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THE EFFECT OF PARTICIPATION IN PROFESSIONAL DEVELOPMENT ON PERCEIVED CHANGE IN TEACHING PRACTICE BY MINNESOTA K-12 PHYSICAL EDUCATION TEACHERS

by

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A Dissertation

Submitted to the Graduate Faculty

of the

University of North Dakota

In partial fulfillment of the requirements

for the degree of

Doctor of Philosophy

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December
2013

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This dissertation, submitted by Sally Krause Sertich in partial fulfillment of the requirements for the Degree of Doctor of Philosophy from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done and is hereby approved.

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Department	Educational Leadership
Degree	Doctor of Philosophy

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Sally Krause Sertich
December 2013

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ACKNOWLEDGEMENTS

I wish to express my appreciation to the members of my advisory committee for their guidance and support during my time in the doctoral program at the University of North Dakota.

ABSTRACT

This study used a conceptual framework of professional development theory to identify characteristics of effective learning activities specific to 259 Minnesota K-12 public school physical education and developmental adapted physical education (PE/DAPE) teachers during 2012-2013. Study results confirmed that as PE/DAPE teacher participation in professional development increased, so too did perceived subsequent change in teaching practice. Both reform and traditional structures of professional development were found effective in teacher learning. Teachers who taught solo were less likely to participate in professional development than those who worked alongside PE/DAPE colleagues in the same school. Moreover, teachers who taught solo were less likely to perceive change in teaching practice following participation in professional development. Study results may provide direction to Minnesota school leaders and university faculty in future planning and development of learning opportunities specific to PE/DAPE teachers with particular consideration for implementing national physical education standards into existing K-12 programs.

Search words: Physical Education, Professional Development, Teacher Education.

CHAPTER I

INTRODUCTION

The Minnesota Legislature passed a Healthy Kids Bill (2010) requiring all public school districts to include national standards in the K-12 physical education content area by 2012-2013. To create teacher commitment to standards reform, it was imperative to design effective professional development activities that provided materials for standards inclusion, time for teachers to learn and interpret national standards, and support for collaboration with other teachers (Chen, 2006; Darling-Hammond, 1993; Darling-Hammond & McLaughlin, 1995; Dutro, Fisk, Koch, Roop, & Wixson, 2002; Spillane & Thompson, 1997). Participation in effective professional development, followed by thoughtful self-reflection and group discussion about changes in teaching practice, were essential learning activities for teachers of all subject contents (Armour & Yelling, 2007; Chen, 2006; Darling-Hammond & Richardson, 2009; Desimone, 2009; Dooner, Mandzuk, & Clifton, 2008; Fullan, 2007; Parise & Spillane, 2010; Parker, Patton, Madden, & Sinclair, 2010; Richter, Kunter, Lusmann, Lüdtke, & Baumert, 2011).

Unfortunately, the nature of teaching creates an environment that isolates teachers from each other. Therefore, providing quality professional development activities could be challenging if efforts failed to recognize the limitations of school schedules and structures (Borko, 2004; Datnow & Schmidt, 2005; Deglau, Ward,

O'Sullivan, & Bush, 2006; Fullan, 2007; Pitts & Spillane, 2009; Snow-Gerono, 2005; Spillane & Thompson, 1997, Templin, 1988). Moreover, resources available to school districts that allotted time for teachers to learn as well as opportunities to network with colleagues affected the quality and sustainability of professional learning (Fullan, 2007; Spillane & Thompson, 1997). To implement legislated mandates into existing Minnesota physical education programs, it is reasonable to expect that PE/DAPE teachers participate in effective professional development designed to consider challenges specific to PE teachers (Healthy Kids Bill, 2010).

Ko, Wallhead, and Ward (2006) concluded that professional development specific to physical educators lacked coherence, progression, and relevance because policy did not align with teaching practice and school resources were earmarked for teachers of core academic subjects. There were additional challenges to providing professional development specific to physical education teachers.

First, the daily work of physical education (PE) and developmental adapted physical education (DAPE) teachers is performed in isolation (Templin, 1988; Deglau et al., 2006). For example, isolation occurs when there is only one PE teacher employed within a school building. This teaching environment limits daily conversations regarding issues specific to physical education curriculum and programming because there is no other PE teacher with whom to talk.

Another example of isolation at a secondary school level is when the composition of a physical education department reflects gender imbalance among its teachers (e.g., one female and two male teachers). Each teacher is responsible for instructing equal daily class periods with approximately the same number of students

per class, and nonteaching duties between classes include supervision of locker rooms and hallways. However, in this scenario, gender specific locker rooms that house teacher offices create barriers to professional conversations between the female and male teachers.

A second challenge in providing professional development is that school schedules offer limited time for professional dialogue and collegiality between physical educators (Templin, 1988; Deglau et al., 2006). Physical education teacher preparation periods may be scheduled at times opposite their same-subject teachers. The workload of physical education teachers who also serve as coaches, limits participation in professional development activities scheduled after the school day because of the additional contractual commitment to sport practices or competitions (O'Sullivan & Delgau, 2006).

A third challenge in providing professional development specific to PE/DAPE teachers is the exclusion of physical education as a core subject within the federal No Child Left Behind Act of 2001 (2002). School resources dedicated to training 'highly qualified' teachers in core subjects of English, reading, language arts, mathematics, science, foreign languages, civics and government, economics, arts, history and geography were a priority outlined in NCLB Act of 2001 (2002, U.S. Department of Education, 2009). The lack of resources for nonacademic subjects such as physical education marginalizes both the content and teachers who deliver it.

Finally, state education policies have created challenges to the structure and design of PE professional development activities. For example, teaching license renewal in Minnesota requires teachers to accumulate 125 clock hours of training over

a five year period. Furthermore, this training must incorporate further preparation in the areas of positive behavioral intervention strategies; accommodation, modification, and adaptation of curriculum, materials and instruction; mental health; and reading (Minnesota Stat. 122A.09, 2013).

While the Healthy Kids Bill (2010) required Minnesota K-12 PE/DAPE teachers to adopt national physical education standards into existing programs, no funding was appropriated for an implementation process. This unfunded mandate left to chance the success of actual implementation: PE national standards were important to implement, but resources that help PE/DAPE teachers commit to this standards reform effort were dependent on the financial health of independent school districts.

Statement of Problem

Spillane, Healy, and Mesler-Parise (2009) found that effective professional development helped all teachers "acquire new knowledge and skills that enable them to practice in new, hopefully improved, ways that in turn contribute to improvements in student learning" (p. 407). Researchers also concluded that effective professional development which supported individual teachers and their departments was critical to curriculum change and standards reform (Darling-Hammond, 1993; Darling-Hammond & McLaughlin, 1995; Datnow & Schmidt, 2005; Fullan, 2007; Pitts & Spillane, 2009).

Passage of the Healthy Kids Bill (2010) mandated the inclusion of national physical education standards into Minnesota public school PE programs. The problem is that given the challenges in providing professional development specific to physical educators, it was unknown whether PE/DAPE teachers participated in effective PE professional development. Further, if PE/DAPE teachers participated in professional

learning activities, then it was unknown if a perceived change in teaching practice followed such participation.

According to NCLB Act of 2001 (2002) criteria, teachers of core academic subjects received funding priority for professional development. Since physical education was not recognized as a core academic subject in Minnesota, professional development activities may or may not have included content appropriate for physical education teachers (Minnesota Department of Education, 2006).

Conceptual Framework

Figure 1 illustrates a conceptual framework of professional development theory supported by researcher consensus around characteristics of effective professional development (Desimone, 2009; Hochberg & Desimone, 2010). According to Desimone (2009) effective professional development promotes reform over traditionally structured environments held over a sustained duration of learning among a collective participation of teacher groups. Within this environment, new teaching knowledge is delivered via active learning opportunities among teachers of a specific content or teaching method focus which, ultimately, creates coherence in learning (Birman, Desimone, Porter, & Garet, 2000; Desimone, 2009; Blank, de las Alas, & Smith, 2008; Choy, Chen, & Bugarin, 2006; Porter, Garet, Desimone, Yoon, & Birman, 2000).

Hochberg & Desimone (2010) added another characteristic of effective professional development called "responsiveness to contextual factors and facilitators." The purpose was to address the accountability policy by aligning instruction with state

standards and student assessments to create coherency between all school-level reform initiatives.

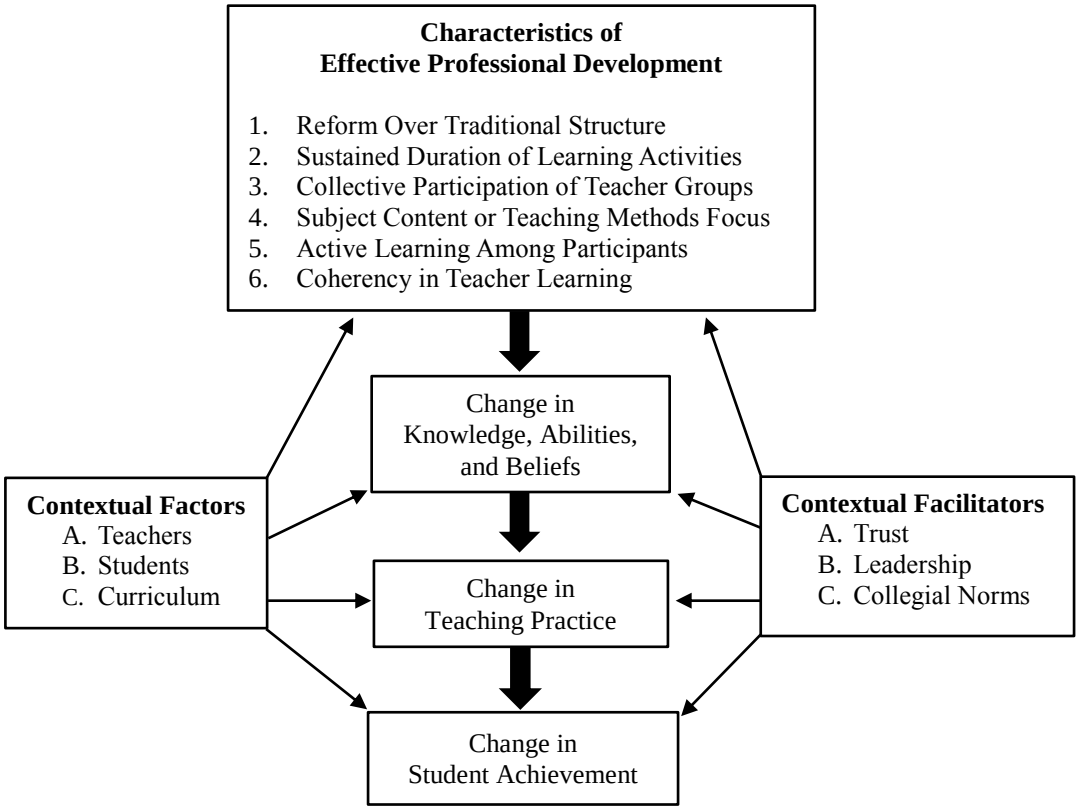


Figure 1. Conceptual framework for studying professional development of teachers with consideration for contextual factors and facilitators (Desimone, 2009; Hochberg & Desimone, 2010).

According to Hochberg and Desimone (2010), contextual factors and facilitators influenced how professional learning opportunities progressed from theory to practice. Teachers, students, and curriculum were considered contextual factors while trust, leadership, and collegial norms were considered facilitators (Hochberg & Desimone, 2010). With consideration for both contextual factors and facilitators, the conceptual framework helped researchers interpret which characteristics of effective professional development to measure and how to measure them in order to identify relationships

between changes in teacher knowledge, teaching practice, and student achievement (Desimone, 2009; Hochberg & Desimone, 2010).

A recent physical education study supported concepts in the framework set forth by Desimone (2009) and Hochberg and Desimone (2010). Parker et al. (2010) found that effective professional development activities for physical education teachers utilized a community of practice, hands-on active learning, and collaboration among PE teachers. It was concluded that collaborative activities allowed PE teachers to share ownership of projects they developed (i.e., curriculum) and created ideas for future professional development (Parker, et al., 2010).

Two physical education studies predated the professional development theory (Desimone, 2009; Hochberg & Desimone, 2010), yet supported concepts in the current framework. Armour and Yelling (2007) found that physical education teachers placed a high value on collaborative learning with and from other teachers using informal networking and communities of practice as well as formal conferences and workshops. Since physical and organizational school structures prevent teacher collaboration (Armour & Yelling, 2004), it was important to incorporate time and funding for teachers to learn collaboratively and to create a culture of professional learning (Brandt, 2003).

Armour and Yelling (2004) also found that the professional isolation experienced by PE teachers could be alleviated by working in collaboration with other physical education professionals using school-based learning opportunities. Specifically, they recommended PE teacher learning be structured to include PE content and support conversations between PE teachers about classes and students.

Conceptual Framework for Study

The Minnesota PE/DAPE Professional Development (MN PE/DAPE PD) study was developed using an adapted version of Desimone (2009) and Hochberg and Desimone's (2010) conceptual framework of professional development. The adapted framework helped identify existing relationships between PE/DAPE teacher participation in effective PE professional development and perceived subsequent change in teaching.

School contextual factors in the MN PE/DAPE PD study included school level (i.e., elementary, junior high, senior high and secondary) and Minnesota region location of the school district. Teacher contextual factors included teachers who taught solo or with other PE/DAPE colleagues and years of PE/DAPE teaching experience. All contextual factors were measured independently against PE/DAPE teacher participation in professional development activities and subsequent perceived change in teaching practice.

Professional development was deemed effective when structured using reform over traditional activities (Desimone, 2009; Garet, Porter, Desimone, Birman, & Yoon 2001; Guskey, 2003; Parise & Spillane, 2010; Richter et al., 2011). However, in this study, both reform and traditional structures of professional development were considered effective and worthy of study.

Specifically, reform structured professional development was defined as teacher-driven, participatory, and collegial activities embedded during the school day and throughout the school year (Desimone, 2009; Parise & Spillane, 2010; Richter et al., 2011). Teacher networks, committees, curriculum review, reading professional

journals, interactions and conversations with teachers, peer observation and feedback, and advice seeking about instruction were examples of reform learning activities (Desimone, 2009; Parise & Spillane, 2010; Richter et al., 2011). This study measured PE/DAPE teacher participation in each of these reform activities.

Traditional structured professional development was defined as system-driven, administrator advised activities led by experts outside the school system using clock hours to measure the duration of participation (Desimone, 2009; Feiman-Nemser, 2001; Lieberman, 1995; Little, 1993; Parise & Spillane, 2010; Richter et al., 2011). Examples of traditional learning activities were workshops, conferences, coursework, and in-district staff development training (Desimone, 2009; Parise & Spillane, 2010; Richter et al., 2011). This study also measured PE/DAPE teacher participation in each of these traditional activities.

Experiences in organizing and directing conferences gave this researcher an inside perspective regarding reform and traditional structures of PE/DAPE professional development. The nature of becoming physically educated assumes that students (in this case, teachers) learn new PE content while being active. Minnesota PE/DAPE conferences are structured to incorporate active learning, networking, and discussion opportunities with colleagues (reform activities). This active, participatory sharing of information challenges the notion that traditional structured PE/DAPE conferences are led by experts who deliver new knowledge via lecturing to a passive audience.

Nieto (2009) recommended teachers be given choices in topic selection and opportunities to collaborate with colleagues. Minnesota PE/DAPE conferences provide opportunities for teachers to choose selectively from a variety of content focused

breakout sessions based on individual learner needs (reform structure). Such sessions are led by practicing PE/DAPE teachers, as well as experts from other education related fields (traditional structure).

Requiring PE teachers to participate in training designed to improve teaching strategies in mathematics is an example of what Varela (2012) considered a one-size-fits-all mentality of professional development. School districts, especially those with small numbers of PE/DAPE teachers, ought to support professional development opportunities that provide for collaboration among a network of PE/DAPE teachers while learning PE content and teaching methods. To generate a greater collective participation of PE/DAPE teachers, Minnesota PE/DAPE conferences typically are offered outside the school district.

Teachers need learning opportunities that relate directly to what they do in the classroom. Professional development isolated from daily class practices might satisfy contractual obligations, but would do little to improve teacher or student learning (Varela, 2012). Professional development, both in-and out-of-district, designed to accommodate PE teaching environments and daily work schedules could alleviate professional isolation. Furthermore, new PE knowledge and teaching skills could be incorporated directly back into PE/DAPE classes.

Finally, professional development must be on-going to be considered effective (Varela, 2012). According to Desimone (2009) "Research has not indicated an exact "tipping point" for duration, but shows support for activities that are spread over a semester (or intense summer institutes with follow-up during the semester) and include 20 hours or more of contact time" (p. 184). This study measured participation in

traditional professional development using contact hours and reform professional development using frequency amounts.

For this study reform and traditional structured activities are considered effective characteristics of PE professional development. Figure 2 illustrates an adapted conceptual framework of professional development theory incorporating characteristics of effective PE professional development specific to PE/DAPE teachers.

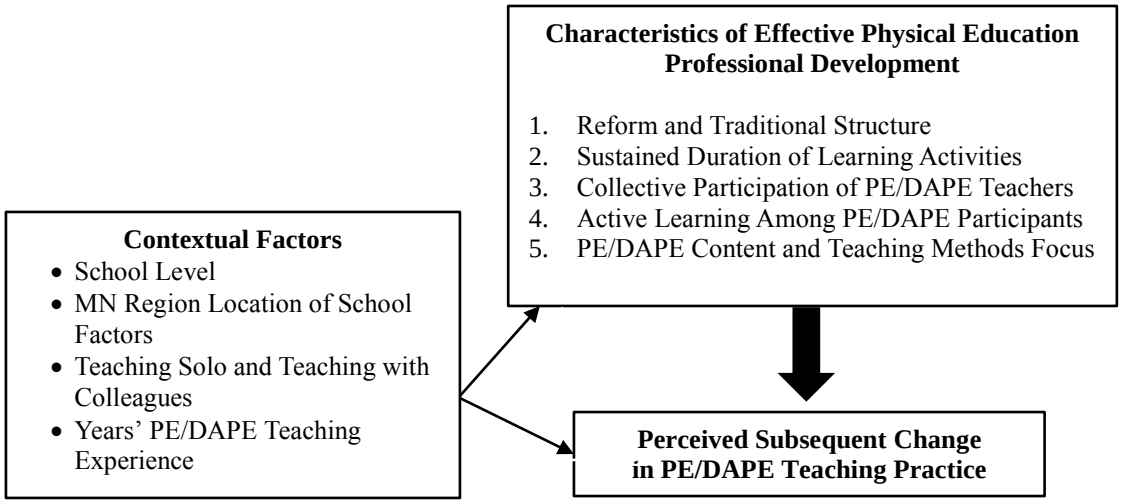


Figure 2. Conceptual framework for Minnesota PE/DAPE teacher professional development study with consideration for contextual school and teacher factors adapted from Desimone (2009) and Hochberg and Desimone (2010).

