

Teacher Beliefs and Changes in Practice Through Professional Development

Ben D. Kern

University of Wyoming

Chad M. Killian

Georgia State University

Douglas W. Ellison

Kent State University

Kim C. Graber

University of Illinois Urbana-Champaign

Elaine Belansky and Nicholas Cutforth

University of Denver

The purpose of this study was to determine how the research intervention called Healthy Eaters, Lifelong Movers (HELM) and associated San Luis Valley Physical Education Academy (SLVPEA) influenced teachers' beliefs about physical education and the extent to which they sustained pedagogical changes over time. Seventeen physical educators who completed the 2-year intervention were interviewed 3 years later, and data collected during HELM/SLVPEA using the System for Observing Fitness Instruction Time were analyzed to create an individual change profile. Mean difference of System for Observing Fitness Instruction Time variables at baseline and postintervention was analyzed using dependent, paired-samples *t* tests, treating each participant as a separate case. Qualitative data were analyzed using a standard interpretive approach and constant comparison methodology. Teachers made significant changes during HELM/SLVPEA and maintained these changes 3 years later. Their beliefs about physical education were altered, and many reported feeling less marginalized. The provision of resources along with ongoing site support facilitated changes in beliefs and practice.

Keywords: SOFIT, SPARK, subjective theory, teacher socialization

Teacher change refers to the process by which teachers make changes to their pedagogy in varying contexts (Guskey, 2014), including their use of instructional resources, approach(es) to teaching, and beliefs about teaching and learning (Fullan, 2007). Research indicates that teachers often resist change (Hargreaves & Fullan, 2012), particularly when it is not self-initiated, but rather mandated in a top-down manner by administrators, policy, or professional development (PD) initiatives (Kern & Graber, 2018; Richardson, 1998). For physical education teachers, the propensity to initiate and attempt change can be understood by considering the development of teaching ideologies from an occupational socialization theory (OST) perspective (Richards, Pennington, & Sinelnikov, 2019). Commonly referred to as teacher socialization, OST describes how physical educators acquire and evolve their subjective theories or beliefs about the purpose of physical education and their role as a teacher through dialectic interactions with socializing agents, such as students, teacher colleagues, administrators, and community members (Richards, Templin, & Graber, 2014). This acquisition of beliefs drives teachers' instructional

decision making, including those related to making pedagogical change (Kern, Graber, Woods, & Templin, 2019).

Teacher Socialization and Beliefs

Though not a linear process, OST is typically discussed in the context of three chronologically distinct phases: (a) acculturation, (b) professional socialization, and (c) organizational socialization (Richards et al., 2019). During the initial acculturation, or pre-training phase of teacher socialization, future teachers spend roughly 13,000 hr as students learning about the profession through an *apprenticeship of observation* by observing their teachers, coaches, and other influential adults (Lortie, 1975; Richards et al., 2014). During this time, highly change-resistant beliefs about physical education teaching are formed (Curtner-Smith, 2017), and students who experience teaching practices that promote learning may come to expect that physical education is an academic subject and the teacher's role is to facilitate student learning (Graber, 1996; Lux & McCullick, 2011). In contrast, those experiencing minimalist or nonteaching teachers (Curtner-Smith, 2009) may conclude that physical education is not academically significant and the teachers' role is of limited value to learning. Research suggests students commonly experience the latter and subsequently enter formal teacher education with narrow views of the profession (Graber, Killian, & Woods, 2017), often choosing to pursue teaching in order to be involved in coaching extracurricular sports (Richards, 2015).

Kern is with the Division of Kinesiology and Health, University of Wyoming, Laramie, WY, USA. Killian is with the Department of Kinesiology and Health, Georgia State University, Atlanta, GA, USA. Ellison is with the School of Teaching, Learning and Curriculum Studies, Kent State University, Kent, OH, USA. Graber is with the Department of Kinesiology & Community Health, University of Illinois Urbana-Champaign, Champaign, IL, USA. Belansky and Cutforth are with the Morgridge College of Education, University of Denver, Denver, CO, USA. Kern (bkern2@uwyo.edu) is corresponding author.

