect student performance” (Berman, 1977, p. 137). The beliefs teachers hold can influence their perception of education, teaching behaviours, and student learning outcomes (Xiang, Lowy, & Mcbride, 2002). In fact, numerous educational researchers view teacher self-efficacy as a major determinant of effective teaching (Ashton & Webb, 1986; Hoy, 2000; Hoy & Woolfolk, 1993). Not specific to PE, teacher self-efficacy has been found to predict student achievement (Ashton, 1984), student motivation (Midgley, Feldlaufer, & Eccles, 1989), and students’ own sense of self-efficacy (Anderson, Greene, & Loewen, 1988). Further, teacher self-efficacy has been linked to teacher’s enthusiasm for
teaching (Allinder, 1994), high confidence levels and positive attitudes, their willingness to experiment with new methods (Stein & Wang, 1988), the amount of effort and persistence a teacher demonstrates (Coladarci, 1992), and their commitment to teaching (Ward, 2005). According to Chase, Lirgg, and Carson’s teacher efficacy model (2001), PE teachers high in overall efficacy will provide more instructional time and a higher quality of feedback to students than teachers with low self-efficacy. While the expressed level of confidence a PE teacher has in his or her ability to help students learn is likely related to their quality of delivery, only a small body of literature is available regarding the self-efficacy of teachers responsible for PE instruction, and how efficacious they are to deliver a high-quality experience for their students.

Many factors can influence the self-efficacy of teachers instructing PE. For example, a teacher’s previous experiences in PE as a student can play an important role in the development of their confidence to appropriately teach PE. Morgan and Bourke (2008), examined the effects of personal school experiences of pre-service (i.e., those currently training to become a teacher; \( n = 386 \)) and in-service (i.e., those already in the teaching profession; \( n = 53 \)) elementary school teachers in Australia, and the influence of these experiences on their PE teaching efficacy. Overall, they found that individuals who recalled more negative experiences in school PE indicated lower levels of PE teaching confidence than those who had more favourable experiences. Additionally, results indicated that the quality of an individual’s school PE experiences directly predicted his or her confidence to teach PE. Surveying 189 generalist teachers, Morgan and Hansen (2008) found that there was a strong inverse correlation \( (r = -.35, p < .01) \)
between teachers’ poor personal experiences in PE and perceived self-efficacy implementing a high-quality lesson. Increased training and education have also been found to impact teachers’ self-efficacy and can even alter their previous negative views towards PE. For example, pre-service teachers have been found to be more efficacious to teach PE after completing course work and practicum placements (Fletcher, Mandigo, & Kosnik, 2013; Zach, Harari, & Harari, 2012). Additionally, in-service teachers have reported higher levels of self-efficacy after taking part in professional development opportunities (Jess & McEvilly, 2015; Petrie, 2010). Furthermore, past research has shown that teachers who are specifically trained in PE as a teachable subject during pre-service teacher education (i.e., PE specialists) are more confident teaching in this setting compared to generalist teachers (i.e., classroom teachers who are not specially trained in PE and are required to teach all curriculum subjects; Decorby et al., 2005; Spence et al., 2004). This can be attributed to the fact that they receive additional and specialized training throughout their pre-service program. A survey of 480 teachers in Alberta found significant differences between generalist teachers and PE specialists’ perceptions of preparedness ($p < .001$), teaching enjoyment ($p < .001$), and confidence ($p < .001$) to teach PE, with specialists reporting higher means across all items (Spence et al., 2004).

Similarly, Decorby and colleagues (2005), explored the quality of PE in two schools in Manitoba, one of which had a specialist teaching PE for the entire school, and the other which utilized generalist teachers to instruct their own PE. Although many comparisons were made between the quality of PE at the two schools, key findings suggest that the specialist teacher was more confident in her ability to plan safe, developmentally
appropriate lessons for her students, focus on basic movement skills, create a non-competitive environment to increase participation rates, and expose students to activities to encourage lifelong participation in a variety of activities. While these two studies highlight the differences in self-efficacy between teachers with varied levels of training, the sample size of these studies are small (i.e., Decorby and colleagues [2005] only included four teachers) and the studies are over 15 years old. In a field that is constantly evolving an updated study incorporating a large, nationwide sample is needed to better explore generalists’ and specialists’ self-efficacy to teach PE, and barriers faced which impact their efficacy and quality of delivery.

**Teacher Education in Canada**

The quality of a PE program is heavily contingent on the teacher leading the class (Morgan & Bourke, 2008). Teachers are responsible for planning and structuring PE classes to meet provincial/territorial curriculum requirements, assessing students’ movements and providing feedback, providing opportunities for cognitive and skill development, keeping students engaged and participation rates high, as well as managing behaviour and creating a safe environment for children to develop the confidence and competence to be active (Ontario College of Teachers, 2015). With the numerous responsibilities required of PE teachers, as mentioned above, the literature suggests teachers’ training and education are major factors contributing to their competence to teach a high-quality class (Fletcher et al., 2013; Zach et al., 2012). For example, Zach, Harari, and Harari (2012), explored 203 pre-service teachers’ confidence to teach PE at the beginning and end of one academic school year. They found that
students’ confidence to teach PE significantly increased after one year of college education. Surveying 285 pre-service teachers before and after attending a 12-hour PE course and two practicum teaching placements, Fletcher, Mandigo, and Kosnik (2013), found that teachers felt that their training and education provided them with useful examples of how to promote inclusive and collaborative opportunities for learning, and gave them more confidence overcoming barriers.

In order to be accredited to teach elementary school or high school within Canada, all individuals must attend a teacher education program. The intent of all pre-service programs is to provide teacher candidates with requisite skills, knowledge, experience, and confidence needed to teach. Within the country, there are 64 institutions that offer teacher education certification. When applying to a teacher education program, a student must specify to which division of teaching they are applying. As education is mandated at the provincial/territorial level, each province/territory has their own unique breakdown of teaching divisions. For example, in Ontario, there are three commonly designated teacher education divisions: Primary/Junior (Kindergarten-Grade 6), Junior/Intermediate (Grades 4-10), and Intermediate/Senior (Grades 7-12). However, other provinces (e.g., British Columbia and Alberta) only have two teaching divisions: Elementary (Kindergarten-Grade 8) and Secondary (Grades 9-12). In some provinces, teaching certificates are division-specific, meaning that a teacher with a Junior/Intermediate certificate is not qualified to teach other divisions. In the lower grades (i.e., Primary/Junior division in Ontario), teachers are commonly referred to as generalist teachers, as they are responsible for teaching
many subjects (e.g., arts, language, social science, math, and science) with no speciality. Teacher education for those enrolled in the intermediate grades (i.e., Junior/Intermediate division in Ontario) is slightly different because the teachers are generalists as well as *subject specialists* in at least one area (e.g., health and PE). At the secondary level, there are no generalist teachers; teachers in the Intermediate/Senior division are specialists in two subject areas (e.g., math and physics). This means that at the elementary school level (i.e., Kindergarten–Grade 8), many teachers are responsible for instructing subjects in which they have had minimal training. In fact, only 53% of elementary schools in the province of Ontario employ a full- or part-time PE teacher (People for Education, 2018). In Alberta, approximately 33% of PE classes are taught by specialists (Thompson et al., 2001). Therefore, a large percentage of PE classes at the elementary school level are taught by generalist teachers.

The high rate of PE instruction by non-specialists is concerning. Generalist teachers have typically reported lower self-efficacy teaching in this environment (Morgan & Bourke, 2008; Morgan & Hansen, 2008), and identified barriers, such as lack of time, minimal training, inadequate facilities and equipment, and low levels of teaching confidence as more inhibitory (Decorby et al., 2005), both factors strongly affecting their quality of instruction. As mentioned previously, specialist teachers have been found to be more confident teaching in this environment (Faulkner et al., 2008; Spence et al., 2004). In addition, students who are taught by PE specialists have demonstrated significantly higher levels of achievement with regards to motor skills,
physical literacy, academic achievement, fitness, and physical activity levels than those taught by non-specialists (Sallis et al., 1997).

Globally, there have been concerns expressed about the preparation of elementary school teachers to deliver PE instruction (Green, 2008; Hardman & Marshall, 2005). Generally, these programs deliver a combination of subject matter knowledge, pedagogical knowledge, knowledge of learners, and the learning of professional values and conduct (Metzler & Tjeerdsma, 2000). However, generalist teachers usually have limited hours to learn how to teach PE (Lu & Lodewyk, 2012) in comparison to those specializing in the field. For example, at Nipissing University in Ontario, Canada, pre-service teachers in the Primary/Junior division (i.e., generalist teachers) receive 36 hours of health and PE training; in contrast, individuals in the Junior/Intermediate division whose teachable subject is health and PE receive 72 hours of training (Nipissing University, 2020). Despite the substantial variation in hours of training, more often than not, PE classes are taught by generalist teachers. Acknowledging that teacher education programs should only be viewed as the first stage in a longer professional learning process, adequate training is necessary to ensure teachers are properly prepared to plan and implement high-quality classes when they enter the workforce.

**Research Rationale**

Due to the important role that the school setting plays in the lives of children and youth, and the fact that PE is a mandatory curriculum component at the elementary school level, this venue represents an ideal environment to provide opportunities for children to develop the knowledge, confidence, and skills to be active for life. However,
despite the published literature exploring the quality of PE instruction (Decorby et al., 2005; Morgan & Hansen, 2008), many questions still remain. For example, although there is research exploring teachers’ confidence instructing PE, there is a need for more recent research in this area as teaching is a dynamic profession which is ever evolving to meet the diverse learning needs of students. Furthermore, little work has been done to compare the self-efficacy and barriers faced teaching PE between generalist teachers and those specialized in PE as a teachable subject in Canada. While the qualifications of teachers instructing PE at the elementary school level have been identified in the literature as influencing the PE experience among students (Davis et al., 2005; McKenzie et al., 1995; Sallis et al., 1997), additional research is needed to identify specifically what factors generalists and specialists perceive facilitate and/or hinder their ability to provide quality PE classes. Furthermore, although elementary and secondary school students' health and PE curriculum is standardized provincially/territorially, no studies have explored the PE training provided to pre-service generalist and PE specialist teachers at Faculties of Education within a province. This training and education have the potential to impact teachers’ self-efficacy. Therefore, additional data within a provincial context is needed so that researchers, policy makers, and educators are able to better promote and support the development of healthy activity behaviours of children through improved training (and in turn, increased self-efficacy) for their teachers.
Purpose Statement

The purpose of this dissertation was to explore the self-efficacy and barriers faced by generalist and PE specialist teachers when instructing PE across Canada, and the PE training these two types of teachers receive during pre-service programs across the province of Ontario. Three distinct, yet related studies were undertaken to achieve this purpose. Study 1 aimed to quantitatively examine and compare the barriers and self-efficacy among generalist and PE specialist elementary teachers across Canada. Study 2, an extension of Study 1, qualitatively explored the experiences of elementary school generalist and specialist teachers when instructing PE, and the perceived barriers and facilitators that influence teaching practices. Study 3 sought to summarize the PE training (i.e., extent [hours], and content) pre-service teachers receive at Faculties of Education across Ontario, and compare the differences in training between generalist teachers, and those specializing in PE as a teachable subject. An integrated-article format was adopted for writing this dissertation, as such, some material from the introduction will be repeated in subsequent chapters.
References


Affecting Implementation and Continuation.


Cheung, P. (2017). School-based physical activity opportunities in PE lessons and after-


Metzler, M. W., & Tjeerdmsa, B. L. (2000). Chapter 1: Teacher education program


Petrie, K. (2010). Creating confident, motivated teachers of physical education in


Sigmund, E., Sigmundová, D., Hamrik, Z., & Gecková, A. M. (2014). Does participation in
physical education reduce sedentary behaviour in school and throughout the day among normal-weight and overweight-to-obese Czech children aged 9-11 years? 


Silva, D. A. S., Chaput, J.-P., Katzmarzyk, P. T., Fogelholm, M., Hu, G., Maher, C., ... 


Singh, A. S., Saliasi, E., Van Den Berg, V., Uijtdewilligen, L., De Groot, R. H. M., Jolles, J., ... 


of physical education. *Centre for Disease Control and Prevention*.


doi.org/10.1123/jtpe.21.2.145

CHAPTER 2

Comparing Canadian Generalist and Specialist Elementary School Teachers’ Self-Efficacy and Barriers Related to Physical Education Instruction

Engaging in physical activity during childhood is extremely important, as it helps children develop the skills and confidence to remain active throughout the lifespan (Hardman, 2011). As Canadian elementary school children (i.e., Kindergarten-Grade 8) spend a large portion of their waking hours in the school environment, this is a valuable setting to promote and engage children in physical activity (Pate et al., 2006). In particular, PE class allows for regular and structured opportunities for students to be active, and a chance to learn, practice, and execute new motor skills (Mandigo, Francis, Lodewyk, & Lopez, 2009). Although the frequency and duration of PE at the elementary school level in Canada varies as curriculum development is the responsibility of each province and territory, it is a requirement that all students are provided with PE in each grade to satisfy requirements for graduation (Government of Canada, 2015). However, there are rising concerns regarding the quality of PE instruction at the elementary school level in Canada and around the world (Armour & Harris, 2013; Hardman & Marshall, 2014; Kilborn, Lorusso, & Francis, 2016). Issues including who is responsible for delivering PE within the elementary school system, and whether these individuals possess the necessary skills and confidence to do so effectively, have been noted (Blair & Capel, 2013; Hardman & Marshall, 2000; Williams, Hay, & Macdonald, 2011; Williams & Macdonald, 2015).
Teachers have a strong influence on the physical activity levels of their students (Morgan & Bourke, 2008). They are responsible for planning and structuring PE classes to meet provincial/territorial curriculum requirements, as well as maximizing opportunities to be active while motivating students to participate. In Canada, PE at the elementary school level is most often led by a generalist teacher, and only three provinces (New Brunswick, Quebec, and Prince Edward Island) have policies that require educators to have a specialization in PE in order to teach PE. In other countries, including Australia, New Zealand, and the United Kingdom, outsourcing the instruction of PE to external providers or sport coaches has become common over the last decade (Blair & Capel, 2011; Williams, Hay, & Macdonald, 2011). While elementary schools have been found to embrace external providers due to their perceived content expertise, there is limited evidence that external providers have the pedagogical or curricular knowledge to construct classes that meet curriculum outcomes (Jones & Green, 2015; Sperka & Enright, 2018). On the other hand, teachers specifically trained in PE have advanced content knowledge in this area (Harris, Cale, & Musson, 2012) as they “have either majored or minored in PE (often 3-5 years) prior to completing their Bachelor of Education degree or have received specialized and intense training during their pre-service program” (Spence et al., 2004, p. 84). The advanced training and knowledge specialist teachers receive can have a large influence on their teaching self-efficacy, as teachers are typically more efficacious when they are confident in their skills (Rich, Lev, & Fischer, 1996). With additional training, pre-service and in-service generalist teachers have been found to improve their self-efficacy to instruct PE (Harris et al., 2012; Petrie,
2010), but their overall self-efficacy still falls short in comparison to specialist teachers (Faucette, Nugent, Sallis, & McKenzie, 2002).

Self-efficacy is defined as people’s beliefs about their capabilities to produce designated levels of performance that exert influence over other events that affect their lives (Bandura, 1997). More specifically, confidence, or self-efficacy refers to the extent to which teachers believe they have the capacity to affect a student’s performance (Ashton, 1984). In line with Social Cognitive Theory (Bandura, 1997), self-efficacy is a major determinant underlying teacher’s behaviour, and researchers in PE and exercise science have recognized the important role that self-efficacy plays in both the initiation of exercise among children and in children’s sport performance (Sallis et al., 1997). Specifically, Chase, Lirgg, and Carson (2001) theorized that teachers’ self-efficacy affects their commitment to teach, persistence in teaching, use of time providing instruction, and the quality and type of feedback provided to students, all of which have the potential to influence the PE experience of their students. Bandura (1997) suggested that efficacious teachers work harder, use more problem-solving strategies, develop greater skills, are more competent, and persist more when faced with barriers compared with less efficacious teachers.

As generalist teachers tend to have limited training in PE, they may lack the necessary confidence to implement their provincial/territorial PE curriculum to effectively enhance the learning of their students (Harris et al., 2012). For example, Spence et al. (2004) conducted a survey of teachers and principals in Alberta, and found that specialists were more confident, felt better trained, enjoyed teaching PE more, and
prioritized more time for PE compared to classes taught by generalist teachers.

Similarly, Decorby and colleagues (2005) explored the quality of PE in two schools in Manitoba, one of which had a specialist teaching PE for the entire school, and the other which utilized generalist teachers to instruct their own PE. Although many comparisons were made between the quality of PE at the two schools, key findings suggested that the specialist teacher was more confident in her ability to plan safe, developmentally appropriate lessons for her students, focus on basic movement skills, create a non-competitive environment to increase participation rates, and expose students to activities to encourage lifelong participation in a variety of activities. Besides lack of training, generalist teachers’ gender has also been found to predict their self-efficacy teaching PE. Callea and colleagues (2008) surveyed 111 generalists (32.4% male) using the Teaching Fundamental Motor Skill Self-Efficacy Questionnaire and found a significant difference ($p < .05$) in perceived self-efficacy of male and female generalists in the area of teaching fundamental motor skills, with males reporting higher self-efficacy than females. Though the influence of gender on self-efficacy to teach PE has yet to be compared between generalists and specialists, it remains necessary as the quality of instruction can be impacted. Given the prevalence of females teaching at the elementary school level, it is vital to increase the self-efficacy of female generalist teachers who teach PE so that their students have a quality PE experience. Overall, Morgan and Bourke (2008) suggest that the quality of PE programs in elementary schools is strongly associated with a teacher’s perceived self-efficacy to instruct PE. Despite consensus from researchers, experts, and professional organizations regarding
the enhanced quality of PE instruction provided by specialists, many of the PE classes at the elementary school level in Canada are taught by generalist teachers. For example, 63% of schools in Ontario reported PE was taught by a non-specialist (Faulkner et al. 2008). Globally, there is a mixture of generalists and specialists teaching elementary school PE classes (Hardman & Marshall, 2014).

To enhance the quality of PE instruction in the elementary school system, it is important to understand not only the self-efficacy of generalist and specialist teachers, but also the unique barriers these two types of teachers face when serving in this capacity. Previous barriers identified by elementary school teachers (both generalists and specialists) have been classified as either institutional (i.e., outside the teachers’ control) or teacher-related (i.e., arising from the teachers’ behaviour; Barroso, McCullum-Gomez, Hoelscher, Kelder, & Murray, 2005; Hyndman, 2017). Major institutional barriers recognized by teachers include lower priority of PE in relation to other subjects, the absence of performance/assessment criteria for PE, inadequate infrastructure (i.e., equipment and facilities), and budget constraints (Barroso et al., 2005; DeCorby et al., 2005; Faulkner et al., 2008; Hyndman, 2017; Konstantinidou, Zisi, Katsarou, & Michalopoulou, 2015; Morgan & Hansen 2008a). On the contrary, teacher-related barriers reported were poor personal experiences in PE, lack of training, knowledge, expertise, and qualifications, low levels of confidence, and being unable to provide developmentally appropriate lessons which are safe (Barroso et al., 2005; Decorby et al., 2005; Faulkner et al., 2008; Hyndman, 2017; Xiang, Lowy, & Mcbride, 2002).
The literature suggests that both types of teachers face barriers (institutional and teacher-related) when teaching PE (Barroso et al., 2005; DeCorby et al., 2005; Faulkner et al., 2008; Hyndman, 2017; Konstantinidou et al., 2015); however, it is theorized that PE specialists may be able to overcome barriers with less difficulty and perceive them as less inhibitory due to higher levels of self-efficacy. Acknowledging that previous work has explored the self-efficacy of elementary school teachers when teaching PE (Harris et al., 2012; Spence et al., 2004), in a field that is constantly evolving, influenced by a range of political, sporting, health, commercial, and community groups with a vested interest in PE, it remains necessary to continue to explore ways to support teachers’ self-efficacy. Lacking from the literature is an updated study incorporating a large, nationwide sample to compare the self-efficacy and strength of barriers faced by male and female elementary generalist and specialist teachers when teaching PE. As such, the purpose of this study was to explore and compare generalist and PE specialist (males and females) elementary teachers’ self-efficacy to instruct and barriers perceived when teaching PE. To our knowledge, this is the first study to explore the association between gender, and generalist and specialist elementary school teachers’ self-efficacy teaching PE.

**Methods**

To maximize reach across Canada, this exploratory study utilized an online survey, collected via Qualtrics [Provo, Utah, USA], between March and May 2018. Participants were provided a letter of information at the beginning of the survey
(Appendix A), and completion of the survey indicated consent to participate. Ethical approval for the study protocol and all related documents was obtained from the Office of Research Ethics at the University of Western Ontario (REB #110491; Appendix B).

**Participants and Recruitment**

Canadian elementary school (i.e., Kindergarten-Grade 8) teachers were eligible to participate if they: were employed full- or part-time (contract, permanent, or long-term occasional); taught at least one period of PE a week; and could read and write in English. Participants were excluded from completing the online survey if they were a supply teacher or did not teach at least one period of PE a week.

Elementary school teachers across Canada were recruited to the study via two channels. First, using social media, a link to the online survey within an advertisement poster (Appendix C) was shared on Twitter and Facebook by research team members once a week for three months. Second, to increase the reach of the survey outside the province of Ontario (where the research team originates), a list of all English-speaking school boards across Canada was compiled, and the researchers contacted the superintendents of each school board via email to gain approval to conduct research within their jurisdiction. School boards in Ontario were not contacted due to the high response rate of participants from Ontario using social media. With the large number of school boards across Canada, if the superintendent (or alternative contact personal) did not respond to the initial research request within 1 month, the school board was deemed unavailable to participate. As it was not possible to obtain a listing of teachers by schools, once a school board agreed to participate, an email was sent by the research
team to every elementary school principal within the jurisdiction inviting participation in
the study, or the superintendent sent the email to the principals (Appendix D). If a
principal agreed to participate, a recruitment email containing a link to the online survey
was provided to share with the teachers at the participating school (Appendix E).