Two professional associations in Minnesota host PE/DAPE conferences in which PE/DAPE teachers can participate annually. The Minnesota Association of Health, Physical Education, Recreation and Dance (MnAHPERD) and Minnesota DAPE Leadership Conferences create professional development activities uniquely for PE/DAPE teachers across the state. Conferences target a collective participation of PE/DAPE teachers, incorporate active learning to deliver information and focus specifically on PE/DAPE content and teaching methods. Attendance at association

sponsored conferences and completion of additional learning activities allows PE/DAPE teachers to earn university credit. Furthermore, PE/DAPE teachers evaluate conference strengths and weaknesses and suggest topics of interest to guide future program structure and design.

Professional development was considered effective when it was offered over a sustained duration (Desimone, 2009; Opfer & Pedder, 2011). The Minnesota PE/DAPE Professional Development Survey included questions about the amount of time spent in the following reform structured activities offered in- and out-of-school districts: conversations with teachers about student learning, teaching strategies, standards implementation and PE curriculum; collaboration with others; peer observations; feedback given and received post-observations; and, advice giving and seeking about PE/DAPE instruction. The survey contained questions specific to the amount of time spent in the following traditional structured activities offered in- and out-of-school districts: PE/DAPE training (e.g., meetings, in-services, workshops, or conferences) and attendance in special courses and university coursework.

Contextual facilitators presented in the conceptual framework by Hochberg and Desimone (2010) were neither identified nor measured in this study. This study did not measure participation in the characteristic labeled 'coherency in teacher learning'. Finally, it was not the intent of this researcher to determine relationships between participation in effective PE professional development and change in teacher knowledge, abilities, and beliefs, and change in student achievement.

This study provided a focused perspective for the structure and design of effective PE professional development by adapting the conceptual framework for

studying professional development of teachers (Desimone, 2009; Hochberg & Desimone, 2010). A further examination of schools as learning organizations, identified structure, culture, politics, and individual teacher learning subsystems as influences and challenges to designing effective professional development (Hoy & Miskel, 2008).

Schools as Learning Organizations

Hoy and Miskel (2008) defined schools as open, social organizational systems "characterized by an interdependence of parts, a clearly defined population, differentiation from its environment, a complex network of social relationships, and its own unique culture" (p. 22). Teacher behavior is influenced by interactions within a set of structural, cultural, political, and individual subsystems that, when combined, transformed the teaching and learning process in schools (Hoy & Miskel, 2008). Viewing professional development from individual subsystems provided unique perspectives on individual and coordinated teacher learning within and between schools.

Structural Subsystem

The structural subsystem is driven by a bureaucratic, formal set of expectations that defined teachers' roles. The way in which teachers interpret their teaching roles is guided by individual experiences and informal perspectives about specific subject matter content, beliefs and goals specific to the school and profession, and a motivation to continue learning effective strategies to instruct students (Hoy & Miskel, 2008). PE/DAPE teachers carry heavy workloads, especially when functioning as teacher and provider of after school, extra-curricular sports and activities. To be considered a

learning organization, school leaders need to establish structures, processes, and practices that promote continuous blocks of time for teachers to think and collectively share ideas that improve student learning (Silins, Mulford, & Zarins, 2002).

Cultural Subsystem

The cultural subsystem is determined by the working relationship between the bureaucratic, formal expectations, and the collective informal needs of individual teachers (Hoy & Miskel, 2008). School culture embodies shared values, beliefs, norms, and ways of thinking that serve to influence behavior within the school, to "hold the unit together, and give it a distinct identity" (Hoy & Miskel, 2008, p. 177). Shared values and beliefs help teachers understand how to be successful, to interpret standards, and to make teaching decisions that align with standards.

Norms are informal expectations that guide teachers in how they communicate and act, and when combined with values, beliefs, and ways of thinking, norms create a "system of interpersonal relations that form spontaneously within all formal organizations" (Hoy & Miskel, 2008, p. 97). Schechter (2012) suggested that researchers study the collective learning among teachers to understand techniques used by school leaders that encourage and support practical applications of collective learning. Doing so could provide an intentional framework that either challenges or supports the existing structure of professional development in schools.

Political Subsystem

The political subsystem permeates all other subsystems in describing how behavior within a school is influenced both formally and informally. "Structure provides formal authority; culture generates informal authority; and the individual

brings the authority of expertise to the organization" (Hoy & Miskel, 2008, p. 28). Politically, individual teachers act to gain power for personal needs. Groups of teachers (i.e., unions) influence bargaining rights and salaries with the school board members. Politics, whether good, bad, informal, or formal, play a large role in shaping the behaviors and relationships of those who work in schools (Hoy & Miskel, 2008). Schechter (2012) cautioned that arranging teacher learning in social settings where teachers share and create knowledge could encourage competition and political power among teachers which may further inhibit social interactions between teachers.

Teacher Subsystem

Improving school organizational learning is contingent upon individual teacher learning that takes place when individual and groups of teachers collaborate in order to solve practical problems (Boske, 2008; Hoy & Miskel, 2008; Marks & Louis, 1999). School improvement efforts focused on a balance of teachers collectively learning from problems and successes help to close gaps between policy and practice (Schechter, 2012).

Pedder and Opfer (2010) analyzed data gathered from a Schools and Continuing Professional Development in England – State of the Nation research study (SoNS) and identified four thematic issues related to planning and organization of continuing professional development in England. First, there was a lack of strategic planning that balanced the needs of individual teacher learning; school, as an organization learning; and national policy priorities.

Second, Pedder and Opfer (2010) found that rarely were organizers of professional development the actual leaders of professional development activities.

Therefore, how schools, as organizations, determined the development and delivery of professional development may or may not have supported effective professional development.

Third, schools, as organizations, provide opportunities for teachers to become aware of professional standards, understand how their professional learning goals related to school improvement, and help teachers achieve their personal learning goals. This results in higher levels of teacher satisfaction with management practices and values (Pedder & Opfer, 2010).

Finally, evaluations of continuing professional development activities lacked "reference to planned outcomes, specific criteria, or value-for-money judgements" (Pedder & Opfer, 2010, p. 447). Pedder and Opfer (2010) found this was true at the school, teacher, and student levels.

Schools are complex learning organizations that require help and guidance in building systems that support ongoing professional development of teachers (Hoy & Miskel, 2008; Opfer & Pedder, 2011). Desimone (2009) and Hochberg and Desimone (2010) provided a conceptual framework for professional development theory using researcher consensus of effective characteristics of learning opportunities for teachers. Opfer and Pedder (2011) and Hoy and Miskel (2008) identified the individual teacher and school organization systems as important, additional influences on teacher learning.

Recognizing that professional development viewed from multiple perspectives provided a larger conceptual framing, the intent of this researcher was to focus specifically on PE/DAPE teacher participation in effective PE learning activities. For this reason, an adaptation of the conceptual framework of Desimone (2009) and

Hochberg and Desimone (2010) which focused on characteristics of effective professional development was chosen.

Purpose of Study

The purpose for this study was to determine whether PE/DAPE teachers participated in effective PE professional development and, if so, to identify whether they perceived a subsequent change in teaching practice. In addition, this researcher sought to determine whether relationships existed between school and teacher contextual factors and participation in professional development as well as subsequent perceived change in teaching practice.

Significance of Study

Chen (2006) found that physical education teachers who knew about and understood national physical education standards were more likely to view them as practical guidelines when translating standards concepts into daily teaching practices and designing learning experiences for students. Understanding Minnesota PE/DAPE teacher participation in effective PE professional development and perceived subsequent change in teaching practice could influence the design of and support for future learning opportunities.

Even more relevant, data about Minnesota PE/DAPE teacher professional development could guide the inclusion of national PE standards into existing programs to satisfy the Healthy Kids Bill (2010) mandate. Research findings may support collaborative efforts in designing professional development tailored to local, regional, and state PE/DAPE teacher and program needs. Parties affected by research findings include PE/DAPE teachers, school leaders, PE/DAPE association members, staff

members of the Minnesota Department of Education and Minnesota Service Cooperatives, and university faculty in physical education teacher preparation programs.

Hypotheses

Three hypotheses frame this study:

H_O^1: There is no relationship between region location of the school district, school level, teaching solo, teaching with PE/DAPE colleagues, and years' PE/DAPE teaching experience and participation for each PE professional development activity.

H_O^2: There is no relationship between region location of the school district, school level, teaching solo, teaching with PE/DAPE colleagues, and years' PE/DAPE teaching experience and perceived subsequent change in teaching practice for each PE professional development activity.

Ho^3: There is no relationship between participation for each PE professional development activity and perceived subsequent change in teaching practice.

Definition of Terms and Acronyms

The following definitions of terms and acronyms support a common understanding of information relevant to this study.

Content standards. "Detailed statements of the high-quality, academic material students should learn" (Stevenson & Swanson, 2002, p. 4).

Developmental Adapted Physical Education (DAPE). Specifically designed physical education instruction and services for a student age three to 21 with identifiable disabilities and documented educational needs required for special education eligibility (Minnesota Rule 3525.1352).

Developmental Adapted Physical Education (DAPE) teacher. A Minnesota licensed physical education teacher has additional training and licensure in designing special instruction for students with identifiable disabilities. Instructional areas include physical and motor fitness; fundamental motor skills and patterns; aquatics, dance, individual and group games, and sports. The DAPE teacher must collaborate and consult with families, teachers, and service providers in the design and implementation of an individual education plan for students (Minnesota Rule 3525.1352, Minnesota Rule 8710.5300).

Highly qualified teacher. A 'highly qualified' teacher meets three characteristics: holds a bachelor's degree, is fully certified in a chosen field, and demonstrates content knowledge in each core academic subject taught (NCLB Act, 2002; U.S. Dept. of Education, 2009).

Minnesota service cooperatives. A "Joint Powers" organization comprised of nine regionally located, educational service cooperatives throughout Minnesota. Elected members from participating public school district boards as well as city, county or other governmental agency boards comprise each Service Cooperative board of directors. Providing cooperative educational programs and services using efficient resources is the purpose for exercising joint power between service cooperatives and member schools (Minnesota Statue 471.59, 2013). Service Cooperative staff structure and design training tailored to the unique needs of region teachers. Service Cooperatives also serve as a liaison for the Minnesota Department of Education and regional school districts (Minnesota Service Cooperatives, 2013).

Physical education. Physical education programs and classes introduce kindergarten through grade 12 students to a variety of movement forms in a positive environment with the goal of providing content knowledge, skills, and confidence so they can enjoy a lifetime of healthy physical activity as adults (Graham, 2008; National Association for Sport and Physical Education, 2004).

Physical education teacher. A Minnesota licensed physical education teacher provides kindergarten through grade 12 student instruction designed to enhance physical growth and development in the areas of physical and motor fitness; fundamental motor skills and patterns; and skills in aquatics, dance, individual and group games, and sports (Minnesota Rule 8710.4700).

Professional development. Organizational learning activities that help teachers acquire new knowledge and skills that allow them to improve their teaching, and ultimately, improve student learning (Guskey, 2003; Desimone, 2009; Spillane et al., 2009).

Standards-based education reform. "Standards-based (education) reform…is founded on a concrete model of educational practice that specifies new high-standards curricula and instructional techniques for the classroom" (Stevenson & Swanson, 2002, p. 2).

Teacher Career Stage Model. Developed by Huberman (1989) and adapted by Richter et al. (2011) this model framed a lifespan perspective on teacher professional development. Early career teachers (Richter et al., 2011) with one to six years of experience aligned with the Survival and Discovery (1-3 years) and Stabilization (4-6 years) phases (Huberman, 1989). Mid-career teachers (Richter et al., 2011) with seven

to 30 years of experience aligned with the Experimentation/Activism and Stock Taking (7-18 years) phase and the Serenity and Conservatism (19-30 years) phases (Huberman, 1989). End of career teachers (Richter et al., 2011) with 30 plus years of experience aligned with the Disengagement (30 plus years) phase (Huberman, 1989).

Delimitations

This study was delimited to Minnesota K-12 public school PE/DAPE teachers within Type 01 and 03 school districts (Appendix A) from nine regional Minnesota Service Cooperatives (Appendix B). Public operating elementary and secondary independent school districts are labeled Type 01. Minneapolis and St. Paul special school districts are labeled Type 03.

Data gathered from PE/DAPE teachers employed during the 2011-2012 school year delimited this study. School levels labeled elementary/intermediate, middle/junior high, senior high, and grades 7-12 secondary identified the type of buildings in which PE/DAPE teachers worked further delimited this study (Appendix C).

A pilot survey, distributed via email to eight physical education teachers in the Bemidji Public School District, helped determine readability and a general understanding of the MN PE/DAPE PD survey. The purpose of the pilot survey was to revise the instrument in preparation for broader distribution. Final survey results and data analysis from the PE/DAPE teachers in the Bemidji School District were not included in this study.

Limitations

This study did not control for the accuracy of perceptions reported by PE/DAPE teachers for participation in professional development and subsequent change in

teaching practice. Even though PE/DAPE teachers could work in isolation, this study did not control for any communication and collaboration between teachers who completed the survey.

Professional development budgets for Minnesota public school districts and individual school teachers within the district were unknown. Also revenues generated from state and local property taxes for public education were unknown. Local school referendums could have created differences between district funding abilities for professional development that were neither controlled for, nor identified in this study.

Distribution of the Minnesota PE/DAPE Professional Development Survey was limited by the number of Minnesota public school superintendents who granted permission to this researcher. When permission was granted, the study was further limited by the number of PE/DAPE teachers who provided consent to participate in the study.

Researcher work experiences and knowledge informed this study. These experiences included teaching developmental adapted physical education (grades preK-12); teaching elementary physical education (grades K-5); coaching extracurricular sports (grades 4-12); teaching physical education teacher preparation at a four year university; participating in PE professional development; as well as designing and directing conferences for practicing PE/DAPE teachers.

Summary

The Healthy Kids Bill (2010) mandated Minnesota K-12 public school PE/DAPE teachers to implement national PE standards into existing programs. Challenges to providing effective PE professional development specific to PE/DAPE

teachers were identified. Therefore, it was unknown whether Minnesota PE/DAPE teachers participated in effective PE professional development and, if so, whether there was subsequent change in teaching practice. An adapted conceptual framework for effective characteristics of PE professional development provided a structure from which to view PE/DAPE learning opportunities.

Chapter II provides a review of literature related to a conceptual framework of professional development theory and how teacher learning is designed. The methodology used in this study is defined in Chapter III. Chapter IV is a presentation of study findings in figure, tabular and narrative form. Chapter V puts forth conclusions and recommendations based on study findings, implications for practice, limitations of research, and suggestions for future research.

CHAPTER II

LITERATURE REVIEW

This study was based on the premise that professional development can improve what teachers know; therefore, improve teaching, and ultimately, student learning (Guskey, 2003; Desimone, 2009; Spillane et al., 2009). Feiman-Nemser (2001) defined professional development as opportunities for all teachers to deepen and extend their subject matter knowledge as well as extend and refine their teaching practices. Professional learning ought to be provided, supported, and enhanced throughout a teaching career in order to produce and maintain 'highly qualified' teachers (Darling-Hammond & Sykes, 1999). The core work of schools is teaching; therefore, it is imperative for the school, as a learning organization, to focus on improving the effectiveness of its teaching (Hawley & Valli, 1999).

This review of literature presents findings from two national professional development studies to provide the reader background knowledge of characteristics of effective professional development. From this body of seminal research came researcher consensus about structure and design characteristics of effective professional development. Research findings from physical education professional development studies are summarized and explained within the context of effective structure and design characteristics of professional development. Contextual school and teacher factors that affect teachers' participation in professional development are presented. Finally, challenges to providing effective development activities are described.

Professional Development Studies

The Longitudinal Study of Teacher Change (LSTC, 1996-1999) and the Schools and Staff Survey (SASS, 1999-2000) were two studies that originated within the Eisenhower Professional Development Program (1996-2000). Though dated, the results from the LSTC (1996-1999) and SASS (1999-2000) were seminal works that provided a foundation of information around which multiple reports by researchers summarized the data sets (Choy et al., 2006; Desimone, Porter, Garet, Yoon, & Birman, 2002; Porter et al., 2000). Ultimately, the data summary produced a conceptual framework to study characteristics of effective professional development (Birman et al., 2000; Choy et al., 2006; Desimone et al., 2002; Desimone, 2009; Hochberg & Desimone, 2010; Porter et al., 2000). As a coherent plan to improve what teachers know and how they teach, effective professional development ought to a) include teacher participation in the design of activities, b) promote teacher collaboration, c) reflect student needs, and d) be evaluated for its impact on teacher practice and student learning (Choy et al., 2006; Desimone et al., 2002; Porter et al., 2000).

Longitudinal Study of Teacher Change (LSTC)

The Eisenhower Professional Development Program was a federal government $335 million investment from 1996-1999 that focused on developing knowledge and skills of mathematics and science teachers by supporting professional development experiences to enhance classroom teaching (Porter et al., 2000). The Longitudinal Study of Teacher Change (1996-1999), a component of the Eisenhower Professional Development Program, documented teaching practice before and after professional development activities and examined the extent to which changes in teaching practice

were attributed to participation in the professional development (Porter et al., 2000; Desimone et al., 2002).

The ultimate purpose of the LSTC was to learn the effectiveness of professional development practices supported by Eisenhower funding and to make recommendations for professional development guidelines that could direct funding toward best practices (Desimone et al., 2002; Porter et al., 2000). The national, cross-sectional, sample population for the LSTC was secondary mathematics and science teachers and elementary classroom teachers within school districts receiving Eisenhower funding. Data were collected regarding professional development activity structures (reform or traditional), contact hours, time span (duration), collective participation, active learning, and coherency in aligning teacher goals, standards, and student assessments (Desimone et al., 2002).

Using the LSTC data set, Porter et al. (2000) and Desimone et al. (2002) classified reform professional development as teacher study groups; teacher collaboration, networks, or committees; mentoring; internships; and resource centers. Traditional professional development was classified as in- and out-of-district workshops or conferences as well as courses for college credit. Teachers reported that 18.7% of professional development activities were reform in structure (Desimone et al., 2002; Porter et al., 2000).