During teacher education (professional socialization), preservice teachers are exposed to information about best practices in P–12 schools, which may be contradictory to their previous acculturation experiences. In highly effective teacher education programs, preservice teachers' beliefs about teaching physical education that do not align with the values espoused in the teacher education program may be altered if students are exposed to high-impact practices by the teacher education faculty (Graber, 1996; Graber et al., 2017). However, research also suggests the impact of professional socialization during preservice education on teachers' beliefs is limited regardless of the extent to which innovative and evidence-based practices are introduced (Darling-Hammond, Holtzman, Gatlin, & Heilig, 2005), and it is common for long-held beliefs developed during acculturation to endure (Curtner-Smith, 2017).

Following formal training, teachers encounter organizational socialization as they begin a professional teaching career in schools. In some cases, beginning physical education teachers enter the workforce with innovative orientations toward teaching acquired during preservice teacher education that often oppose the status quo, and these novice teachers may seek to change the more custodial approach of more veteran teachers and their programs (Richards et al., 2019; Stroot & Ko, 2006). In most cases, however, teachers conform to the more custodial orientations of their teaching colleagues (Confait, 2015; Curtner-Smith, Hastie, & Kinchin, 2008) and the greater school context (Blankenship & Coleman, 2009; Kearney, 2014), often referred to as the *institutional press* (Zeichner & Tabachnick, 1983). Compounding difficulties experienced with a mismatch of teaching orientations (e.g., innovative vs. custodial), physical education teachers commonly experience marginalization with regard to their content area and their status as teachers (Gaudreault, Richards, & Woods, 2017). This phenomenon can lead some teachers reduce their expectations for student performance in physical education classes (Laureano et al., 2014) and may result in premature departure from the teaching profession.

Teacher socialization offers critical insight into how teachers' beliefs are formed (Richards & Lux Gaudreault, 2017) and a well-developed body of literature has also demonstrated that teacher beliefs both precede and predict practice (Fang, 1996; Lumpe, Czerniak, Haney, & Beltyukova, 2012; Tsangaridou, 2006). Beliefs form the basis for nearly all instructional decisions (Hargreaves & Fullan, 2012; Kulinna, Silverman, & Keating, 2000), including those related to curriculum, instructional strategies, and assessment (Kennedy, 2005). While critical to the educational process, teacher beliefs that are reinforced by socializing agents can be especially difficult to change (Curtner-Smith et al., 2008; Lee & Curtner-Smith, 2011). For example, some physical education teachers hold a belief that dressing for and participating in physical education class is sufficient for students to earn high grades (Melograno, 2007). This belief is supported when socializing agents, such as students, teaching colleagues, administrators, and parents, also believe that physical education is not of the same academic rigor as other subjects (Kougioumtzis, Patriksson, & Stråhlman, 2011; Lux & McCullick, 2011) and encourage the teacher to simply allow students to play games without focusing on skill development or other forms of student learning. Encouragingly, research conducted with physical education teachers has shown that the metaphors teachers use to describe themselves tend to shift from teacher-centered to more student-centered as they transition from preservice to in-service teaching (Stylianou, Hodges Kulinna, Cothran, & Kwon, 2013). Study of teachers' metaphors provides insight to their beliefs (Tannehill &

MacPhail, 2014), which is an important consideration in their continued professional learning.

Professional Development

Past research has also addressed teacher beliefs regarding the effectiveness of PD, and while important to teachers' continued professional growth (Moon, 2011), most PD administered in schools is not effective in altering teachers' practices or their beliefs about the education process (Borko, 2004; Kennedy, 2016). School in-service PD often takes the form of short-term workshops that offer only superficial learning, inadequate resources, and little follow-up, ultimately leading to minimal substantial pedagogical change (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009). Guskey (2002) contends that teacher belief change through PD can only occur after teachers experience positive changes in student learning outcomes as a result of their changes in practice. Fullan (2007) concurred that change in beliefs is central to long-term sustained instructional change and added that teachers must initiate and actively participate in PD, as well as have some ownership or agency to make change as a result of PD.

Despite a less than fruitful track record, there are reports in the physical education literature where PD has successfully transformed teachers' instructional practices, and to varying extents, their beliefs (Hodges, Hodges Kulinna, Lee, & Kwon, 2017; Patton & Griffin, 2008; Ward, Doutis, & Evans, 1999). For example, Ward et al.'s (1999) *The Saber-tooth project* showed changes in teachers' practices along with a more unified vision of physical education as a result of a year-long PD initiative. Patton and Griffin (2008) reported improved alignment of physical education teachers' instruction and assessment practices through ongoing PD, and to a lesser extent, changes in their beliefs about teaching physical education. Recently, Hodges et al. (2017) indicated that positive student outcomes helped to reinforce physical education teachers' beliefs about teaching health-related fitness knowledge over a 4-week PD initiative in which Knowledge in Action Lesson Segments were implemented. In spite of these reports of PD successfully altering physical education teachers' practice and beliefs, there remains few examples of physical education-specific PD in which changes to teaching practices are objectively measured and evidence of changes to teachers' subjective theories are evaluated longitudinally.