Of the 186 school boards contacted across Canada, 25 opted to participate in the
present study, 80 did not reply, and 81 declined to take part in the study. Boards that
declined to participate primarily did so due to competing research demands, or the time
of year in which the research was taking place. The ethics application deadline had
already passed for some school boards and many school boards do not allow research at
the end of the school year (i.e., during the months of May and June). Because the email
distribution list that formed the sampling frame was masked to the researchers (for
ethical reasons), a response rate could not be calculated.

Of the 1,303 individuals who accessed the online survey, 53 participants
submitted blank surveys, and 136 did not meet the inclusion criteria (52 were supply or
occasional teachers, and 84 did not teach at least one class of PE a week); as such, they
were removed from the study. A total of 1,114 elementary school teachers (818
generalists, 296 specialists) had complete survey data and were retained for this study.
A full description of the participating teachers’ demographic information is presented in
Table 1. The ratio of males to females was significantly higher for specialists compared
to generalist teachers \( \chi^2(2) = 76.14, p < .001 \). No significant differences between each
group were found when comparing age, ethnicity, teaching experience, and number of
students enrolled in the school. There was representation from all provinces and
Table 1

*Descriptive Characteristics of Generalist and Specialist Teachers (n = 1,114)*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Generalist Teacher</th>
<th>PE Specialist</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years, $M$ (SD)</td>
<td>39.36 (10.18)</td>
<td>40.10 (10.09)</td>
<td>.290</td>
</tr>
<tr>
<td>Gender (male/female), n</td>
<td>107/694</td>
<td>107/187</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Employment status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>680</td>
<td>257</td>
<td>.004</td>
</tr>
<tr>
<td>Part-time</td>
<td>68</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>Long-term occasional</td>
<td>67</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td>.507</td>
</tr>
<tr>
<td>Caucasian</td>
<td>727</td>
<td>268</td>
<td></td>
</tr>
<tr>
<td>African Canadian</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Native/Aboriginal</td>
<td>11</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Arab</td>
<td>3</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Latin-American</td>
<td>38</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>9</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>13</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Teaching experience (years)</td>
<td></td>
<td></td>
<td>.098</td>
</tr>
<tr>
<td>&lt;1</td>
<td>30</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>1-5</td>
<td>186</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>6-10</td>
<td>173</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>11-15</td>
<td>149</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>16-20</td>
<td>111</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>&gt;20</td>
<td>166</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>Frequency teaching PE (per week)</td>
<td></td>
<td></td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Daily</td>
<td>221</td>
<td>212</td>
<td></td>
</tr>
<tr>
<td>2-3 times</td>
<td>500</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td>Once</td>
<td>85</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Less than once</td>
<td>9</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Grade(s) taught</td>
<td></td>
<td></td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Primary (Kindergarten-grade 3)</td>
<td>340</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>Junior (grades 4-6)</td>
<td>262</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>Intermediate (grades 7 and 8)</td>
<td>77</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>More than one above</td>
<td>134</td>
<td>151</td>
<td></td>
</tr>
<tr>
<td># of Students enrolled in school</td>
<td></td>
<td></td>
<td>.154</td>
</tr>
<tr>
<td>&lt;200</td>
<td>139</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>200-399</td>
<td>321</td>
<td>114</td>
<td></td>
</tr>
<tr>
<td>400-599</td>
<td>239</td>
<td>83</td>
<td></td>
</tr>
<tr>
<td>600-799</td>
<td>79</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td>&gt;800</td>
<td>28</td>
<td>13</td>
<td></td>
</tr>
</tbody>
</table>

Note. Frequencies (n) unless otherwise noted. Groups were compared using independent samples $t$-tests for continuous data and $\chi^2$ tests for categorical data. Numbers may not add to group totals due to missing data for individual characteristics. PE = physical education.
territories, with the highest number of participants from Ontario (n = 425), and lowest from Nunavut (n = 10). This was not unexpected, as Ontario is the most populated province in Canada, inhabiting one-third of the population of Canada. The data regarding the number of participants from each province, separated by type of teacher (i.e., generalist or PE specialist), are presented in Figure 1.

**Instruments**

The questionnaire for this study was comprised of three parts. First, participants answered questions related to their personal characteristics (Appendix F). Second, the participants completed the *Teacher Efficacy Scale in Physical Education* (TESPE; Chase, Lirgg, & Carson, 2001; Appendix G). Lastly, participants answered questions related to *Major Barriers Inhibiting the Delivery of Physical Education* (Appendix H).

**Participant characteristics.** Designed to determine eligibility (i.e., employment status, teach at least one class of PE), gather information regarding potential correlates of teachers’ self-efficacy (i.e., generalist teacher or PE specialist, years of experience), and participant demographics (i.e., sex, age, province, ethnicity), these questions were completed by participants at the beginning of the online survey. To classify teachers as specialists or generalists, participants were asked to self-identify as an educator specifically trained in PE (i.e., PE specialist), or a teacher who has not been specially trained in PE (i.e., generalist without specialization in PE).

**Teacher Efficacy Scale in Physical Education (TESPE).** A valid and reliable measure of self-efficacy for elementary school teachers (Cronbach’s alpha = .89; Spearman Brown split-half coefficient = .86; Chase, Lirgg, & Carson 2001), this tool was used to assess how
Figure 1. Number of Participants \((n = 1,114)\) Based on the Province/Territory in Which They Teach, Separated by Type of Teacher (Generalist vs. PE Specialist). PE = physical education.
confident elementary school teachers feel that they can positively affect the learning of their students during PE class. The 16-item scale spans four dimensions of teacher efficacy, with 4-items per dimension: (a) motivation (i.e., a teacher’s confidence in his/her ability to motivate students); (b) analysis of skills (i.e., the teacher’s ability to analyze students’ performance in skills); (c) preparation (i.e., the teacher’s ability to prepare and plan for instruction); and (d) communication (i.e., the teacher’s ability to communicate information to his/her students). Each item is rated on a 7-point Likert scale ranging from 1 (no confidence) to 7 (extremely confident) following the probe, “how sure are you in your ability to...”. The items were combined to generate four subscale scores: motivation ($\alpha = .77$), analysis of skills ($\alpha = .79$), preparation ($\alpha = .78$), and communication ($\alpha = .79$). An overall teaching efficacy score ($\alpha = .79$) was generated by summing the four subscale scores. To gain more in-depth information, five additional questions were included which focused on teachers’ self-efficacy to keep children engaged in high-intensity activity, and incorporate unique skills such as fitness and yoga in PE class; however, in order to maintain the tool’s reliability, these items were asked separately, and were not included in the participants’ overall teaching efficacy score. The five additional questions were asked on the same 7-point Likert scale.

**Major barriers inhibiting the delivery of PE.** This section of the questionnaire was designed by the research team based on an extensive literature review examining relevant information about barriers faced when teaching PE (e.g., DeCorby et al., 2005; Morgan & Hansen, 2008a). Based on this review, a list of 11 previously identified barriers were collated and presented to the study participants as follows: “On a scale of
1-6 (1 = no barrier, does not inhibit; 6 = major barrier, strongly inhibits) indicate the strength of each barrier on your ability to instruct PE.” The 11 barriers listed were both institutional (e.g., facilities, equipment, time) and teacher-related (e.g., confidence, knowledge, motivation).

**Data Analysis**

All statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS; Armonk, New York, USA) program (version 25). Frequencies were run to examine the demographic characteristics of generalist teachers and PE specialists. To compare the two groups of participants, continuous variables (i.e., age) were evaluated using independent sample t-tests, while categorical variables (i.e., gender, employment status) were explored using Pearson chi-square calculations.

Multivariate analyses of covariance (MANCOVA) followed by univariate analyses of covariance (ANCOVA), were conducted to compare means for each of the subscales of the TESPE and overall score across teacher type (generalist versus specialist) and gender (male versus female). These analyses controlled for years of teaching experience and age of teacher (years). In the event of multivariate significance, univariate tests were interpreted without adjustment to the Type I error, per the recommendations of Hummel and Sligo (1971). Where multivariate analyses were non-significant, follow-up univariate analyses were adjusted to control for multiple comparison bias, using the Holm-Bonferroni correct method (Holm, 1979), wherein the strongest correction was applied to the largest effects. The five additional self-efficacy items were not combined to form a subscale score; each of the five questions were analyzed individually (i.e., item
by item) using a Mann-Whitney U, and were not included in the overall self-efficacy score of generalist and specialist teachers to maintain the tool’s reliability. To account for multiple comparison bias, the previously described Holm-Bonferroni correction method was applied to adjust the p-values.

Median scores and standard deviations were calculated for the 11 barriers listed. In order to compare the strength of perceived barriers teaching PE between the two groups, 11 Mann-Whitney U tests were run, one for each barrier listed. Again, the Holm-Bonferroni correction was applied to control the familywise error rate (Holm, 1979).

Results

Generalists’ and Specialists’ Self-Efficacy Teaching PE

After adjusting for years of teaching experience and age of teachers, the results of the MANCOVA revealed a significant multivariate interaction between type of teacher and gender \((F(4, 990) = 2.752, p = .027)\). Follow-up ANCOVAs revealed statistically significant \((p < .05)\) differences between type of teacher, and each of the subscales of the TESPE (see Table 2). In each of these analyses, men consistently reported higher levels of self-efficacy than women, but these differences were greater among generalist teachers, as evidenced in the profile plots presented in Figure 2. In fact, additional ANCOVAs revealed statistically significant \((p < .001)\) differences between male and female generalist teachers across each of the subscales of the TESPE, while there was only a significant difference \((p < .05)\) between genders on the analysis of skill subscale for specialists. Descriptive statistics for the additional self-efficacy variables, as well as
Table 2

**Self-Efficacy of Generalist and PE Specialist Teachers Assessed by the TESPE**

<table>
<thead>
<tr>
<th></th>
<th>Generalist Teacher</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>Male</td>
<td>Female</td>
<td>Total</td>
<td>Male</td>
<td>Female</td>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motivation(^o)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>54.00</td>
<td>4.74</td>
<td>.03</td>
<td>.005</td>
</tr>
<tr>
<td></td>
<td>23.73 (3.26)</td>
<td>22.34</td>
<td>(3.62)</td>
<td>22.52</td>
<td>24.53 (2.97)</td>
<td>24.38 (3.03)</td>
<td>24.44 (3.00)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analysis of skill(^o)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>197.07</td>
<td>10.54</td>
<td>.001</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>22.03 (4.54)</td>
<td>18.71</td>
<td>(4.76)</td>
<td>19.14</td>
<td>24.29 (2.74)</td>
<td>23.32 (3.48)</td>
<td>23.68 (3.25)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preparation(^o)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>89.29</td>
<td>5.31</td>
<td>.02</td>
<td>.005</td>
</tr>
<tr>
<td></td>
<td>21.77 (4.18)</td>
<td>19.90</td>
<td>(4.49)</td>
<td>20.15</td>
<td>23.47 (3.17)</td>
<td>23.21 (3.56)</td>
<td>23.31 (3.42)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication(^o)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>127.24</td>
<td>8.30</td>
<td>.004</td>
<td>.008</td>
</tr>
<tr>
<td></td>
<td>22.80 (3.71)</td>
<td>20.43</td>
<td>(4.30)</td>
<td>20.74</td>
<td>24.37 (2.89)</td>
<td>23.89 (3.41)</td>
<td>24.07 (3.22)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall SE(^f)</td>
<td>90.33 (14.58)</td>
<td>81.37</td>
<td>(15.80)</td>
<td>82.55</td>
<td>96.67 (10.72)</td>
<td>94.80 (12.23)</td>
<td>95.50 (11.71)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Effect size was reported as partial eta-squared. TESPE = Teacher Efficacy Scale in Physical Education (Chase, Lirgg, & Carson, 2001); SE = self-efficacy; PE = physical education; MS = mean square.
\(^o\)Out of a possible score of 28
\(^f\)Out of a possible score of 112
Figure 2. Profile Plots of Estimated Marginal Means of Self-Efficacy for: A) Motivation Subscale, B) Analysis of Skill Subscale, C) Preparation Subscale, D) Communication Subscale, E) Overall Teacher Efficacy Score. Covariates (gender and type of teacher) appearing in the model are evaluated at the following values: age (years) = 39.61 and teaching experience (years) = 3.84. Error bars: 95% CI.
the results of the five Mann-Whitney U tests are presented in Table 3. Specialist teachers reported significantly higher self-efficacy scores across all items ($p < .001$).

**Perceived Strength of Barriers Teaching PE**

Descriptive statistics, examined by type of teacher, as well as the results of the 11 Mann-Whitney U tests for the barrier-related questions are displayed in Table 4. There was a statistically significant difference between the perceived strength of barriers for all but two of the listed barriers (class size, $z = -1.29$, $p = .196$; no support from other teachers or principal, $z = -1.34$, $p = .181$), with generalist teachers reporting barriers as more inhibitory than specialists when teaching PE.

**Discussion**

The purpose of this study was to explore Canadian elementary school teachers’ (generalists and PE specialists) self-efficacy and perceived strength of barriers when teaching PE, with a particular interest in examining the influence of gender. This study is unique from previous work as it includes a national representation of generalist teachers and PE specialists, and is the first study to explore teachers’ self-efficacy based on teacher specialization and gender. Results from the current study suggest that the self-efficacy of generalists and specialists differ significantly when teaching PE, as do the perceived strength of many barriers when attempting to provide quality PE classes. All analyses revealed that specialists have higher self-efficacy when teaching PE and perceived 9 of the 11 barriers to teaching as less inhibitory. As well, the results highlighted that men consistently reported higher levels of self-efficacy across the four dimensions of self-efficacy than women, but these differences are greater among
### Table 3

*Medians, Mean Rank, and Mann-Whitney U of Additional Self-Efficacy Variables*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Generalist Teacher</th>
<th>PE Specialist</th>
<th>Mann-Whitney U</th>
<th>z</th>
<th>Adjusted p</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keep students engaged in MVPA</td>
<td>5.00 483.45</td>
<td>6.00 636.17</td>
<td>75708</td>
<td>-7.46</td>
<td>&lt;.001</td>
<td>.03</td>
</tr>
<tr>
<td>Teach unique skills (yoga and dance)</td>
<td>4.00 492.96</td>
<td>5.00 605.06</td>
<td>84122</td>
<td>-5.38</td>
<td>&lt;.001</td>
<td>.01</td>
</tr>
<tr>
<td>Incorporate fitness skills</td>
<td>5.00 459.28</td>
<td>6.00 702.14</td>
<td>57434</td>
<td>-11.74</td>
<td>&lt;.001</td>
<td>.11</td>
</tr>
<tr>
<td>Demonstrate fitness skills</td>
<td>5.00 462.85</td>
<td>6.00 688.94</td>
<td>60481</td>
<td>-10.94</td>
<td>&lt;.001</td>
<td>.09</td>
</tr>
<tr>
<td>Adapt class for students with disabilities</td>
<td>5.00 491.78</td>
<td>5.00 606.73</td>
<td>83216</td>
<td>-5.57</td>
<td>&lt;.001</td>
<td>.02</td>
</tr>
</tbody>
</table>

Note. Scored out of 7, with a higher score indicating greater self-efficacy. The Holm-Bonferroni Method was applied to adjust the p-values for each set of multiple comparisons. Effect size was reported as eta-squared. PE = physical education; SD = standard deviation; MVPA = moderate-to-vigorous physical activity.
Table 4

*Medians, Mean Rank, and Mann-Whitney U for Perceived Strength of Barriers Experienced by Generalist and PE Specialist Teachers*

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Generalist Teacher</th>
<th>PE Specialist</th>
<th>Mann-Whitney U</th>
<th>z</th>
<th>Adjusted p</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median  Mean rank</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of time/crowded curriculum</td>
<td>4.00  537.89</td>
<td>3.00  478.48</td>
<td>94435.00</td>
<td>-2.87</td>
<td>.004</td>
<td>.001</td>
</tr>
<tr>
<td>Overbooked gym</td>
<td>4.00  536.76</td>
<td>3.00  485.39</td>
<td>96570.50</td>
<td>-2.48</td>
<td>.013</td>
<td>0</td>
</tr>
<tr>
<td>Inadequate facilities and equipment</td>
<td>4.00  543.63</td>
<td>3.00  454.99</td>
<td>87529.00</td>
<td>-4.27</td>
<td>&lt;.001</td>
<td>.008</td>
</tr>
<tr>
<td>Lack required physical fitness</td>
<td>2.00  541.73</td>
<td>2.00  458.43</td>
<td>88481.00</td>
<td>-4.11</td>
<td>&lt;.001</td>
<td>.007</td>
</tr>
<tr>
<td>Lack of adequate training</td>
<td>3.00  607.99</td>
<td>1.00  293.93</td>
<td>42959.00</td>
<td>-15.18</td>
<td>&lt;.001</td>
<td>.12</td>
</tr>
<tr>
<td>Low levels of teaching confidence</td>
<td>2.00  568.35</td>
<td>1.00  400.21</td>
<td>72599.00</td>
<td>-8.58</td>
<td>&lt;.001</td>
<td>.04</td>
</tr>
<tr>
<td>Poor personal experiences in PE</td>
<td>1.00  572.33</td>
<td>1.00  386.53</td>
<td>68889.00</td>
<td>-10.00</td>
<td>&lt;.001</td>
<td>.06</td>
</tr>
<tr>
<td>Low levels of personal interest in PE</td>
<td>1.00  564.69</td>
<td>1.00  410.28</td>
<td>75407.50</td>
<td>-8.22</td>
<td>&lt;.001</td>
<td>.03</td>
</tr>
<tr>
<td>Class size too big</td>
<td>3.00  514.84</td>
<td>3.00  541.52</td>
<td>101354.00</td>
<td>-1.29</td>
<td>.196</td>
<td>0</td>
</tr>
<tr>
<td>No support from other teachers or principal</td>
<td>2.00  530.20</td>
<td>2.00  503.24</td>
<td>101343.50</td>
<td>-1.34</td>
<td>.181</td>
<td>0</td>
</tr>
<tr>
<td>No support from PE specialist</td>
<td>2.00  584.70</td>
<td>1.00  342.02</td>
<td>56237.50</td>
<td>-12.21</td>
<td>&lt;.001</td>
<td>.11</td>
</tr>
</tbody>
</table>

Note. Scored out of 6, with a higher score indicating the barrier is more inhibitory. The Holm-Bonferroni Method was applied to adjust the p-values for each set of multiple comparisons. Effect size was reported as eta-squared. PE = physical education; SD = standard deviation.
generalist teachers. Although there was a large discrepancy in the size of each group, the underrepresentation of PE specialists in the study aligns with the wide variation for employing PE specialists across Canada, which is consistent with other countries (Hardman & Marshall, 2014).

**Self-Efficacy Teaching PE**

Teaching at the elementary school level is unique; in many countries, teachers are expected to instruct multiple subjects despite lacking training from their pre-service programs (Kilborn et al., 2016). Notwithstanding some teachers’ best efforts to deliver quality PE to their students, their inexperience and shortage in training reduce their ability to facilitate engaging and energetic lessons (DeCorby et al., 2005). In the current study, compared to PE specialists, generalist teachers recorded lower levels of teacher efficacy across the four dimensions of the TESPE, and a lower overall teacher efficacy score. Although we did not assess the quality of PE led by generalist and specialist teachers, previous research suggests that a teacher’s self-efficacy strongly contributes to the quality of PE instruction (Morgan & Bourke, 2008). Teacher efficacy has been linked to motivation and enthusiasm for teaching (Allinder, 1994), ability to persist when faced with adversity (Decorby et al., 2005), willingness to experiment with new methods (Ghaith & Yaghi, 1997), commitment to teaching (Chase et al., 2001), and high confidence levels and positive attitudes (Morgan & Bourke, 2008).

A teachers’ ability to motivate their students to participate in PE class and create a positive learning environment which supports ongoing desire to be active is essential to ensure they are reaping the numerous health benefits of being physically active. As
PE is a standard component of the elementary school curriculum, it provides an ideal opportunity for students to be exposed to a plethora of activities and movements, accumulate minutes of physical activity, and develop fundamental movement skills (i.e., throwing, catching, running, kicking). However, in the current study, we found a significant difference between the two types of teachers on the motivation subscale of the TESPE. Additionally, results of our single item questions suggest that PE specialists are significantly more confident in their ability to keep their students engaged in MVPA for the majority of a typical PE class. Studies comparing PE taught by specialists and generalists have provided similar findings (McKenzie et al., 1995; McKenzie, Sallis, Facuette, Roby, & Kolody, 1993). For example, using the System for Observing Fitness Instruction Time (SOFIT; McKenzie, Sallis, & Nader, 1992), McKenzie et al. (1995) reported that students of specialist teachers averaged 2.9 more minutes of MVPA, and 3.1 more minutes involved in skills and drills per PE class compared to students partaking in a class taught by a non-specialist. These are large differences considering that the duration of a typical PE class is approximately 40-minutes (Kilborn et al., 2016).

Encouraging students to take part in PE class, learn and practice fundamental movement skills, and to remain involved for its entirety, can be influenced not only by the teachers’ ability to motivate students, but also the structure and organization of a class.