An average of 18.2 contact hours was spent participating in reform and traditional professional development during one school year (Desimone et al., 2002; Porter et al., 2000). The duration of professional development was measured on a 9-point scale with the following options: (1) less than a day, (2) one day, (3) two to four

days, (4) one week, (5) one month, (6) two to five months, (7) six to nine months, (8) 10 to 12 months, and (9) more than one year. The average duration of professional development activities was between two to four days and one week or a score of 3.81 on the 9-point scale (Desimone et al., 2002; Porter et al., 2000).

Professional development that contained a collective participation of teachers was defined as a participation of all teachers within the school or set of schools and within the teacher's department or grade level (Desimone et al., 2002; Porter et al., 2000). The extent to which teachers collectively participated in professional development activities was coded on a 3-point scale as (0) not collective, (1) somewhat collective, and (2) collective. The average was less than "somewhat collective" or a score of 0.33 on the 3- point scale (Desimone et al., 2002; Porter et al., 2000).

Specific content or methods focus defined teaching practices in professional development that used a) technology such as calculators and computers, b) instructional methods such as independent work on projects, work on problems with no obvious solutions, technical writing skills, interdisciplinary lessons, debate ideas, and c) student assessments such as essays, performance, observations, reports, projects, and portfolios (Desimone et al., 2002; Porter et al., 2000). Research findings concluded that "many teachers" almost never used technology, while "some teachers" used technology in most lessons; "many teachers" almost never used instructional methods, while "some teachers" used the instructional methods in most lessons; and "many teachers" placed minor importance on methods of student assessment, while "many teachers" perceived method of student assessment as very important (Desimone et al., 2002; Porter et al., 2000).

Active learning was defined as observing and being observed; planning time; reviewing student work; as well as presenting, leading, and writing (Desimone et al., 2002; Porter et al., 2000). Active learning opportunities were measured using an index of 0 or no opportunities provided to 20 or all types of opportunities provided. Teachers reported an average of 3.43 active learning opportunities on an index of 1-20 (Desimone et al., 2002; Porter et al., 2000).

Professional development that emphasized a coherence in teacher learning was defined as including teacher's professional development goals, aligning with standards, curriculum frameworks, student assessments, and providing opportunities for teachers to share and discuss what was learned after the professional development activity (Desimone et al., 2002; Porter et al., 2000). Coherence in teacher learning was measured using weighted survey items set within a 9- point scale ranging from 0 or no type of coherence to 9 or all types of coherence. Teachers reported an average of 5.33 on a 9- point scale on items that measured coherence of teacher learning during professional development (Desimone et al., 2002; Porter et al., 2000).

Results from the LSCT (1996-1999) found a relationship between a focus on specific content or methods of teaching practice during professional development and the probability that teachers would incorporate the teaching practices in their classrooms (Desimone et al., 2002; Porter et al., 2000). A second finding suggested that change in teaching practice was stronger when professional development contained the following characteristics: reform over traditional structure of activities; a collective participation of teachers from the same subject, grade or school; active learning

opportunities; and a coherency in aligning teachers' goals, state standards, and student assessments (Desimone et al., 2002; Porter et al., 2000).

In light of these two findings, overall LSTC (1996-1999) results concluded that most teachers did not experience consistent, high-quality professional development and teachers from the same school often experienced different types and amounts of professional development. The combined total of variations in professional development opportunities resulted in little, average change in teaching practice (Desimone et al., 2002; Porter et al., 2000). Nonetheless, individual teachers in the sample did alter their classroom practices which implied that some schools and districts provided "a more coherent, systemic program of high-quality professional development for their teachers" (Porter et al., 2000, p. ES-2).

Schools and Staff Survey (SASS)

The Schools and Staff Survey (SASS) was a 1999-2000 nationally representative, integrated survey of districts, schools, principals, and teachers (Choy et al., 2006). The purpose was to gather information "about how professional development is organized and managed at the district and school levels and to discover to what extent professional development reflects the approaches now being recommended" (Choy et al., 2006, p. 4). Choy et al. (2006) examined the prevalence of effective structure and design characteristics of professional development using data collected from the SASS (1999-2000) and found 95 percent of public school teachers participated in traditional structured professional development (i.e., workshops, training sessions, and conferences). The most common reform structure activity was "regularly scheduled collaboration with other teachers (73%) on instructional issues…" (Choy et

al., 2006, p. 47). During a 12 month period, less than half of all teachers participated in the following reform structured activities: "…individual or collaborative research…mentoring or peer observation and coaching…observational visits to other schools…university courses…teacher network organized by an outside agency…" (Choy et al., 2006, p. 47).

The SASS (1999-2000) measured the total amount of hours spent in professional development in terms of overall participation in six topic areas. Choy et al. (2006) found the following:

> In four of the six topic areas covered, between 25 to 35 percent of teachers reported nine to 32 hours of professional development: standards (35 percent), teaching methods (31 percent), in-depth study content (28 percent), and uses of computers (25 percent). Of these four topics, an additional 8 to 17 percent of teachers reported that they had participated in activities lasting 33 hours or more. Teachers were less likely to have spent more than 8 hours on student assessment and discipline and classroom management (p. 69).

Choy et al. (2006) also found a significant relationship between the amounts of hours spent in professional development and perceived usefulness of the activity. Specifically "… the more time teachers spent in professional development, the more likely they were to indicate it was useful" (Choy et al., 2006; p. 73).

Results of the LSTC (1996-1999) and SASS (1999-2000) surveys and the overall Eisenhower Professional Development Program (1996-1999) evaluation generated knowledge used to design and support a conceptual framework for effective professional development (Choy et al., 2006; Desimone, 2009; Desimone et al., 2002; Hochberg & Desimone, 2010; Porter et al., 2000). Any overall plan for comprehensive education change included effective professional development as a necessary

component (Choy et al., 2006; Desimone et al., 2002; Porter et al., 2000). Specifically, effective professional development meant that activities reflected student needs, were designed using teacher input, promoted teacher collaboration, and were evaluated for impact on teacher practice and student learning (Choy et al., 2006; Desimone et al., 2002; Porter et al., 2000). Additional studies in this review supported findings from the LSTC (1996-1999) and SASS (1999-2000) and served as building blocks for a conceptual framework for professional development theory.

Characteristics of Effective Professional Development

Structural and design characteristics of effective professional development defined the contents of and set a standard for learning activities that improved teacher knowledge and teaching practice (Birman et al., 2000; Blank et al., 2008; Choy et al., 2006; Desimone, 2009; Desimone et al., 2002; Hochberg & Desimone, 2010; Porter et al., 2000). Structural characteristics of effective professional development included learning activities that took place in a reform over traditionally structured environment, were held over a set duration of time, and used a collective participation of teachers.

Design characteristics of effective professional development included learning activities that emphasized a specific subject content or teaching methods focus, enabled active learning among participants, and promoted a coherence in teacher learning (Birman et al., 2000; Blank et al., 2008; Choy et al., 2006; Desimone, 2009; Hochberg & Desimone, 2010; Porter et al., 2000). Additional explanations and examples highlight differences between effective characteristics of professional development.

Reform Professional Development

Parise and Spillane (2010) defined reform professional development as "interactions with teachers around teaching and learning, including conversations about instruction, peer observation and feedback, and advice seeking about instruction" (p. 324). Other researchers identified study groups, teacher networks, mentoring relationships, committees or task forces, internships, individual research projects, teacher resource centers, curriculum review, and reading professional journals as reform professional development (Desimone, 2009; Garet et al., 2001; Guskey, 2003; Richter et al., 2011). Reform professional development typically did not follow a set curriculum, nor was it restricted to a specific environment. Reform activities were embedded in the work of the school day (Desimone, 2009).

Since reform professional development was longer in duration, Birman et al. (2000) and Garet et al. (2001) concluded it was more effective. Keay (2006) found that a collaborative working environment among experienced physical education teachers was an important element of reform professional development. One exception to this finding was collaborative activities were not beneficial for early career PE teachers because a lack of experience caused beginning PE teachers to acquiesce to the wisdom of more experienced teachers (Keay, 2006).

Tozer and Horsely (2006) maintained that collectively, physical education teachers influenced change best at the school level using intentional professional learning communities to work together to learn what was necessary to improve student learning. Nieto (2009) suggested that novice teachers find a teacher friend to create a

community in which seeking advice may provide the support necessary to survive the first few years of teaching.

Traditional Professional Development

Feiman-Nemser (2001) defined traditional professional development as workshops, conferences, coursework and mandated staff development sessions focusing on a specified curriculum led by experts who provided information to be incorporated into classes once teachers returned to school. Traditional professional development used a "training model" (Little, 1993) or "traditional view" approach (Lieberman, 1995) that assumed teacher participation via contact hours increased knowledge and improved teaching skill (Feiman-Nemser, 2001; Richter et al., 2011). Parise and Spillane (2010) found that both reform and traditional professional development were significantly associated with changes in mathematics and English language arts teachers' practice. The finding contrasted the reform over traditional structure of professional development proposed by Desimone (2009).

Armour and Yelling (2007) also found that physical education teachers learned predominately by participating in traditional professional development activities, yet physical education teachers also placed a high value on learning with and from professional teachers in self-selected networks of reform professional development. Traditional structured professional development was what characterized the learning most available to physical education teachers (Armour & Yelling, 2004). Even so, Nieto (2009) criticized traditional professional development offered away from the classroom without specific follow-up as being inadequate and irrelevant while Connelly and James (1998) found it most unlikely to impact teacher practice.

Parker et al. (2010) found that physical education teachers working in collaboration with each other felt empowered to continue and expand their learning. In two separate studies, Armour and Yelling (2004; 2007) found physical education teachers valued collaborative learning opportunities because they perceived what they learned as benefitting students in their schools. Physical education teachers also reported that when traditional professional development did not meet their needs, they compensated by interacting and networking with other teachers during the formal course or workshop (Armour & Yelling, 2007). Armour and Yelling (2007) recommended an intentional balance of traditional and reform professional development for physical education teachers to help align new PE subject content or teaching strategy information to current teaching and school situations.

Sustained Duration of Professional Development

Using national data from the Eisenhower (1996-1999) Program, Porter et al. (2000) found the average duration of professional development activities was less than one week, teachers received an average of 25 contact hours, and half of all teachers participated in activities that lasted 15 or fewer hours. Desimone, Smith and Ueno (2006) classified six or fewer hours of professional development as low-quality duration; six to 15 hours of professional development as medium-quality duration; and one or more college classes or more than 16 hours of workshops or seminars as high-quality duration.

Desimone et al. (2006) found mathematics teachers who possessed strong content knowledge typically chose to participate in sustained professional development opportunities. Conversely, mathematics teachers with weak content knowledge chose

not to participate in content focused or sustained professional development (Desimone et al., 2006).

Yoon, Duncan, Lee, Scarloss and Shapley (2007) reviewed nine studies regarding the duration of teacher professional development and found that 14 or fewer hours of activities showed no effect on student learning, but more than 14 hours showed significant positive effects on student learning. Further, 30-100 hours of activities over a 6-12 month duration created the largest effect on student learning. While research has not pinpointed an exact span of time or number of contact hours as effective professional development, Desimone (2009) maintained that 20 or more contact hours or training throughout the course of a semester could be considered an effective amount of time.

Literature reviews by Armour and Yelling (2007) as well as Ward and Doutis (1999) found little evidence of sustained learning over time for teachers of physical education. A study by Westfall (2010) concluded that change in teaching practice made by elementary physical education teachers was more likely if professional development activities were provided within a social context of other physical education teachers, situated within the context of the physical education environment, and funded over time.

Collective Participation of Teachers

Professional development set in an environment that promoted a collective participation of teachers from the same department, subject content, or grade level were considered effective (Ball, 1996; Birman et al., 2000; Choy et al., 2006; Desimone, 2009; Porter et al., 2000). Collectively participating with colleagues helped teachers to

identify and solve problems, integrate previous knowledge with new knowledge, develop a common understanding of standards and curriculum scope and sequence, and promote school change beyond individual classrooms (Birman et al., 2000; Choy et al., 2006; Darling-Hammond & McLaughlin, 1995; Darling-Hammond & Richardson, 2009; Desimone, 2009; Porter et al., 2000).

National data from the Eisenhower (1996-1999) Program revealed 74 percent of public school teachers reported collective participation in regularly scheduled collaboration with other teachers regarding issues related to instruction (Porter et al., 2000). SASS (1999-2000) survey data found that teachers in public schools that provided time for collaboration during the school day were more likely to collaborate regularly with other teachers than teachers in public schools that did not provide this time (Choy et al., 2006). Findings also revealed that less experienced teachers were least likely to collaborate with other teachers than those with more teaching experience (Choy et al., 2006).

Collective participation in professional development allowed physical education teachers to stay current in their field (Chen, 2006) and was critical to their overall learning (Ko et al., 2006). For physical education teachers to buy into, embrace, try out, and integrate standards into daily practice, Chen (2006) posited teachers must first gain knowledge, understanding, acceptance, and support of physical education standards by reading professional journals and regularly attending professional conferences, meetings, and workshops. Keay (2006) found that all members of physical education teaching departments may not be perceived as equal or capable in terms of valued contributions until they proved themselves worthy of that distinction.

According to Deglau et al. (2006), it was important to incorporate time for sharing, discussion, and learning new strategies into PE teacher learning opportunities to empower PE teachers as content specialists.

Specific Content or Methods Focus

Focus on specific subject matter or teaching methods is a key characteristic of effective professional development. Wilson and Berne (1999) found that effective professional development for teachers included opportunities to talk about specific subject matter, students, learning, and teaching. Furthermore, if teachers needed to increase subject content knowledge, then professional development ought to be structured in ways that consider differences in disciplines (Wilson & Berne, 1999).

A consensus of researchers found that effective mathematics and science professional development required a content focus designed to model new teaching strategies and allowed teachers to practice and reflect on teaching newly learned strategies (Birman et al., 2000; Cohen & Hill, 2001; Darling-Hammond & Richardson, 2009; Garet et al., 2001). Moreover, Van Driel and Berry (2012) stated that developing pedagogical content knowledge is a complex process that is "highly specific to the context, situation, and person" and suggested that developers align activities with teachers' subject content, provide teaching time to incorporate new instructional strategies and materials, and provide non-instructional time to "…reflect, individually and collectively, on their experiences" (p. 27).

Firestone, Mangin, Martinez and Polovsky (2005) concluded that the boundary lines between subject content and teaching methods were not clearly established, especially when students learned from each other rather than being directed by the

teacher. Therefore, the content focus of effective professional development required an emphasis on considering students' special needs (Firestone et al., 2005; Nieto, 2009). Understanding and relating to students who belong to certain ethnic groups, who have disabilities, or who are simply in unique situations helps teachers determine the most effective methods to deliver subject content material (Firestone et al., 2005; Nieto, 2009).

A focus on physical education subject content was found to be a critical characteristic of professional development in a number of studies specific to teachers of physical education (Armour & Yelling, 2004; Armour & Yelling, 2007; Betchel & O'Sullivan, 2006; Chen, 2006; Ko et al., 2006; Parker et al., 2010). One requirement of the NCLB Act (2002) was to prioritize school-wide professional development funding in academic content areas. However, doing so either limited or eliminated opportunities for teachers in other subjects (i.e., physical education, music, etc.) to update content knowledge specific to their field (Ko et al., 2006; Tozer & Horsely, 2006). Armour and Yelling (2007) concluded that both physical education content and its teachers are marginalized, which makes funding and time for physical education professional development difficult to obtain.

School based, in-service trainings were ineffective for teachers of physical education when the content was not PE specific (Armour & Yelling, 2007). Lack of funding and emphasis on developing content knowledge were two reasons Armour and Yelling (2007) offered in support of providing professional development during the school day. Furthermore, researchers recommended PE professional development be offered in the PE environment using a modified PE schedule to allow teachers time to

share a common interest (i.e., PE standards implementation) as well as to collaborate and share resources (Bechtel & O'Sullivan, 2006; Parker et al., 2010).

Active Learning

Hoy and Miskel (2008) described an active learning environment as one that placed teachers of all ages and experiences on equal footing in debate and discourse using agreed upon language, norms, and processes that challenged currently held beliefs and values in the subculture, political, and bureaucratic organizational systems of schools. Birman et al. (2000) found that active learning opportunities encouraged teachers to become engaged via meaningful discussion, lesson planning, teaching practice, observing other teachers, being observed by other teachers, receiving feedback, and taking membership in support networks to increase knowledge and skill and change classroom practices. According to Spillane (1999) planning and revising curricular units engaged teachers more deeply with their teaching and, subsequently, helped them better understand the principles of effective curriculum.

Keay (2006) found that active learning among experienced physical education teachers was an important element of professional development; however, early career physical education teachers depended upon their more experienced teachers as mentors who helped guide their teaching. The power of teaching experience suggested a caution regarding the use of collaborative networking between physical education teacher groups because, without effective leadership and direction, poor or ineffective teaching practice could be reinforced (Keay, 2006; Wenger, 1998).

Coherence in Teacher Learning

The extent to which learning was consistent with teacher knowledge and beliefs as well as the degree to which the school, district, and state reforms and policies aligned with what was taught in professional development defined coherence in teacher learning (Desimone, 2009; Hochberg & Desimone, 2010). To underscore the importance of this characteristic, 59 percent of public school principals who participated in the SASS (1999-2000) reported that local or state academic standards or the school improvement plan was very influential in determining the coherence of professional development activities (Choy et al., 2006).

Firestone et al. (2005) defined coherence as a consistent focus of professional development topics delivered via active learning over a sustained duration. Coherent, learning opportunities that "…are consistent with teacher goals, build on earlier activities, are followed by additional activities, involve teachers in discussing their experiences with other teachers and administrators in schools" were related to increased teacher learning and improved practice (Birman et al., 2000, p. 31).

A review of literature by Armour and Yelling (2007) found physical education teacher participation in professional development opportunities was limited and PE curriculum remained relatively unchanged. There was a haphazard pattern of offerings, learning progressions, and coherency in physical education teacher professional development (Armour & Yelling, 2007; Ward & Doutis, 1999). Despite this, PE teachers considered professional development, designed in collaboration with university support, to be valuable, interesting and stimulating to their learning (Armour & Yelling, 2007; Ward & Doutis, 1999).

School and Teacher Factors and Effective Professional Development

The SASS (1999-2000) survey findings identified six school and teacher factors against which teacher participation in professional development was measured and significantly related (Choy et al., 2006). These factors included:

1. Size of school district
2. Size of school building
3. School level
4. School resources
5. Highest education degree
6. Teaching experience

Size of School District

The SASS (1999-2000) identified five levels of student enrollment in public school districts: < 450; 450-999; 1,000-4,999; 5,000-9,999; and 10,000 or more students (Choy et al., 2006). Specifically, teachers in districts with 5,000 or more students

> …were more likely than their colleagues in the smallest districts (with enrollments of fewer than 450 students) to make observational visits to other schools, conduct individual or collaborative research, collaborate regularly with other teachers, participate in mentoring or peer observation and coaching, and present at workshops, conferences, or training sessions (Choy et al., 2006, p. 57).