The Healthy Eaters, Lifelong Movers (HELM) project that facilitated the formation of the San Luis Valley Physical Education Academy (SLVPEA) (Belansky, Cutforth, Kern, & Scarbro, 2016) is one recent example where physical educators received extensive, ongoing PD over a 2-year period, and changes to their teaching practices along with student outcomes were documented using the System for Observing Fitness Instruction Time (SOFIT). The teachers involved in the SLVPEA, a subdivision of HELM, were provided evidence-based curriculum, multiple days of training, and collaboration with colleagues, equipment, and monthly/biweekly follow-up support from master teachers known as site-coordinators. Ultimately, these efforts resulted in significant increases in student moderate-to-vigorous physical activity (MVPA) and skill-focused instructional time, along with significant reductions in class time spent on behavior management, game play, and free play (Belansky et al., 2016). For a complete description of the HELM project and SLVPEA activities, see Belansky et al. (2016).

Currently there is little research regarding the sustainability of changes made as a result of PD in physical education (Goodyear,

2017), particularly in regard to interventions aiming to increase student MVPA as a result of altered teaching practices (Lonsdale, Rosenkranz, Peralta, Bennie, & Fahey, 2013). In addition, few studies have considered the challenges faced by rural physical educators (Joens-Matre et al., 2008), who make up a considerable percentage of the workforce (Provasnik et al., 2007). Furthermore, a small number of studies have chronicled successful PD initiatives longitudinally in general education (Caena, 2011); thus, longitudinal examinations of PD are important to the broader educational field at this time. To that end, the longitudinal sustainability of PD, while underrepresented in the literature, may be the most salient because the true value of PD resonates in its long-term effectiveness for future practice (Guskey, 2002). Moreover, the concept of longitudinal teacher change through PD has not been examined in relation to teacher socialization and beliefs; therefore, the nature of how PD initiatives impact the dynamics of teacher socialization and the greater school context in which physical educators work is not understood at this time.

To better understand sustainable teacher change PD initiatives, a 3-year follow-up study, grounded in teacher socialization theory, was conducted with teachers who participated in the HELM/SLVPEA. The purpose of the study was to determine how the HELM project and SLVPEA influenced teachers' beliefs about physical education and the extent to which they sustained pedagogical changes following cessation of the project. Specifically, three research questions framed the inquiry: (a) To what extent did teachers' pedagogical practices and beliefs about physical education change and sustain after participation in the HELM project and the SLVPEA? (b) How did the HELM project and SLVPEA impact teachers' interactions with socializing agents and the organizational context in which they work? and (c) What features of the HELM project and SLVPEA were most impactful to teachers' ability to initiate and sustain change?

Methods

The HELM project represented a school–university partnership between 14 rural school districts in southern Colorado and the University of Colorado-Denver. Related activities occurred during two consecutive school years from 2011 to 2013, with each teacher experiencing one full school year of project-related PD. The goal of HELM was to increase opportunities for healthy eating and physical activity for children attending partner schools. The SLVPEA was the branch of the HELM project that focused on increasing student physical activity levels in and out of school through the promotion of high-quality physical education instruction. As participants in the SLVPEA, teachers received the online and print versions of the Sports Play and Active Recreation for Kids (SPARK) physical education curriculum (sparkpe.org, n.d.), an equipment package worth roughly \$4,000 to implement SPARK, three 2-day PD workshops conducted by SPARK elite level trainers and HELM personnel, and biweekly/monthly instructional support from site coordinators.

A primary goal of the SLVPEA was to increase student MVPA as a result of changes to teachers' pedagogical practices such that they would be more in line with the curricular model called Health Optimizing Physical Education (HOPE; Metzler, McKenzie, van der Mars, Barrett-Williams, & Ellis, 2013) and promote greater student knowledge and skill development for participation in lifelong physical activity (Belansky et al., 2016). The SPARK curriculum was chosen because of its alignment with the HOPE model and availability of on-site delivery of associated PD.