In this study, specialist teachers scored significantly higher on the preparation dimension of the self-efficacy scale compared to generalist teachers. Preparing PE classes which are developmentally appropriate, stimulate learning, and require little
transition time in order to maximize movement and skill development is not an easy feat for elementary school teachers. The physical abilities of students in elementary school vary drastically, and it is extremely difficult for teachers to structure lessons which are flexible to meet the individual needs of each student. In a case study of two elementary schools in Manitoba, one had a specialist teaching PE for the entire school, and in the other PE was taught by each of the generalist teachers; it was reported that the specialist was better able to prepare developmentally appropriate lessons which were safe and inclusive to all students, regardless of the students’ level of ability (Decorby et al., 2005). After surveying 480 teachers in Alberta, Spence et al. (2004) found similar results; PE specialists reported significantly higher scores than generalist teachers for feeling prepared to teach. Specialists have increased their content knowledge through pre-service programs and have likely accumulated more experience planning and teaching PE lessons throughout their years of teaching compared to generalists. However, when provided with additional support, generalist teachers have reported an increased sense of efficacy when it comes to preparing PE classes. For example, as mentioned previously, following a 1-year PE professional development program, generalists reported feeling better prepared for PE class and believed their classes were of higher quality (Petrie, 2010). Although generalist teachers are capable of increasing their self-efficacy to prepare PE classes which are engaging and inclusive, it is still specialist teachers who have the upper hand in developing structurally sound lessons which enhance students’ physical and psychological growth (Decorby et al., 2005; McKenzie et al., 2001).
The ability to analyze students’ movements and effectively provide feedback for improvement is an imperative role of elementary school teachers when teaching PE. Unfortunately, not all teachers have the knowledge and confidence necessary to assess their students’ movement and appropriately relay suggestions for progression. Using data from the School Health Policies and Programs Study, which included a nationally representative sample of school districts in the US, Davis, Burgeson, Brener, McManus, and Wechsler (2005) reported that nearly 70% of specialist teachers analyzed their student’s movements using skill performance tests, compared to only 47% of teachers without PE training. Additionally, 66% of students in the study who were taught by a specialist teacher were provided with feedback regarding their performance executing movements, while only 38% of generalist teachers delivered feedback (Davis et al., 2005). Similarly, in the current study, PE specialists reported a significantly higher sense of efficacy on both the analysis of skill and communication subscales of the TESPE. PE is an ideal time to strengthen children’s fundamental movement skills, as having these skills is an essential part of enjoyable participation and can create a lifelong interest in an active lifestyle. Teachers’ self-efficacy communicating instructions to students, evaluating students’ movement and administering recommendations for improvement has the potential to not only impact students’ confidence and competence during PE, but also their future physical activity participation.

**Gender**

Generally, females tend to be less active than males (Hallal et al., 2012), and this discrepancy in activity levels may influence the self-efficacy among generalist teachers.
In fact, teachers' own activity levels and past experiences participating in PE and sport have been shown to influence self-efficacy for teaching PE (Morgan & Hansen, 2008b). Therefore, differences in teachers' self-efficacy may be explained or compounded by factors unrelated to their training. A novel finding of this study was the difference in self-efficacy noted between male and female teachers, particularly for generalist teachers. Across all subscales of the TESPE, female generalist teachers reported lower self-efficacy to instruct PE, in comparison to male generalist teachers and male and female specialist teachers. Specialist teachers on the other hand reported very similar levels of self-efficacy across genders, which may be explained by their knowledge and expertise in the field, counteracting other influential determinants of perceived self-efficacy (i.e., past PE experiences, physical activity levels). As the majority of teachers at the elementary school level are female (83.6%; Statistics Canada, 2015), it is important to acknowledge that these teachers may have additional barriers to overcome prior to teaching PE and may require more support and training in comparison to their male counterparts. Additional research is needed to understand what is contributing to the gender differences between male and female generalist teachers.

**Barriers Teaching PE**

This study confirmed that generalists and PE specialists both experience barriers when teaching PE, with the most inhibitory barriers being classified as institutional (i.e., outside of the teachers’ control), including lack of time, overbooked gym, and inadequate facilities and equipment. When comparing the two types of teachers, generalist teachers reported all but two of the listed barriers as significantly more
inhibitory. The impact of institutional barriers on generalists’ self-efficacy teaching PE is in line with previous literature (Decorby et al., 2005; Faulkner et al., 2008; Konstantinidou et al., 2015; Morgan & Hansen, 2008a).

The perceived strength of many teacher-related barriers was also found to differ significantly between types of teacher in the current study. It was not unexpected that generalist teachers scored inadequate training as the strongest teacher-related barrier, as this has consistently been reported in the literature (Decorby et al., 2005; Faulkner et al., 2008; Morgan & Hansen, 2008a). For example, comparing PE instruction of teachers in Ontario, Faulkner et al. (2008) reported the only consistent barrier which differed between generalist and specialist teachers was teacher training. The time dedicated towards PE during generalist teachers’ pre-service programs is minimal, reducing not only their content knowledge, but also their confidence to provide quality lessons. In a study conducted by Morgan and Bourke (2008), teachers felt significantly less confident to teach units in which they perceived they had received poorer quality training. On the contrary, Fletcher and colleagues (2013) found no significant difference in self-efficacy for overcoming barriers to teaching PE in their study in which 308 generalist teachers attended a 12-hour PE methods course and two practicum placements. It is important to acknowledge that training is not the only factor influencing teachers’ self-efficacy. Other studies have identified additional barriers reducing teachers’ confidence, and hence their ability to instruct quality PE. Carney and Chedzoy (1998) found that the lack of confidence of non-specialists teaching PE is related to the lack of belief in their own ability to perform skills competently. Moreover, Breslin and colleagues (2012) indicated
that if non-specialist teachers did not personally enjoy an activity, did not participate in physical activity themselves, or had poor personal PE experiences in the past, they did not feel confident delivering an effective lesson. Similar results were noted in the current study, with generalist teachers reporting lacking required physical fitness, poor personal experience in PE, and low levels of enthusiasm in PE as more inhibitory to teaching PE than specialists.

Though the literature suggests PE specialists incur many of the same barriers as generalist teachers, overall, they tend to rank barriers as less inhibitory to teaching quality PE. Regardless of training, all teachers may be facing subtle yet challenging barriers limiting their quality of delivery. Teachers work in a demanding school environment and are expected to achieve outcomes in several subject areas. With an already crowded curriculum, teachers may feel pressured to prioritize subjects such as numeracy and literacy over PE (Westheimer, 2008). As well, insufficient facilities and affordance of equipment may challenge even the best-prepared teachers to deliver PE in the elementary school setting. Nevertheless, specialist teachers may be better able to persist when faced with barriers due to their efficacy teaching PE based upon the current findings.

Limitations

Strengths of this study include a large sample and wide representation of teachers from across the country, and the use of a validated tool to assess self-efficacy to teach PE. However, this study has limitations that also must be acknowledged. Although every attempt was made to contact all English-speaking school boards across
Canada (outside of Ontario), many boards (n = 80) did not respond, reducing the generalizability of this study. Furthermore, those school boards which did respond were typically responsible for smaller jurisdictions, which could have influenced the findings. Additionally, despite acquiring responses from all 13 provinces and territories across Canada, the majority of the responders (40%) were from Ontario. The strong representation from one province could have influenced the results, as curriculum within schools and pre-service training is not standardized across the country; however, it is important to note that the province of Ontario does have the most teachers in Canada. As well, provincial comparisons could not be made due to the low representation from some locations. Furthermore, as the survey was only available in English, this could have excluded many teachers from the province of Quebec, where French is the predominant language. As well, participants were recruited from social media; while the first three questions of the questionnaire were intended to screen eligible participants, we could not control who accessed the survey. Also, these are self-report data; thus, those teachers who were trained in PE may have been aware of answers that would be considered professionally and socially desirable. Additionally, teachers were required to classify themselves as a generalist teacher not specifically trained in PE or PE specialist. Despite a definition being provided for each classification, as this is a nationwide study and pre-service training varies across the country, some teachers might have interpreted the definition of a PE specialist differently. Also, some teachers trained in PE may now be in a generalist role, while teachers not specially trained in PE may be responsible for teaching PE full-time. Though the intent was to
categorize teachers based on their training (i.e., Do you identify yourself as a: generalist teacher [not specifically trained in PE] or a specialist teacher specifically trained in PE), it is important to acknowledge that some teachers may have classified themselves based on other factors, such as: current employment type, sport experience and background, and coaching. Finally, the questionnaire pertaining to major barriers was adapted from multiple different studies, and therefore, has not been validated.

**Conclusion**

Despite stronger self-efficacy among specialists when teaching PE, and their ability to persist in the face of institutional and teacher-related barriers, they are underrepresented in elementary school PE classes in Canada (Deacon, 2001; Faulkner et al., 2008) and other countries (Hardman & Marshall, 2014). Generalists, specifically females who make up the majority of teachers at the elementary school level reported significantly lower self-efficacy teaching PE compared to their male counterparts and specialists of both genders. Earlier research has demonstrated that PE during elementary school is the optimal time for children to develop positive skills, attitudes, and knowledge about physical activity (Gallahue, Ozmun, & Goodway, 2012). Given the documented evidence of the benefits of PE specialists on the quality of instruction (Faulkner et al., 2008; Harris et al., 2012) it seems logical to provide students with the appropriate instruction during elementary school PE to help them acquire these important skills during a critical developmental period in which healthy lifestyle behaviours (i.e., physical activity) are established. Unfortunately, although this argument has been made for many years, due to budget constraints and the focus on
alternative curriculum subjects, PE specialists are unlikely to be hired to instruct all PE classes for elementary school students. Given that generalists are likely going to continue to play a pivotal role in teaching elementary school PE, it is necessary to focus on ways of enhancing their knowledge and self-efficacy in this environment. Although researchers have examined the implementation of additional PE training for pre-service generalist teachers (Harris et al., 2012), and additional professional development sessions for in-service teachers (Petrie, 2010), both of which have been found to be successful at improving teachers’ self-efficacy, no wider implementations of these trainings has taken place in these jurisdictions. Despite decades of findings similar to those found in the current study, no radical changes have been made to improve the self-efficacy of generalists teaching PE within Canada. However, in Scotland, Jess and McEvilly (2015) have had success improving teachers’ self-efficacy and knowledge by focusing on career-long professional learning opportunities influencing teachers as professional learners, including longer term, participative, and situated approaches. While successful, this approach requires significant investment in human, financial, and material resources. The findings from this study, support the need for a significant change in the PE training of generalist teachers -- females in particular -- to enhance their self-efficacy, which could in turn lead to higher quality PE instruction. This study serves as a call to action for educators and advocates of PE in Canada and other countries, to improve the landscape of PE pre-service education to make it a more proactive and far-reaching pedagogical approach to foster practical knowledge and self-efficacy teaching PE. This may be a more cost-effective approach than offering ongoing
professional development activities for all generalist teachers. If no action is taken to improve the knowledge and self-efficacy of generalist teachers with respect to PE, no improvements in children’s motor skill development and school based physical activity should be expected, given the common use of generalists for teaching this subject. Having confident, prepared, and knowledgeable teachers who are able to overcome barriers (which are frequently out of their control) when teaching PE can help set children on the path for lifelong engagement in physical activity.
References


doi:10.1123/jtpe.21.3.287


doi:10.1016/S0749-3797(01)00335-X


Spence, J. C., Melnychuk, N., Mandigo, J. L., Marshall, D., Schwartz, M., Thompson, L. P.,


CHAPTER 3

Factors that Influence Canadian Generalist and Physical Education Specialist Elementary School Teachers’ Practices in Physical Education: A Qualitative Study

As children spend a large portion of their waking hours at school, providing opportunities to participate in physical activity while in this setting is critical to ensuring they are accumulating sufficient amounts of activity to benefit their health (Pate et al., 2006). As a mandatory component of the elementary school curriculum in Canada and other countries, PE class is an optimal time for children to be active during the school day (National Association for Sport and Physical Education, 2012; Physical and Health Education Canada, 2014). It allows for regular and structured opportunities to be active, and provides time for children to become physically literate, developing the fundamental movement skills, knowledge, and attitudes needed to lead a healthy active lifestyle (Mandigo, Francis, Lodewyk, & Lopez, 2009).

Education in Canada is regulated at the provincial/territorial level, with the Ministry of Education in each province and territory developing its own PE curriculum specific to its particular needs, resources, and policies (Kilborn, Lorusso, & Francis, 2016). Further, at the elementary school level, the qualifications of educators permitted to instruct PE differ among individual school boards within each province/territory (Kilborn et al., 2016). Teacher qualifications in elementary school PE include ‘generalist’ teachers (i.e., those who are not specially trained in PE during pre-service education) and PE ‘specialist’ teachers (i.e., those with specialized PE training during pre-service education).

A version of this manuscript has been accepted for publication. Truelove, S., Bruijns, B.A., Johnson, A.M., Burke, S.M., & Tucker, P. (May 12, 2020). Factors that Influence Canadian Generalist and Physical Education Specialist Elementary School Teachers’ Practices in Physical Education: A Qualitative Study. Canadian Journal of Education.
education). Compared to generalist teachers, PE specialists have advanced content knowledge in this area, “as they have either majored or minored in PE (often 3-5 years) prior to completing their Bachelor of Education degree or have received specialized and intense training during their pre-service program” (Spence et al., 2004, p. 84). Currently, 53% of elementary schools in the province of Ontario employ a full- or part-time PE teacher (People for Education, 2018); in Alberta, approximately 33% of PE classes at the elementary school level are taught by specialists (Thompson et al., 2001). Globally, there is a mixture of generalist and specialist educators teaching elementary school PE classes (Hardman & Marshall, 2014).

Although only a small percentage of PE specialist teachers are employed as full- or part-time PE teachers at the elementary school level within Canada, arguments made by researchers and educators supporting schools employing PE specialists have been continually presented in the literature as a solution to improve the quality of PE instruction (Buschner, 1984; Davis, Burgeson, Brener, McManus, & Wechsler, 2005; McKenzie, Sallis, Faucette, Roby, & Kolody, 1993; Sallis et al., 1997). Students who are taught PE by specialists demonstrate significantly higher levels of achievement with regards to motor skills, physical literacy, academic achievement, fitness, and physical activity levels than do those taught by non-specialists (Sallis et al., 1997), and also experience better health outcomes (Telford, Olive, Cochrane, Davey, & Telford, 2016).

The advanced training that PE specialists receive during their pre-service education programs can contribute to their quality of curricular delivery by heightening their self-efficacy to teach in this environment (Chase, Lirgg, & Carson, 2001). Teacher
self-efficacy refers to the extent to which they believe that they have the capacity to affect a student’s performance (Ashton, 1984); and according to Social Cognitive Theory (Bandura, 1989), self-efficacy is a major determinant underlying behaviour. Within the context of education, studies have found that PE teachers’ self-efficacy can affect: students’ learning motivation; atmosphere; and satisfaction (Pan, 2014); their commitment to teach; persistence in teaching; use of time providing instruction; and quality of feedback provided to students (Chase et al., 2001); and, their ability to prevail when faced with barriers (Barroso, McCullum-Gomez, Hoelscher, Kelder, & Murray, 2005). As such, it is important to ensure that elementary teachers are efficacious in teaching PE.

Previous research, mostly quantitative in design, suggests that both generalist and PE specialist teachers face barriers when instructing PE; however, it is theorized that the magnitude of the barriers and the influence they have on teaching practices may differ based on the qualifications of the teacher and their perceived self-efficacy. For example, Barroso and colleagues (2005) explored the perceived strength of eight barriers on 596 specialist teachers’ ability to instruct quality PE; they reported that the strongest barriers were ones typically outside of their control (e.g., large class sizes, low priority relative to other academic subjects, inadequate indoor facilities). On the contrary, generalist teachers have reported many institutional and teacher-related barriers when instructing PE (e.g., low levels of confidence, lack of training, knowledge, expertise, and qualifications), which can affect their ability to provide a high-quality PE experience for their students (Decorby, Halas, Dixon, Wintrup, & Janzen, 2005;
Hyndman, 2017). In fact, generalist teachers may even avoid teaching PE if the perceived barriers are substantial (Faucette, Nugent, Sallis, & McKenzie, 2002).

Ontario Physical and Health Education Association (OPHEA) – a non-profit organization that supports health and PE in Ontario – suggests that both generalist and specialist elementary school teachers are capable of delivering quality physical activity initiatives and programs (OPHEA, 2016), and resources are accessible for teachers. However, while strategies that have been recommended or employed to support teaching in this environment (e.g., workshops, additional equipment, etc.) may be beneficial, they do not generally tailor content or training to the specific needs of each type of teacher. A “one model fits all” approach to support generalist and PE specialists instructing PE may not be appropriate, as these teachers have diverse backgrounds, education and training, and teaching philosophies. It is also unclear what types of supports generalist and specialist teachers would most welcome and find beneficial to improve their self-efficacy in teaching PE. A qualitative examination is needed to gain an in-depth understanding of factors influencing each type of teachers’ practices and self-efficacy related to the instruction of PE, and what supports and resources they identify as necessary to improve their teaching practices. Additionally, as the teaching profession is dynamic and ever-evolving to meet the diverse learning needs of students, new research is needed in this field. An updated study is warranted, and may help educators, policymakers, and researchers design strategies to support generalists and specialists teaching PE. Therefore, the purpose of this study was to explore the experiences of
elementary school generalist and PE specialist teachers when instructing PE, and the barriers and facilitators that influence PE teaching practices.

**Methods**

Interviews were used to capture rich descriptions and personal accounts of generalist and specialist elementary school teachers’ experiences instructing PE. Data were collected from in-depth interviews that were conducted as part of a larger study which utilized an online questionnaire to explore Canadian elementary school generalist and specialist teachers’ self-efficacy and perceived barriers when instructing PE (Truelove Johnson, Burke, & Tucker, 2019). Ethical approval for the study protocol and all related documents was obtained from the Office of Research Ethics at the University of Western Ontario (REB #110491; Appendix A).

**Participants and Recruitment**

Participants were drawn from a pool of elementary school teachers from across Canada who participated in a large exploratory study which utilized an online survey via the platform Qualtrics®. A detailed account of recruitment for the original study has been published elsewhere (Truelove et al., 2019). A total of 1,114 elementary school teachers (818 generalist and 296 PE specialists) completed the online survey and were included in the original study. A subsample of teachers (n = 397) indicated at the end of the online survey that they would be interested in taking part in a follow-up interview. Teachers were eligible to participate for an interview if they: 1) were a full-time, part-time, or long-term occasional elementary school teacher in Canada; 2) were teaching at least one class of PE a week; 3) spoke English; 4) indicated at the end of the online
survey that they were willing to take part in an interview; and 5) agreed to have the interview audio-recorded. Two lists were created, one for each of generalist \((n = 290)\) and PE specialist teachers \((n = 107)\), and random sampling took place. Teachers on each list were assigned a number, and a list of random numbers was generated for each list using Microsoft Excel to select participants for interviews. Potential participants were sent a letter of information via email (Appendix I) by the first author and invited by the first author for a follow-up phone interview. If an individual did not respond to the initial email within one week, the first author contacted the next teacher on the randomized list (two unique lists; generalists and PE specialists). If a teacher confirmed interest in participating, the first author contacted the teacher again to arrange a convenient time for the phone interview to take place. Recruitment took place until theoretical saturation was achieved; that is, a point where further iterations of the data collection and analysis were not necessary because collecting more information would not add to the results (Patton, 2014). A total of 17 generalist teachers and 19 PE specialist teachers were contacted and invited to participate in a follow-up phone interview.

**Data Collection**

Teachers verbally consented to participate at the start of the interview (Appendix J) and were able to skip questions or end the interview at any time. All phone interviews were audio-recorded using an Olympus Digital Voice Recorder and lasted approximately 20-30 minutes. All interviews took place between April and May 2018.

A semi-structured interview guide (Appendix K) developed by the research team was used to ensure consistency across participants, while allowing for flexibility in
responses. Questions were phrased to explore the perspectives of generalist and PE specialist teachers about their experiences instructing PE, with a particular focus on teaching philosophy; barriers faced when instructing PE; facilitators that enhance PE; and, their self-efficacy when teaching PE.

Data Analysis

Interviews were transcribed verbatim by a professional transcriptionist. Participant anonymity was maintained, and for the purpose of analysis, transcripts were analyzed according to teacher category (generalist [G] versus specialist [S]). Two coders used deductive followed by inductive content analysis to code and analyze the transcripts and identify common themes (Elo & Kyngäs, 2008). Content analysis was used because it is a systematic and objective means to describe and quantify phenomena and allows text of a similar nature to be classified into distinct categories (Downe-Wamboldt, 1992). Initial codes were deductively generated from the literature and interview guide. The first round of coding involved the two coders analyzing the data separately, applying codes, and discussing afterwards to reach consensus. If no existing code appropriately captured the data, a new code was developed through inductive content analysis. Intercoder reliability was evaluated using reliability checks throughout the data analysis period (i.e., reviewing disconfirming evidence and debriefing; Creswell & Plano Clark, 2017). Confirmation bias was addressed as the second coder was not involved in the project directly and was only responsible for coding interviews. A second round of coding was performed by the first author, using “top-level” codes (Elo & Kyngäs, 2008), to gather similar concepts and identify emergent
themes. Throughout the analytical process, quotes within themes were reviewed and scrutinized independently by each coder and then discussed to help ensure the trustworthiness of the analysis (Patton, 2014). Trustworthiness (credibility, confirmability, dependability, transferability) was ensured throughout the analytical process. All analyses were completed using QSR NVivo 12.

Results

The perspectives of 16 elementary school teachers across Canada (8 generalists and 8 PE specialists) from five different provinces (Alberta, British Columbia, New Brunswick, Nova Scotia, and Ontario) were collected. Participants were primarily female (n = 14) and had been teaching for an average of 15 years (range = 2 to 31 years). Individual participant characteristics are presented in Table 1. On the basis of these data, three overarching concepts were identified which were perceived to influence teaching practices: 1) teaching philosophy and goals for PE; 2) barriers and facilitators (both internal and external); and 3) self-efficacy. The nature of these factors was dependent on the type of teacher providing instruction. Key concepts and categories are summarized in Table 2.