In addition, Choy et al. (2006) found a higher percentage of teachers in smaller school districts (less than 450 students) attended university courses for recertification or advanced certification (36.2%) and for subject specific content (27.1%).

Size of School

Choy et al. (2006) found the size of the school affected participation in professional development as "teachers in the smallest schools (fewer than 150 students) were more likely than teachers in larger schools to enroll in college courses for certification or to visit other schools, but were less likely to collaborate regularly with other teachers" (p. 57). Moreover, Choy et al. (2006) found "teachers who taught in the larger schools were also less likely than those in smaller schools to have addressed student discipline and classroom management" (p. 67).

School Level

Regarding school level, Choy et al. (2006) found "…secondary school teachers were less likely than elementary school teachers to attend or present at workshops, conferences, or training sessions" (p. 57). Furthermore, Choy et al. (2006) found

> Elementary school teachers were more likely than other teachers to have engaged in professional development related to their main teaching field, content and performance standards in their main teaching field, and uses of computers for instruction…secondary school teachers were less likely than elementary school teachers to have addressed teaching methods and student assessment in their professional development (p. 61).

School Resources

According to Choy et al. (2006),

> School resources for professional development and teacher participation in some professional development activities were also related. In the public sector, teachers who taught in schools with their own professional development budgets were more likely than those who taught in schools without such budgets to take university courses for certification, conduct research, collaborate regularly with other teachers, and present at workshops, conferences, or training sessions. In addition, teachers in schools that provided time for professional development during regular contract hours were more likely than those in schools that did not

> provide this time to have collaborated regularly with other teachers… (p. 58).

Highest Education Degree

The highest degree earned was significantly associated with teacher participation in professional development (Choy et al., 2006).

> Teachers with a bachelor's degree or less were more likely than those with a master's degree to have taken university courses to obtain full or advanced certification or enroll in college courses in their main teaching field. They were generally less likely than teachers with a master's or more advanced degree to visit other schools, conduct research, participate in a teacher network, or present at workshops, conferences, or training sessions (Choy et al., 2006, p. 59).

Teaching Experience

Richter et al. (2011) applied the Teacher Career Stage Model (Huberman, 1989) to frame a lifespan perspective on German Mathematics teacher participation in professional development. Years of teaching experience were identified by Richter et al. (2011) as early career (one to seven years), mid-career (seven to 18 and 19-30 years) and end-of-career (30 plus years). SASS (1999-2000) data identified teaching experience in four bands of years' experience: three or less, four to nine, 10-19 and 20 or more years (Choy et al., 2006).

Richter et al. (2011) found the participation rates in formal learning opportunities peaked during teachers' mid-career years (around 20 years' experience). In contrast, SASS (1999-2000) data showed constant participation in professional development across all four bands of years' experience (Choy et al., 2006). Richter et al. (2011) attributed this difference to the fact that participation in professional

development is voluntary in Germany while U.S. teacher participation is both mandatory and voluntary.

Richter et al. (2011) also found that early career teachers collaborated more often than mid- and end of career teachers. Conversely, data from the SASS (1999-2000) found the opposite to be true. Specifically, teachers with three or less years of experience "…were generally less likely than other teachers to visit other schools, conduct research, collaborate regularly with other teachers, participate in a network of teachers and…" (Choy et al., 2006, pp. 58-59).

Richter et al. (2011) found that participation in courses related to subject specific content and pedagogy, psychology, pedagogy and general skills peaked during mid-career (20-29 years' experience). Contrarily, SASS (1999-2000) data indicated that early career teachers (3 years or less) "were more likely than teachers with 10 or more years of teaching experience to take university courses in their main teaching field" (Choy et al., 2006, p. 58).

Furthermore, a higher percentage (28.5%) of mid- to end of career teachers (20 plus years) prioritized training to use computers for instruction while early career (three or fewer yeas) teachers (24.9%) prioritized training to learn about student discipline and class management (Choy et al., 2006). Near equal percentages (21.6%; 23.5%; 24.6%; 21.9%) of teachers in each band of years' experience indicated additional professional development in their main subject field as a top priority (Choy et al., 2006). Finally, a higher percentage of early and mid-career teachers (three to nine years' experience) prioritized teaching methods as a topic for additional professional development (Choy et al., 2006).

Hochberg and Desimone (2010) recommended professional development be viewed from perspectives that consider school and teacher factors and facilitators. However, research was limited regarding professional development of PE/DAPE teachers as viewed from the perspectives of school and teacher factors. Therefore, the following characteristics were of interest to this researcher and incorporated in the study: Minnesota region location of the school district; school level; teaching solo, teaching with PE/DAPE colleagues; and years' PE/DAPE teaching experience.

Challenges to Providing Effective Professional Development

National data from the Eisenhower Project (1996-1999) revealed that most professional development activities did not have collective participation of teachers, did not emphasize content, lacked coherence in teacher learning, and included limited opportunities for active learning (Porter et al., 2000). Porter et al. (2000) found many examples of high quality professional development that had a positive effect on teaching practice; however, the programs were not consistent enough to produce an overall change in teaching practice.

Cost and planning time were two challenges in providing quality, effective professional development (Birman et al., 2000). Limited resources for planning and development forced school officials to decide whether to provide less focused and sustained professional development for all teachers or provide high quality professional development for fewer teachers in fewer schools (Desimone et al., 2002). Desimone et al. (2002) found greater variation in professional development participation between individual teachers within schools, rather than between schools, which implied there

was not a well-planned, coherent approach to aligning professional development and instruction.

Challenges that prevented physical education teachers from participating in traditional professional development opportunities included cost, time, location, and availability of substitute teachers (Armour & Yelling, 2007). PE teacher participation in reform professional development was a solution to overcoming the obstacles of attending out-of-district traditional professional development because reform structured activities offered more accessibility, flexibility, and freedom (Armour & Yelling, 2007).

Teacher isolation and workplace conditions were factors that created barriers to physical education teacher participation in effective professional development (Templin, 1988). Physical education teacher "isolation may be defined as the absence of routine and pedagogically based collegial interaction. . .Teachers rarely engage in activities whereby personal and professional support for one another is given or whereby pedagogical problems may be solved" (Templin, 1988, p. 197). Furthermore, teachers of subject content that carried a marginalized status (e.g., physical education) were especially burdened by isolation in that they "… must provide self-stimulation, develop their own solutions to pedagogical problems when assistance is needed, and assess their own successes and failures" (Templin, 1988, p. 197).

Professional isolation among physical education teachers was common; however, a work environment created by collegiality among physical education teachers significantly reduced professional isolation (Ward & O'Sullivan, 1998; Doutis & Ward, 1999). To help overcome teacher isolation and build communities of practice, Feinman-Nemser (2001) recommended serious collegial talk time (e.g., sharing and

analyzing ideas, values and practices; critical thinking; and thoughtful conversation) as an alternative approach to professional development.

Professional learning communities (PLC's) structured around a common theme for conversation and professional inquiry enhanced teacher content knowledge, increased teacher effectiveness, and increased student achievement (Joyce & Calhoun, 2010). Participating in PLC's allowed teachers the opportunity to share their experiences with others and to be reflective practitioners (McDiarmid & Clevenger-Bright, 2008). Yet, bringing teachers together to engage in a focused conversation was "challenged by scheduling, recruiting participants with common interests and needs, and ensuring that there is adequate leadership to guide the group and maintain focus on the targeted topics" (Nadelson, Seifert, Hettinger, & Coats, 2013, p. 84).

Summary

Chapter two presented findings from seminal professional development work that defined characteristics of effective professional development used in the conceptual framework for this study. Research findings specific to physical education professional development studies were summarized and explained within the context of structure and design characteristics of effective professional development. School and teacher factors that impacted participation in professional development were identified. Challenges to providing effective professional development for all teachers and those specific to physical education were acknowledged. To counter the identified challenges, suggestions for structuring and designing professional development activities were offered.

Chapter III defines the methodology of this study. Chapter IV is a presentation of the findings of this study in tabular and narrative form. Chapter V presents conclusions and recommendations based on study findings, implications for practice, and suggestions for future research.

CHAPTER III

METHODOLOGY

Chapter three describes the setting in which research for this study was conducted, the sample population, survey instrument, data collection, and data analysis. Individual survey items, methods, and procedures describe how data were gathered for research questions.

Setting and Sample Population

There were 334 Minnesota, public operating, elementary and secondary, Independent School Districts (Type 01) and Special School Districts (Type 03) located throughout nine Minnesota Service Cooperatives in which PE/DAPE teachers were employed (Appendix A; Appendix B). Other educational entities were not included in this study because it was unknown whether or not the districts offered PE programs (Appendix A). Each Minnesota Service Cooperative is a nonprofit, membership based organization that serves as a leadership partner with region schools in planning for and providing professional development programs and services that maximize school district resources (Minnesota Statute 123A.22, 2013). Minnesota Service Cooperatives offer professional development opportunities via conferences, seminars, and workshops on a regional basis or customized training to individual school districts within the region (Minnesota Service Cooperatives, 2013). The unique needs of schools within each Minnesota Service Cooperative region determine professional development offerings, such as specific learning activities and training.

Public schools buildings are defined, organized, and coded by the Minnesota Department of Education (Appendix C). For this study, the number of junior high schools ($N = 35$) did not produce enough cases for data analysis. Therefore, the number of junior high and middle schools ($N = 190$) were combined and coded as 20.

Table 1

Minnesota Public School Building Classifications 2011-2012

School Level	Grades	Code
Elementary and Intermediate	K-6; 4-6	10
Middle and Junior High	5-8; 7-9	20
Senior High	9/10-12	32
Secondary	7-12	33

The participants in this study were K-12 physical education and developmental adapted physical education teachers employed in Minnesota public school districts during 2012-2013. There were a total 3,108 licensed full- and part-time PE/DAPE teachers in Minnesota public schools with teaching assignment descriptions of general physical education; swimming; individual, dual, and team sports; physical conditioning/fitness; and developmental adapted physical education in 2011-2012 (Minnesota Department of Education, 2012). Coaching was not considered a teaching assignment; rather a separate contract that required duties above and beyond the school day. For this reason, those individuals whose only professional role was coaching, were not participants in this study.

Survey Construction

To construct the Minnesota PE/DAPE Professional Development Survey, questions from the Longitudinal Study of Teacher Change (LSTC, 1996-1999) and the Schools and Staff Survey (SASS, 1999-2000) were adapted specific to PE/DAPE teacher participation in effective PE professional development and subsequent perceived change in teaching practice. The Minnesota PE/DAPE Professional Development Survey also was designed to gather information about contextual school factors such as region location of the school district, school level, and teacher factors, such as PE/DAPE teaching experience and whether the teacher taught solo or with PE/DAPE teaching colleagues in the same school.

A Qualtrics (2012) software program provided by the University of North Dakota was used to format and distribute the Minnesota PE/DAPE Professional Development Survey (Appendix D). The first section of the Minnesota PE/DAPE Professional Development Survey introduced the researcher, defined the purpose of the study, and assured the PE/DAPE teacher that permission was received from the school district superintendent as a condition for email distribution (Appendix E).

The survey was designed specifically for licensed PE/DAPE teachers who taught PE and/or DAPE in a Minnesota K-12 public school for at least one school year. A "yes" response confirmed a minimum of one year experience teaching PE/DAPE content. After clicking on the "yes" response, the second section of the survey was revealed. A "no" response directed the participant to the end of the survey.

The second section of the survey provided participants with information regarding informed consent, survey procedures, risks and benefits to survey

participation, financial information, confidentiality, participation options, procedures, and contact information for asking questions. A statement of confidentially assured survey participants anonymity and that any information provided about individual schools and district location would not be disclosed without permission or as required by law (Appendix E). Additionally, participants were informed that any region information would be included in the overall collection of data.

Upon confirmation of voluntary participation in the study, the survey was deemed valid and questions were revealed. A "no" response identified the choice not to participate in the study and sent the participant to the end of survey. The remaining 48 questions were presented to gather information about participation in 16 effective PE professional development activities, amounts of participation, and subsequent perceived change in teaching. Table 2 displays survey item contents and corresponding question numbers.

The school factor of region location of the school district was pre-determined and recorded by the researcher prior to survey distribution. Survey item one contained one contextual school factor question to identify the school level at which participants spent the majority of time teaching PE/DAPE. There were four options from which to choose: elementary/intermediate school (grades K-5/6), middle/junior high school (grades 6/7-8/9), senior high school (grades 9/10-12), or secondary schools (grades 7-12).

Survey items two and three contained two questions regarding participant factors. PE/DAPE teaching experience was defined as the combined number of years' teaching PE/DAPE content up to and including 2011-2012. Teaching solo and teaching

with PE/DAPE colleagues were defined as the total head count of full- and part-time PE, DAPE and PE/DAPE teachers working in the same school.

Table 2

Minnesota PE/DAPE Professional Development Survey Items and Question Numbers

Contextual School and Teacher Factors	Questions
School level	1
Years' PE/DAPE Teaching Experience	2
Teaching Solo or with Colleagues	3
Reform Structured PD Activities	**Questions**
Conversations about Student Learning	10-12
Conversations about PE Curriculum	13-15
Conversations about Implementing PE Standards	16-18
Conversations about Teaching Strategies	19-21
Observations made by other PE/DAPE Teachers	22-24
Feedback Received after Teaching Observation	25-27
Observations of other PE/DAPE Teachers	28-30
Feedback Given after Teaching Observation	31-33
Collaboration with other PE/DAPE Teachers	34-36
Advice Sought about PE/DAPE issues	37-39
Advice Given about PE/DAPE issues	40-42
Reading PE Professional Literature	43-45
Traditional Structured PD Activities	**Questions**
Out-of-District Training	7-9
In-District Training	4-6
University Courses	46-48
Special Courses	49-51

Amounts of participation for each reform professional development activity were measured using six frequency options:

1. less than one time a month
2. one time a month
3. two to three times a month
4. one time a week
5. two to three times a week
6. daily

Amount of participation for each traditional professional development activity was measured using average total hours of attendance. The amount of participation in university courses was identified initially as a total number of semester credits; however, prior to data analysis, the researcher applied a formula of one semester credit multiplied by 15 clock hours to convert credits into total hours of participation.

Levels of perceived change in teaching practice following confirmed participation for each professional development activity were measured using a 5- point Likert scale:

1. no changes
2. few changes
3. some changes
4. many changes
5. significant changes

The survey format was consistent for each of the 16 reform and traditional structured professional development activity questions. First, participants were asked

to confirm involvement for each professional development activity by choosing a "yes" or "no" response. A "no" response to this question revealed the next professional development activity listed on the survey. A "yes" response to this question prompted teachers to identify the average duration or hourly amount of time spent participating in the professional development activity. Subsequently, participants were asked to identify a level of perceived change in teaching practice based on the amount of participation in that particular professional development activity.

Assuming informed consent was provided, the minimum number of responses for survey completion was 20 based upon no participation for any of the professional development activities. The maximum number of responses for survey completion was 51 based on confirmed participation and an identified amount of participation and subsequent perceived change in teaching for all 16 professional development activities. The final section of the survey provided a space for respondents to give feedback or comments about the survey.

Pilot Study

A pilot study was distributed via email addresses to eight PE/DAPE teachers in the Bemidji Public School District in August 2012. The purpose was to determine readability and understanding of the MN PE/DAPE Professional Development Survey in preparation for broad distribution. Written feedback regarding survey structure and design was received from seven Bemidji PE/DAPE teachers. Based upon feedback received, changes were incorporated into the survey. The revised survey was re-distributed to the same eight PE/DAPE teachers for further suggestions for

improvement. No further suggestions were received. Data from completed pilot surveys were not included in the actual study.

Data Collection

To explain the study and request permission to distribute the Minnesota PE/DAPE Professional Development Survey to K-12 PE/DAPE teachers, an email was sent to 334 superintendents in Type 01 and 03 public school districts (Appendix A). A total of 113 superintendents (34%) granted permission for survey distribution to district PE/DAPE teachers.

Upon securing superintendent permission, the MN PE/DAPE Professional Development Survey was distributed to 656 Minnesota K-12 PE/DAPE teachers. Email addresses were found on individual school websites, recorded, and saved into one of nine Minnesota Service Cooperatives region panels created in the Qualtrics (2012) survey site. Each school district was aligned with a Minnesota Service Cooperatives region (Appendix B). Information in the body of the email introduced the researcher, explained the purpose of the study, and provided a link to the anonymous survey site within the University of North Dakota Qualtrics (2012) website. After a one-week time period, a follow up email reminder was sent to teachers who had not completed the survey.

Of the 656 emails sent to Minnesota K-12 public school PE/DAPE teachers, 308 PE/DAPE teachers responded. Of these responses, 26 teachers declined participation in the research study. Twenty-two teachers completed the survey, but failed to provide consent. After the survey completion dates closed, it was discovered that failure to choose any response for consent to participate in the study followed by

pressing return directed the teacher to the actual survey questions, not to the end of the survey. Therefore, surveys that left blank the response for consent to participate were considered invalid ($N = 22$) and data from these surveys were not included in this study.

One teacher consented to participate in the study, completed the school and teacher factor questions, but did not respond to any of the professional development participation or perceived change in teaching practice questions. A decision was made to eliminate this case. The total number of valid cases was 259 (39% response rate). All data were stored and saved within the Qualtrics (2012) website. A summary of the results was provided to Minnesota public school district superintendents and PE/DAPE teachers after completion of the dissertation.

Data Analysis

MN PE/DAPE Professional Development Survey data were analyzed using an IBM SPSS® Statistics Software program 20.0. Descriptive data from original, collapsed, re-valued and re-labeled variables for contextual school and teacher factors, PE/DAPE teacher participation for each PE professional development activity, and perceived subsequent change in teaching practice were analyzed and described.

$H_O{}^1$: There is no relationship between region location of the school district, school level, teaching solo, teaching with PE/DAPE colleagues, and years' PE/DAPE teaching experience and participation for each PE professional development activity. For hypothesis one, original variables were collapsed and revalued to create appropriate case sizes. Data from original, collapsed, and revalued variables were analyzed and presented.

To measure traditional professional development, nonparametric Pearson Chi-Square tests were used when the dependent variable was ordinal and less than five levels (Mertler & Vannatta, 2002). The alpha criterion was set at the .05 level. Symmetric measures Phi and Cramer's V confirmed results of Pearson Chi Square at the .05 level.