Importantly, the current study was conducted 3 years following the conclusion of HELM/SLVPEA and represents efforts to understand its lasting effects. The HELM/SLVPEA project was designed around Fullan's (2007) recommendation that four broad conditions must exist for PD to be effective in promoting long-term change: (a) teachers initiate and actively participate, (b) both local pressure and support for change is available for the duration of PD, (c) teachers change both practices and beliefs, and (d) teachers demonstrate ownership in making change. In order to garner support in a more bottom-up as opposed to top-down manner, the HELM/SLVPEA researchers utilized a community-based participatory approach (Israel, Eng, Schulz, & Parker, 2005), to guide decision making and procedures for working with teachers, and facilitating an equitable partnership. The research procedures included in the original study that took place at the conclusion of HELM/SLVPEA are available in Belansky et al. (2016), and procedures included here are focused on the 3-year follow-up.

Collection of SOFIT Data

Student physical activity levels and physical education lesson context were assessed via SOFIT at baseline and postintervention. The SOFIT data collection was conducted by two trained/certified data collectors from April 2011 (baseline) to March–May 2013 (post), and complete data were available for 17 physical education teachers. The SOFIT data collection training resulting in SOFIT data collection certification was administered by an independent expert to all data collectors in the study, and 89.9% interrater agreement was achieved in both video recorded and live physical education lessons prior to any data collection. Baseline SOFIT measures were taken prior to PD and postintervention SOFIT data collection occurred for each teacher after approximately 1 calendar year. Elementary and secondary teachers entered the intervention first; thus, their baseline SOFIT testing occurred in April–May 2011 with posttesting in March–May 2012. Middle and high school teachers entered the intervention a year later, and baseline SOFIT occurred in March–May 2012 with posttesting occurring in March–May 2013. In addition to the establishment of interrater reliability at baseline, interrater reliability checks were completed at the end of the first year on 6.3% of observations yielding 91.1% interrater agreement and at the end of the second year on 7.4% yielding 92.4% interrater agreement.

The SOFIT data were analyzed in aggregate for all 17 teachers, and data categories were based on the percentage of physical education class time students spent engaged in MVPA, MVPA in the first 5 min of class, and the percentage of class time when the teaching context was primarily: management, knowledge instruction, fitness instruction, skill practice, game play, or free play (Belansky et al., 2016). For the purposes of this study, the SOFIT data collected during SLVPEA were further analyzed to produce an individual pedagogical change profile for each teacher that included changes in their lesson context variables and student MVPA. This analysis was conducted in order to demonstrate the extent to which each individual teacher made pedagogical changes throughout the intervention and provide context and a source of data triangulation for this 3-year qualitative follow-up study.

Formal Interviews

Teachers who completed all HELM/SLVPEA-related activities from April 2011 to May 2013 ($N=22$) and for which complete SOFIT data were available ($n=17$) were included in the current study. After receiving University of Illinois institutional review

Table 1 Teacher Pseudonyms and Demographic Information

Pseudonym	Grade level taught	Years of experience
Arnold	Elementary K–5	8
Autumn	Middle school 6–8	5
Braden	Middle school 7–8	5
Byron	Middle school 6–8	5
Candice	Middle school 6–8	11
Deidre	Elementary K–2	27
Jacob	Middle school 6–8	10
Julian	Elementary Pre–K–5	15
Katelynn	Multigrade K–12	19
Kari	Elementary K–5	27
Marcus	High school 9–12	25
Miguel	Multigrade K–12	10
Patty	Middle school 6–8	21
Roger	Elementary K–5	8
Talia	Elementary K–5	20
Valerie	Elementary K–6	29
Winston	Multigrade K–12	5

Note. Years of experience represent the number of consecutive or nonconsecutive years teaching physical education at the time of data collection in spring 2016. Deidre, Miguel, and Valerie are now retired. Talia is currently employed in administration in her district.