Teaching Philosophy and Goals

Teachers’ philosophies and goals served as the foundation upon which their approach to teaching PE was developed and influenced the way they planned and implemented lessons. When teachers described their goals for PE class and what they hoped their students would take away from their elementary school PE experiences, many focused on concepts such as children being active for life, gaining confidence,
Table 1

*Participant Characteristics of Elementary School Teachers (n = 16)*

<table>
<thead>
<tr>
<th></th>
<th>Sex</th>
<th>Province</th>
<th>Years of teaching experience</th>
<th>Self-reported self-efficacy for teaching PE (out of 10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generalist</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Female</td>
<td>Ontario</td>
<td>31</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>Female</td>
<td>Ontario</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Male</td>
<td>Ontario</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>Female</td>
<td>Ontario</td>
<td>28</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>Female</td>
<td>Ontario</td>
<td>3</td>
<td>6.</td>
</tr>
<tr>
<td>6</td>
<td>Female</td>
<td>Nova Scotia</td>
<td>24</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>Female</td>
<td>Ontario</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td>Female</td>
<td>Ontario</td>
<td>15</td>
<td>7</td>
</tr>
<tr>
<td>PE Specialist</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Female</td>
<td>British Columbia</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>Female</td>
<td>New Brunswick</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>Male</td>
<td>Alberta</td>
<td>17</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>Female</td>
<td>British Columbia</td>
<td>17</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>Female</td>
<td>New Brunswick</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>6</td>
<td>Female</td>
<td>New Brunswick</td>
<td>26</td>
<td>9</td>
</tr>
<tr>
<td>7</td>
<td>Female</td>
<td>New Brunswick</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>8</td>
<td>Female</td>
<td>Alberta</td>
<td>29</td>
<td>8</td>
</tr>
</tbody>
</table>

Note. PE = physical education.
### Table 2

**Factors Influencing Generalist and Specialist Elementary School Teachers Instructing PE**

<table>
<thead>
<tr>
<th>Key factors</th>
<th>Major categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching philosophy and goals</td>
<td>Remaining active for life (G, S)</td>
</tr>
<tr>
<td></td>
<td>Gaining confidence (S)</td>
</tr>
<tr>
<td></td>
<td>Getting exercise (G, S)</td>
</tr>
<tr>
<td></td>
<td>Improving health (S)</td>
</tr>
<tr>
<td></td>
<td>Positive attitude towards being active (S)</td>
</tr>
<tr>
<td>Barriers</td>
<td>Lack of time (G)</td>
</tr>
<tr>
<td></td>
<td>Shared facilities (G, S)</td>
</tr>
<tr>
<td></td>
<td>Age appropriate equipment (G)</td>
</tr>
<tr>
<td></td>
<td>Inadequate training (G)</td>
</tr>
<tr>
<td></td>
<td>Lack of knowledge and experience (G)</td>
</tr>
<tr>
<td></td>
<td>Low confidence (G)</td>
</tr>
<tr>
<td>Facilitators</td>
<td>Professional development opportunities (G, S)</td>
</tr>
<tr>
<td></td>
<td>Technology (G, S)</td>
</tr>
<tr>
<td></td>
<td>Support from specialists and community partners (G, S)</td>
</tr>
<tr>
<td></td>
<td>Background (G, S)</td>
</tr>
<tr>
<td></td>
<td>Training (S)</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>Training (G, S)</td>
</tr>
<tr>
<td></td>
<td>Experience (G, S)</td>
</tr>
<tr>
<td></td>
<td>Content dependent (G)</td>
</tr>
<tr>
<td></td>
<td>Personal interest (S)</td>
</tr>
</tbody>
</table>

Note. The letters in brackets refer to the type of teacher the example refers to, G = generalist, S = PE specialist. PE = physical education.
getting exercise, improving health, and adopting a positive attitude toward being active.

However, as noted above, responses differed according to the type of teacher. Specialist teachers most frequently expressed that their goal for PE was to introduce their students to a variety of activities so they could continue to be active throughout the lifespan. For example, S5 reported that their goal for PE was: “[s]tudents engaging in physical activity [...] but learning skills that they can utilize throughout their life, and also, enjoying the activities they are doing.” In addition, instead of focusing on individual sports, specialist teachers noted that their philosophy for a successful class was one where all students were participating, learning skills, and developing confidence to be active. For example, S7 said: “[w]here children are moving, enjoying the physical movements. They are learning a new skill or applying it in a game, and I think just overall, building confidence in their ability to move.” These teachers looked at students’ PE experiences as a whole, and instead of focusing solely on learning specific sports, they acknowledged that learning the skills and confidence (i.e., physically literate) to remain active for life was an important objective.

When generalists described their teaching philosophy and goals, they often said that a successful lesson would be one “that the students are moving most of the time and they are engaged” (G5). Less focus was placed on fundamental movement skills and more on ensuring that their students were being active during class.

**Barriers Faced When Instructing PE**

Three overarching barriers were identified by teachers that were perceived to affect their practices and ability to provide quality PE classes for their students. These
included time, facilities and equipment, and training and confidence. Descriptions and examples pertaining to each are detailed below.

**Time.** The time constraints elementary school teachers face appear to be contingent on their type of qualification. While specialist teachers who instruct PE full-time are only required to focus on one subject, generalist teachers must strategically allocate time to various subjects to meet curricular demands in many areas. As noted by G4: “[our school board and principal] has really pushed for bringing up our literacy and numeracy marks and assessment grades, so honestly, I don’t know how much teachers even really stick to those PE minutes strictly.” Typically, PE was deemed a lower priority in comparison to other [academic] subjects, a dilemma that many expressed was unfortunate as they were aware of the positive benefits of activity for their students. Both types of teachers commented on the lack of time in the gymnasium as a result of other extenuating circumstances: “[s]ometimes our gym classes get shortened if we have assemblies and such” (S1); and “[d]uring Christmas time, we lose a lot of gym because the stage is down. And during volleyball season, the grade 7s leave the net up in the gym for a month at a time” (G1).

**Facility and equipment.** Many teachers noted that the physical environment was a barrier to teaching high-quality (and frequent) PE classes. Depending on the size of the school, PE classes were noted to be either infrequent or overcrowded, affecting their ability to reach curriculum requirements of time allocated for PE. For example, one specialist noted:
So definitely the space [...] and because we only have one gym that, you know, you have to have those double classes with 45 sometimes 50 kids, it is definitely a barrier to what you can teach and what you can do and what kinds of games you can play. (S8)

To offset the barrier of only having one gymnasium, some generalist teachers mentioned that their PE class took place in another room within the school.

For me, the limitations are the space. I am not in the big gym. I am in the activity room. So we are limited to certain games and activities based on the physical space. So I might have 28 to 30 five-year old’s running around not in a typical normal sized gym. (G3)

It appears that both types of teachers are limited by the physical space in which they are provided to teach PE and are restricted to activities in which large groups can participate in a small space safely. Many teachers felt that sharing the confined space of the gymnasium was a safety concern as: “[k]ids are not spatially aware at this age” (G4).

Teachers also mentioned that their gymnasium was used as a mutual space, commonly shared with sport coaches, music and drama clubs, and utilized to host mini tournaments, so gym classes were cancelled frequently.

In terms of equipment, only generalists reported a lack of available equipment in their school as a barrier to instructing PE. In particular, insufficient age-appropriate equipment for the primary grades was reported by some teachers as negatively affecting their ability to teach quality PE: “[t]here seems to be a focus on buying more basketballs, more volleyballs, more badminton rackets. The equipment that the older
kids use, and very little equipment is bought for primary” (G1). Primary students are still developing their fundamental motor skills, and the equipment needs for this population are unique. Without access to a plentiful supply of age-appropriate equipment, generalist teachers reported that it was difficult to implement new games/activities in their classes: “If I find a game I like online and I go to do it at school and I realize, oh no, I only have 5 hula-hoops and I needed a whole bunch” (G2).

**Training and confidence.** Almost all generalist teachers indicated that their lack of training and confidence inhibited their ability to provide quality PE classes for their students. Although specialists did not indicate such barriers, when referring to their generalist colleagues, S5 noted:

> For them, I would say a barrier would be knowledge of how to teach. So I think generalists don’t know how to necessarily organize their classes and structure it so that they can maximize the time that they have within the space and then often generalist teachers, I would say, are also fearful because they don’t know the skills themselves. So, they don’t necessarily teach a lot of skills and instead resort to more games.

One teacher went as far to say: “[y]ou know, I have had teachers tell me they play dodgeball 80% of the time” (S8). Due to their lack of training during their pre-service programs, generalist teachers usually rely on past sport experiences when teaching in this setting; however, this is problematic if a teacher has minimal sport- or physical activity-related experience: “[y]ou know, if you don’t do a lot of sports, or a lot of physical activities, it’s really threatening to teach PE” (G5). This can lead to generalist
teachers believing that: “PE is a break in the day, and I don’t need to plan anything. It’s almost like recess” (G3). While the majority of the specialist teachers did not express any barriers in regard to their training or confidence, one shared: “I’m pretty confident in teaching the skills, but my biggest barrier has been teaching kindergarten PE, because my training was heavy set on the older intermediate grades and high school” (S1). With the wide range of curriculum components that need to be taught in elementary school PE, both types of teachers believed they could be better trained when it came to specific units, such as dance, gymnastics, and yoga.

**Facilitators to Instructing PE**

When generalist and specialist teachers were prompted to provide positive factors and resources that contribute to their teaching practices, four overarching themes emerged from the interviews. These included: professional development opportunities, technology, support from specialists and community partners, and background and training. Descriptions and examples pertaining to each are detailed below.

**Professional development opportunities.** Specialist teachers reported that attending workshops and conferences related to PE was extremely valuable to their pedagogy. Although one generalist teacher stated that they participated in workshops made available to: “[e]ducate myself about the various sports and really how to be the very best at teaching PE” (G4); the majority of generalist teachers expressed they wished they had access to: “[a] hands-on workshop or something, to teach us the games and we participate in them” (G2). Specialist teachers indicated that: “In the past, we
would’ve met with PE teachers in the region [...] on professional learning days to discuss different things and share ideas” (S5); “But they’ve kind of pulled away from that where they just want everyone to be indulged in the literacy or numeracy together [during professional learning sessions]” (S7). Specialists appeared to value the time they had to share ideas with other PE teachers, and noted: “[n]ow it’s really hard to get time to actually meet to do things unless it’s, you know, after hours” (S7). Generalist teachers did not comment on a lack of focus on PE during professional learning days.

**Technology.** Both types of teachers frequently reported the use of technology when planning and teaching PE classes. Teachers mentioned websites such as YouTube, Pinterest, Facebook, and OPHEA as being excellent resources when teaching PE. The ease of using technology to learn new games was expressed by one generalist teacher:

I’m always resorting to YouTube to kind of watch an example of the game being played instead of just reading instructions online or in a book. I find its kind of easier to get a better idea of the game that’s being played. (G2)

Not only can technology help teachers learn new games and skills, but it can also help students become aware of their movement. As one specialist teacher noted: “[w]e’re using a couple programs on the iPad so we can tape movement and then show the kids” (S6). Similarly, other specialists integrated technology into their classes to provide visuals for their students, so they could watch an expert perform a certain skill.

**PE specialists and community partners.** Regardless of their accreditation, all teachers believed that having a specialist instruct PE would be more beneficial to their students’ motor development. For example, one teacher noted: “[t]hey are just able to
implement [PE] that much more effectively” (G6). In addition, having a consistent PE teacher during elementary school could help provide students with progressive development of their fundamental movement from year to year. For example, G7 expressed:

I think if we had a PE specialist, like someone running it for the whole school who was more like qualified to do so, I think it would be a more cohesive experience for them throughout their schooling. Right now, from grade to grade, it’s hugely varied, and you might cover some skills one year, but not the next and I think having that consistency throughout would help.

S3 iterated that PE: “[s]hould be taken seriously,” and: “[w]henever possible, we should have people who are trained and have the knowledge necessary to teach PE, because it’s not just recess. It’s not a period off.”

As specialist teachers are not always available to instruct PE, many teachers rely on individuals from the community to teach units with which they are unfamiliar, such as dance, gymnastics, and yoga. Whereas some specialist teachers reported that having community organizations/partners teach their classes provided them the opportunity: “[t]o help gain confidence for the future year or give a basis of activities for future teaching” (S5), many generalists noted that they relied on these individuals for current and future classes. For example, G2 shared: “[t]o be honest, I haven’t gone to any effort to give myself more knowledge so that I can teach them. I’ve just been seeking outside help for that and will continue to seek help.”
Background and training. Experience and personal interest in sports seemed to contribute strongly to both types of teachers’ practices in PE. Teachers with more experience at the elementary school level reflected that they had learned: “[w]hat works and doesn’t work over the years” (G3). As well, teachers were much more confident facilitating a lesson where they were familiar with the sport or activity. Specialists indicated that the training they received during their pre-service schooling and practicum placements shaped their teaching practices, and positively contributed to their ability to provide a high-quality PE experience for their students.

Self-Efficacy

The final factor which teachers indicated influenced their teaching practices was their self-efficacy for PE-related instruction. During the interviews, teachers were asked to rate their perceived self-efficacy to teach PE on a 10-point scale, with 1 being not confident at all, to 10 being extremely confident, to provide context behind their responses. On average, generalist teachers self-reported a score of 6.8, while specialists self-reported a score of 9.3. Specialists acknowledged that the additional training they received during their pre-service programs as well as years of experience teaching in this environment strongly influenced their self-efficacy to lead high-quality PE classes. Not surprisingly, the generalist teachers with the least years of teaching experience in the present study also reported the lowest self-efficacy scores. Moreover, this group of teachers noted that their self-efficacy related to teaching PE was significantly dependent on the content or unit being taught. For example, G4 expressed: “I think absolutely, my confidence changes depending on what activity or what class or unit I have to teach,
absolutely, because we are always so much more confident when we’re experienced and we’re knowledgeable.” In contrast, specialists conveyed high levels of self-efficacy teaching in this environment regardless of the content (e.g., “I feel pretty confident teaching whatever unit it is” (S3)).

Discussion

The purpose of the present study was to explore the perspectives of generalist and PE specialist teachers when instructing PE, and to examine factors that influence teaching practices. Teachers provided extensive information about factors that influence their ability to provide quality PE instruction, and it was clear that many of these factors were dependent on the type of teacher providing the instruction.

With respect to teaching philosophies, generalist and specialist teachers emphasized different outcome goals for their PE classes, which determined the nature of their lessons. It was evident that specialist teachers approached PE as an opportunity to develop students’ fundamental movement skills in order to develop physically literate individuals capable of sustaining active and healthy lifestyles. Similarly, McEvoy and colleagues (2017) explored the views of 14 PE teachers from seven countries regarding the purpose(s) of PE, and the general consensus was that PE should prepare young people for a lifetime of physical activity. Likewise, a review of 95 qualitative studies that focused on stakeholders’ (i.e., teachers, pupils, principals, policy makers) views on the purpose of PE identified children being active and learning physical, social, and emotional skills as outcome goals of PE (Ní Chróinín, Fletcher, Jess, & Corr, 2019). Alternatively, the philosophies for generalists in the current study when teaching PE
appeared to be centered on keeping children moving throughout their class, with seemingly little regard for developing fundamental motor and physical literacy skills. Similarly, in 1983, Placek suggested that keeping students “busy, happy and good” during PE superseded all other learning outcomes for PE. Despite these varying philosophies, research has shown that activity levels during PE are similar when taught by generalist and specialist teachers. In fact, a recent meta-analysis ($n = 39$ studies) conducted by Truelove and colleagues (2020) found that the average percentage of PE class spent in MVPA was 29.9% and 33.8% under the instruction of generalist and specialist teachers, respectively. Acknowledging that PE is an ideal time for children to accumulate minutes of physical activity to benefit their health (Mandigo, Francis, Lodewyk, & Lopez, 2009), it is only one component of a quality PE program (Hardman, 2011).

From a theoretical perspective, PE is not merely an activity or sport, but an academic subject that utilizes physical activity (i.e., movement) as a vehicle to achieve an educational outcome prescribed by the curriculum (Lu & De Lisio, 2008). Physical literacy is a core element in achieving the overarching goal promoted by a quality PE program, and many believe it must represent the overall goal of every PE class (Whitehead, 2007). Mastering fundamental movement skills and developing confidence to perform these skills during PE is vital for current and future participation in physical activity (Gallahue & Donnelly, 2007).

Teachers of both classifications also expressed how various factors impeded or facilitated their ability to instruct PE. Generalist teachers noted more negative than
positive factors compared to specialists, which highlights the challenges associated with delivering high-quality classes for this distinct group. Barriers faced by generalists are not new findings (Decorby, Halas, Dixon, Wintrup, & Janzen, 2005; Morgan & Bourke, 2005; Morgan & Hansen, 2008). As a result of insufficient PE training during pre-service programs (Deacon, 2001), generalists have been shown to be at a disadvantage teaching this subject in comparison to specialists and have been found to be reluctant to do so (Hastie & Martin, 2006). A teacher who has had less training in the field typically exhibits lower confidence (Morgan & Bourke, 2008; Morgan & Hansen, 2008; Xiang, Lowy, & Mcbride, 2002), limited knowledge (Decorby et al., 2005), insufficient planning (Decorby et al., 2005), reduced interest and enthusiasm (Morgan & Hansen, 2008), and a poorer attitude towards teaching PE (Dwyer, Allison, Hansen, Goldenberg, & Boutilier, 2003), all of which have the capability of affecting the PE experience, and long-term activity habits of their students. The barriers associated with limited training were also expressed by the generalist teachers in this study. If generalist teachers are going to continue to be required to teach PE at the elementary school level, it is critical they are trained properly to reduce teacher-related barriers and ensure the students under their supervision are developing the skillset and confidence to remain active for life.

Generalist teachers in the current study indicated that there was pressure from their school board and principals to focus on subjects like math and language to improve numeracy and literacy skills of their students, leaving minimal (if any) time for PE class. The time constraints faced by generalist teachers are unique. Time devoted to one academic subject in turn reduces the amount of available time for other curricular
subjects. In fact, the length of PE lessons taught by generalists have been found to be shorter in comparison to classes taught by specialists (Sallis et al., 1997). Conversely, specialists may only be responsible for teaching one subject, generating no competing academic demands. In a study conducted by Barroso and colleagues (2005), specialist teachers ranked insufficient time in the school day as the second lowest perceived barrier to teaching PE (out of 8) for four straight years. Specialists do not have to intricately plan their day to make time for multiple subjects, or factor in transition time from the generalist or recess to the gymnasium. To help alleviate this barrier for generalist teachers, it is imperative that they are supported to accommodate PE into their weekly schedule.

Both generalists and specialists in the current study identified the physical environment as a major barrier when trying to teach a quality PE program. Large class sizes coupled with small spaces creates a safety concern, especially when children are still developing their motor skills and spatial awareness (Barroso et al., 2005). Teachers are legally responsible for ensuring that safe conditions are provided in their PE classes (Manitoba Physical Education Teachers’ Association, 2001). Unfortunately, generalist teachers may not be trained to minimize safety concerns or be aware of their responsibilities, nor realize potential hazards that are inherent to physical activity environments (Decorby et al., 2005). Safety is an issue that must be addressed proactively in all schools, starting with ensuring the space provided for PE is large enough for the number of students and the activity being played. Unfortunately, findings from Hardman and Marshall's (2000) international survey on the state and
status of PE indicated that 69% of PE facilities globally are inadequate (58% in the United States, and 87% in Canada). The level of provision, together with challenges presented by inadequate maintenance of facilities, can detrimentally influence the nature, scope, and quality of PE programs. As such, it is near impossible to expect even the best-prepared teachers to instruct high-quality (and safe) classes when the space provided is inadequate. One solution to overcoming large class sizes and inadequate facilities in PE is to utilize other environments, for example, outdoor spaces and multi-purpose classrooms.

Equipment is also an area of deficiency when teaching elementary school PE. Specifically, access to age-appropriate equipment is a common barrier listed by generalist teachers (Jenkinson & Benson, 2010; Morgan & Hansen, 2008). As mentioned previously, elementary school students are in the process of developing their fundamental motor skills (Morgan et al., 2013). Thus, standard equipment (which is typically plentiful in supply), such as racquets, volleyballs, and standard basketball nets are inappropriate for younger students, as they do not allow children to be successful in their movements. Without an ample supply of equipment which is suitable for younger students (e.g., pool noodles, beach balls, bean bags, etc.), generalist teachers have been noted to struggle adapting traditional games to their younger pupils (Morgan & Hansen, 2008b; True Love et al., 2019). Lack of resources and equipment also makes it difficult to work on individual skills, affecting skill acquisition (Decorby et al., 2005). On the other hand, specialist teachers have been found to perceive insufficient equipment and resources as only a minor barrier affecting their quality of instruction (Barroso et al.,
2005; Truelove et al., 2019). In this study, specialist teachers noted that their experience teaching in this environment left them better off when equipment was scarce, as they were more creative and resourceful when improvising activities using similarly shaped or sized pieces of equipment. In order to combat this barrier, teachers’ lessons should be planned in advance in accordance with the available equipment at their school, and equipment needs for PE should be brought to the attention of the school principal.

There were also many positive factors which teachers indicated supported their efforts to provide high-quality PE experiences for their students. Specialists in this study articulated how valuable attending conferences, workshops, and professional development days was to their pedagogy, while generalist teachers expressed their interest in taking part in hands-on workshops to improve their PE-related self-efficacy and expand their skill repertoire. Partaking in professional development opportunities, such as workshops and conferences focused on PE, have been shown to heighten teachers’ confidence teaching in this environment (Jess & McEvilly, 2015; Martin, Mccaugtry, Hodges-Kulinna, & Cothran, 2008; Sallis et al., 1997). While even limited professional development, such as a one-day workshop, can positively impact teachers’ self-efficacy (Martin et al., 2008), a host of general education studies have shown that ongoing professional development leads to substantially higher increases in teacher efficacy (Jess & McEvilly, 2015; Vannatta & Nancy, 2004; Watson, 2006). Unfortunately, generalist teachers have been found to participate in comparatively little PE professional development compared with other core subjects (e.g., mathematics and literacy), and what they have encountered has often lacked depth and challenge, and
displayed limited coherence, relevance, and progression (Armour & Yelling, 2004; Armour, Makopoulou, & Chambers, 2012). Moreover, conferences concentrated on PE are typically only attended by PE specialists, widening the gap between generalists’ and specialists’ confidence and knowledge instructing in this environment. To improve generalists’ self-efficacy and knowledge teaching in this unique environment, ongoing opportunities for professional development need to be available to both types of teachers, and there should be support from principals and school board officials for teachers to take part in these sessions.