To measure reform professional development, a one-way Analysis of Variance (ANOVA) was used when the dependent variable was interval-ratio (Mertler & Vannatta, 2002). A factorial ANOVA was used to examine a combination of school level, teaching solo, and teaching with PE/DAPE colleagues when the dependent variable was interval-ratio (Mertler & Vannatta, 2002). The alpha criterion was set at the .05 level. A factorial ANOVA could not be used with a combination of years' PE/DAPE teaching experience and region location of school district because the number of cells was too large and the sample size was too small.

H_O^2: There is no relationship between region location of the school district, school level, teaching solo, teaching with PE/DAPE colleagues, and years' PE/DAPE teaching experience and perceived subsequent change in teaching practice for each PE professional development activity. For hypothesis two, original variables were collapsed and re-valued to create appropriate case sizes. Data from original, collapsed, re-valued and re-labeled variables were analyzed and presented.

To measure traditional professional development, nonparametric Pearson Chi Square tests were used for data analysis when the dependent variable was ordinal and less than five levels (Mertler & Vannatta, 2002). The alpha criterion was set at the .05

level. Symmetric measures Phi and Cramer's V confirmed results of Pearson Chi Square at the .05 level.

To measure reform professional development, a one-way ANOVA was used for data analysis when the dependent variable was interval-ratio (Mertler & Vannatta, 2002). A factorial ANOVA was used to examine a combination of school level, teaching solo and teaching with PE/DAPE colleagues when the dependent variable was interval-ratio (Mertler & Vannatta, 2002). The alpha criterion was set at the .05 level.

Ho^3: There is no relationship between participation for each PE professional development activity and perceived subsequent change in teaching practice. For hypothesis three, original variables were collapsed and re-valued to create appropriate case sizes. Data from original, collapsed, revalued and re-labeled variables were analyzed and presented.

Because of the likelihood that relationships were simple and direct, two separate tests were used to analyze independent, collapsed and re-valued variables of participation for each PE professional development activity and dependent, collapsed and re-valued variables for perceived subsequent change in teaching practice. Spearman correlation tests were used when one of the variables was ordinal with less than five levels (Mertler & Vannatta, 2002). Pearson correlation tests were used when both variables were interval-ratio (Mertler & Vannatta, 2002).

Summary

Chapter III described the methodology used in this study. Chapter IV is a presentation of the findings of this study in tabular and narrative form. Chapter V

provides conclusions and recommendations based on study findings, implications for practice, and suggestions for future research.

CHAPTER IV

RESULTS

Results of this study are presented in five sections. Section one contains an analysis of descriptive data for region location of the school district, school level, teaching solo, teaching with PE/DAPE colleagues, and years' PE/DAPE teaching experience. Original, collapsed, and re-labeled variables were presented using frequency tables.

Section two contains an analysis of descriptive data for participation for each PE professional development activity and perceived subsequent change in teaching practice. Original, collapsed, re-valued, and re-labeled variables for each set of data were presented using frequency tables.

Section three contains an analysis of data in response to the first null hypothesis. Collapsed independent and dependents variables were used to analyze relationships between region location of the school district, school level, teaching solo, teaching with PE/DAPE colleagues, years' PE/DAPE teaching experience, and participation for each PE professional development activity.

Section four contains an analysis of data in response to the second null hypothesis. Collapsed independent and dependents variables were used to analyze relationships between region location of the school district, school level, teaching solo,

teaching with PE/DAPE colleagues, years' PE/DAPE teaching experience, and perceived subsequent change in teaching practice.

Section five contains an analysis of data in response to hypothesis three. Collapsed independent and dependents variables were used to analyze relationships between participation for each PE professional development activity and perceived subsequent change in teaching practice.

Section One: Descriptive Data for School and Teacher Factors

Minnesota Service Cooperative region location of the school district and school levels were school factors in this study. Teaching solo, teaching with PE/DAPE colleagues, and years' PE/DAPE teaching experience were teacher factors in this study. Section one contains separate analyses of descriptive data for each school and teacher factor.

Minnesota Service Cooperative Region Location of School District

The largest number of teachers participating in this study taught in school districts located in Minnesota Service Cooperative Region 7 (N = 54, 20.8%) and Region 11 (N = 42, 16.2%). The fewest number of teacher participants taught in schools located in Minnesota Service Cooperative Region 4 (N = 12, 4.6%) and Region 9 (N = 14, 5.4%) (Appendix B). To create population, economic, and geographic likeness, a decision was made to collapse and re-value variables for the school district location into three, newly labeled Minnesota Service Cooperative Regions—North, Central, and South. Original data were retained for Minnesota Service Cooperative Region 11, but re-labeled as Metro. Table 3 displays frequencies for survey

participation by original, collapsed, re-valued, and re-labeled variables of Minnesota Service Cooperative regions, listed in rank order from most to least participation.

Table 3

Survey Participation by Minnesota Service Cooperative Regions

Region Numbers	Original Data *N* = 259	
	Frequency	Percent
7	54	20.8
11	42	16.2
10	35	13.5
3	32	12.4
1 & 2	25	9.7
5	25	9.7
6 & 8	20	7.7
9	14	5.4
4	12	4.6

Region Names and Numbers	Collapsed Data *N* = 217		Original Data *N* = 42	
	Frequency	Percent	Frequency	Percent
Central (4, 5, 7)	91	35.1		
South (6 & 8, 9, 10)	69	26.7		
North (1 & 2, 3)	57	22.0		
Metro (11)			42	16.2

School Level

Most survey participants taught in elementary schools (*N* = 123, 47.5%). The fewest number of survey participants taught in senior high schools (*N* = 35, 13.5%). Because there were insufficient cases to meet the assumptions for data analysis and concerns about data validity, a decision was made to collapse middle/ junior high, senior high and 7th -12th grade secondary school levels into one variable labeled secondary schools (grades 6/7-12). Original data for the elementary school level were retained. Table 4 displays frequencies for survey participation by original school level variables and one collapsed secondary school level variable (*N* = 136, 52.5%), listed in rank order from most to least participation.

Table 4

Survey Participation by School Levels

School Levels	Original Data *N* = 259	
	Frequency	Percent
Elementary Schools (grades K-5/6)	123	47.5
Secondary Schools (grades 7-12)	54	20.9
Middle/Junior High Schools (grades 6-8; 7-9)	47	18.1
Senior High Schools (grades 9/10-12)	35	13.5

School Levels	Collapsed Data *N* = 136		Original Data *N* = 123	
	Frequency	Percent	Frequency	Percent
Secondary Schools (grades 6/7-12)	136	52.5		
Elementary Schools (grades K-5/6)			123	47.5

Teaching Solo or with PE/DAPE Colleagues

The majority of PE/DAPE teachers either taught solo (*N* = 61, 23.6%) or with one other PE/DAPE colleague (*N* = 81, 31.2%). The smallest numbers of PE/DAPE teachers teaching with PE/DAPE colleagues were six (*N* = 2, 0.8%), seven (*N* = 3, 1.2%), and nine teachers (*N* = 2, 0.8%); there were no schools with eight PE/DAPE colleagues. The mean number of PE/DAPE teachers per school was 2.76.

Because there were insufficient cases to meet the assumptions for data analysis and concerns about data validity, a decision was made to collapse the variables containing one or more PE/DAPE colleagues into one variable (*N* = 198) and re-label as teaching with PE/DAPE colleagues. The variable for teaching solo (*N* = 61) was retained. Table 5 displays frequencies for survey participation by teachers who taught solo and those who taught with PE/DAPE colleagues, listed in rank order from most to least participation.

Table 5

Survey Participation by Teaching Solo and Teaching with PE/DAPE Colleagues

Number PE/DAPE Colleagues	Original Data *N* = 259	
	Frequency	Percent
1 colleague	81	31.2
Teaching solo	61	23.6
2 colleagues	49	18.9
3 colleagues	30	11.6
4 colleagues	20	7.7
5 colleagues	11	4.2

Table 5 continued

Number PE/DAPE Colleagues	Original Data $N = 259$	
	Frequency	Percent
7 colleagues	3	1.2
6 colleagues	2	0.8
9 colleagues	2	0.8

Number of PE/DAPE Colleagues $N = 259$	Original Data $N = 61$		Collapsed Data $N = 198$	
	Frequency	Percent	Frequency	Percent
Teaching Solo	61	23.6		
Teaching with PE/DAPE Colleagues			198	76.4

Years' PE/DAPE Teaching Experience

The mean number of years' PE/DAPE teaching experience was 17.0 with a range from one to 43 years. To explain professional development participation from a lifespan perspective of teaching experience, the individual variables for years' PE/DAPE teaching experience were collapsed, re-valued, and re-labeled to align with research findings by Huberman (1989), Richter et al. (2011), and the SASS (1999-2000) study. The highest numbers of survey participants were classified as mid-career teachers with eight to 19 ($N = 99$, 38.2%) and 20-29 years' experience ($N = 74$, 28.6%). The fewest numbers of survey participants were classified as end-of-career teachers ($N = 28$, 10.8%). Table 6 displays frequencies for survey participation by collapsed, re-valued, and re-labeled variables for years' PE/DAPE teaching experience, listed in rank order from most to least participation.

Table 6

Survey Participation by Years' PE/DAPE Teaching Experience

Years' DAPE Teaching Experience	Collapsed Data *N* = 259	
	Frequency	Percent
Mid-Career (8-19 years)	99	38.2
Mid-Career (20-29 years)	74	28.6
Early Career (1-7 years)	53	20.5
End-of-Career (30 plus years)	28	10.8
Missing Cases	5	1.9

Section Two: Descriptive Data for Participation in Professional Development and Perceived Subsequent Change in Teaching Practice

Section two contains an analysis of data that described teacher participation for each professional development activity and perceived subsequent change in teaching practice. Descriptive data for variables were presented using frequency tables.

Participation in Professional Development

For the 12 professional development activities identified in this study, a majority of PE/DAPE teachers participated in reform (R) over traditional (T) activities. Refer to Table 7 for values.

A "yes" response to receiving feedback after being observed by other PE/DAPE teachers was valid only when the respondent confirmed participation in being observed by others. Likewise, a "yes" response to giving feedback after observing other PE/DAPE teachers was valid only when the respondent confirmed participation in observing others. This explained the higher value of missing numbers for feedback

received and given post-observation. However, due to insufficient cases to meet the assumptions for data analysis, a decision was made to eliminate the variables for feedback received post-observation, feedback given post-observation, and participation in special coursework and university coursework.

Original amounts of participation in reform (frequencies) and traditional (hours) professional development were re-valued on two levels and re-labeled because there were insufficient cases to meet the assumptions for data analysis and concerns about data validity (0 = no participation; 1 = participation). The variable labeled "no participation" remained the same, but was re-valued to zero. Missing values for participation in professional development activities were re-valued to zero and re-labeled as "no participation." Table 7 displays frequencies for collapsed and re-valued variables for teacher participation in 12 professional development activities, listed in rank order from most to least participation.

Perceived Subsequent Change in Teaching Practice

Of all teachers in this study (N = 259), the majority perceived change in teaching practice following participation in nine reform and one traditional professional development activity. The fewest numbers of teachers perceived change in teaching practice following participation in two reform and one traditional professional development activities. Refer to Table 7 for individual activities and respective values.

Because there were insufficient cases to meet the assumptions for data analysis and concerns about data validity, the original variables for "few, some, many, and significant change" were collapsed into one variable, re-valued to one, and re-labeled "perceived change in teaching." The variable labeled "no perceived change in

teaching" remained the same, but was re-valued to zero. The missing values for perceived change in teaching after participation in professional development activities were re-valued to zero and re-labeled as "no perceived change in teaching."

Table 7

Teacher Participation in 12 Professional Development Activities and Perceived Subsequent Change in Teaching Practice

Reform (R) and Traditional (T) Professional Development Activities	Teacher Participation (*N* = 259)		Perceived Subsequent Change in Teaching (*N* = 259)	
	N	%	*N*	%
Conversations about Student Learning (R)	245	94.6	228	88.0
Conversations about Teaching Strategies (R)	214	82.6	207	79.9
Reading Professional PE Literature (R)	188	72.6	176	68.0
Seeking Advice about PE/DAPE Issues (R)	183	70.7	172	66.4
Giving Advice about PE/DAPE Issues (R)	172	66.4	106	40.9
Conversations about PE Standards (R)	171	66.0	146	56.4
Conversations about PE Curriculum (R)	167	64.5	147	56.8
Collaboration with PE/DAPE Teachers (R)	140	54.1	125	48.3
Observed by Other PE/DAPE Teachers (R)	133	51.4	81	31.3
Observed Other PE/DAPE Teachers (R)	126	48.7	97	37.5
Out-of-District Training (T)	106	40.9	102	39.4
In-District Training (T)	106	40.9	98	37.8

A decision was made to eliminate the original variables for perceived change in teaching following participation in special coursework, feedback received post-observation, and feedback given post-observation and university coursework due to insufficient cases to meet the assumptions for data analysis. Table 7 also displays

frequencies for collapsed and re-valued variables for perceived change in teaching practice following participation for 12 professional development activities, though not listed in rank order.

Section Three: Analysis of Data in Response to Hypothesis One

Hypothesis one stated there is no relationship between region location of the school district, school level, teaching solo, teaching with PE/DAPE colleagues, and years' PE/DAPE teaching experience, and participation for each PE professional development activity. Descriptive data for each variable are presented in narrative form.

School and Teacher Factors and Participation in Traditional PD

To test relationships between school and teacher factors as well as participation in traditional professional development, nonparametric Pearson Chi-Square tests were used when the dependent variable was ordinal and less than five levels (Mertler & Vannatta, 2002). The alpha criterion was set at the 0.05 level. Symmetric measures Phi and Cramer's V confirmed results of Pearson Chi Square at the .05 level.

Region location and traditional PD.

A 2 x 4 Chi-Square test of independence was used to examine participation in traditional professional development as a function of region location of the school district. There was no difference between region location and participation rates in traditional professional development, $\chi^2(9, N = 259) = 15.59, p = .076$.

School level and traditional PD.

A 2 x 4 Chi-Square test of independence was used to examine participation in traditional professional development as a function of school level. The relationship was not significant, $\chi^2(3, N = 259) = 6.01, p = .111$.

Teaching solo, teaching with PE/DAPE colleagues and traditional PD.

A 2 x 4 Chi-Square test of independence was used to examine participation in traditional professional development as a function of teaching solo and teaching with PE/DAPE colleagues. The relationship was significant, $\chi2(3, N = 259) = 8.457, p = .037$. PE/DAPE teachers who taught solo participated less in traditional professional development than teachers who taught with colleagues.

Years' PE/DAPE teaching experience and traditional PD.

A 2 x 4 Chi-Square test of independence was used to examine participation in traditional professional development as a function of years' PE/DAPE teaching experience. The relationship was not significant, $\chi^2(9, N = 254) = 16.70, p = .054$.

School and Teacher Factors and Participation in Reform PD

To test relationships between school and teacher factors as well as participation in reform professional development, factorial and one-way ANOVA's were used when the dependent variable was interval-ratio (Mertler & Vannatta, 2002). The alpha criterion was set at the 0.05 level.

Region location and reform PD.

A one-way ANOVA was used to examine participation in reform professional development as a function of region location of the school district. There was no

difference between region location and participation rates in reform professional development, $F(3, 255) = .593$, $p = .620$.

School level, teaching solo, teaching with PE/DAPE colleagues and reform PD.

A 2 x 2 factorial ANOVA was used to examine participation in reform professional development as a function of school level, teaching solo, and teaching with colleagues. The interaction of school level, teaching solo, and teaching with PE/DAPE colleagues was not significant, $F(1, 255) = 0.10$, $p = .756$. The main effect of school level was not significant, $F(1, 255) = 0.93$, $p = .337$.

The main effect of teaching solo, teaching with PE/DAPE colleagues, and participation in reform professional development was significant, $F(1, 255) = 20.95$, $p < .0005$. PE/DAPE teachers who taught solo participated less in reform professional development ($M = 5.51$) than those who taught with PE/DAPE colleagues ($M = 7.09$).

Years' PE/DAPE teaching experience and reform PD.

A one-way ANOVA was used to examine participation in reform professional development as a function of years' PE/DAPE teaching experience. The effect of years' PE/DAPE teaching experience was not significant, $F(3, 250) = 1.54$, $p = .206$.

School and Teacher Factors and Participation in Combined Reform and Traditional PD

To test relationships between school and teacher factors and a combination of reform and traditional professional development, factorial and one-way ANOVA's were used when the dependent variable was interval-ratio (Mertler & Vannatta, 2002). The alpha criterion was set at the 0.05 level.

Region location and combined PD.

A one-way ANOVA was used to examine participation in a combination of reform and traditional professional development as a function of region location of the school district. There was no difference between region location and participation rates in a combination of reform and traditional professional development, $F(3, 255) = .324$, $p = .808$.

School level, teaching solo, teaching with PE/DAPE colleagues and combined PD.

A 2 x 2 factorial ANOVA was used to examine participation in a combination of traditional and reform professional development as a function of school level, teaching solo, and teaching with PE/DAPE colleagues. The interaction of school level, teaching solo, and teaching with PE/DAPE colleagues was not significant, $F(1, 255) = .98$, $p = .323$. The main effect of school level was not significant, $F(1, 255) = 2.30$, $p = .132$.

The main effect of teaching solo and teaching with PE/DAPE colleagues and participation in a combination of reform and traditional professional development was significant, $F(1, 255) = 25.311$, $p < .0005$. Teachers who taught solo participated less in a combination of traditional and reform professional development ($M = 6.37$) than those who taught with PE/DAPE colleagues ($M = 8.36$).

Years' PE/DAPE teaching experience and combined PD.

A one-way ANOVA was used to examine participation in a combination of reform and traditional professional development as a function of years' PE/DAPE

teaching experience. The effect of years' PE/DAPE teaching experience was not significant, $F(3, 250) = 1.11$, $p = .344$.

Section Four: Analysis of Data in Response to Hypothesis Two

Hypothesis two stated there is no relationship between region location of the school district, school level, teaching solo, teaching with PE/DAPE colleagues, and years' PE/DAPE teaching experience, and perceived subsequent change in teaching practice for each PE professional development activity. Descriptive data for each variable are presented in narrative form.

School and Teacher Factors and Perceived Change in Teaching Practice Following Traditional PD

To test relationships between school and teacher factors and perceived change in teaching following participation in traditional professional development, nonparametric Pearson Chi-Square tests were used when the dependent variable was ordinal and less than five levels (Mertler & Vannatta, 2002). The alpha criterion was set at the 0.05 level. Symmetric measures Phi and Cramer's V confirmed results of Pearson Chi Square at the .05 level.