board approval for the current (3-year follow-up) study, these 17 teachers were recruited via e-mail request for interview and each provided written consent. Each teacher completed an in-depth interview lasting approximately 60 min after a 34- to 36-month time span following the conclusion of HELM/SLVPEA activities (see Table 1 for demographic information). A semistructured interview guide (Patton, 2015) focusing on the pedagogical changes that teachers made during the time they were involved in HELM/SLVPEA was utilized for interviews. The interview questions were directly aligned with the study research questions and allowed participants to elaborate on the aspects of their programs they changed and sustained, as well as the reaction of socializing agents and the elements of the intervention that they found most valuable. Sample questions included (a) “How did you and your physical education program change during the HELM project?” (b) “How did students, colleagues, administrators, and parents of students respond to the changes you made during HELM?” and (c) “What parts of HELM/SLVPEA did you find most beneficial, and why?” The interviews were conducted by multiple researchers and were then audio recorded and transcribed verbatim. Prior to analysis, participants were assigned pseudonyms to protect their individual identities and a different researcher conducted the qualitative analysis in order to reduce the possibility of bias. The lead researcher, who served as a research assistant/site coordinator during HELM/SLVPEA and worked closely with participating teachers, did not conduct interviews to avoid potential bias. Furthermore, data analysis was conducted as a team that also included others not involved with the initial PD project.

Data Analysis

System for Observing Fitness Instruction Time. The SOFIT data analysis included calculation of descriptive statistics (mean

difference \pm *SD*), resulting in a pre/post difference profile for each participant on all SOFIT measures, including the percentage of physical education class time that was spent in: (a) overall student MVPA, (b) student MVPA in the first 5 min of class, (c) management, (d) knowledge instruction, (e) fitness instruction, (f) skill practice, (g) game play, and (h) free play (Table 2). Participants’ pre/post data for each SOFIT category were inspected visually via histogram plots and each appeared approximately normally distributed. Kolmogorov–Smirnov tests revealed no significant ($p < .05$) deviations from normal; thus, the assumption of normality of data was accepted prior to parametric testing. Dependent, paired-samples *t* tests for each SOFIT variable were conducted separately for each individual teacher to determine if the means of each SOFIT categorical variable differed from pre- to postintervention. Effect sizes for each individual teacher’s SOFIT difference scores were calculated and represented as Cohen’s *d* (Table 2), with the following benchmark values 0.2 = small, 0.5 = medium, and 0.8 = large effect size (Cohen, 1988). Significance was accepted at $p < .05$.

Interviews. Following transcription of all interviews, the data were coded by a single researcher using a standard interpretive approach and constant comparison methodology (Strauss & Corbin, 2015). The coding process included multiple readings of all transcripts, followed by an initial assignment of open codes, then axial coding and the construction of themes (Saldaña, 2015). The open coding process identified participant response patterns in the data and was carried out inductively in order to avoid interpretations being driven only by existing theory (Strauss & Corbin, 2015). Axial coding and thematic construction was conducted using teacher socialization theory as an interpretive guide, and at this point, the analytic process became deductive in nature.

Credibility and trustworthiness. To ensure the credibility and trustworthiness of analysis, peer debriefing, negative case analysis, frequent member checks, and triangulation were employed at various times throughout data collection and analysis (Lincoln & Guba, 1985). Peer debriefing occurred during the data collection period, throughout coding, and continued regularly during thematic construction. Debriefing sessions included individuals who were former and current physical education teachers, university physical education teacher educators, and university education and public health researchers. Negative cases were identified throughout analysis, which contributed to a full range of responses and ensured that final themes were representative of all participant data (Lincoln & Guba, 1985). Member checking was conducted by frequently asking clarifying questions such as “I hear you saying . . . is that correct?” Following interviews, member checks were obtained by e-mailing individual participants a researcher prepared summary of their responses to questions and asking if their intended meaning was accurately captured (Lincoln & Guba, 1985). No participants offered requests for substantial changes as a result of these summaries.

The SOFIT analysis yielded a profile of pedagogical change each teacher made throughout the HELM/SLVPEA intervention, which was then matched against their responses to interview questions as a source of triangulation. For example, one interview question required teachers to describe changes they made to their practice during HELM, and each teacher’s response to this question was checked against their individual SOFIT data in order to support and/or refute their responses. This direct triangulation increases the confidence in the teachers’ responses, as the interviews were conducted approximately 3 years following the end of HELM/

Table 2 Mean Pre- to Postintervention Percentage of Class Time Spent With Students Engaged in MVPA and Time Spent in Different Teaching Contexts as Measured by SOFIT