Specialists in the current study noted that the use of technology during their classes was extremely beneficial to their students learning, as the students could visualize their movements and compare their performance to a more skilled model with a particular focus on identifying key features of the technique. The use of technology within the field of PE, by means of access to resources online, or integration of digital technology within PE, has enormous potential to support teachers to provide high-quality PE experiences for their students (Wyant & Baek, 2019). As technology is now a major part of the modern learning landscape, teachers are continuously seeking new methods to integrate digital learning resources and supports into PE classes (Hyndman, 2017b; Kim, Bonk, Teng, Zeng, & Oh, 2006). Technology can also be useful for teachers to gather new ideas and network with other teachers. For example, generalists and specialists in the current study conveyed that access to free online platforms such as YouTube, Pinterest, and Facebook have helped them expand their repertoire of games and activities, which in turn keeps their students motivated and engaged in PE classes.
Support from teachers specifically trained in PE has also been acknowledged as beneficial to generalist teachers faced with the task of teaching their own PE (Faucette et al., 2002; Truelove et al., 2019). For example, Faucette and colleagues (2002) explored the effect of a 2-year professional development program (Project SPARK) led by specialists on 16 generalist teachers’ self-confidence when teaching PE. After the program, qualitative data indicated that frequent support by a specialist, and modeling classes of a specialist were extremely valuable in increasing the generalist teachers’ self-confidence when teaching PE. Outsourcing PE to external providers was noted as common practice by both types of teachers in the current study. This form of content delivery can be an effective method for offering elementary school students specialist instruction, as well as providing training for teachers (Sperka & Enright, 2018). However, generalist teachers in the present study indicated that their use of external providers in PE was purely to replace themselves, rather than to support their efforts teaching in this environment. While schools and teachers have been seen to accept and often embrace the role of external providers in delivering PE due to their perceived content expertise, there is limited to no evidence that external providers have the pedagogical or curricular knowledge or skills to construct experiences that address curricular outcomes (Sperka & Enright, 2018). External providers should be used as a support mechanism and supplement teachers teaching in this environment (as the specialists reported in this study), rather than a substitute to ensure students are still receiving instruction from someone qualified in the profession.
Limitations

A number of limitations must be acknowledged. First, interviews were only conducted in English which may have discouraged/excluded teachers from other parts of Canada from taking part (as French is the dominant language in some provinces).

Secondly, the majority of participants were female. While the majority of teachers at the elementary school level in Canada are female (83.6%; Statistics Canada, 2015), this subgroup has also been found to have lower self-efficacy teaching PE (Truelove et al., 2019). Additionally, while efforts were taken to capture diverse perspectives by recruiting through randomization, the majority of the generalist teachers were from one province (i.e., Ontario). As education is regulated at the provincial level, policies within the province regarding the training and education of teachers and implementation of PE in schools could have influenced the findings. Despite efforts to recruit a large sample from all provinces/territories, a larger, more diverse sample from across the country is necessary to alleviate these concerns and increase the generalizability of the findings.

Furthermore, as information was collected via interviews, social desirability bias could have affected the findings, as teachers may have been more likely to perceive that institutional barriers had an adverse impact on their efforts to teach PE rather than attribute a lack of success to their own shortcomings.

Conclusion

This research is the first qualitative study to highlight how Canadian elementary school teachers’ specialization affects their daily experiences teaching PE classes, specifically with regard to teaching philosophies, barriers and facilitators, and self-
efficacy. It was evident that a number of perceived barriers inhibited generalist teachers’ efforts and capacity to implement regular and developmentally appropriate PE lessons. Of concern, many of the barriers expressed by generalists in the current study were noted internationally more than 10 years ago (Barroso et al., 2005; Decorby et al., 2005; Morgan & Bourke, 2008; Morgan & Hansen, 2008). Despite over a decade of research, there have been no radical changes to improve the landscape for individuals required to teach in this setting. This qualitative exploration of factors that influence generalists’ and specialists’ experiences in PE might help provide clarification as to what additional training, support, and resources are desired and needed, and serves as a call to action to improve the teaching landscape for teaching PE in Canada. In addition, insights to what specialists perceive positively impact their teaching practices, such as advanced training, professional development opportunities, heightened self-efficacy, and use of technology, may help direct researchers, policymakers, and educators to tailor resources to support generalists teaching in this unfamiliar setting, closing the gap between the qualities of instruction between the two types of teachers. Based on these findings, it appears that generalist teachers may be at a disadvantage teaching PE due to lack of training, experience, and self-efficacy in this environment, coupled with the responsibility of teaching multiple curricular priorities. If generalist teachers are going to continue to be required to instruct PE at the elementary school level, it is essential that they have the knowledge, confidence, and support necessary to be successful teaching in this subject-area. Improved (and tailored) pre-service training, and ongoing professional development opportunities for in-service teachers could help ensure that
all individuals responsible for teaching PE are properly trained to handle the unique demands of teaching in this setting.
References


Dance Conference.


doi.org/10.14221/ajte.2017v42n7.3


doi.org/10.1177%2F1356336X15586909


fitness in elementary school students. Sports, Play and Active Recreation for Kids.

American Journal of Public Health, 87(8), 1328–1334.
doi.org/10.2105/AJPH.87.8.1328

doi.org/10.1177/1356336X17699430


CHAPTER 4

Physical Education Training for Ontario Pre-Service Teachers: An Environmental Scan

PE class is an optimal time for elementary school children to be active during the school day (National Association for Sport and Physical Education, 2012; Physical and Health Education Canada, 2014). As a mandatory component of the school curriculum in Canada, PE allows for regular and structured opportunities to be active, and provides time for children to become physically literate, developing the fundamental movement skills, knowledge, and attitudes needed to lead a healthy active lifestyle (Mandigo, Francis, Lodewyk, & Lopez, 2009). However, the quality of PE instruction provided to children in Canada, and around the world has been questioned in the literature (Hardman, 2011; Hardman & Marshall, 2000).

Teachers have a strong influence on the PE experiences of their students (Morgan & Bourke, 2008). They are responsible for planning and structuring PE classes to meet provincial curriculum requirements, assessing student movements and providing feedback, keeping students engaged and participation rates high, as well as managing behaviour and creating a safe environment for children to develop the confidence and competence to be active (Ontario College of Teachers, 2015). Unfortunately, many teachers feel unprepared to teach PE, and are not confident teaching in this environment (Morgan & Bourke, 2008). This is problematic, as a teacher’s confidence or self-efficacy to teach PE has been found to be related to their enthusiasm for teaching, positive attitude, and quality of instruction (Morgan & Bourke, 2005). Additionally, teachers’ self-efficacy for teaching PE can affect the amount of teaching experience they provide.

*A version of this manuscript has been submitted for publication. Truelove, S., Burke, S.M., & Tucker, P. (submitted May 6, 2020). Physical Education Training for Ontario Pre-Service Teachers: An Environmental Scan. *Canadian Journal of Education.*
effort and persistence they demonstrate (especially when faced with barriers; Barroso, McCullum-Gomez, Hoelscher, Kelder, & Murray, 2005).

The literature suggests that teachers’ training and education are important contributing factors with regard to their confidence in their ability to teach PE, which in turn can impact their quality of instruction. For example, Zach, Harari and Harari (2012), explored 203 pre-service teachers’ confidence to teach PE at the beginning and end of one academic school year, and found that the confidence of the pre-service teachers to teach PE significantly increased ($p < .001$) after one year of university education.

Additionally, surveying 285 pre-service teachers before and after attending a 12-hour PE course and two practicum teaching placements, Fletcher, Mandigo and Kosnik (2013), found that pre-service teachers felt that their training and education gave them more confidence to teach and overcome barriers in this setting. Generalist teachers (i.e., those who are not specially trained in a specific subject during pre-service teacher education), have expressed lower self-efficacy to teach PE compared to PE specialists (i.e., those who are trained in health and PE as a teachable subject during pre-service teacher education; Truelove, Johnson, Burke, & Tucker, 2019). Recent reports have indicated that 47% of elementary schools in Ontario do not employ a full- or part-time PE specialist (People for Education, 2018). Hence, a large percentage of generalist teachers are required to teach PE classes despite possessing minimal training. As all individuals must attend a teacher education program in order to be certified to teach in a publicly funded school in Ontario, it seems logical and financially responsible to provide the necessary training in all required curriculum subjects, including PE, to
support and enhance teacher confidence and preparedness, and to set a strong foundation for future professional growth. Because teachers have reported inadequate PE training during their university programs in Ontario (Faulkner et al., 2008; Fletcher et al., 2013), it is apparent that a better understanding of the current offerings of PE training for both generalist and PE specialists within Faculties of Education across the province is necessary.

In the province of Ontario, there are 15 post-secondary institutions that offer a Bachelor of Education degree. The intent of these 2-year teacher education programs is to provide teacher candidates with requisite skills, knowledge, experience, and confidence needed to enter teaching in a variety of subject matters (Van Nuland, 2011). Despite all teacher education programs in Ontario requiring accreditation from the Ontario College of Teachers (as education is mandated at the provincial level), Croker and Dibbon (2008) and Petrarca and Kitchen (2017) showed that individual teacher education programs across the province are markedly different in structure, courses, and foci. Ontario universities take pride in the distinct ways in which they organize their programs to deliver meaningful teacher education that complies with the Ontario College of Teachers accreditation requirements (Petrarca & Kitchen, 2017); however, it may be these differences that significantly affect the learning experiences of their students. To date, there have been no studies conducted to measure the extent (i.e., time devoted to courses [hours]) or content (i.e., topics covered) of the PE curriculum provided to pre-service teachers during teacher education degree programs in Ontario. A review of all PE curricula within teacher education programs across Ontario could be
used, in consultation with educators, Faculties of Education, and provincial and territorial Ministries of Education and Health, to formulate recommendations for future PE training of teachers in Ontario, and across the country. Therefore, the purpose of this study was to: 1) explore the PE training (i.e., extent, content) reportedly delivered to pre-service teachers at Faculties of Education across Ontario, and 2) compare the differences in training offered to generalist teachers versus those specializing in PE as a teachable subject.

Methods

A descriptive environmental scan was employed. Within the area of education, environmental scans are used to collect information about the current activities and structure of institutions, such as schools and school boards, policies and curriculums, and Ministries of Education (Griffin, Woods, & Nguyen, 2005; Pivik, 2012). Specifically, environmental scans are suitable for the identification and synthesis of information or evidence about existing resources, training, barriers and facilitators to action, and/or knowledge and practice gaps pertaining to the topic under study (Graham, Evitts, & Thomas-MacLean, 2008). In the absence of standard guidelines for this approach, researchers have used reviews of pertinent literature or documents (Donnelly & Thompson, 2015), surveys or interviews with key informants (McPherson et al., 2014), or a combination of the two to conduct environmental scans (Aslakson et al., 2014). This scan, gathering information pertaining to PE courses at Faculties of Education across Ontario, involved a review of publicly available information online. This study was
classified as a quality assurance/improvement study by the Office of Research Ethics at the University of Western Ontario; as such, ethical approval was not required.

**Sample**

To facilitate comparisons, all post-secondary institutions across Ontario \( n = 15 \) offering a consecutive Bachelor of Education teacher education program (i.e., a program taken by candidates who have already completed a university degree) were targeted for participation. A list of eligible institutions was available online through the Ontario College of Teachers (2020).

**Data Collection**

The scan involved reviewing each institution’s Faculty of Education website to seek information pertaining to: the extent of PE training reportedly offered (i.e., the number of hours pre-service teachers are expected to spend in PE courses) and content of training (i.e., the course syllabi of the PE courses). If the information provided online was not sufficient, the first author contacted the institutions directly for additional information. Course instructors were contacted directly for course syllabi if their email address was available online; however, if the instructor could not be contacted, an email was sent to the Dean of Education at the institution requesting the required information. The scan of online information took place between December 2019 and February 2020, and only information listed after 2018 was collected in order to ensure the most up-to-date information was being utilized. The first author gathered the majority of the information, while a francophone research assistant searched the websites of institutions which only offered consecutive Bachelor of Education programs.
in French \((n = 1)\). A data extraction table was created by the research team to systematically capture information pertaining to pre-service teacher training offered at each institution in Ontario (Appendix L). In Ontario, teacher education programs leading to certification are grouped into three divisions: Primary/Junior (Kindergarten-Grade 6), Junior/Intermediate (Grade 4-10), and Intermediate/Senior (Grade 7-12). Primary/Junior teacher candidates are not required to have a subject specialty, whereas Junior/Intermediate teacher candidates must specialize in one “teachable” subject and Intermediate/Senior teacher candidates typically require two teachable subjects. Therefore, the hours devoted to courses on PE and course syllabi were separated by institution, teaching division as well as teaching specialty.

**Data Analysis**

Means, modes, and standard deviations were run using SPSS (version 25) to examine the hours reportedly devoted to PE courses as noted online, by institution, teaching division, and specialization of the teacher. Inductive content analysis was used to examine the course syllabi of the PE classes for content of training (Elo & Kyngäs, 2008). An inductive approach was used as this was the first study to explore the PE training of pre-service teachers across Ontario. Content analysis was used as it is a systematic and objective means to describe and quantify phenomena by measuring the frequencies of codes and categories and allows text of similar nature to be classified into distinct categories (Downe-Wamboldt, 1992; Elo & Kyngäs, 2008). The three stages of content analysis were followed when analyzing the course syllabi: 1) preparation (i.e., delineating meaning units and becoming immersed in the data through several
repetitive readings); 2) organizing (i.e., using an inductive, deductive, or a combined approach); and 3) reporting (Elo & Kyngäs, 2008). The course syllabus for each PE course was imported into QSR NVivo (version 12). The syllabi were read several times by two unique coders to become familiar with the depth and breadth of the content and to obtain a sense of the whole syllabus (Elo & Kyngäs, 2008). Using open coding, the two coders generated notes and headings while reading the course syllabi and combined the notes onto coding sheets to freely generate categories (Cole, 1988). After open coding, the lists of categories were grouped under higher order headings, aiming to reduce the number of categories by collapsing those that were similar (Burnard, 1991). Numeric data from QSR NVivo were used to manually calculate the frequencies of components included in PE course syllabi. All data were analyzed by teaching division (e.g., Primary/Junior, Junior/Intermediate, Intermediate/Senior) and specialization of the teacher. Elements of trustworthiness (i.e., confirmability, dependability, and transferability) were monitored and considered at every phase of content analysis (Elo et al., 2014). More specifically, throughout the analysis process, Elo and colleagues' (2014) trustworthiness improvement checklist, which contains a series of questions for the researcher to consider at each content analysis phase, was utilized as a guiding framework. Questions pertained to: preparation (e.g., are the meaning units too broad or narrow?), organization (e.g., is there overlap between two categories?), and reporting (e.g., can the reader evaluate the transferability of the results?).
Results

All post-secondary institutions \((n = 15)\) were found to offer teacher education certification for the Primary/Junior division; however, only 10 institutions were noted to offer Junior/Intermediate and Intermediate/Senior teacher education certification. PE was found to be offered as a teachable subject at 6 institutions in the Junior/Intermediate division, and 10 institutions for the Intermediate/Senior division.

Extent of Training

Information regarding the in-class hours spent dedicated to PE training was acquired for 14 of 15 institutions at the Primary/Junior level, 8 of 10 institutions at the Junior/Intermediate level (4 of 6 institutions which offer PE as a Junior/Intermediate teachable subject), and 9 of 10 institutions which offer PE as an Intermediate/Senior teachable subject. The average reported time devoted to PE courses in the Primary/Junior division was 31.7 hours \((SD = 7.6; \text{ mode } = 36)\). Pre-service teachers in the Junior/Intermediate division were reportedly offered an average of 27.0 hours \((SD = 9.6; \text{ mode } = 18, 36)\) of PE training throughout the program, while those whose teachable subject was PE were found to be offered an average of 66.0 hours \((SD = 17.2; \text{ mode } = 36)\) in PE courses. At the Intermediate/Senior level, where pre-service teachers are required to choose two teachable subjects, students are reportedly offered an average of 77.3 hours \((SD = 16.8; \text{ mode } = 72)\) devoted to PE training. See Table 1 for reported curriculum hours devoted to PE courses by institution, teaching division, and teaching specialty.
Table 1

Hours of PE Training by Institution as Reported by Faculties of Education in Ontario

<table>
<thead>
<tr>
<th>Institution</th>
<th>P/J</th>
<th>J/I</th>
<th>J/I PE Specialist</th>
<th>I/S PE Specialist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brock University</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>102</td>
</tr>
<tr>
<td>Lakehead University</td>
<td>36</td>
<td>N/A</td>
<td>N/A</td>
<td>108</td>
</tr>
<tr>
<td>Laurentian University</td>
<td>36</td>
<td>36</td>
<td>N/A</td>
<td>72</td>
</tr>
<tr>
<td>Niagara University</td>
<td>36</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Nipissing University</td>
<td>36</td>
<td>36</td>
<td>72</td>
<td>72</td>
</tr>
<tr>
<td>Queen’s University</td>
<td>36</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Redeemer University</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>N/A</td>
</tr>
<tr>
<td>Trent University</td>
<td>36</td>
<td>N/A</td>
<td>N/A</td>
<td>72</td>
</tr>
<tr>
<td>Tyndale University</td>
<td>36</td>
<td>36</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>University of Ontario Institute of Technology</td>
<td>36</td>
<td>N/A</td>
<td>N/A</td>
<td>72</td>
</tr>
<tr>
<td>University of Ottawa</td>
<td>30*</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>University of Windsor</td>
<td>36</td>
<td>18</td>
<td>54</td>
<td>54</td>
</tr>
<tr>
<td>Western University</td>
<td>18</td>
<td>18</td>
<td>N/A</td>
<td>72</td>
</tr>
<tr>
<td>Wilfrid Laurier University</td>
<td>18</td>
<td>18</td>
<td>36</td>
<td>N/A</td>
</tr>
<tr>
<td>York University</td>
<td>18</td>
<td>18</td>
<td>N/A</td>
<td>72</td>
</tr>
<tr>
<td><strong>Mean (SD)</strong></td>
<td>31.7 (7.6)</td>
<td>27.0 (9.6)</td>
<td>66.0 (17.2)</td>
<td>77.3 (16.8)</td>
</tr>
<tr>
<td><strong>Mode</strong></td>
<td>36</td>
<td>18, 36</td>
<td>36</td>
<td>72</td>
</tr>
</tbody>
</table>

Note. PE = physical education; P/J = primary/junior; J/I = junior/intermediate; I/S = intermediate/senior; N/A = not applicable; - = information not available.

*University of Ottawa offers blended courses, in which PE is taught alongside other curriculum components. The average time spent dedicated to teaching PE was calculated from the course syllabi.
Course Content

The syllabi for PE courses at 11 of 15 Faculties of Education across Ontario were available online or received from the institution directly and were included in the qualitative analysis. Regardless of institution and teaching division, all PE course syllabi (100%) included components of: 1) knowledge, planning and implementation of the Ontario Health and Physical Education curriculum; 2) physical literacy; 3) assessment and evaluation; and 4) practical teaching experience. Other components which were regularly included in the course content across institutions and teaching divisions were: 1) teaching games for understanding (92.9%); 2) use of OPHEA as a resource (92.9%); 3) theories of teaching (92.9%); 4) safety policies (89.3%); 5) inclusion of diverse populations (85.7%); 6) utilizing current research to inform teaching practices (78.6%); and 7) importance of skill progression (75.0%). Learning objectives which were infrequently imbedded in course syllabi were: 1) learning to teach cooperative games (67.9%), Indigenous games (42.9%) and fitness (39.3%); 2) developing classroom management strategies for the gymnasium (60.7%); 3) exploring the comprehensive school health model (35.7%); and 4) recognizing opportunities for interdisciplinary teaching and learning (i.e., integrating PE into other subject areas; 46.4%).

When comparing course syllabi for PE specialist teachers versus generalist teachers, specialist teachers were expected to receive additional training in: 1) developing fundamental movement skills (90.9% versus 58.8%); 2) using technology to enhance both teaching and student learning in PE (81.8% versus 41.2%); 3) locating resources to support instruction (90.0% versus 35.3%); and 4) formulating an
individualized perspective and philosophy for teaching PE (81.8% versus 41.2%). Refer to Table 2 for a complete list of course content reportedly offered in PE courses at Faculties of Education across Ontario, separated by teaching division and teaching specialty.

**Discussion**

The purpose of this environmental scan was to determine the reported extent and scope of PE training provided to pre-service teachers at Faculties of Education across Ontario, and to compare the training offered to generalist versus PE specialist teachers. This is the first study to provide a provincial overview of the PE training offered to pre-service teachers during their Bachelor of Education degrees; an important first step in identifying existing strengths and whether there is a need for revisions to better serve this population before entering the workforce. Multiple findings from this study warrant discussion.