Region location and perceived change in teaching practice following traditional PD.

A 2 x 4 Chi-Square test of independence was used to examine perceived change in teaching following participation in traditional professional development as a function of region location of the school district. There was no difference between region location and perceived change in teaching following participation in traditional professional development, $\chi^2(9, N = 259) = 13.64$, $p = .136$.

School level and perceived change in teaching practice following traditional PD.

A 2 x 4 Chi-Square test of independence was used to examine perceived change in teaching following participation in traditional professional development as a function of school level. The relationship was not significant, $\chi^2(3, N = 259) = 4.53, p = .209$.

Teaching solo, teaching with PE/DAPE colleagues and perceived change in teaching practice following traditional PD.

A 2 x 4 Chi-Square test of independence was used to examine perceived change in teaching following participation in traditional professional development as a function of teaching solo and teaching with PE/DAPE colleagues. The relationship was not significant, $\chi^2(3, N = 259) = 3.22, p = .359$.

Years' PE/DAPE teaching experience and perceived change in teaching practice following traditional PD.

A 2 x 4 Chi-Square test of independence was used to examine perceived change in teaching following participation in traditional professional development as a function of years' PE/DAPE teaching experience. The relationship was not significant, $\chi^2(9, N = 254) = 5.01, p = .833$.

School and Teacher Factors and Perceived Change in Teaching Practice Following Reform PD

To test relationships between school and teacher contextual factors and perceived change in teaching following participation in reform professional development, factorial and one-way ANOVA's were used when the dependent variable was interval-ratio (Mertler & Vannatta, 2002). The alpha criterion was set at the 0.05 level.

Region location and perceived change in teaching practice following reform PD.

A one-way ANOVA was used to examine perceived change in teaching following participation in reform professional development as a function of region location of the school district. There was no difference between region location and perceived change in teaching following participation in reform professional development, $F(3, 255) = .400$, $p = .753$.

School level, teaching solo, teaching with PE/DAPE colleagues and perceived change in teaching practice following reform PD.

A 2 x 2 factorial ANOVA was used to examine perceived change in teaching following participation in reform professional development as a function of school level, teaching solo and teaching with PE/DAPE colleagues. The interaction of school level, teaching solo and teaching with PE/DAPE colleagues was not significant, $F(1, 255) = .038$, $p = .845$. The main effect of school level was not significant, $F(1, 255) = 0.53$, $p = .467$.

The main effect of teaching solo, teaching with PE/DAPE colleagues, and participation in reform professional development was significant, $F(1, 255) = 12.66$, $p < .0005$. Teachers who taught solo were less likely to perceive change in teaching following participation in reform professional development ($M = 4.79$) than were those who taught with PE/DAPE colleagues ($M = 6.03$).

Years' PE/DAPE teaching experience and perceived change in teaching practice following reform PD.

A one-way ANOVA was used to examine perceived change in teaching after participation in reform professional development as a function of years' PE/DAPE

teaching experience. The effect of years' PE/DAPE teaching experience was not significant, $F(3, 250) = 2.27$, $p = .081$.

School and Teacher Factors and Perceived Change in Teaching Practice Following Participation in Combined Reform and Traditional PD

To test relationships between school and teacher factors and perceived change in teaching following participation in a combination of reform and traditional professional development, one-way and factorial ANOVA's were used when the dependent variable was interval-ratio (Mertler & Vannatta, 2002). The alpha criterion was set at the 0.05 level.

Region location and perceived change in teaching practice following combined PD.

A one-way ANOVA was used to examine perceived change in teaching following participation in a combination of reform and traditional professional development as a function of region location of the school district. There was no difference between region location and perceived change in teaching following participation in a combination professional development, $F(3, 255) = .157$, $p = .925$.

School level, teaching solo, teaching with PE/DAPE colleagues and perceived change in teaching practice following combined PD.

A 2 x 2 factorial ANOVA was used to examine perceived change in teaching following participation in a combination of traditional and reform professional development as a function of school level, teaching solo, and teaching with PE/DAPE colleagues. The interaction of school level, teaching solo and teaching with PE/DAPE colleagues was not significant, $F(1, 255) = .495$, $p = .482$. The main effect of school level was not significant, $F(1, 255) = .742$, $p = .390$.

The main effect of teaching solo and teaching with PE/DAPE colleagues was significant, $F(1, 255) = 13.18$, $p < .0005$. Teachers who taught solo were less likely to perceive changes in teaching following participation in a combination of reform and traditional professional development ($M = 5.61$) than were those who taught with PE/DAPE colleagues ($M = 7.06$).

Years' PE/DAPE teaching experience and perceived change in teaching practice following combined PD.

A one-way ANOVA was used to examine perceived change in teaching following participation in a combination of reform and traditional professional development as a function of years' PE/DAPE teaching experience. The effect of years' PE/DAPE teaching experience was not significant, $F(3, 250) = 1.94$, $p = .124$.

Section Five: Analysis of Data in Response to Hypothesis Three

Hypothesis three stated there is no relationship between participation for each PE professional development activity and perceived subsequent change in teaching practice. Spearman correlation tests were used when one of the variables was ordinal with less than five levels (Mertler & Vannatta, 2002). Pearson correlation tests were used when both variables were interval-ratio (Mertler & Vannatta, 2002).

A "yes" response to participating in any professional development activity was necessary in order for teachers to confirm subsequent perceived change in teaching practice. One teacher did not confirm participation in one traditional professional development activity, yet claimed subsequent perceived change in teaching practice. A decision was made to eliminate this response for perceived change in teaching practice

because there was no confirmed participation in the traditional professional development activity ($N = 1$).

Similarly, there were 67 teachers who did not confirm participation in reform professional development activities, yet claimed subsequent perceived change in teaching practice. A decision was made to eliminate these responses for perceived change in teaching practice because there was no confirmed participation in the reform professional development activities ($N = 67$).

Participation in Traditional PD and Perceived Subsequent Change in Teaching Practice

A Spearman correlation confirmed a significant direct relationship between participation in traditional professional development and perceived subsequent change in teaching practice, $r(256) = .87$, $p < .0005$. Thus, as more teachers participated in traditional professional development, they were more likely to report perceived subsequent change in teaching practice.

Participation in Reform PD and Perceived Subsequent Change in Teaching Practice

A Pearson correlation confirmed a significant direct relationship between participation in reform professional development and perceived subsequent change in teaching practice, $r(190) = .78$, $p < .0005$. Thus, as more teachers participated in reform professional development, they more likely were to report perceived subsequent change in teaching practice.

Participation in Combined Reform and Traditional PD and Perceived Subsequent Change in Teaching Practice

A Pearson correlation confirmed a significant direct relationship between participation in reform and traditional professional development and perceived subsequent change in teaching practice, $r(257) = .88$, $p < .0005$. Thus, as more teachers participated in reform and traditional professional development, they were more likely to report perceived subsequent change in teaching practice.

Summary

Results from this study rejected the first null hypothesis by confirming a significant relationship between teaching solo, teaching with PE/DAPE colleagues, and participation for each PE professional development activity. Specifically, teachers who taught solo were less likely to participate in reform, traditional, and a combination of reform and traditional professional development than were those who taught with PE/DAPE colleagues. The null hypotheses were retained for region location of the school district, school level, and years' PE/DAPE teaching experience and participation for each PE professional development activity.

Results from this study rejected the second null hypothesis by confirming a significant relationship between teaching solo, teaching with PE/DAPE colleagues, and perceived change in teaching practice following participation in reform and a combination of reform and traditional professional development. Specifically, teachers who taught solo were less likely to perceive change in teaching practice following participation in reform and a combination of reform and traditional professional development than were those who taught with PE/DAPE colleagues.

The null hypothesis was retained for teaching solo, teaching with PE/DAPE colleagues, and perceived change in teaching practice following participation in traditional professional development. Furthermore, the null hypotheses were retained for region location of the school district, school level, and years' PE/DAPE teaching experience, and perceived change in teaching practice following participation in reform, traditional, and a combination of reform and traditional professional development.

Results from this study rejected the third null hypothesis by confirming significant relationships between participation in reform, traditional, and a combination of reform and traditional professional development and perceived subsequent change in teaching practice. Particularly, as more teachers participated in reform, traditional and a combination of reform and traditional professional development, the more likely they were to report perceived subsequent change in teaching practice.

Chapter V provides conclusions and recommendations based on findings from this study and other studies found in the literature review. Limitations of this study are presented, as well as implications for practice and suggestions for future research.

CHAPTER V

DISCUSSION

This study examined the professional development of Minnesota K-12 PE/DAPE teachers in light of passage of the Healthy Kids Bill (2010) that mandated implementation of national standards into all existing PE programs. A conceptual framework for professional development theory was adapted by defining characteristics of effective professional development activities specific to PE/DAPE teachers. The purposes for this study were threefold. First, this study measured PE/DAPE teacher participation in professional development focused on PE content and teaching methods. Second, this study identified whether PE/DAPE teachers perceived change in teaching practice following participation in professional development. Third, this study measured the impact of school and teacher factors on PE/DAPE teacher participation in professional development and perceived subsequent change in teaching practice.

Conceptual Framework Review for MN PE/DAPE Study

An evaluation of the Eisenhower Professional Development Program (1996-1999), of which the Longitudinal Study of Teacher Change (1996-1999) was a component, and the Schools and Staff Survey (1999-2000) study revealed four main professional development themes (Choy et al., 2006; Desimone et al., 2002; Porter et al., 2000). First, sustained, intensive professional development that focused on fewer teachers led to effective change in teaching practice. Second, characteristics

of effective professional development included an emphasis on reform over traditional structure, an extended duration of participation, a collective participation of teachers, a specific content or methods focus, active learning opportunities, and coherence in learning. Third, school districts that systematically planned for coherent and strategic learning opportunities for teachers improved the quality and effectiveness of professional development. Fourth, professional development was most effective when teachers participated in designing learning activities that promoted collaboration, reflected on student needs, and were evaluated for impact on teacher practice and student learning.

For this study, the MN PE/DAPE Professional Development Survey was developed based on the premise that change in teaching practice was stronger when teachers participated in effective professional development (Desimone et al., 2002; Porter et al., 2000). Specifically, characteristics of effective professional development include reform over traditional structured activities, a collective participation of teachers from the same subject, grade or school, active learning opportunities, and coherence in aligning teachers' goals, state standards and student assessments (Desimone et al., 2002; Porter et al., 2000). Since Armour and Yelling (2007) found that PE teachers learned predominately by participating in a balance of reform and traditional learning activities, the MN PE/DAPE Professional Development Survey gathered information about reform and traditional learning activities.

The format of survey questions followed a chronological sequence. PE/DAPE teachers confirmed participation in 12 reform and four traditional PE learning activities. Upon confirmation of participation, teachers identified amounts or frequencies of

participation and then identified a level of perceived subsequent change in teaching practice. PE/DAPE learning opportunities identified in the study were presumed active. It was not the intent of this researcher to determine coherence of teacher learning, identify strategic planning for PE professional development, or evaluate the professional development process.

Data from the SASS (1999-2000) survey identified six school and teacher factors against which teacher participation in professional development was measured and significantly related (Choy et al., 2006). For this study, five school and teacher factors were identified and measured against PE/DAPE teacher participation in professional development and perceived subsequent change in teaching practice. These contextual factors included region location of the school district, school level, teaching solo, teaching with PE/DAPE colleagues, and years' PE/DAPE teaching experience.

Limitations

One limitation to this study was the sample size (N = 259). Although participants were PE/DAPE teachers located in nine Minnesota Service Cooperative regions with urban, suburban, and rural representation, the sample size represented a small fraction of the 3,108 licensed public school PE/DAPE teachers (8.3%) during 2011-2012. Conversely, it was encouraging that 34% of public school superintendents granted permission to distribute the survey to 656 PE/DAPE teachers which, ultimately, produced a 39% teacher response rate.

Another limitation, directly related to sample size, was the length of the survey. Specifically, the number of response choices identifying amounts of professional development and levels of perceived subsequent change in teaching practice failed to

produce enough data within each variable for appropriate analysis. Therefore, variables were collapsed and/or eliminated from the study. In hindsight, fewer response choices might have generated enough data to analyze strength of relationships between amounts of participation and levels of perceived subsequent change in teaching practice.

Finally, the number of learning activities identified in this study was limited. PE/DAPE learning activities were adapted from LSTC (1996-2000) and SASS (1999-2000) studies and supported by a conceptual framework that defined structural and design characteristics of effective professional development. PE/DAPE teachers could have participated in additional effective professional development activities that were neither identified nor included in this study.

Study Findings and Conclusions

Results of the MN PE/DAPE Professional Development study found relationships between reform and traditional learning activities participated in by MN PE/DAPE teachers and perceived subsequent change in teaching practice. Another study finding revealed that teaching solo significantly impacted participation in PE professional development and perceived subsequent change in teaching practice.

Finding One

Increases in PE/DAPE teacher participation in PE professional development were significantly associated with increases in perceived subsequent change in teaching practice. Choy et al. (2006) also found a significant relationship between the amounts of hours spent in professional development and perceived usefulness of the activity. Specifically "… the more time teachers spent in professional development, the more likely they were to indicate it was useful" (Choy et al., 2006; p. 73). Similarly, finding

one is consistent with data from the LSCT (1996-1999) which confirmed a relationship between a focus on specific content or teaching methods during professional development and the probability that teachers would incorporate the teaching practices in their classrooms (Desimone et al., 2002; Porter et al., 2000).

Conclusion: Participation in PE/DAPE Professional Development is Justifiable

As PE/DAPE teacher participation in effective professional development increases, the perceived impact new training has on teaching practice also increases. This finding justifies PE/DAPE teacher requests for financial and human resources that support participation in on-going effective PE professional development among a community of PE/DAPE teachers. Moreover, the finding justifies expectations for PE/DAPE teacher participation in effective professional development and expectations for new learning to improve teaching practice.

Physical education program improvement goals, such as increasing teacher awareness of national standards, can help close gaps created between policy (e.g., Healthy Kids Bill, 2010) and practice (Chen, 2006; Schechter, 2012). Creating teacher commitment to standards reform presumes materials for standards inclusion, time for teachers to learn and interpret national standards, and support for collaboration with other teachers (Chen, 2006; Darling-Hammond, 1993; Darling-Hammond & McLaughlin, 1995; Dutro et al., 2002; Spillane & Thompson, 1997). The ultimate responsibility for professional growth lies with the PE/DAPE teacher. However, support from education leaders is both necessary and justifiable in terms of participation in professional development and expected improvement made in teaching practice.

Finding Two

Although PE/DAPE teachers participated in more reform than traditional structured activities, both reform and traditional professional development were significantly related to a perceived subsequent change in teaching practice. This finding is consistent with research by Armour and Yelling (2007) that confirmed PE teachers learned predominately by participating in a balance of reform and traditional learning activities. Parise and Spillane (2010) also found both reform and traditional professional development were significantly associated with changes in mathematics and English language arts teachers' practice. This finding contradicts findings that asserted reform structured activities were more effective than those structured traditionally (Desimone, 2009) and traditional professional development was most available to PE teachers (Armour & Yelling, 2004; 2007).

Conclusion: Reform and Traditional PE Learning Activities are Effective

The importance of this finding is that participation in both reform and traditional structured learning activities was significantly related to perceived subsequent change in teaching practice. There are plausible explanations for higher rates of PE/DAPE teacher participation in reform over traditional activities. Since the MN PE/DAPE Professional Development Survey contained more reform (12) than traditional (4) professional development questions, the increased participation in reform activities reflected this imbalance. In times of legislative mandates and budget cuts, reform professional development activities such as conversations about students, instruction, and curriculum; reading professional literature; advice seeking; and teacher collaboration were effective alternatives to traditional learning activities (Parise &

Spillane, 2010; Desimone, 2009; Tozer & Horsely, 2006). Moreover, recent school improvement efforts have focused on embedding reform learning activities into the school day via organized teams of teachers (Parise & Spillane, 2010; Parker et al., 2010; Schechter, 2012; Snow-Gerono, 2005).

Professional development funding that focused on training "highly qualified" teachers in core subject areas (i.e., mathematics, science) was one outcome of NCLB Act (2002) mandate. Funding earmarked for academic content teachers could explain less PE/DAPE teacher participation in traditional structured out-of-district PE/DAPE conferences or workshops.

Even though PE/DAPE teachers in this study participated less in traditional professional development, teachers still reported perceiving subsequent change in teaching practice. Of the total number of PE/DAPE teachers, 92.4% and 96.2% reported change in teaching practice following participation at in-district training (N = 106; N = 98) and out-of-district (N = 106; N = 102) training, respectively. Assuming PE professional development contained a community of PE/DAPE teachers who participated actively and collaboratively, it is encouraging to know that participation in both reform and traditional learning activities is significantly related to perceived change in teaching practice.

Finding Three

Teachers who taught solo were less likely to participate in professional development than those who taught with PE/DAPE colleagues. Furthermore, teachers who taught solo were less likely to perceive subsequent change in teaching practice than those who taught with PE/DAPE colleagues. Teacher isolation, common among

PE teachers, was considered an obstacle to teacher participation in professional development (Deglau et al., 2006; Templin, 1988). However, in this study, teacher isolation and teaching solo are two separate concepts.

Teacher isolation can occur whether PE/DAPE teachers teach solo or with PE/DAPE colleagues. The number of PE/DAPE teachers employed in a school or district reflects, among other things, the number of students enrolled, school building size and the financial health of the school district. The problem is not that PE/DAPE teachers teach solo. The critical issue is that teaching solo seems to affect PE/DAPE teacher participation in professional development and thus, their perceived subsequent change in teaching practice.

Conclusion: Teaching Solo Affects Participation in PE/DAPE Professional Development

Collapsed data from MN PE/DAPE survey measured participation in 10 reform and two traditional structured learning activities. Realistically, PE/DAPE teachers who taught solo could not participate effectively in reform activities embedded within the school day because there were no other PE/DAPE teachers with whom to work and collaborate. Research shows that organizational support for groups of teachers to collaborate in order to solve practical problems and issues is effective (Boske, 2008; Hoy & Miskel, 2008; Marks & Louis, 1999).

Furthermore, participation in effective professional development followed by thoughtful self-reflection and group discussion about changes made in teaching practice were essential components of effective professional development for teachers of all subject contents (Armour & Yelling, 2007; Chen, 2006; Darling-Hammond &

Richardson, 2009; Desimone, 2009; Dooner et al., 2008; Fullan, 2007; Parise & Spillane, 2010; Parker et al., 2010; Richter et al., 2011). Therefore, one conclusion is that school support is necessary for effectively organizing groups of MN PE/DAPE teachers to learn and work collaboratively, especially teachers who teach solo.