Teacher name (SOFIT obs. pre, post)	Overall %MVPA		%MVPA First 5 min		%Management Mean diff. (d)	%Knowledge Mean diff. (d)	%Fitness Mean diff. (d)	%Skill practice Mean diff. (d)	%Game play Mean diff. (d)	%Free play Mean diff. (d)	
	Mean	diff. (d)	Mean	diff. (d)							
Arnold (<i>n</i> = 16, 12)	16.7 ± 8.3***	(2.0)	30.0 ± 9.7***	(3.1)	-6.6 ± 10.5**	(0.6)	4.5 ± 12.2* (0.4)	6.3 ± 13.8 (0.5)	14.2 ± 24.9* (0.6)	-19.9 ± 34.8** (0.6)	0.2 ± 0.7 (0.3)
Autumn (<i>n</i> = 6, 6)	23.2 ± 12.3**	(1.9)	31.1 ± 28.2 (1.1)		-6.8 ± 6.4**	(1.1)	-15.4 ± 26.7 (0.6)	9.5 ± 24.8 (0.4)	10.6 ± 41.9 (0.3)	-9.6 ± 17.7 (0.5)	0.0 ± 0.0 (0)
Braden (<i>n</i> = 3, 6)	22.5 ± 13.5*	(1.7)	23.3 ± 6.0***	(3.9)	-6.9 ± 7.7 (0.9)		3.7 ± 4.5 (0.8)	-12.9 ± 20.3 (0.6)	-2.4 ± 12.1 (0.2)	24.0 ± 5.8 (4.1)	0.0 ± 0.0 (0)
Byron (<i>n</i> = 23, 16)	18.5 ± 13.6***	(1.4)	21.4 ± 17.3**	(1.2)	-7.0 ± 2.6***	(2.7)	-7.7 ± 7.6* (1.0)	8.6 ± 29.2 (0.3)	12.1 ± 23.4*** (0.5)	-37.0 ± 17.7*** (2.1)	0.0 ± 0.0 (0)
Candice (<i>n</i> = 14, 14)	24.7 ± 18.8***	(1.3)	22.1 ± 7.6***	(2.9)	-3.5 ± 8.8 (0.4)		1.6 ± 11.3 (0.1)	2.7 ± 19.8 (0.1)	7.0 ± 26.3 (0.3)	-6.8 ± 25.6 (0.3)	-4.5 ± 3.9*** (1.2)
Deidre (<i>n</i> = 24, 18)	20.9 ± 20.6***	(1.0)	29.8 ± 9.1***	(3.3)	-8.0 ± 3.5***	(2.3)	3.9 ± 17.9 (0.2)	6.0 ± 6.2*** (1.0)	14.3 ± 22.5*** (0.6)	-27.6 ± 21.9*** (1.3)	0.0 ± 0.0 (0)
Jacob (<i>n</i> = 14, 15)	12.5 ± 10.6***	(1.2)	10.5 ± 16.5* (0.6)		-5.8 ± 1.7***	(3.4)	5.2 ± 14.4* (0.4)	6.0 ± 10.4* (0.6)	0.5 ± 1.6 (0.3)	-6.5 ± 9.9 (0.7)	0.0 ± 0.0 (0)
Julian (<i>n</i> = 20, 18)	4.4 ± 17.1 (0.3)		29.7 ± 22.6***	(1.3)	-5.9 ± 3.7***	(1.6)	3.3 ± 8.2*** (0.4)	5.7 ± 13.5 (0.4)	17.3 ± 18.2*** (1.0)	-21.8 ± 12.9*** (1.7)	-3.7 ± 6.4* (0.6)
Katelynn (<i>n</i> = 9, 9)	4.9 ± 9.1 (0.5)		0.7 ± 3.4 (0.2)		-2.9 ± 3.5 (0.8)		3.9 ± 1.8*** (2.2)	2.3 ± 21.6 (0.1)	19.8 ± 18.0* (1.1)	-18.1 ± 17.8* (1.0)	0.0 ± 0.0 (0)
Kari (<i>n</i> = 17, 9)	8.8 ± 9.6** (0.9)		18.4 ± 26.6* (0.7)		-3.0 ± 5.9 (0.5)		2.6 ± 10.6 (0.2)	7.1 ± 15.2* (0.5)	15.7 ± 18.2 (0.9)	9.1 ± 24.3 (0.4)	-9.2 ± 8.6*** (1.1)
Marcus (<i>n</i> = 15, 11)	21.9 ± 23.3***	(0.9)	26.7 ± 35.1***	(0.8)	-7.2 ± 9.5** (0.8)		4.6 ± 8.0** (0.6)	12.0 ± 44.6 (0.3)	12.9 ± 45.9 (0.3)	-27.1 ± 49.5* (0.5)	-1.6 ± 6.1 (0.3)
Miguel (<i>n</i> = 9, 9)	16.6 ± 11.3***	(1.5)	28.1 ± 18.2**	(1.5)	-2.3 ± 4.2 (0.5)		-3.4 ± 5.4 (0.6)	4.1 ± 11.4 (0.4)	7.2 ± 29.7 (0.2)	-18.7 ± 20.7 (0.9)	-25.2 ± 26.5*** (1.0)
Patty (<i>n</i> = 4, 5)	16.2 ± 2.1***	(7.7)	22.3 ± 21.1* (1.1)		-5.7 ± 5.8 (1.0)		0.7 ± 5.5 (0.1)	8.8 ± 22.5 (0.4)	15.3 ± 11.0 (1.4)	-5.1 ± 19.3 (0.3)	-4.5 ± 6.3 (0.7)
Roger (<i>n</i> = 12, 12)	17.3 ± 11.7***	(1.5)	25.6 ± 22.2**	(1.2)	-3.2 ± 7.2 (0.4)		3.6 ± 11.1** (0.3)	8.0 ± 28.4 (0.3)	29.6 ± 31.7** (0.9)	-19.7 ± 19.8 (1.0)	0.0 ± 0.0 (0)
Talia (<i>n</i> = 17, 14)	9.6 ± 13.1** (0.7)		20.9 ± 21.5**	(1.0)	-2.2 ± 3.7 (0.6)		1.1 ± 13.9 (0.1)	8.2 ± 19.5* (0.4)	26.1 ± 18.8*** (1.4)	-28.6 ± 19.8*** (1.4)	-0.2 ± 0.6 (0.3)
Valerie (<i>n</i> = 12, 12)	15.0 ± 8.7***	(1.7)	21.0 ± 45.0 (0.5)		3.7 ± 5.3 (0.7)		3.29 ± 7.2 (0.5)	0.4 ± 27.7 (0.0)	27.4 ± 6.0 (4.6)	-29.4 ± 27.4*** (1.1)	0.0 ± 0.0 (0)
Winston (<i>n</i> = 9, 6)	21.8 ± 17.7 (1.2)		23.0 ± 14.7 (1.6)		3.3 ± 3.8 (0.9)		3.8 ± 8.0 (0.5)	-6.1 ± 2.3 (2.7)	7.5 ± 26.6 (0.3)	-5.9 ± 17.7 (0.3)	-4.5 ± 5.7 (0.8)