While all post-secondary institutions offering teacher education programs in the province are accredited by the Ontario College of Teachers, the present study highlights the differences between institutions, as well as teaching divisions, for hours of PE training and the focus of this training. On the basis of publicly available online information, the time allocated to PE training appears to be similar for generalist teachers at the Primary/Junior and Junior/Intermediate teaching levels across Ontario. In comparison, Junior/Intermediate pre-service teachers whose teachable subject is PE appear to be offered substantially more training (~35 additional hours). While it seems
Table 2

Content Included in PE Courses as Reported by Faculties of Education in Ontario

<table>
<thead>
<tr>
<th>Course Content</th>
<th>P/J (n = 11)</th>
<th>J/I (n = 6)</th>
<th>J/I PE Specialist (n = 4)</th>
<th>I/S PE Specialist (n = 7)</th>
<th>Total (n = 28)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment and evaluation</td>
<td>11 (100.0%)</td>
<td>6 (100.0%)</td>
<td>4 (100.0%)</td>
<td>7 (100.0%)</td>
<td>28 (100%)</td>
</tr>
<tr>
<td>Class management</td>
<td>6 (54.5%)</td>
<td>4 (66.7%)</td>
<td>4 (100.0%)</td>
<td>3 (42.9%)</td>
<td>17 (60.7%)</td>
</tr>
<tr>
<td>Comprehensive school health</td>
<td>2 (18.2%)</td>
<td>3 (50.0%)</td>
<td>2 (50.0%)</td>
<td>3 (42.9%)</td>
<td>10 (35.7%)</td>
</tr>
<tr>
<td>Cooperative games</td>
<td>9 (81.8%)</td>
<td>4 (66.7%)</td>
<td>3 (75.0%)</td>
<td>3 (42.9%)</td>
<td>19 (67.9%)</td>
</tr>
<tr>
<td>Daily physical activity</td>
<td>8 (72.7%)</td>
<td>5 (83.3%)</td>
<td>3 (75.0%)</td>
<td>3 (42.9%)</td>
<td>19 (67.9%)</td>
</tr>
<tr>
<td>Fitness</td>
<td>2 (18.2%)</td>
<td>3 (50.0%)</td>
<td>2 (50.0%)</td>
<td>4 (57.1%)</td>
<td>11 (39.3%)</td>
</tr>
<tr>
<td>Fundamental movement skills</td>
<td>6 (54.5%)</td>
<td>4 (66.7%)</td>
<td>4 (100.0%)</td>
<td>6 (85.7%)</td>
<td>20 (71.4%)</td>
</tr>
<tr>
<td>Inclusion</td>
<td>10 (90.9%)</td>
<td>5 (83.3%)</td>
<td>3 (75.0%)</td>
<td>6 (85.7%)</td>
<td>24 (85.7%)</td>
</tr>
<tr>
<td>Indigenous games</td>
<td>5 (45.5%)</td>
<td>3 (50.0%)</td>
<td>2 (50.0%)</td>
<td>2 (28.6%)</td>
<td>12 (42.9%)</td>
</tr>
<tr>
<td>Interdisciplinary teaching</td>
<td>4 (36.4%)</td>
<td>4 (66.7%)</td>
<td>2 (50.0%)</td>
<td>3 (42.9%)</td>
<td>13 (46.4%)</td>
</tr>
<tr>
<td>Ontario PE curriculum</td>
<td>11 (100.0%)</td>
<td>6 (100.0%)</td>
<td>4 (100.0%)</td>
<td>7 (100.0%)</td>
<td>28 (100%)</td>
</tr>
<tr>
<td>OPHEA</td>
<td>10 (90.9%)</td>
<td>6 (100.0%)</td>
<td>4 (100.0%)</td>
<td>6 (85.7%)</td>
<td>26 (92.9%)</td>
</tr>
<tr>
<td>Personal teaching philosophy</td>
<td>3 (27.3%)</td>
<td>4 (66.7%)</td>
<td>4 (100.0%)</td>
<td>5 (71.4%)</td>
<td>16 (57.1%)</td>
</tr>
<tr>
<td>Physical literacy</td>
<td>11 (100.0%)</td>
<td>6 (100.0%)</td>
<td>4 (100.0%)</td>
<td>7 (100.0%)</td>
<td>28 (100%)</td>
</tr>
<tr>
<td>Planning</td>
<td>11 (100.0%)</td>
<td>6 (100.0%)</td>
<td>4 (100.0%)</td>
<td>7 (100.0%)</td>
<td>28 (100%)</td>
</tr>
<tr>
<td>Practical teaching experience</td>
<td>11 (100.0%)</td>
<td>6 (100.0%)</td>
<td>4 (100.0%)</td>
<td>7 (100.0%)</td>
<td>28 (100%)</td>
</tr>
<tr>
<td>Research</td>
<td>8 (72.7%)</td>
<td>4 (66.7%)</td>
<td>4 (100.0%)</td>
<td>6 (85.7%)</td>
<td>22 (78.6%)</td>
</tr>
<tr>
<td>Resources</td>
<td>4 (36.4%)</td>
<td>2 (33.3%)</td>
<td>3 (75.0%)</td>
<td>7 (100.0%)</td>
<td>16 (57.1%)</td>
</tr>
<tr>
<td>Safety</td>
<td>10 (90.9%)</td>
<td>5 (83.3%)</td>
<td>3 (75.0%)</td>
<td>7 (100.0%)</td>
<td>25 (89.3%)</td>
</tr>
<tr>
<td>Skill progression</td>
<td>8 (72.7%)</td>
<td>4 (66.7%)</td>
<td>3 (75.0%)</td>
<td>6 (85.7%)</td>
<td>21 (75.0%)</td>
</tr>
<tr>
<td>Teaching games for understanding</td>
<td>10 (90.9%)</td>
<td>6 (100.0%)</td>
<td>4 (100.0%)</td>
<td>6 (85.7%)</td>
<td>26 (92.9%)</td>
</tr>
<tr>
<td>Technology integration</td>
<td>5 (45.5%)</td>
<td>2 (33.3%)</td>
<td>4 (100.0%)</td>
<td>5 (71.4%)</td>
<td>16 (57.1%)</td>
</tr>
<tr>
<td>Theories of teaching</td>
<td>9 (81.8%)</td>
<td>6 (100.0%)</td>
<td>4 (100.0%)</td>
<td>7 (100.0%)</td>
<td>26 (92.9%)</td>
</tr>
</tbody>
</table>

Note. Each teaching division is not offered at every institution. P/J = primary/junior; J/I = junior/intermediate; I/S = intermediate/senior; PE = physical education; OPHEA = Ontario Physical Health and Education Association.
reasonable that PE specialists receive more training than their generalist counterparts, only a fraction of these individuals are eventually employed as a full- or part-time PE teacher in the province (People for Education, 2018). As a result, many generalist teachers are responsible for PE instruction and a surplus of PE specialists are teaching multiple curriculum subjects, underutilizing their additional qualifications. Additional training and education can increase educators’ confidence teaching PE (Fletcher et al., 2013), and many generalist teachers have expressed a desire for more robust training in PE (Decorby, Halas, Dixon, Wintrup, & Janzen, 2005; Morgan & Hansen, 2008). However, 36 hours of training is comparable to other curriculum subjects taught at Faculties of Education across Ontario (e.g., social studies, language, arts; Nipissing University, 2020). If additional training is necessary, it is still unclear if this training should be provided during pre-service teacher education, as a proactive approach, or as part of later professional development, which has been shown to be successful at improving teachers’ confidence in this setting (Jess & McEvilly, 2015; Martin, Mccaughtry, Hodges-Kulinna, & Cothran, 2008). While there have been mixed findings as to whether PE specialists provide higher quality classes at the elementary school level (e.g., Primary/Junior and Junior/Intermediate divisions; Constantinides, Montalvo, & Silverman, 2013; Law et al., 2018), financial constraints in the education system and support from school boards and provincial Ministries of Education are likely to blame for PE specialists not being hired full-time. At the Intermediate/Senior level, teachers are only qualified to teach two subjects; therefore, the additional hours of PE training students are offered (~45 hours) during pre-service teacher education programs is
necessary to ensure they are adequately prepared once they enter the workforce and are required to teach their specialties.

Equally important as the time devoted to PE training is the specific content delivered to pre-service teachers in their courses. Scanning 11 Faculties of Education PE course syllabi revealed numerous similarities between courses of the same teaching division, and teaching specialties. Developing an understanding of, planning, and implementing the Ontario Health and Physical Education curriculum was encompassed in all course syllabi explored. Ontario’s 2015 Health and Physical Education curriculum is divided into three strands: active living, movement competence (i.e., physical literacy), and healthy living (Ministry of Education, 2015b, 2015a). During training, pre-service teachers are expected to develop the knowledge and confidence to teach these three components of the curriculum, and how to (short- and long-term) plan and apply all strands to create a balanced, positive learning environment that will help students develop appropriate skills to lead healthy, active lives (Ministry of Education, 2015a, 2015b). Without appropriate content knowledge gained through the curriculum, research shows that many new teachers rely on their existing knowledge and teaching approaches from their own backgrounds (often sport-related) to plan and implement lessons (Capel, 2007). This becomes problematic, as lessons are less likely to meet curriculum requirements and follow an appropriate sequence and scope, and more likely to be shaped by teachers’ personal attitudes, biases, and previous experiences in PE (Elliot, Atencio, Campbell, & Jess, 2013; Morgan & Hansen, 2008b).
A comprehensive knowledge of the curriculum is also necessary for teachers to devise and conduct authentic assessments and evaluations of their students’ progress towards learning the skills needed for healthy and active living. Encouragingly, all course syllabi explored in the current environmental scan referenced the need for pre-service teachers to be able to develop assessment tools and evaluate their students’ learning in PE. This is critical, as without proper training, teachers often prefer to assess students based on effort and improvement as opposed to achievement of specific learning objectives. Early work by Placer and Dodds (1988), as well as more recent findings (Johnson, 2008; Lund & Kirk, 2002), indicate that teachers were, in general, predisposed to value appropriate behaviour, enjoyment of activity, and participation rather than the learning of content stated in the curriculum.

The final component, which was found to be included in all PE courses at Faculties of Education across Ontario included in this scan, was an aspect of practical teaching experience. Although implementation is unique to each institution, all student teachers are required to lead a PE class for their peers (typically in groups) to apply the skills they learned throughout their course, receive constructive feedback from their instructor, and gain confidence teaching in this setting. As supported by Bandura, mastery experiences, such as successful teaching experiences can greatly influence a teachers’ self-efficacy (Bandura, 1986, 1991). Well-designed teacher education programs with significant opportunities for mastery teaching experiences can positively influence one’s perceptions of teaching efficacy, reinforcing one’s ability to be successful early in their teaching career (Hand, 2014).
Many other critical learning objectives were identified when scanning the PE course syllabi; however, these objectives were not present in syllabi across all institutions and teaching divisions. For example, the syllabi for many courses noted that pre-service teachers would be required to demonstrate an understanding of the application and importance of creating a safe, equitable and inclusive PE environment. Inclusive education requires the adaptation and modification of resources and delivery of lessons to effectively ensure all children (regardless of ability level) are able to participate actively (Coates, 2012). Unfortunately, many studies have found that pre-service teachers do not feel confident implementing safe and inclusive classes (Coates, 2012; Loreman, Sharma, & Forlin, 2013; Sharma, Forlin, & Loreman, 2008). Florian and Spratt (2013), argue that all teacher education programs need to prepare teachers to be reflective practitioners who are equipped with strategies that are responsive to the individual needs of diverse learners. Teachers are among the most influential factors affecting student success (Watkins, 2012), and given the global movement towards inclusive classrooms as well as the growing number of children identified as having special learning needs (Sharma et al., 2008), it has become imperative that all teachers are prepared for and are confident about teaching learners with diverse abilities. Therefore, teacher education programs should ensure that their curriculum fosters attitudes and practices that support inclusion (Forlin & Hopewell, 2006).

After scanning the course syllabi, it was evident that a large percentage of pre-service teachers are trained in the teaching games for understanding model in their PE courses. This approach focuses on teaching children the tactical understanding of a
game before dealing with the performance of skills (Bunker & Thorpe, 1982). The teaching games for understanding model has become popular because of its potential to: 1) facilitate the development of technical skills and tactical knowledge; 2) empower children to learn for themselves and take responsibility; 3) assess the tactical transfers across games; and 4) increase the fun and enjoyment in playing games (Wang & Ha, 2012). Research has shown that many teachers have positive attitudes towards the teaching games for understanding model because it provides a fun and equitable experience to students, as well as promotes the students’ intellectual development (Light & Tan, 2006; Rossi, Fry, McNeill, & Tan, 2007). However, many teachers have avoided the implementation of the teaching games for understanding model in class due to limited knowledge and understanding of the model (Butler, 2005; McNeill et al., 2004; Wright et al., 2006). Providing sufficient training during pre-service teacher education can help young teachers feel confident applying this new model to their PE classes, in turn, maximizing students’ learning and enjoyment (Butler, 2005).

When comparing the content of courses developed for generalist versus PE specialist teachers, it was evident that a handful of learning objectives outlined in the course syllabi were unique to those specializing in the field. The importance of learning how to teach the three categories of fundamental movement skills (e.g., balance skills, locomotor skills, and ball skills) was frequently reported in syllabi for specialist teachers compared to generalist teachers. Fundamental movement skills are the “building blocks“ for more complex and specialized skills that children need throughout their lives to competently participate in different games, sports and recreational activities (Hands,
PE class is an ideal location for students to develop these skills. It provides an authentic learning environment that is developmentally appropriate, based on the individual’s developmental level, which may necessitate that a new skill be learned and practiced in a closed environment (e.g., without pressures of competition or external variables), before being able to integrate it in other more advanced movements and settings (Boyce, 1992). Additionally, systematic reviews have found strong evidence for a positive association between fundamental movement skills proficiency and physical activity (Holfelder & Schott, 2014; Lubans, Morgan, Cliff, Barnett, & Okely, 2010) and fitness (Cattuzzo et al., 2016) in children, and an inverse association with body weight status (Lubans et al., 2010). Unfortunately, elementary teachers without specific training have been shown to have lower levels of perceived self-efficacy in teaching fundamental movement skills (Morgan & Bourke, 2005; Xiang, Lowy, & Mcbride, 2002).

Due to the potential long-term impact of fundamental movement skills on the health and well-being of children, it is of uttermost importance that all teachers, inclusive of generalists, are confident supporting the development of these skills in their PE classes.

Integrating technology to enhance both teaching and student learning in PE has enormous potential (Wyant & Baek, 2019), and was regularly reported in course syllabi for specialist teachers at Faculties of Education across Ontario. Researchers from several countries have found positive outcomes of technology-integrated PE on students’ cognitive understanding and motivation (Legrain, Gillet, Gernigon, & Lafreniere, 2015), motor skill performance (O’Loughlin, Chróinín, & O’Grady, 2013), and assessment (Penney, Jones, Newhouse, & Cambell, 2012). While meaningful use of technology in PE
can positively influence the learning of students, use of technology alone does not ensure quality education. Throughout their training, pre-service teachers need to be prepared to design educational experiences that promote the construction of applicable knowledge and understand the fundamentals of teaching PE while integrating technology (Juniu, 2011). Training using technology can come in many shapes and forms; in the current environmental scan, pre-service teachers whose teachable subject was PE were commonly required to integrate technology into a lesson while peer teaching. Only a fraction of courses for generalist teachers included components of technology integration. As technology is now a major part of the learning landscape, teachers need to be prepared to meaningfully incorporate digital learning resources and supports into PE classes to benefit their students’ learning (Casey & Jones, 2011; Juniu, 2011).

In the current environmental scan, several course syllabi for specialist teachers referenced the formulation of an individualized perspective and philosophy for teaching PE as a learning objective, whereas only a small percentage of courses for generalist teachers encompassed this objective. Individuals’ personal beliefs, values, and training can significantly impact their teaching philosophy, which in turn affects the PE experience of their students (Tsangaridou, 2006; 2008). Generalist and specialist teachers have been found to have varying philosophies when it comes to teaching PE. In a study conducted by Truelove and colleagues (2020), generalist teachers’ philosophies were found to be centered on keeping children moving throughout their class, with seemingly little regard for developing physical literacy skills; whereas specialist teachers
approached PE as an opportunity to develop students’ fundamental movement skills in order to develop physically literate individuals capable of sustaining active and healthy lives. Many internal and external factors can influence one’s teaching philosophy, but as demonstrated by McEvoy and colleagues (2017), although individuals all enter teacher education programs with various sporting, education, and health views, with proper training, these views can undergo a process of change. Through course work, teaching experience, and self-reflection during teacher education, pre-service teachers have the opportunity to craft their own teaching philosophy adhering to the standards set out by the Ontario College of Teachers. Therefore, formulating an individualized teaching philosophy for PE should be incorporated into generalist teachers’ courses at Faculties of Education across Ontario to ensure they are creating an environment which maximizes their students’ learning potential.

**Limitations**

Despite the multitude of important findings from this study, limitations must be considered. First, although we intended to include all universities and colleges in Ontario which offer consecutive teacher education programs in this study, course syllabi for all schools could not be located, and one school declined to participate. Therefore, the summary provided may not reflect the PE training of all pre-service teachers across Ontario, potentially limiting the generalizability of our findings. Second, the intent of this paper was to raise awareness of the PE training delivered to pre-service teachers at Faculties of Education across Ontario, not to evaluate individual programs. Thus, the content of PE courses was presented as frequencies. Third, as instructors create their
own course syllabi, it can be expected that courses will change year to year at each institution. Fourth, the full extent of the courses may not be reflected in the course syllabi, leading to underreporting of course content. Conversely, not all information listed in the course syllabi may be reflected during training. This study only presents the reported content provided to teacher candidates during their pre-service programs. Finally, while not the focus of the study, it is important to note that some of the PE courses also included a health component, which was not explored.

**Conclusion**

This study provides a provincial scan of the extent and content of PE training reportedly delivered to pre-service teachers at Faculties of Education across Ontario. Although all institutions are held to the same accreditation standards, it was evident that the extent and scope of PE training at each institution is not identical. The time devoted to PE courses varies. Additionally, while four components of courses (e.g., knowledge of curriculum, physical literacy, assessment and evaluation, and practical teaching experience) were included in all PE syllabi scanned, a proportion of additional important learning objectives were missing from institutions’ PE courses. Additionally, some content was more frequently reported in syllabi for classes offered to teachers specializing in PE compared to generalist teachers. Numerous teachers (specifically generalists) have reported low levels of self-efficacy teaching in this environment, which in turn can affect the PE experiences of their students (Morgan & Bourke, 2008; Morgan & Hansen, 2008a). In light of the recent evidence which suggests that generally, elementary school PE is taught by generalist teachers (People for Education, 2018),
Faculties of Education might consider providing alternative training to these teachers, potentially more in line with the content and extent currently provided to specialists. Teacher education programs in Ontario need to provide teacher candidates with the requisite skills, knowledge, experience, and confidence to teach PE. Well-structured courses that encompass critical learning objectives, and quality teaching experiences have the potential to provide new teachers with a strong foundation before they enter the workforce. This study brings awareness to the current training reportedly delivered to pre-service teachers at Faculties of Education across Ontario, and highlights both strengths and gaps where training could be improved. Findings from the present study may encourage provincial Ministries of Education, as well as college/university faculty and staff to consider making modifications to current PE curricula requirements and/or course content of generalist and specialist teachers to ensure new teachers are well-prepared to lead quality PE classes for their students.
References


Law, B., Bruner, B., Benson, S. M. S., Anderson, K., Gregg, M., Hall, N., ... Tremblay, M. S. (2018). Associations between teacher training and measures of physical literacy


Sport Pedagogy, 13(1), 1–29. doi.org/10.1080/17408980701345550


doi.org/10.1080/09687590802469271


CHAPTER 5

Summary, Discussion of Implications, Limitations, and Future Directions

The overarching purpose of this dissertation was to increase our understanding of generalist and PE specialist teachers’ self-efficacy and barriers faced instructing PE, and the reported PE training these teachers receive during pre-service education. To achieve this goal, three independent investigations were conducted. Study 1 involved surveying generalist and PE specialist elementary school teachers across Canada to examine their self-efficacy teaching PE and explore the strength of barriers faced teaching in this environment. The results of this work indicate the contrasting levels of self-efficacy between the two types of teachers, and the difference in perceived strength of barriers affecting their instruction. Specifically, it was found that specialist teachers’ self-efficacy was significantly higher ($p < .05$) than that of generalist teachers. Moreover, gender was found to predict teachers’ self-efficacy, with female generalist teachers reporting the lowest scores on the TESPE, compared to male generalists, and male and female specialists. Additionally, there was a statistically significant difference between the perceived strength of 9 out of the 11 listed barriers (i.e., lack of time/crowded curriculum, overbooked gym, inadequate facilities and equipment, lack required physical fitness, insufficient training, lack of confidence, poor experiences in PE, low personal interest in PE, and no support from PE specialist) with generalist teachers reporting barriers as more inhibitory than specialists. This is the first study to provide a national picture of the self-efficacy of generalist and specialist teachers when teaching PE, and the perceived strength of barriers, representing an important
contribution to the field. It serves as a first step, identifying the need to intervene to improve teachers’ self-efficacy, particularly supporting efforts targeting female generalist teachers.

Study 2 involved carrying out interviews with 8 generalist and 8 PE specialist elementary school teachers across Canada to explore their experiences when instructing PE, and the perceived barriers and facilitators that influence their teaching practices. Overall, generalist and specialist teachers identified many unique factors that influenced their instruction of PE. Barriers which generalists perceived inhibited their ability to provide quality PE instruction included: lack of time, inadequate facilities and equipment, insufficient training, lack of knowledge, and low self-efficacy. Conversely, specialists noted that their advanced training, professional development opportunities, high self-efficacy, and use of technology positively supported their PE teaching practices. This study provides much insight into how Canadian elementary school teachers’ specialization affects their perceived barriers and facilitators related to instructing PE classes. Insights to factors perceived by specialists to positively impact teaching practices may help researchers, policymakers, and educators to tailor resources to support generalists teaching in this unfamiliar setting, helping to narrow the gap between the self-efficacy of the two types of teachers, in turn leveling the quality of instruction.

Finally, Study 3 entailed an environmental scan to summarize the reported PE training (i.e., extent [hours], content) pre-service teachers receive at Faculties of Education across Ontario when earning their Bachelor of Education degree, and to
compare the training between generalist teachers, and those specializing in PE as a teachable subject. The study highlighted the difference in time devoted to PE training among institutions, as well as teaching divisions (i.e., Primary/Junior, Junior/Intermediate, Intermediate/Senior) and teaching specialties. Teachers whose teachable subject is health and PE (i.e., PE specialist) receive approximately 35 additional hours of PE training in the Junior/Intermediate teaching division, and 45 hours in the Intermediate/Senior teaching division compared to those teachers not specializing in the subject. Furthermore, reviewing the course syllabus for each PE course revealed numerous similarities between courses of the same teaching division, and teaching specialties. All courses scanned included components of knowledge, planning and implementation of the Ontario Health and Physical Education curriculum; physical literacy; assessment and evaluation; and, practical teaching experience. However, when comparing those trained in PE as a teachable subject with generalist teachers, specialist teachers receive additional training in: developing fundamental movement skills; using technology to enhance both teaching and student learning in PE; locating resources to support instruction; and formulating an individualized perspective and philosophy for teaching PE. Together, the findings from the final study underscore the differences in training reportedly provided to generalist and PE specialist teachers during teacher education programs at Faculties of Education in Ontario. This was the first study to provide a provincial picture of the PE training pre-service teachers receive during their Bachelor of Education degree, an initial step to bringing awareness to the extent and
scope of PE training for pre-service teachers, and understanding if there is a subsequent
need for intervention to better serve this population before entering the workforce.