Establishing learning communities of same subject teachers for professional inquiry and conversation and was found to enhance teacher knowledge and increase teacher effectiveness (Joyce & Calhoun, 2010). However, bringing same subject teachers together to participate in a focused conversation was "challenged by scheduling, recruiting participants with common interests and needs, and ensuring that there is adequate leadership to guide the group and maintain focus on the targeted topics" (p. 84, Nadelson et al., 2013). Suffice it to say, organizing groups of PE/DAPE teachers would require navigating similar obstacles.

As Keay (2006) pointed out, all members of physical education teaching departments may not be perceived as equal or capable in terms of valued contributions until they proved themselves worthy of that distinction. In particular, early career physical education teachers were found to depend upon their more experienced colleagues as mentors. For this reason, Keay (2006) and Wenger (1998) suggested caution regarding the use of collaborative networking between physical education teacher groups because, without effective leadership and direction, poor or ineffective teaching practice could be reinforced. Assuming professional development contains effective leadership and direction, PE/DAPE teachers, especially those who teach solo, could benefit from a collaborative PE/DAPE learning environment created within a school building, district or region.

Conclusions based on study findings help frame recommendations for actions specific to PE/DAPE professional development in Minnesota. The following recommendations, categorized by groups of educators, begin with those who work closest with K-12 grade students—PE/DAPE teachers. Additional educator groups include school district leaders (i.e., principals, superintendents, and district staff development committees), Minnesota Service Cooperatives staff, Minnesota Department of Education (MDE) leaders and university PE/DAPE teacher preparation faculty. A collaborative effort from all identified educators is crucial in achieving a common goal of building a community of PE/DAPE professional teachers to improve PE knowledge, teaching skills and ultimately, teaching practice.

Recommendations

This study found that increases in PE/DAPE teacher participation in PE professional development, both reform and traditional, were significantly related to increases in perceived subsequent change in teaching practice. One contextual factor that limited teacher participation in professional development and consequently, their perceived change in teaching was identified as PE/DAPE teachers who taught solo.

Recommendations based on study findings are presented within the context of implementing national physical education standards into Minnesota public school PE programs (Healthy Kids Bill, 2010). A collective participation of Minnesota PE/DAPE teachers, school leaders, and university faculty working together can design and structure effective PE professional development opportunities to implement PE standards. The task of incorporating standards based PE assessments logically would follow the implementation of national PE standards into existing PE programs.

PE/DAPE Teachers

The more PE/DAPE teachers participate in professional development, the more they perceived subsequent change in teaching practice. This finding legitimizes the professional duty and obligation PE/DAPE teachers have to continue learning. Requests for school resources (i.e., registration cost, time, travel, lodging, and availability of substitute teachers) to participate in effective PE/DAPE professional development allow physical education teachers to stay current in their field (Chen, 2006) and are critical to their overall learning (Ko et al., 2006). One recommendation is that PE/DAPE teachers actively seek opportunities to learn new information about PE content and teaching methods.

Specific to the Healthy Kids Bill (2010) policy mandate, PE/DAPE teachers must first gain knowledge, understanding, acceptance, and support of physical education standards by reading professional journals and attending professional conferences, meetings, and workshops regularly (Chen, 2006). Therefore, another recommendation is that PE/DAPE teachers participate in learning communities with PE/DAPE colleagues, when possible, to identify and solve problems, network, and discuss issues critical to teaching practice and programs.

Participation in reform and traditional structured PE/DAPE professional development were significantly related to perceived subsequent change in teaching practice. Therefore, PE/DAPE teachers, particularly those who teach solo, need encouragement and resources to attend effective PE professional development structured using reform or traditional activities. Previous research confirmed that the structure and design of professional learning opportunities incorporate time and space

for a collective participation of teachers to network, discuss, and reflect upon any knowledge gained following such participation (Borko, 2004; Chen, 2006; Darling-Hammond, 1993; Deglau et al., 2006; Fullan, 2007).

State-wide and national PE/DAPE organization websites are resources currently available for PE/DAPE teachers to interact on-line with colleagues and locate additional learning opportunities. Typically, PE teacher leaders moderate the on-line conversations and respond to PE/DAPE teacher questions about teaching content, strategies, and issues common to everyday teacher work. Teacher participation simply requires awareness that such sites exist and an initial sign up process. Once logged into a site, the resource of time, either during or outside of the school day, is required for reading, thinking and writing.

PE/DAPE teachers have a responsibility not only to participate in effective professional development, but to collaborate in the design of specific learning activities that fit both teacher and student needs. Active membership in state and national PE/DAPE organizations, networks, and participation in conferences and workshops are ways to fulfill individual teacher learning needs. Moreover, PE/DAPE teachers actively involved in shaping school and district PE professional development opportunities may feel increased ownership and commitment to participate in professional development and perceive subsequent change in teaching practice.

School District Leaders

Opfer and Pedder (2011) and Hoy and Miskel (2008) identified the individual teacher and school organization systems as important influences on teacher learning. Improving school organizational learning is contingent upon individual teacher learning

that takes place when individual and groups of teachers collaborate in order to solve practical problems (Boske, 2008; Hoy & Miskel, 2008; Marks & Louis, 1999). Based on study findings, one recommendation is that school leaders encourage, support, and expect collective PE/DAPE teacher participation in effective PE professional development. It is realistic that administrators also provide increased motivation and support for PE/DAPE teachers who teach solo to participate in learning opportunities alongside other PE/DAPE colleagues.

Another recommendation is that administrators work collaboratively with teachers and state education leaders to develop structures, processes, and practices that promote PE/DAPE teacher participation in effective PE professional development. Promoting and providing on-going blocks of time for PE/DAPE teachers to think and collectively share ideas is essential in this process.

PE/DAPE teachers need time to become aware of national PE standards (Chen, 2006). Opportunities for teachers to share values and beliefs with colleagues can help them understand how to interpret standards and make teaching decisions that align with standards (Hoy & Miskel, 2008). Financial and human resources that support participation in reform and traditional professional development ought to be made available to PE/DAPE teachers.

Pedder and Opfer (2010) found that organizers of professional development rarely were the actual leaders of learning activities. Therefore, it behooves administrators to include PE/DAPE teachers in the design and delivery of PE activities that support effective professional development practices. Including Minnesota Service Cooperative Agency staff in the design, development, and delivery of PE professional

development would streamline both cost and delivery of information to all PE/DAPE teachers within respective regions.

Carefully designed and structured professional development consisting of a balance of teachers who learn collectively improves individual teacher learning, school organizational learning, and understanding of policy priorities (Schechter, 2012). These administrator recommendations could impact PE/DAPE teacher learning and specifically, be useful in terms of achieving mandates of the Healthy Kids Bill (2010).

Minnesota Service Cooperatives

Minnesota Service Cooperatives use regional delivery systems to provide programs and services through unique and collaborative partnerships to school districts, government agencies, and nonprofits (Minnesota Service Cooperatives, 2013). Membership in service cooperatives gives school districts the ability to maximize resources. The purposes of Minnesota Service Cooperatives align well with the learning needs of Minnesota K-12 public school PE/DAPE teachers.

One recommendation is that Service Cooperative program directors become aware of PE/DAPE teacher professional development needs. Cooperatives provide customized services to meet the educational needs of teachers. With input from region PE/DAPE teachers and school district leaders, Service Cooperative program directors could customize PE professional development in alignment with Minnesota Healthy Kids Bill (2010) policy requirements. Progress reports to state policy makers could become part of a feedback loop in establishing a system of accountability for implementing national PE standards in public schools.

Service Cooperative program directors encourage, support, and foster effective working relationships by serving as liaisons between state and national PE/DAPE associations, PE/DAPE teachers, and Minnesota Department of Education (MDE) personnel. Resources available within each Service Cooperative can be used to promote and advertise PE/DAPE professional development programs and provide staff and technical expertise for the delivery of PE/DAPE learning activities.

University PE/DAPE Teacher Preparation Faculty

One recommendation is that university PE/DAPE teacher preparation faculty considers creating partnerships with PE/DAPE teachers, school district leaders and Service Cooperatives. Minnesota State Colleges and Universities (MnSCU System) PE/DAPE teacher preparation faculty can provide expertise in designing and delivering professional development unique to PE/DAPE teacher and K-12 student needs within Service Cooperative regions to which each university aligns geographically.

The MnSCU System is comprised of seven public universities, of which six universities offer a PE teacher preparation programs and four universities offer DAPE programs. There is one MnSCU university located in six different Service Cooperative regions. The University of Minnesota System offers one graduate PE teacher preparation program located in the Metro Educational Service Unit (Region 11) and one undergraduate program in the Northeast Service Cooperative (Region 3). There are no public universities in the metro area that offer undergraduate PE or DAPE teacher preparation programs. The National Joint Powers Alliance Service Cooperative (Region 5) contains no public university; however, two MnSCU universities are within proximity (Regions 4 and 7).

MnSCU universities currently utilize an on-line instructional management system (Desire to Learn or D2L) that, with adaptations, could manage on-going, on-line communication among PE/DAPE teachers. Collaborative partnerships between public university faculty, Service Cooperatives, and the MDE could streamline PE/DAPE professional development opportunities for teachers throughout Minnesota.

Another recommendation is that university faculty members investigate additional on-line learning models to deliver learning opportunities specific to region or state-wide PE/DAPE teacher needs. Massive On-line Open Courses (MOOC's) designed to offer large-scale participation in university coursework (without semester credit or cost) to anyone with internet access is one example of using technology to share information. A certificate of course completion satisfying Minnesota Board of Teaching licensure requirements for local continuing education units would document clock hour participation. Providing PE/DAPE training via MOOC's may increase teacher participation in professional development, especially to those who teach solo.

At the individual program and university levels, PE/DAPE teacher preparation faculty need to role model active membership and participation in PE/DAPE professional development opportunities. One recommendation is that faculty accompanies PE/DAPE student majors to local, state, and national conferences and trainings. Doing so could instill in students the habit of participating in continued learning opportunities with other teaching professionals. Hence, it is important for individual MnSCU and the University of Minnesota department faculty to secure financial and human resources to assist PE/DAPE student majors in attending activities within a community of practicing PE/DAPE teachers.

It is reasonable to expect that university faculty help build and instill professional behaviors in student PE/DAPE majors. Forging relationships with local and regional school districts, Service Cooperatives and PE/DAPE state organizations is one way to accomplish this expectation.

Minnesota Department of Education

One recommendation for key personnel at the Minnesota Department of Education (MDE) is to provide resources to districts and Service Cooperatives for the development and delivery PE/DAPE teacher learning opportunities. Implementing national PE standards into existing PE programs, a Healthy Kids Bill (2010) mandate, ought to be a current focus of PE/DAPE teacher training.

Another recommendation is that MDE staff partner with PE/DAPE teachers, school district leaders and Service Cooperatives to create accountability measures that guide and support the implementation of PE national standards into local programs. Currently, the number of K-12 public school PE programs that include national standards is unknown. By establishing a process to communicate and work effectively with all interested parties, MDE serves to bridge gaps between policy action and PE/DAPE teacher work.

The MDE website contains a standards implementation toolkit. Using the Service Cooperatives structure, expert staff from MDE could deliver training sessions for PE/DAPE teachers interested in taking leadership roles in the standards implementation process. The following MDE personnel currently available to identify and provide resources appropriate for PE/DAPE professional development include Mary Thissen-Milder, Specialist for PE, Active Schools, Recess and Classroom; Beth

Aune, Director of Academic Standards and Instructional Effectiveness; and Steve Dibb, Director of School Support.

Implications for Practice

The above recommendations identified groups of educators and actions to increase involvement in the design and delivery of effective PE professional development as well as PE/DAPE teacher participation. Research findings in this study suggest that Minnesota PE/DAPE teachers, education leaders, and providers of PE/DAPE professional development coordinate efforts to deliver ongoing, effective training for PE/DAPE teachers.

First, findings from this study suggest an awareness of the impact of teacher participation in effective PE/DAPE professional development. It is incumbent upon this researcher to share study findings with relevant PE/DAPE professionals and education leaders. Articles written in professional journals and newsletters have potential to reach a broad audience. To create awareness, PE/DAPE teachers, school district leaders, Service Cooperative staff members and MDE personnel need a summary of study findings and recommendations. Such information serves to promote and maintain ongoing conversation and collaboration between interested educators about ways to structure, design, and deliver PE/DAPE professional development.

Study findings have implications for planners of PE/DAPE professional development. It is imperative that PE/DAPE teachers be included in shaping learning opportunities that meet their unique needs. Quite simply, ask PE/DAPE teachers what they need and involve them in designing their own learning opportunities. Make professional development accessible via the Service Cooperatives system. Bring

together groups of PE/DAPE teachers for focused discussions, problem solving, and networking. Incorporate technology to ensure increased accessibility, continuity of learning, and work toward task completion. Effective communication and creative planning can increase PE/DAPE teacher participation in professional development.

Study findings have implications for school district leaders who employ teachers of PE/DAPE or any other subject content who teach solo. A professional development planning process that successfully gathers a collective participation of PE/DAPE teachers may be duplicated for other teachers of the same subject, grade level, or departments.

There was a significant relationship between both reform and traditional professional development activities that focused on PE content and teaching methods via active learning and perceived subsequent change in teaching practice. This study finding has implications for supporting teacher participation in reform activities embedded during the school day and throughout the school year. Such activities included teacher networks, committees, curriculum review, reading professional journals, interactions and conversations with teachers, peer observation and feedback, and advice seeking. Also support should be provided for teacher participation in traditional professional development led by experts within and outside the school. Such traditional activities include conferences, workshop, coursework, and staff training within school districts

Study findings impact the way in which university faculty members develop and deliver coursework for PE/DAPE student majors. Framing learning activities as

both reform and traditional, faculty can augment student learning by making connections between teaching content and how it relates to teaching practice.

Faculty members who attend local, regional, and state PE/DAPE professional development increase their work load, especially when accompanying students. Time necessary for group planning and travel results in faculty performing other required duties with less time. However, creating authentic and practical learning experiences by collaborating with student majors, practicing teachers and Service Cooperative staff may be necessary to improve PE/DAPE programs and, ultimately, K-12 student learning.

In a general sense, study findings and recommendations create different work. Organizing collaborative working relationships between local, regional, and state PE/DAPE professionals requires a persistent and focused effort. Implementing national PE standards into existing Minnesota PE public school programs is the agreed upon priority. Toward this end, communities of PE/DAPE teachers and education leaders must contribute collectively in the design, structure, and delivery of effective PE/DAPE professional development. Persistent efforts that encourage and support PE/DAPE teachers in learning about, interpreting, and implementing standards concepts into daily teaching practices can pay off in terms of how teachers design learning experiences for Minnesota K-12 students.

Suggestions for Future Research

The effects of specific amounts participation in professional development on specific levels of perceived subsequent change in teaching practice remain unknown. This study attempted to measure participation amounts in reform professional

development and levels of perceived subsequent change in teaching practice. Amounts of participation were measured using the following options: Less than once a month, one time a month, two to three times a month, one time a week, two to three times a week, and daily. Traditional professional development was measured using clock hours that ranged from zero to 42. Perceived subsequent change in teaching practice was measured on five levels: No, few, some, many, and significant changes.

The inability to gather sufficient data for each level of measurement caused uncertainty in concluding reasons for relationships between participation and perceived subsequent change in teaching practice other than that they simply existed. Selecting fewer levels of measurement for the amounts and frequencies of participation and levels of perceived subsequent change in teaching practice could produce enough data for an in-depth analysis.

A number of data points eliminated from this study remained of interest to this researcher. Drilling down into the available information to understand nuances between these data points could increase knowledge about specific ways to design and structure PE professional development.

The finding which identified a significant relationship between teaching solo and participating in PE professional development prompts further research. Understanding the teaching world from the perspective of PE/DAPE teachers who teach solo through interviewing could reveal more information about how to better design and structure professional development.

Further research that identifies whether national standards exist in current Minnesota PE/DAPE programs could serve as a springboard for providing effective PE

professional development to teachers who need it most. For PE programs that already include national standards, further research to identify the impact of the Healthy Kids Bill (2010) mandates on teaching practice and student learning seems a logical next research step.

Summary

Results of this study found that as PE/DAPE teacher participation in professional development increased, so too did perceived subsequent change in teaching practice. This study also found that both reform and traditional learning activities impacted PE/DAPE teaching practice. Finally, teaching solo affected participation in professional development and perceived subsequent change in teaching practice.

This study supports PE professional development that takes place in reform and traditional environments involving a collective participation of PE/DAPE teachers. Moreover, effective PE professional development includes activities that focus on PE/DAPE content and teaching methods delivered via active learning among teachers. Study findings and recommendations can guide the structure, design and delivery of effective PE professional development specific to Minnesota K-12 PE/DAPE teachers.