Note. Each individual SOFIT observation consisted of one full class period. The number of pre- to postintervention SOFIT observations for each teacher are indicated in parentheses, with the first being the number of preintervention observations and the second being the number of postintervention observations. The number of observations varied between teachers due to the number of physical education classes taught and availability of ordinary class periods. %Management = mean percentage of class time spent on managerial tasks; %Knowledge = mean percentage of class time spent on student knowledge acquisition; %Fitness = mean percentage of class time spent on fitness instruction; %Skill practice = mean percentage of class time spent on skill development; %Game play = mean percentage of class time spent on playing games; %Free play = mean percentage of class time spent with students engaged in free play (e.g., no instruction); Mean diff. = difference in means from pre- to postintervention; MVPA = moderate-to-vigorous physical activity; SOFIT = system for observing fitness instruction time.

* $p < .05$. ** $p < .01$. *** $p < .001$.

SLVPEA activities, and some of the pedagogical changes that teachers made may have occurred near the beginning of the intervention, which would have been approximately 5 years prior to interviews.

Results

Collective analysis of all data revealed that teachers involved in HELM/SLVPEA made extensive changes to their instructional practices that were sustained 3 years postintervention. The teaching context change profile for each participant was also highly consistent with all participants' indications about pedagogical change they were sustaining at the time of the 3-year follow-up.