Discussion of Implications

Despite the inherent limitations noted for each study (refer to Chapters 2-4), the
overall findings of this body of work provide new insight into the self-efficacy of
generalist and PE specialist teachers across the country for instructing PE, the barriers
they face when teaching this subject, and the extent and scope of their training during
pre-service education. Firstly, given the low levels of self-efficacy reported by generalist
teachers in Studies 1 and 2, increased efforts are needed to not only confirm these
findings (as these were the first published studies to look at a national sample of
elementary school teachers’ self-efficacy teaching PE), but to examine what specifically
impacts teachers’ self-efficacy. As noted in Study 1, generalist teachers scored
significantly lower on all subscales of the TESPE (i.e., motivation, analysis of skill,
preparation, and communication). This highlights that teachers are not efficacious
across the teaching spectrum, opening the potential for improvement in many areas.
However, before advances can be made, it must first be determined why these teachers
are not confident teaching in this setting. Acknowledging that many sources may impact
one’s self-efficacy to teach PE (e.g., insufficient training [Fletcher, Mandigo, & Kosnik,
2013], poor personal experiences in PE [Breslin et al., 2012], lack of physical skills
[Carney & Chedzoy, 1998]), it is imperative to determine where to focus efforts so
supports and resources can be made available to teachers. As indicated in Study 1,
increased efforts should specifically be directed towards female generalist teachers, as
they reported the lowest self-efficacy scores, and they are also employed at the highest rate in elementary schools within Canada. Approximately 84% of teachers at the elementary school level in Canada are female (Statistics Canada, 2015); as this was the first study to highlight gender differences in self-efficacy among teachers instructing PE, additional research is needed to understand what is contributing to these gender differences.

Secondly, Studies 1 and 2 draw attention to the barriers teachers face when instructing PE, and what they perceive impacts their quality of teaching. Both generalist and specialist teachers noted institutional barriers (i.e., outside of their control), including lack of time, overbooked gym, and inadequate equipment and facilities as inhibiting their quality of delivery, although generalists reported them as more inhibitory. This can likely be attributed to their lower self-efficacy. Bandura (1997) suggested that efficacious teachers persist more when faced with barriers compared to less efficacious teachers. It is feasible to suggest that some teachers’ self-efficacy has even declined due to unsuccessful attempts at teaching effective PE lessons under difficult circumstances (Morgan & Hansen, 2008). Therefore, not only can one’s self-efficacy impact how inhibitory they perceive barriers, but the strength of barriers themselves can in turn influence one’s self-efficacy. Regardless of initial teaching efficacy, institutional barriers can have a negative impact on teachers’ confidence, attitudes, and enthusiasm, which highlights the importance of lobbying to reduce the effect of these barriers (Morgan & Hansen, 2008). Past studies have acknowledged similar barriers to those found in this dissertation (Decorby, Halas, Dixon, Wintrup, &
Janzen, 2005; Faulkner et al., 2008; Morgan & Hansen, 2008); however, little progress has been made to reduce these barriers for teachers. PE is often viewed as a lower priority compared to more ‘academic’ subjects, such as mathematics and literacy (Westheimer, 2008), which ultimately leads to less time and financial resources directed towards the subject (Barroso, McCullum-Gomez, Hoelscher, Kelder, & Murray, 2005). As the impediments listed are inherently outside of a teachers’ control, it is up to higher level personnel (i.e., principals, school boards, and Ministries of Education) to address these barriers so teachers can focus on providing a high-quality PE experience for their students.

Thirdly, many teachers (specifically generalists), believe they are inadequately prepared to teach PE, as noted in Studies 1 and 2. This is problematic as a teachers’ training is highly correlated with their self-efficacy (Fletcher & Kosnik, 2016; Zach, Harari, & Harari, 2012). Training typically comes in two forms: pre-service teacher education and later professional development. While the goal of teacher education programs is to provide students with the requisite skills, knowledge, experience, and confidence needed before entering the workforce (Van Nuland, 2011), many teachers still do not feel prepared to teach PE upon graduation (Morgan & Bourke, 2005). When reviewing the PE training pre-service teachers reportedly receive at Faculties of Education across Ontario (Study 3), it was evident that generalist teachers receive substantially less training compared to those whose teachable subject is PE. While it seems logical that PE specialists receive more training than their generalist counterparts, only a fraction of these individuals are eventually employed as a full- or
part-time PE teacher in the province (People for Education, 2018), leaving many teachers with minimal PE training responsible for PE instruction.

Additional training during pre-service education could be one solution to improve teachers’ self-efficacy, and the literature in this field has advocated for additional training for generalist teachers (Barroso et al., 2005; Decorby et al., 2005; Morgan & Hansen, 2008a). However, the extent of PE training generalists currently receive at Faculties of Education in Ontario is on par with other curriculum subjects (Nipissing University, 2020). This raises questions whether the extent of training isn’t the issue, rather the information conveyed isn’t being retained due to the quality or mode of delivery, or the material covered during pre-service education is not comprehensive. As evident in Study 3, compared to generalists, during pre-service education specialist teachers receive further training regarding fundamental movement skills, technology integration, locating resources to support instruction, and developing an individualized perspective and philosophy for teaching PE. Future research should explore the PE-related knowledge, training, and self-efficacy of teacher candidates to determine if there is a need to provide supplementary training or a different format of PE training during pre-service teacher certification, specifically for generalist teachers. Introducing additional content (or modifying the current content or delivery) at this stage of a teacher’s career will ensure that all teachers (regardless of specialization) are appropriately trained in PE before entering the teaching profession, where they can positively influence children’s health behaviours.
Providing professional development opportunities for teachers once they are already in the workforce is an alternative way to deliver additional training and partaking in these sessions has been shown to heighten teachers’ confidence instructing in this setting (Jess & McEvilly, 2015; Martin, McCaughrty, Hodges-Kulinna, & Cothran, 2008). But as noted in Study 2, professional development opportunities focused on PE are typically only attended by specialist teachers. Generalist teachers have been found to participate in comparatively little PE professional development compared with other core subjects, and what they have encountered has often lacked depth and challenge, and displayed limited coherence, relevance, and progression (Armour & Yelling, 2004; Armour, Makopoulou, & Chambers, 2012).

Globally, there are many debates regarding who should be teaching PE class to children. Ultimately, we want people teaching who are knowledgeable and confident to do so. While PE specialists are the ideal choice due to their increased training and higher self-efficacy, hiring full-time PE teachers across Canada isn’t a reality at this time due to financial constraints in the education system. Based on my findings, it is essential that additional supports and resources be provided to both generalist and specialist teachers to help aid them in instructing high-quality PE classes for their students. Whether these supports come in the form of supplementary training during pre-service education, or later professional development for in-service teachers, all teachers should be provided with the appropriate training so they can provide children with the best chance to develop the skills needed to lead healthy active lives.
Limitations and Future Directions

This compendium of studies highlights the contrasting levels of self-efficacy among generalist and specialist teachers instructing PE, their pre-service training, and the perceived strength of barriers on their teaching practices. Despite the multitude of important findings, limitations must be considered. First, as teaching is a primarily female-dominated profession in Canada (84%; Statistics Canada, 2015), the majority of participants in Studies 1 and 2 were female. This subgroup has been found to have lower self-efficacy teaching PE; therefore, the results of this overall dissertation may not be representative of the entire teaching profession within the country. Future studies should attempt to understand what is contributing to these gender gaps in self-efficacy, so appropriate resources and supports can be made available to female teachers. Second, as education is regulated at the provincial level and a national sample of teachers was utilized in Studies 1 and 2, policies within the provinces regarding the training of teachers at Faculties of Education and implementation of PE in schools could have influenced the findings. Also, low provincial/territorial response rates prevented exploring statistical inferences and may also limit the within-province/territory generalizability of findings. Upcoming work in the field of education should investigate provincial comparisons. Third, it is important to note that in addition to training and education, many alternative factors can influence one’s self-efficacy (Morgan & Hansen, 2008b). Therefore, one cannot assume that all specialist teachers will provide higher quality classes than their generalist counterparts due to additional training during pre-service education. Fourth, while teachers’ self-efficacy has been found to be positively
correlated with quality of instruction (Faulkner et al., 2008; Harris, Cale, & Musson, 2012), the quality of a PE class can be measured in many forms (i.e., student enjoyment, development of skills, physical activity levels, etc.). Consequently, not all teachers with high self-efficacy will provide a meaningful PE experience for their students, nor is there clarity in measuring/identifying the success of current PE offerings.

**Conclusion**

PE is an ideal environment for students to develop the skills they need to lead healthy, active lives (Mandigo, Francis, Lodewyk, & Lopez, 2009). However, the task of creating a learning environment conducive to the development of knowledge, confidence and competence, and executing skills rests heavily on the shoulders of teachers. If a teacher is not efficacious in their abilities, the quality of their instruction is likely to suffer (Bandura, 1997), overall affecting the PE experience of their students. This dissertation as a whole not only purports that self-efficacy levels instructing PE are low among generalist teachers, but that the training and supports currently provided to these teachers should be re-evaluated and consideration of other, non-knowledge based influences on PE (e.g., previous experiences in PE, personal interest) should be explored. As it remains highly unlikely that PE specialist teachers will be employed full-time across the country due to financial constraints, it is essential to ensure that generalist teachers are efficacious and adequately prepared to teach PE before entering the workforce. Moving forward, the findings from this work may serve as support for educators, advocates of PE in Canada and other countries, researchers, and policy makers to tailor resources and supports to generalists teaching in this unfamiliar setting.
In addition, the quality of PE training provided during pre-service education programs should be reviewed to determine if modifications should be made to content, delivery, and/or extent to better serve teacher candidates to ensure they are well-prepared to lead quality PE classes for their students. In summary, the three articles discussed herein serve as foundational studies for future work in PE pedagogy in Canada.
References


doi.org/10.1080/03004279.2016.1169486


doi.org/10.1080/17408980701345683


doi.org/10.1080/02701367.2008.10599517


People for Education. (2018). *The new basics for public education*. Toronto, ON, ON:

People for Education.


Appendix A

Letter of Information and Consent for Study 1
Exploring the Physical Education-Related Needs and Self-Efficacy of Elementary School Teachers

Investigators:
Stephanie Truelove, Faculty of Health Sciences, University of Western Ontario
Dr. Trish Tucker, Faculty of Health Sciences, University of Western Ontario
Dr. Andrew Johnson, Faculty of Health Sciences, University of Western Ontario
Dr. Shauna Burke, Faculty of Health Sciences, University of Western Ontario

Letter of Information and Consent

Invitation to participate:
Physical education class provides an ideal environment for students to be physically active; however, the instruction of physical education varies between individual teachers across the country. As such, this study aims to assess teachers’ self-efficacy to teach physical education and identify challenges for teaching physical education at the elementary school level. You are being invited to participate because you are an elementary school teacher in Canada.

Purpose of this letter:
The purpose of this letter is to provide you with the information needed to make an informed decision regarding your participation in the present study.

Purpose of this study:
The purpose of this study is to assess elementary school teachers’ self-efficacy to instruct physical education and identify challenges for teaching physical education at the elementary level.

Inclusion criteria:
Elementary school teachers (full or part-time/long-term occasional) across Canada, who teach at least one period of physical education, are eligible to participate.

Exclusion criteria:
Teachers who are not full or part-time at the elementary school level (supply or occasional teachers), who do not teach at least one period of physical education, and who do not live in Canada are ineligible to participate in this study.

Study procedures:
If you agree to participate, you will be asked to complete a 10-minute survey online.

Possible risks and harms:
There are no known risks or discomforts associated with participating in this study.

Possible benefits:
You may not directly benefit from participating in this study; however, by participating, you will provide researchers with valuable information about self-efficacy levels of elementary school teachers for instructing physical education, and future supports/resources which may improve self-efficacy levels among teachers responsible for physical education class.
Compensation:
At the end of the survey, you will be provided with instructions on how to enter a draw to win one of twenty, $25 Chapters gift cards, as appreciation for your time if interested.

Voluntary participation:
Participation in this study is voluntary. You may refuse to participate, skip any survey question, or withdraw from the study at any time prior to submitting your survey. Due to the anonymous nature of the survey, once you begin the survey, we have no way of knowing which data belongs to you. Therefore, if you decide to withdraw from the study, the information that was collected prior to you leaving the study will be included. No new information will be collected without your permission.

Confidentiality:
The information collected will be used for research purposes only. Your survey data will be collected anonymously through a secure online survey platform called Qualtrics; however, you will be provided an opportunity to provide your name and contact information into a separate survey if you would like to receive a copy of the study’s results, be entered into a draw, or be contacted for a follow-up interview. Providing your contact information is completely optional, and the data collected in the survey will not in any way be linked to your identifiable information. Qualtrics uses encryption technology and restricted access authorizations to protect all data collected. In addition, Western’s Qualtrics server is in Ireland, where privacy standards are maintained under the European Union safe harbour framework. All data will be aggregated with other participants for publishing or presentation purposes. All information collected for this study will be kept confidential. Only the investigators of this study will have access to the data collected. Representatives of The University of Western Ontario Non-Medical Research Ethics Board many require access to your study-related records to monitor the conduct of the research. All electronic files will be saved on password-protected computers. Data will be saved for 7 years before it is properly destroyed.

Contacts for further information:
If you have any questions about the conduct of this study or your rights as a research participant, you may contact the Office of Human Research Ethics at the University of Western Ontario [phone number], email: [email]. If you have any questions about this study, please contact Stephanie Truelove [phone number], email: [email], or Dr. Trish Tucker, [phone number], email: [email].

Publication:
If you would like to receive a copy of the overall results of the study, please indicate so by following the link after the final question on the survey.

Consent:
Completion of the survey is indication of your consent to participate.

This letter is yours to keep for future reference.
Appendix B

Ethics Approval for Study 1 and Study 2
Dear Dr. Patricia Tucker

The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the WREM application form for the above mentioned study, as of the date noted above. NMREB approval for this study remains valid until the expiry date noted above, conditional to timely submission and acceptance of NMREB Continuing Ethics Review.

This research study is to be conducted by the investigator noted above. All other required institutional approvals must also be obtained prior to the conduct of the study.

Documents Approved:

<table>
<thead>
<tr>
<th>Document Name</th>
<th>Document Type</th>
<th>Document Date</th>
<th>Document Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advertisement for social media Jan 24</td>
<td>Recruitment Materials</td>
<td>24/Jan/2018</td>
<td>01/24/2018</td>
</tr>
<tr>
<td>Contact Information for draw, results, and interview</td>
<td>Online Survey</td>
<td>08/Jan/2018</td>
<td>01/08/2018</td>
</tr>
<tr>
<td>End of Study Letter - Jan 8</td>
<td>End of Study Letter</td>
<td>08/Jan/2018</td>
<td>01/08/2018</td>
</tr>
<tr>
<td>Facebook &amp; Twitter Posts - Jan 8</td>
<td>Recruitment Materials</td>
<td>08/Jan/2018</td>
<td>01/08/2018</td>
</tr>
<tr>
<td>LOI - survey - Jan 30</td>
<td>Implied Consent/Assent</td>
<td>30/Jan/2018</td>
<td>01/30/2018</td>
</tr>
<tr>
<td>LOI interview - Jan 24</td>
<td>Verbal Consent/Assent</td>
<td>24/Jan/2018</td>
<td>01/24/2018</td>
</tr>
<tr>
<td>Phone Interview Script - Jan 26</td>
<td>Interview Guide</td>
<td>26/Jan/2018</td>
<td>01/26/2018</td>
</tr>
<tr>
<td>Questionnaire - Jan 24</td>
<td>Online Survey</td>
<td>24/Jan/2018</td>
<td>01/24/2018</td>
</tr>
<tr>
<td>Verbal Script for Consent - Jan 24</td>
<td>Verbal Consent/Assent</td>
<td>24/Jan/2018</td>
<td>01/24/2018</td>
</tr>
</tbody>
</table>

No deviations from, or changes to the protocol should be initiated without prior written approval from the NMREB, except when necessary to eliminate immediate hazard(s) to study participants or when the change(s) involves only administrative or logistical aspects of the trial.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario. Members of the NMREB who are named as investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB. The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00006941.

Please do not hesitate to contact us if you have any questions.

Sincerely,

Katelyn Harris, Research Ethics Officer on behalf of Dr. Randal Graham, NMREB Chair

Note: This correspondence includes an electronic signature (validation and approval via an online system that is compliant with all regulations).
Date: 29 March 2018

To Dr. Patricia Tucker

Project ID: 110491

Study Title: Exploring the Physical Education-Related Needs and Self-Efficacy of Elementary School Teachers

Application Type: NMREB Amendment Form

Review Type: Delegated

Full Board Reporting Date: 04 May 2018

Date Approval Issued: 29 Mar/2018 12:46

REB Approval Expiry Date: 14 Feb/2018

Dear Dr. Patricia Tucker,

The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the WREM application form for the amendment, as of the date noted above.

Documents Approved:

<table>
<thead>
<tr>
<th>Document Name</th>
<th>Document Type</th>
<th>Document Date</th>
<th>Document Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recruitment Email - GoodLife Kids Foundation - March 28</td>
<td>Recruitment Materials</td>
<td>28 Mar/2018</td>
<td>03/28/2018</td>
</tr>
<tr>
<td>Recruitment Email - Principal &amp; Teacher March 28</td>
<td>Recruitment Materials</td>
<td>28 Mar/2018</td>
<td>03/28/2018</td>
</tr>
</tbody>
</table>

REB members involved in the research project do not participate in the review, discussion or decision.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Human (TCP2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario. Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB. The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

Please do not hesitate to contact us if you have any questions.

Sincerely,

Katelyn Harris, Research Ethics Officer on behalf of Dr. Randal Graham, NMREB Chair

*Note: This correspondence includes an electronic signature (validation and approval via an online system that is compliant with all regulations).*
Appendix C

Participant Recruitment Poster for Study 1 and Study 2
ARE YOU AN ELEMENTARY SCHOOL TEACHER IN CANADA?

Researchers at Western University would like to hear from you about your experiences instructing physical education.

To participate, please click https://uwo.eu.qualtrics.com/jfe/form/SV_2ajJrQJlw6Xktg1 to complete a brief survey.

Participants will be entered into a draw to win one of twenty, $25 Chapters gift cards.

For additional information, please contact Stephanie Truelove at [redacted] or Dr. Trish Tucker at [redacted]

Version Date: 01/24/2018
Appendix D

Email Script to Principals for Study 1 and Study 2
Subject Line: Invitation to Participate in Research Study

Dear Principal (insert last name):

My name is Stephanie Truelove, and I am a PhD student in Health Sciences at the University of Western Ontario working under the supervision of Dr. Trish Tucker. My research efforts are focused on supporting physical activity among children within the school environment. Physical education provides an ideal setting for children to be physically active; however, the instruction of physical education varies between individual teachers across the county. Currently, physical education specialists (i.e., gym teachers specifically trained in physical education) are not mandated in any province/territory at the elementary school level; therefore, generalist teachers (i.e., teachers not specifically trained in physical education) are typically responsible for physical education instruction. It is important to identify both generalist and physical education specialists’ self-efficacy and barriers faced when instructing physical education in order to better support teachers serving in this capacity.

The purpose of this email is to see if (insert school name) would be interested in participating in our study. All elementary schools across Canada are eligible to participate. If you are willing to participate, we would ask that you please circulate an anonymous online survey with all of the teachers enrolled in your school/board. The survey will take approximately **5-10 minutes** to complete and will gather information related to elementary school teachers’ self-efficacy instructing physical education, as well as barriers faced.

Thank you very much for your consideration. We would be more than happy to share the survey with you beforehand and/or share the results following the study. Please let me know if you have any questions or require more information. We would be happy to address any of your inquiries, and we look forward to hearing from you.

Warm regards,

Stephanie Truelove

Stephanie Truelove, PhD Student
Faculty of Health Sciences, Health and Rehabilitation Sciences
Western University
London, Ontario, CANADA N6G 1H1
Appendix E

Email Script to Teachers for Study 1 and Study 2
Subject Line: Share your thoughts on Physical Education!

Dear Teacher:

Researchers at the University of Western Ontario are conducting a study to explore elementary school teachers’ self-efficacy instructing physical education, and barriers faced when serving in this capacity.

We are looking for elementary school teachers (full or part-time/long-term occasional) across Canada, who teach at least one period of physical education to complete a brief online survey. Participation in this anonymous survey is completely voluntary and will take approximately 5-10 minutes to complete. If you are interested in participating, please begin by reviewing the additional details in the Letter of Information at the beginning of the survey. The survey can be accessed at the following link: https://uwo.eu.qualtrics.com/jfe/form/SV_2ajJrQJlw6Xktg1. We appreciate your completion of this survey, as it will provide a picture of the self-efficacy of elementary school teachers and barriers faced when instructing physical education across Canada.

All participants will have the chance of winning one of twenty, $25 Indigo gift cards. No personal information will be collected, and all data will be grouped with other participants for publishing purposes. Your decision to participate (or not) will have no bearing on your employment. We appreciate your willingness to participate.

If you have any questions about this study, please contact Stephanie Truelove, email: struelo2@uwo.ca, or Dr. Trish Tucker, email: ttucker2@uwo.ca.

Warm regards,

Stephanie Truelove

Stephanie Truelove, PhD Student
Faculty of Health Sciences, Health and Rehabilitation Sciences
Western University
London, Ontario, CANADA N6G 1H1
Appendix F

Participant Demographic Questionnaire for Study 1
Exploring the Physical Education-Related Needs and Self-Efficacy of Elementary School Teachers

What is your employment status?
- Full Time
- Part Time
- Long-Term Occasional
- Supply/Occasional*

*if/then statement – If supply/occasional option chosen, then the participant will be excluded from the study and taken to the final thank you page.

Do you teach at least one class of physical education?
- Yes
- No*

*if/then statement – if no option chosen, then the participant will be excluded from the study and taken to the final thank you page.