APPENDICES

APPENDIX A

MINNESOTA PUBLIC SCHOOL DISTRICTS TYPES 2011-2012

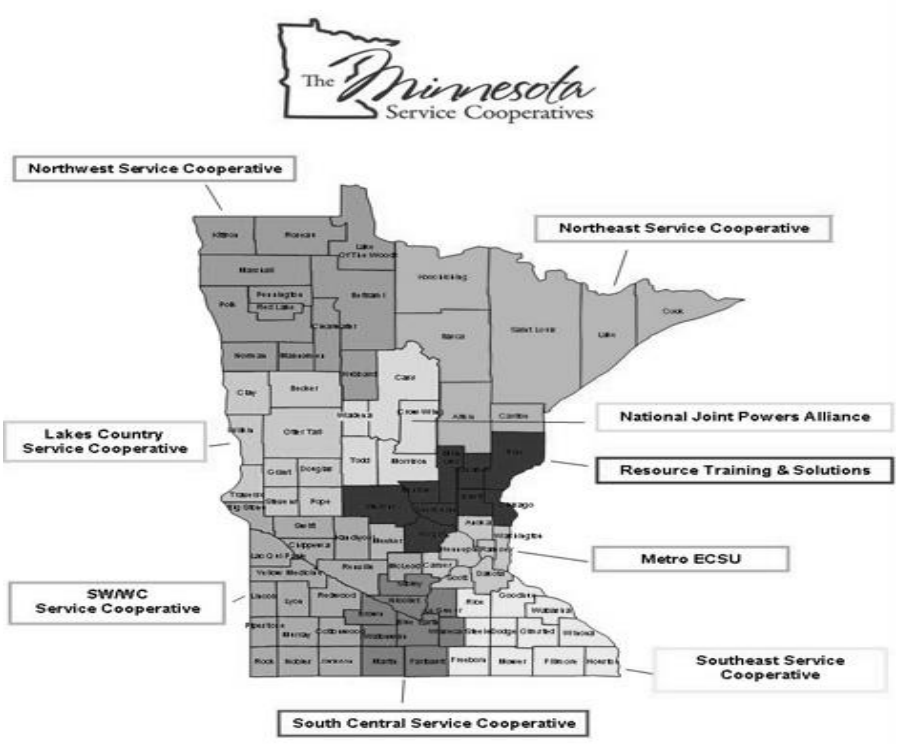
School type	Educational entity (included in study)	Total number of schools
01	Public Operating Elementary and Secondary Independent Districts	333
03	Special School Districts (Minneapolis and St. Paul)	2

School type	Educational Entity (not included in study)	Total number of schools
02	Non-Operating Common School Districts (Pinsburg, Franconia)	2
06	Intermediate School Districts (Districts 287, 916, 917)	3
07	Charter Schools	148
52/52	Miscellaneous Cooperative Districts	21
52/53	Special Education &/or Vocational Cooperative Districts	16
61	Education Districts	13
62	Integration Districts	5
70	State Schools/Academies	2
75	Telecommunication Districts	0

(Minnesota Department of Education, 2012)

APPENDIX B

MINNESOTA SERVICE COOPERATIVES REGION NUMBERS AND NAMES



Region number	Minnesota Cooperative Service Name
1 & 2	Northwest Service Cooperative
3	Northeast Service Cooperative
4	Lake Country Service Cooperative
5	National Joint Powers Alliance
7	Resources Training & Solutions
6 & 8	Southwest/West Central Service Cooperative
9	South Central Service Cooperative
10	Southeast Service Cooperative
11	Metro Educational Service Unit

(Minnesota Service Cooperative, 2013)

APPENDIX C

MINNESOTA PUBLIC SCHOOL BUILDING CLASSIFICATIONS 2011-2012

Code	School building classification	Grade level units	Total schools
10	Elementary Schools	PK-6	921
20	Middle Schools	5-8	190
31	Junior High Schools	7-9	35
32	Senior High Schools	9-12 or 10-12	210
33	Combined Secondary Schools	7-12	222
40	K-12 Schools	K-12	21

(Minnesota Department of Education, 2012)

APPENDIX D

MINNESOTA PE/DAPE PROFESSIONAL DEVELOPMENT SURVEY (MN PE/DAPE PD SURVEY)

School and Teacher Factors

1. Check the grade level school building unit that most closely resembles where you currently spend the majority of your time teaching PE and/or DAPE. Check only one.
   - o Elementary or Intermediate School
   - o Middle or Junior High School
   - o Senior High School
   - o 7-12 Secondary Schools

2. How many combined years of PE/DAPE teaching experience do you have up to and including this 2012-2013 school year? (Round up to the nearest whole number.) _____ years.

3. Including yourself, what is the total number of PE/DAPE teachers who teach in the same school building where you spend the majority of your time teaching? (Use an actual headcount of PE/DAPE, not the number of full- or part-time position.
   - o 1
   - o 2
   - o 3
   - o 4
   - o 5
   - o 6
   - o 7
   - o 8
   - o 9
   - o 10 or more

Professional Development Opportunities

4. During the past 12 months, did you attend PE/DAPE meetings, in-service, workshops or conferences in your school devoted to training PE/DAPE teachers in PE/DAPE content ideas, techniques, or materials?
   - o Yes
   - o No (Skip to question 7.)

5. On average, how many total hours did you attend PE/DAPE meetings, in-service, workshops or conferences in your school devoted to training PE/DAPE teachers in PE/DAPE content ideas, techniques, or materials?
   _____ hours

6. How much did you change the way you teach because of your attendance at PE/DAPE meetings, in-service, workshops or conferences in your school devoted to training PE/DAPE teachers in PE/DAPE content ideas, techniques, or materials?
   - o I made no changes
   - o I made a few changes
   - o I made some changes
   - o I made many changes
   - o I made significant changes

7. During the past 12 months, did you attend PE/DAPE meetings, in-service, workshops or conferences outside your school devoted to training PE/DAPE teachers in PE/DAPE content ideas, techniques, or materials?
   - o Yes
   - o No (Skip to question 10.)

8. On average, how many total hours did you attend PE/DAPE meetings, in-service, workshops or conferences outside your school devoted to training PE/DAPE teachers in PE/DAPE content ideas, techniques, or materials?
   _____ hours

9. How much did you change the way you teach because of your attendance at PE/DAPE meetings, in-service, workshops or conferences outside your school devoted to training PE/DAPE teachers in PE/DAPE content ideas, techniques, or materials?
   - o I made no changes
   - o I made a few changes
   - o I made some changes
   - o I made many changes
   - o I made significant changes

10. During the past 12 months did you have conversations with any PE/DAPE teachers about student learning in PE/DAPE?
    - o Yes
    - o No (Skip to question 13.)

11. On average, how often did you have conversations with any PE/DAPE teachers about student learning in PE/DAPE?
    - Less than once a month
    - Once a month
    - 2-3 times a month
    - Once a week
    - 2-3 times a week
    - Daily

12. How much did you change the way you teach because of your conversation with other PE/DAPE teachers about student learning in PE/DAPE?
    - I made no changes
    - I made a few changes
    - I made some changes
    - I made many changes
    - I made significant changes

13. During the past 12 months did you have conversations with any PE/DAPE teachers about new PE/DAPE curriculum or programs?
    - Yes
    - No (Skip to question 16.)

14. On average, how often did you have conversations with any PE/DAPE teachers about new PE/DAPE curriculum or programs?
    - Less than once a month
    - Once a month
    - 2-3 times a month
    - Once a week
    - 2-3 times a week
    - Daily

15. How much did you change the way you teach because of your conversation with other PE/DAPE teachers about new PE/DAPE curriculum or programs?
    - I made no changes
    - I made a few changes
    - I made some changes
    - I made many changes
    - I made significant changes

16. During the past 12 months did you have conversations with any PE/DAPE teachers about implementing national physical education standards?
    - Yes
    - No (Skip to question 19.)

17. On average, how often did you have conversations with any PE/DAPE teachers about implementing national physical education standards?
    - o Less than once a month
    - o Once a month
    - o 2-3 times a month
    - o Once a week
    - o 2-3 times a week
    - o Daily

18. How much did you change the way you teach because of your conversation with other PE/DAPE teachers about implementing national physical education standards?
    - o I made no changes
    - o I made a few changes
    - o I made some changes
    - o I made many changes
    - o I made significant changes

19. During the past 12 months did you have conversations with any PE/DAPE teachers about PE/DAPE teaching strategies?
    - o Yes
    - o No (Skip to question 22.)

20. On average, how often did you have conversations with any PE/DAPE teachers about PE/DAPE teaching strategies?
    - o Less than once a month
    - o Once a month
    - o 2-3 times a month
    - o Once a week
    - o 2-3 times a week
    - o Daily

21. How much did you change the way you teach because of your conversation with other PE/DAPE teachers about PE/DAPE teaching strategies?
    - o I made no changes
    - o I made a few changes
    - o I made some changes
    - o I made many changes
    - o I made significant changes

22. During the past 12 months did any PE/DAPE teachers observe you instructing PE/DAPE students?
    - o Yes
    - o No (Skip to question 25.)

23. On average, how often did any PE/DAPE teachers observe you instructing PE/DAPE students?
    - o Less than once a month
    - o Once a month
    - o 2-3 times a month
    - o Once a week
    - o 2-3 times a week
    - o Daily

24. How much did you change the way you teach because other PE/DAPE teachers observed you instructing PE/DAPE students?
    - o I made no changes
    - o I made a few changes
    - o I made some changes
    - o I made many changes
    - o I made significant changes

25. During the past 12 months did you receive feedback from any PE/DAPE teachers after they observed you instructing PE/DAPE students?
    - o Yes
    - o No (Skip to question 28.)

26. On average, how often did you receive feedback from any PE/DAPE teachers after they observed you instructing PE/DAPE students?
    - o Less than once a month
    - o Once a month
    - o 2-3 times a month
    - o Once a week
    - o 2-3 times a week
    - o Daily

27. How much did you change the way you teach because you received feedback from any PE/DAPE teachers after they observed you instructing PE/DAPE students?
    - o I made no changes
    - o I made a few changes
    - o I made some changes
    - o I made many changes
    - o I made significant changes

28. During the past 12 months did you observe other PE/DAPE teachers instructing PE/DAPE students?
    - o Yes
    - o No (Skip to question 31.)

29. On average, how often did you observe other PE/DAPE teachers instructing PE/DAPE students?
    - o Less than once a month
    - o Once a month
    - o 2-3 times a month
    - o Once a week
    - o 2-3 times a week
    - o Daily

30. How much did you change the way you teach because you observed other PE/DAPE teachers instructing PE/DAPE students?
    - o I made no changes
    - o I made a few changes
    - o I made some changes
    - o I made many changes
    - o I made significant changes

31. During the past 12 months did you give feedback to any PE/DAPE teachers after you observed them instructing PE/DAPE students?
    - o Yes
    - o No (Skip to question 34.)

32. On average, how often did you give feedback to any PE/DAPE teachers after you observed them instructing PE/DAPE students?
    - o Less than once a month
    - o Once a month
    - o 2-3 times a month
    - o Once a week
    - o 2-3 times a week
    - o Daily

33. How much did you change the way you teach because of the feedback you gave to other PE/DAPE teachers after you observed them instructing PE/DAPE students?
    - o I made no changes
    - o I made a few changes
    - o I made some changes
    - o I made many changes
    - o I made significant changes

34. During the past 12 months did you work in collaboration with other PE/DAPE teachers on school or district PE/DAPE projects, excluding team teaching?
    - o Yes
    - o No (Skip to question 37.)

35. On average, how often did you work in collaboration with other PE/DAPE teachers on school or district PE/DAPE projects, excluding team teaching?
    - o Less than once a month
    - o Once a month
    - o 2-3 times a month
    - o Once a week
    - o 2-3 times a week
    - o Daily

36. How much did you change the way you teach because you worked in collaboration with other PE/DAPE teachers on school or district PE/DAPE projects, excluding team teaching?
    - o I made no changes
    - o I made a few changes
    - o I made some changes
    - o I made many changes
    - o I made significant changes

37. During the past 12 months did <u>you seek advice</u> about PE/DAPE issues (i.e., student learning, curriculum, standards, and teaching strategies) via email, Internet, phone, texting, and/or face-to-face meetings with other PE/DAPE teachers?
    - o Yes
    - o No (Skip to question 40.)

38. On average, how often did <u>you seek advice</u> about PE/DAPE issues (i.e., student learning, curriculum, standards**,** and teaching strategies) via email, Internet, phone, texting, and/or face-to-face meetings with other PE/DAPE teachers?
    - o Less than once a month
    - o Once a month
    - o 2-3 times a month
    - o Once a week
    - o 2-3 times a week
    - o Daily

39. How much did you change the way you teach because of the <u>advice you received</u> about PE/DAPE issues (i.e., student learning, curriculum, standards, and teaching strategies) via email, Internet, phone, texting, and/or face-to-face meetings with other PE/DAPE teachers?
    - o I made no changes
    - o I made a few changes
    - o I made some changes
    - o I made many changes
    - o I made significant changes

40. During the past 12 months did you give advice about PE/DAPE issues (i.e., student learning, curriculum, standards, and teaching strategies) via email, Internet, phone, texting, and/or face-to-face meetings with other PE/DAPE teachers?
    - o Yes
    - o No (Skip to question 43.)

41. On average, how often did you give advice about PE/DAPE issues (i.e., student learning, curriculum, standards, and teaching strategies) via email, Internet, phone, texting, and/or face-to-face meetings with other PE/DAPE teachers?
    - o Less than once a month
    - o Once a month
    - o 2-3 times a month
    - o Once a week
    - o 2-3 times a week
    - o Daily

42. How much did you change the way you teach because of the advice you gave about PE/DAPE issues (i.e., student learning, curriculum, standards, and teaching strategies) via email, Internet, phone, texting, and/or face-to-face meetings with other PE/DAPE teachers?
    - o I made no changes
    - o I made a few changes
    - o I made some changes
    - o I made many changes
    - o I made significant changes

43. During the past 12 months did you read professional journals, articles, or books related to PE/DAPE content?
    - o Yes
    - o No (Skip to question 46.)

44. On average, how often did you read professional journals, articles, or books related to PE/DAPE content?
    - o Less than once a month
    - o Once a month
    - o 2-3 times a month
    - o Once a week
    - o 2-3 times a week
    - o Daily

45. How much did you change the way you teach because of what you read in professional journals, articles, or books related to PE/DAPE content?
    - o I made no changes
    - o I made a few changes
    - o I made some changes
    - o I made many changes
    - o I made significant changes

46. During the past 12 months did you enroll in any PE/DAPE graduate level university or college courses?
    - o Yes
    - o No (Skip to question 49.)

47. On average, how many <u>total credits</u> did you earn by participating in PE/DAPE graduate level university or college courses?
    _____ credits.

48. How much did you change the way you teach because of your participation in PE/DAPE graduate level university or college courses?
    - o I made no changes
    - o I made a few changes
    - o I made some changes
    - o I made many changes
    - o I made significant changes

49. During the past 12 months did you attend in any PE/DAPE special courses (i.e., Red Cross or First Aid certification)?
    - o Yes
    - o No (Skip to end of survey.)

50. On average, how many <u>total hours</u> did you attend any PE/DAPE special courses (i.e., Red Cross or First Aid certification)?
    _____ hours.

51. How much did you change the way you teach because of your attendance at PE/DAPE special courses (i.e., Red Cross or First Aid certification)?
    - o I made no changes
    - o I made a few changes
    - o I made some changes
    - o I made many changes
    - o I made significant changes

<u>End of Survey</u>

THANK YOU! You have reached the end of the MN PE/DAPE Professional Development Survey.

If you have any additional comments, please share them in the space provided below. Any feedback you have will be considered and appreciated.

I will send a summary of key findings from this study to your Superintendent with a request to share the results with you and your entire district PE/DAPE staff.

Finally, please click on the >> **forward arrows** to submit your responses. Thanks again. Sally

APPENDIX E

SURVEY PARTICIPANT INFORMED CONSENT

PROJECT TITLE: The effect of participation in professional development on perceived change in teaching by Minnesota K-12 physical education teachers.

PROJECT DIRECTOR: Sally Sertich

PHONE: 218-368-0640

DEPARTMENT: Educational Leadership/University of North Dakota

Introduction/Purpose:
Welcome! My name is Sally Sertich and I invite you to participate in a research study as part of my dissertation process at the University of North Dakota. You are receiving this email because your school district superintendent granted me permission to distribute my survey to you regarding professional development activities of Minnesota K-12 public school physical education and/or developmental adapted physical education (PE/DAPE) teachers.

The purpose of this study is to learn about characteristics of professional development activities that influence changes in your PE/DAPE teaching practice. I invite you to complete the Minnesota PE/DAPE Professional Development (MN PE/DAPE PD) survey below.

The survey will take approximately 5-10 minutes to complete. Let's begin.

This survey is designed for licensed teachers who have been teaching PE and/or DAPE in a MN K-12 public school for at least one school year. Does this describe your teaching experience?

- Yes
- No

Informed Consent: Should you decide to participate in this research study, you must give informed consent prior to completing the survey. This consent is based on an understanding of the nature and risks of the research. The information below will help you understand the research process. Research projects include only participants who

choose to participate voluntarily. At the end of this section, you will be asked to indicate whether or not you choose to participate.

Procedure: Your school district superintendent granted me permission to invite you to participate in the MN PE/DAPE Teacher Professional Development Survey. As a participant, you will be asked to complete the survey using this on-line software program called Qualtrics. The survey will take approximately 5-10 minutes to complete. The questions in the survey pertain to your participation in specific professional development activities over the past 12 months and your perceptions about whether or not the knowledge you gained changed your teaching practice.

Risks**:** There are no known physical risks associated with taking part in this study. If you feel uncomfortable while filling out the survey, or experience any fatigue or discomfort, you may choose to discontinue your participation at that time.

Benefits**:** There may be no direct individual benefit to you from taking part in the research study; however, your participation may help identify characteristics of PE/DAPE professional development activities that influence changes in teaching practice and, ultimately, help improve the learning of K-12 students.

Financial Information**:** You will not be paid, nor have any costs to you for being in this research study. The University of North Dakota and the researcher are receiving no payments from other agencies, organizations, or companies to conduct this research study.

Confidentiality**:** The records of this study will be kept private to the extent permitted by law. The study record may be reviewed by Government agencies, and the University of North Dakota Institutional Review Board. Any information that is obtained in this study and that can be identified with you, your school building and school district will remain confidential and will be disclosed only with your permission or as required by law. Confidentiality will be maintained by using the Qualtrics survey software program to assure you that no individual PE/DAPE teacher, individual school building or individual school district will be mentioned in the study findings.

A summary of the survey findings will be sent via email to your superintendent with a request that this information be shared with you.

Findings from this study may be used for publication or presentation at scientific meetings. Should survey findings be discussed, you, your school building and school district will be protected by using a pseudonym. If I write a report or article about this

study, I will describe the study findings in a summarized manner so that you, your school building, and school district cannot be identified.

The research data will be recorded and saved using the Qualtrics survey software program at the University of North Dakota. Any data collected from human participants over computer networks will be transmitted in encrypted form. At the end of the research study, the survey data will be kept in a bank safe deposit box to protect your anonymity and destroyed after a three year time period.

Participation**:** Your participation is voluntary. You may choose not to participate or you may discontinue your participation at any time without penalty or loss of benefits to which you are otherwise entitled. Your decision whether or not to participate will not affect your current or future relations with the University of North Dakota.

Contact and Questions: The researcher conducting this study is Sally Sertich. Prior to deciding whether or not to participate, you may ask any questions by sending an email to sally.sertich@my.und.edu. I will respond with further information to help you make an informed participation decision. If you have questions, concerns, or complaints about the research at a later date, please contact me at sally.sertich@my.und.edu or my advisor, Brenda Kallio at brenda.kallio@email.und.edu. If you have questions regarding your rights as a research subject, or if you have any concerns or complaints about the research, you may contact the University of North Dakota Institutional Review Board at (701) 777-4279. Please call this number if you cannot reach research staff, or you wish to talk with someone else.

Clicking the ***"Yes"*** option below indicates that this research study has been explained to you and that you agree to participate voluntarily in this study.

Clicking the ***"No"*** option below indicates that you choose not to participate in this study.

- o Yes, I will participate voluntarily in this study. I read and understand the conditions for this research project.
- o No, I choose not to participate in this research project.

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