Do you identify yourself as a:
- Generalist Teacher (i.e., not specifically trained in physical education)
- Gym teacher specifically trained in physical education

Are you currently, or have you in the past been part of the GoodLife4Kids School Program?
- Yes
- No

What province do you teach in?
- British Columbia
- Alberta
- Saskatchewan
- Manitoba
- Ontario
- Quebec
- New Brunswick
- Nova Scotia
- Prince Edward Island
- Newfoundland and Labrador
- Northwest Territories
- Yukon
- Nunavut

What is your sex?
- Male
- Female
- Prefer not to answer
What is your age (years)? ________

What is your racial background/ethnicity?
- Caucasian
- African Canadian
- Native/Aboriginal
- Arab
- Latin-American
- Asian
- Other
- Prefer not to answer

What grade(s) do you teach?
- Primary (kindergarten - grade 3)
- Junior (grades 4-6)
- Intermediate (grades 7 and 8)
- More than one of the above

How often do you teach physical education in a week?
- Daily
- 2-3 times a week
- Once a week
- Less than once a week

How many years of experience do you have teaching?
- <1 year
- 1-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- >20 years

Approximately how many students are enrolled in your school? ______________
Appendix G

Teacher Efficacy Scale in Physical Education for Study 1
Teacher Efficacy Scale for Physical Education

Teaching efficacy is defined as how confident you are that you can positively affect the learning of your students. Reflect upon a typical physical education (PE) teaching situation and then rate how sure you are about your teaching ability for each of the items below. Please be honest in your evaluation. Please note that a low number does not mean you are a below average teacher, just less confident in that area of teaching. Your answers will be kept completely confidential.

1 = no confidence at all  |  4 = moderately confident  |  7 = extremely confident

<table>
<thead>
<tr>
<th></th>
<th>No confidence at all</th>
<th>Moderately confident</th>
<th>Extremely confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Adjust your teaching style, when necessary, to motivate your students during PE</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Analyze what is wrong with a movement</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Prepare lesson plans using behavioural objectives that promote learning</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Provide students information feedback about their performance in a positive manner</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Motivate your students to persist after failing in skill attempts</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Watch students perform skills and analyze what improvements they should make</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Plan a developmentally appropriate curriculum for all grades that you teach</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Explain instructional cues and strategies to your students in ways that they will understand</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Break down or extend certain skills to match the ability level of your students</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>
10. Prepare lessons that match the ability level of your students
   
11. Correctly explain technique cues for skills to your students
   
12. Talk with students in ways that allows them to feel that you care
   
13. Appropriately describe ways in which your students can improve their performance
   
14. Organize quick transitions from one activity to another
   
15. Organize activities in class so that your students frequently feel successful
   
16. Motivate your students to attempt new skills

Reproduced with permission of the authors (M. Chase as corresponding author – personal communication December 26, 2017)

Following the same rating as the previous questions, please rate your confidence in your teaching ability for each of the items below.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>No confidence at all</th>
<th>Moderately confident</th>
<th>Extremely confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.</td>
<td>Keep your students engaged in moderate-to vigorous-intensity (heart pumping) physical activity for the majority of your PE class</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>Teach unique skills, such as dance, yoga, and pilates</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>Incorporate fitness skills (i.e., speed, agility, balance, power, coordination, reaction time) during your PE class</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>Demonstrate fitness skills to your students so they can learn through role modeling</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>Adapt your PE class for students with physical or intellectual disabilities</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix H

Major Barriers Questionnaire for Study 1
Think about your past experiences teaching physical education. On a scale from 1-6, 1 = no barrier, does not inhibit, and 6 = major barrier, strongly inhibits, indicate the strength of each barrier on your ability to instruct physical education.

<table>
<thead>
<tr>
<th>Lack of time/crowded curriculum</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gym is overbooked</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inadequate facilities and equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack required physical fitness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of adequate training</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low levels of teaching confidence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor personal experiences in PE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low levels of personal interest/enthusiasm in PE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class size is too big</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No support from other teachers or principal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No support from PE specialist</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Thank you for completing this survey. Please press submit.
Appendix I

Letter of Information for Study 2
Exploring the Physical Education-Related Needs and Self-Efficacy of Elementary School Teachers

Investigators:
Stephanie Truelove, Faculty of Health Sciences, University of Western Ontario
Dr. Trish Tucker, Faculty of Health Sciences, University of Western Ontario
Dr. Andrew Johnson, Faculty of Health Sciences, University of Western Ontario
Dr. Shauna Burke, Faculty of Health Sciences, University of Western Ontario

Letter of Information

Invitation to participate:
Physical education class provides an ideal environment for students to be physically active; however, the instruction of physical education varies between individual teachers across the country. As such, these interviews aim to assess teachers’ self-efficacy to teach physical education, and self-identified challenges and necessary supports for teaching physical education at the elementary school level. You are being invited to participate because you are an elementary school teacher in Canada who has indicated an interest in participating.

Purpose of this letter:
The purpose of this letter is to provide you with the information needed to make an informed decision regarding your participation in the present study.

Purpose of this study:
The purpose of this study is to assess elementary school teachers’ self-efficacy to instruct physical education, and self-identified challenges and necessary supports for teaching physical education at the elementary school level.

Inclusion criteria:
Elementary school teachers (full or part-time/long-term occasional) across Canada, who teach at least one period of physical education, speak English, and agree to be audio-recorded, are eligible to participate.

Exclusion criteria:
Teachers who: are not full or part-time at the elementary school level (supply or occasional teachers), do not teach at least one period of physical education, do not speak English, and do not live in Canada will be ineligible to participate in this study.

Study procedures:
If you agree to participate in this study, you may be asked to complete a 30 minute phone interview regarding challenges and supports to teaching physical education. The interview will be recorded; however, all data will be presented in aggregate form and your name will not be used in any subsequent publications.
Possible risks and harms:
There are no known risks or discomforts associated with participating in this study.

Possible benefits:
You may not directly benefit from participating in this study; however, by participating, you will provide researchers with valuable information about self-efficacy levels of elementary school teachers to instruct physical education, and future supports/resources to improve self-efficacy teaching physical education class.

Compensation:
After completing the interview, you will receive a $25 Chapters gift card by email, as appreciation for your time.

Voluntary participation:
Participation in this study is voluntary. You are not required to answer the questions and you may pass on any question that makes you feel uncomfortable. At any time, you may notify the researcher that you would like to stop the interview and your participation in the study. There is no penalty for discontinuing participation. If you decide to withdraw from the study, you have the right to request withdrawal of information collected about you. If you wish to have your information removed please let the researcher know.

Confidentiality:
The information collected will be used for research purposes only, and neither your name nor any personally identifiable information will be revealed. All information collected for this study will be kept confidential. Only the investigators of this study, as well as a professional transcriptionist will have access to the data collected. Representatives of The University of Western Ontario Non-Medical Research Ethics Board may require access to your study-related records to monitor the conduct of the research. All electronic files will be saved on password-protected computers. Data will be saved for 7 years before it is properly destroyed.

Contacts for further information:
If you have any questions about the conduct of this study or your rights as a research participant you may contact the Office of Human Research Ethics at the University of Western Ontario [contact information], email: [email]. If you have any questions about this study, please contact Stephanie Truelove [contact information], email: [email], or Dr. Trish Tucker [contact information], email: [email].

Consent:
Verbal consent will be acquired on audio-recording at the time of the interview.

This letter is yours to keep for future reference.
Appendix J

Verbal Script for Consent for Study 2
Exploring the Physical Education-Related Needs and Self-Efficacy of Elementary School Teachers

Investigators:

Stephanie Truelove, Faculty of Health Sciences, University of Western Ontario
Dr. Trish Tucker, Faculty of Health Sciences, University of Western Ontario
Dr. Andrew Johnson, Faculty of Health Sciences, University of Western Ontario
Dr. Shauna Burke, Faculty of Health Sciences, University of Western Ontario

Verbal Script for Consent

Name: __________________
Date of interview: _______________

Do you confirm that you have read the Letter of Information and have had all questions answered to your satisfaction?

___ YES ___ NO

Do you agree to participate in this research?

___ YES ___ NO

**Do you agree to be audio-recorded?

___ YES ___ NO

Do you consent to the use of unidentified quotes obtained during the study in the dissemination of this research?

___ YES ___ NO

**If a participant does not agree to be audio recorded, then they will be read:

Thank you for your interest in participating in a follow-up interview; however, in order to be eligible for the study we need to be able to record the interview to analyze your responses. Thank you for your time.”
Appendix K

Phone Interview Script for Study 2
Exploring the Physical Education-Related Needs and Self-Efficacy of Elementary School Teachers

Semi-Structured Interview Protocol

Interviewer:

Hi ___________, I appreciate you taking the time to speak with me today. My name is Stephanie Truelove, and as mentioned in the Letter of Information, I am a PhD student at The University of Western Ontario. I’m collecting information concerning elementary school teachers’ confidence instructing physical education, as well as potential barriers and facilitators to teaching physical education.

I would like to tape record what you have to say so I don’t miss any of your thoughts. These records will more accurately represent this conversation and help me to authentically interpret your words. Before we start, I want to assure you that as a participant you have some rights. First, your participation in the interview is completely voluntary. You may refuse to answer any question that makes you uncomfortable, or you may withdraw from the interview at any time without consequence. Based upon your answers this interview will likely take between 30 and 40 minutes to complete.

I also want you to know that the interview results will be strictly confidential. The audio recording will be transcribed by a professional transcriptionist, and your name will not appear anywhere in the transcript, nor in any publications that result from this work. Excerpts of the interview may be published or made public, but your name or any other identifying details will not be revealed. The only people who will have access to the complete tape and transcript will be the research team and a transcriptionist.

Before we begin the interview, I need to ask you a few questions to document your consent to participate in the study.

1) Do you confirm that you have read the Letter of Information and have had all questions answered to your satisfaction?
2) Do you agree to participate in this research?
3) *Do you agree to be audio-recorded?
4) Do you consent to the use of unidentified quotes obtained during the study in the dissemination of this research?

**If a participant does not agree to be audio recorded, then they will be read:

Thank you for your interest in participating in a follow-up interview; however, in order to be eligible for the study we need to be able to record the interview to analyze your responses. Thank you for your time.”
Do you have any questions right now about what I’m doing, why I’m doing it, or what I will do with this information? If you have any questions as we go along, or after the interview is over, please feel free to ask them.

Are you ready to start the interview?

**Sample Probing Questions to Elicit Discussion:**

*Note: This is a semi-structured interview guide. Probing questions may or may not be asked depending on participants’ responses to initial questions.*

**Physical Activity Participation:**

1. **Tell me about your own physical activity background.**
   - Tell me about your past participation in physical activity.
   - Tell me about your leisure sport participation.
   - What type of experience do you have coaching?
   - Tell me about your current physical activity levels.

**Current PE Teaching Practices:**

2. **What does a typical PE class look like under your instruction?**
   - How often do you teach PE per week?
   - How do you typically plan your PE class?
   - Are your students moving for the majority of a typical PE class? How are you able to keep them moving at a high intensity?
   - Tell me about your motivation teaching PE.
   - Do you have an overall goal for your PE sessions? “A successful PE class to me would be:
   - Tell me about your experiences teaching novel movement skills (fitness, yoga, pilates, dance, etc.).
   - What do you hope your students take away from their PE experience?

**Barriers:**

3. **Based on your experiences, what are the biggest barriers you face when teaching PE?**
   - Tell me about barriers in regard to your gym space/facilities?
   - What barriers do you face in regard to equipment?
   - Can you tell me about a situation when time was a barrier?
   - How is your PE knowledge a barrier?
   - How does your school culture/environment act as a barrier instructing PE?
   - What type of safety concerns do you have when teaching PE?
   - As a PE specialist – what you do observe as the biggest barrier for generalist teachers instructing their own physical education class?

4. **What is it about these barriers that makes it difficult to instruct PE?**
Facilitators:

5. Think about your experiences teaching PE. Describe what kinds of facilitators you think are beneficial which improve the quality of instruction for your students.
   - What enables you to offer good quality PE instruction?
   - How is your gym/outdoor playground a facilitator?
   - Tell me about your support from other colleagues when planning/instructing PE.
   - How could a PE specialist be beneficial to improve your PE instruction? *Asked to only generalist teachers*
   - How could your principal provide these facilitators/resources/supports?
   - How could your school board provide these facilitators/resources/supports?

6. There are many resources provided to teachers to support physical education knowledge and instruction. Which ones have you heard of?
   - How are you able to incorporate these into your lessons?
   - What resources/supports do you think you would most likely utilize/incorporate in your PE preparation/classes if they were provided to you?

Self-Efficacy

7. On a scale from 1-10, with 1 being not confident, and 10 being extremely confident, how confident are you instructing physical education?
   - Tell me about your confidence teaching physical education.
   - What influences your confidence?
   - Does your confidence change based on the content/unit being taught?
   - What about the grade/age of the students?

Is there anything else that you would like to add to the interview about your experience as an elementary school teacher instructing PE class that I did not ask about or that you think would be important to mention?

Interviewer:
Thank you for taking the time to share your insights with me. As compensation for your time, you will be emailed a $25 Chapters gift card.
Appendix L

Data Extraction Table for Study 3
<table>
<thead>
<tr>
<th>Institution</th>
<th>PE Courses (hrs)</th>
<th>P/J</th>
<th>J/I</th>
<th>J/I PE Specialist</th>
<th>I/S PE Specialist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brock University</td>
<td>EDBE 8P46 (36)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EDBE 8P56 (36)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EDBE 8P56 (36)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EDBE 8F84埃 (102)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lakehead University</td>
<td>EDUC 4071 (36)</td>
<td></td>
<td></td>
<td></td>
<td>EDUC 4207</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>EDUC 4278 (108)</td>
</tr>
<tr>
<td>Laurentian University</td>
<td>EDUC 4157FL (36)</td>
<td></td>
<td></td>
<td></td>
<td>EDUC 4556FL</td>
</tr>
<tr>
<td></td>
<td>EDUC 4267FL (36)</td>
<td></td>
<td></td>
<td></td>
<td>(72)</td>
</tr>
<tr>
<td>Niagara University</td>
<td>EDU 432 (36)</td>
<td></td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Nipissing University</td>
<td>EDUC 4737 (36)</td>
<td></td>
<td></td>
<td>EDUC 4817 (36)</td>
<td>EDUC 4758</td>
</tr>
<tr>
<td></td>
<td>EDUC 4817 (36)</td>
<td></td>
<td></td>
<td>EDUC 4758 (72)</td>
<td>EDUC 4759</td>
</tr>
<tr>
<td></td>
<td>EDUC 4817 (72)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Queen's University</td>
<td>CURR 395 (36)</td>
<td></td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Redeemer University</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Trent University</td>
<td>EDUC 4574H (36)</td>
<td></td>
<td></td>
<td></td>
<td>EDUC 4676Y (72)</td>
</tr>
<tr>
<td>Tyndale University</td>
<td>EDUP 506 (36)</td>
<td></td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>University of Ontario Institute of Technology</td>
<td>EDUC 1314U (36)</td>
<td>N/A</td>
<td>N/A</td>
<td>CURS 453U CURS 4504U (72)</td>
<td></td>
</tr>
<tr>
<td>University of Ottawa</td>
<td>PED 3120</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PED 3113 (30)*</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>University of Windsor</td>
<td>EDUC 5313 (36)</td>
<td>EDUC 5323 (18)</td>
<td>EDUC 5369 (54)</td>
<td>EDUC 5333 EDUC 5369 (54)</td>
<td></td>
</tr>
<tr>
<td>Western University</td>
<td>EDUC 5172 (18)</td>
<td>EDUC 5172 (18)</td>
<td>N/A</td>
<td>EDUC 5220 (72)</td>
<td></td>
</tr>
<tr>
<td>Wilfrid Laurier University</td>
<td>EU 423P (18)</td>
<td>EU 423I (18)</td>
<td>EU 423 EU 463 (36)</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>York University</td>
<td>EDPJ 3100 (18)</td>
<td>EDJI 3100 (18)</td>
<td>N/A</td>
<td>ED 4000 ED 4001 (72)</td>
<td></td>
</tr>
</tbody>
</table>
Curriculum Vitae

Personal Information

Name: Stephanie Truelove  Phone: [Redacted]
Address: 270 Sarnia Road, London, ON  Email: struelo2@uwo.ca

Education, Awards, & Honours

EDUCATION

Doctorate of Philosophy – Health and Rehabilitation Sciences  2016 - 2020
Field: Health Promotion
University of Western Ontario, London, ON

*Training, Barriers, and Self-Efficacy to Physical Education Instruction for Generalist and Specialist Teachers (Dissertation Title)*

*A Meta-analysis of Children’s Activity During Physical Education Lessons Taught by Generalist and Specialist Teachers (Comprehensive Examination Title)*

Master of Science – Health and Rehabilitation Sciences  2014 - 2016
Field: Health Promotion
University of Western Ontario, London, ON

*Change in Preschoolers’ Health-Related Quality of Life Following the Implementation of a Childcare Physical Activity Intervention (Thesis Title)*

Honours Bachelor of Science  2010 - 2014
Field: Life Sciences
McMaster University, Hamilton, ON

AWARDS & HONOURS

2019-2020
1. Ontario Graduate Scholarship. Value: $15,000
2. Mitacs Accelerate Program. Value: $15,000
3. CIHR Travel Award. Institute Community Support. Value: $1,000

2018-2019
1. Faculty of Health Sciences Graduate Student Fall Travel Award. Value: $500
2. Faculty of Health Sciences Graduate Student Summer Travel Award. Value: $250
3. Health and Rehabilitation Sciences Graduate Student Summer Travel Award. Value: $500
4. Ontario Graduate Scholarship. Value: $15,000

2017-2018
1. Mitacs Accelerate Program. Value: $15,000

2016-2017
1. Ontario Graduate Scholarship. Value: $15,000
2015-2016
1. Government of Ontario - Seniors Community Grant Program Recipient. Value: $3,000
2. Faculty of Health Sciences Graduate Student Summer Travel Award. Value: $250
3. Health and Rehabilitation Sciences Graduate Student Summer Travel Award. Value: $500

2014-2015
1. CIS Academic All-Canadian (track)
2. Dean’s Honours List – Western University

2013-2014
1. CIS Academic All-Canadian (basketball)
2. Athletic Scholarship. Value: $1,500
3. Dean’s Honours List – McMaster University

2012-2013
1. CIS Academic All-Canadian (basketball)
2. Athletic Scholarship. Value: $2,000
2. Dean’s Honours List – McMaster University

2010-2011
1. McMaster University Entrance Scholarship. Value: $3,000
2. Athletic Scholarship. Value: $2,500

Related Work Experience

**RESEARCH EXPERIENCE**

**Research Assistant** September 2014 – April 2020
Child Health and Physical Activity Lab, University of Western Ontario, London, ON
Assisted with the preparation of ethics submissions; collected data using Actical accelerometers; assisted with data entry, cleaning, and analysis; assisted with manuscript writing; aided with the dissemination of results

**Undergraduate Research Assistant** May 2014 – September 2014
Chemical Engineering Laboratory, McMaster University, Hamilton, ON
Conducted daily experiments on the viability of hydrogels made from different polymers. Inputted and graphed all data in the lab, which was carried out by numerous PhD students over the course of the summer.

**Laboratory Assistant** May 2013 – June 2013
Histology and Neuroanatomy Laboratory, McMaster University, Hamilton, ON
Learned advanced skills in the neuroanatomy laboratory such as: preparing and staining slides, cutting specimens, microscopes, and neuroanatomy.

**TEACHING EXPERIENCE**

**Teaching Assistant** January 2018 – April 2018
HS 4750 - Ageing and Community Health  
School of Health Studies, University of Western Ontario, London, ON  

**Teaching Assistant**  
September 2018 – December 2018  

HS 4740 - Chronic Disease Prevention & Management  
School of Health Studies, University of Western Ontario, London, ON  

**Teaching Assistant**  
January 2016 – April 2016  

OT 9562 - Mental Health in Context  
School of Occupational Therapy, University of Western Ontario, London, ON  

**Teaching Assistant**  
January 2015 – April 2015  

- **Publications & Presentations**

**PUBLICATIONS**

Published Refereed Papers (n = 9)

doi:10.1186/s12966-02-0912-4


*Ranked 2nd top article for 2018-2019 published in IJBNPA within Early Childhood Education


Accepted Refereed Papers (n = 2)


Submitted Refereed Papers (n = 2)


PRESENTATIONS

Conferences (n = 16)


*Won the award for the best student poster presentation.


*Won the award for the best oral presentation by a Master’s student.

Keynote Speaker (n = 1)


Guest Lectures (n = 11)


The Importance of Measure Physical Activity. (May 2019). Discovery Days. University of Western Ontario, London, ON.


SciNapse Science Case Competition @ University of Western Ontario. (March 2016). An invited panelist and judge. University of Western Ontario, London, ON.

Services & Administration

EVALUATION OF ARTICLES FOR SCIENTIFIC JOURNALS

Manuscript Reviewer

Health Education and Behaviour (2020)
Journal of Physical Activity and Health (2019, 2020)
Research Quarterly for Exercise and Sport (2019)
BMC Public Health (2018, 2019)
European Physical Education Review (2018)

PROFESSIONAL AFFILIATIONS

Student Member–International Society of Physical Activity and Health 2018-Present
Student Member – Physical Health and Education Canada 2018-Present
Student Member–Child and Youth Network of London 2016-Present
Student Member–NASPEM 2015-Present
Student Member–Obesity Canada – Students and New Professionals 2014-Present
General Member–Special Olympics Ontario 2011-Present
General Member–Children’s Miracle Network 2010-Present
PROFESSIONAL DEVELOPMENT & CERTIFICATIONS

2020

*Children’s Fitness Coach*, Canfit Pro. (Online Certification)


*Introduction to R Workshop*. Western Data Science Solutions and the Department of Statistics and Actuarial Sciences. University of Western Ontario.

McGill Personal Finance Essentials. McGill University Desautels Faculty of Management. (Online Certificate)

2019

Standard First Aid and CPR Level C. Canadian Red Cross.

2018

*Using NVivo as a Research Tool*. (Webinar). Hosted by the University of Western Ontario.


*Living Systematic Reviews*. (Webinar). Hosted by the University of Saskatchewan.

*Doctoral Leadership Forum*. Hosted by the University of Western Ontario.

2017

*Canadian 24-Hour Movement Guidelines for the Early Years*. (Webinar). Hosted by Healthy Active Living and Obesity Research Group.

*What’s the Problem with Screen Time?* (Community Forum). Hosted by London Healthy Kids Community Challenge.

*Introduction to Knowledge Translation*. (eLearning Module). Hosted by SickKids Hospital.

*How to Prepare a Knowledge Translation Plan*. (eLearning Module). Hosted by SickKids Hospital.

*Motivational Interviewing Training*. (Workshop). Hosted by the University of Western Ontario.

Workplace Hazardous Material Information System. (Online Training).

2015


*Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans*. (Online Training)