System for Observing Fitness Instruction Time

Analysis of individual participant mean difference pre- to post-intervention SOFIT data showed that the overall percentage of class time spent with students engaged in MVPA and the percentage of student MVPA in the first 5 min of class increased for all participants, 14 of 17 were significantly higher for overall percentage MVPA ($p < .05$, $d = 0.3$ – 7.7), and 13 of 17 teachers' classes showed significantly higher average percentage MVPA in the first 5 min of physical education class ($p < .05$, $d = 0.2$ – 3.9). Significant increases in the percentage of class time spent in knowledge instruction were observed among six participants with eight others increasing nonsignificantly ($p > .05$, $d = 0.1$ – 2.2). Fitness instruction time increased significantly ($p < .05$, $d = 0.4$ – 1.0) with four participants and increased nonsignificantly ($p > .05$, $d = 0.2$ – 2.7) with 11 others, while all but one teacher increased skill practice time, seven of which demonstrated significant increases ($p < .05$, $d = 0.5$ – 1.4). All but two participants decreased in percentage of class time spent in management, with seven statistically significant ($p < .05$, $d = 0.6$ – 3.4), and all but one participant decreased percentage of time spent in game play, eight of which were statistically significant decreases ($p < .05$, $d = 0.6$ – 2.1). Sixteen of 17 participants' percentage of class time spent in free play either decreased or stayed the same, with five teachers showing significant decreases in free play ($p < .05$, $d = 0.6$ – 1.2). See Table 2 for a more detailed description of results of analysis of SOFIT data.

It is worth noting that among the 17 participant cases, there was a predominance of what would be considered positive changes in each SOFIT data category, with the majority being statistically significant ($p < .05$). Additional calculation of effect size of mean differences via Cohen's d calculation revealed that in most cases where statistical significance was achieved, at least a small effect size was evident; however, caution should be taken in interpretation of the p values and effect sizes of these mean difference data. For example, the sample sizes ranged considerably; thus, some teachers who exhibited rather large mean differences that were not statistically significant had large effect sizes (e.g., ≥ 0.8) and vice versa (i.e., small but statistically significant differences with small effect size). For this reason, the reader is encouraged to consider each teacher's individual SOFIT change data in regard to the number of SOFIT observations (Table 2).

Interviews

The analysis of interview data revealed five main themes: (a) physical education programs changed and sustained, (b) from traditional ideology to HOPE, (c) demarginalized programs and legitimized teaching, (d) from hesitation to willingness

to engage in PD, and (e) resources + support = success. It is important to note that although the official name of the intervention that physical education teachers participated in was called the SLVPEA, most referred to intervention and university partners as "HELM." This is reflected in the teacher quotes that follow, and the reader should consider these references to HELM as reference to the SLVPEA.

Physical Education Programs Changed and Sustained

The physical education teachers involved in HELM/SLVPEA reported making significant changes to their programs during the intervention and claimed they maintained these practices at the time of the interviews, 3 years later. Specifically, many teachers emphasized that they adopted new class management strategies designed to increase student activity levels and engagement in class activities. When asked about changes made during HELM/SLVPEA, Roger said, "I think the biggest change was to my class structure, like getting kids active as soon as possible, and shorter and clearer instructions." Similarly, Patty noted, "I made a huge change, especially with my beginning of class routine. I would never go back to the way I used to do it." Most teachers echoed Roger and Patty, and some such as Candice and Kari specifically noted that they abandoned traditional management strategies like squad lines in favor of beginning class with a quick start activity. Candice said, "I stopped having kids sit in (squad) lines to take roll, now I get them moving right away and I'm more aware of keeping their MVPA up," and Kari stated, "I changed from taking roll in squad lines to more of an active approach, getting them (students) moving right away." This change in start-of-class procedures is confirmed by the individual teacher SOFIT data showing a significant increase in percentage of time spent in MVPA during the first 5 min of class (Table 2) and is not surprising given the emphasis on MVPA promotion during the intervention (Belansky et al., 2016). Importantly, however, all teachers who mentioned changing their start of class procedures to include more MVPA also referred to this as their current practice 3 years following the intervention.

Teachers also adopted new communication strategies to reduce the amount of time spent transitioning between activities and increase the efficiency of their verbal instructions. For example, Valerie stated, "One of the best things I learned in the workshops was to say (to students) 'when I say go,' then tell them (students) what I want them to do. It really cut down on time going from one activity to the next." Deidre's comment was representative of teachers in the study who also expressed joy and satisfaction about their communication changes: "Now I talk less and students move more, and my instructions are shorter. I tell them what they need to know and I say 'go,' and they all do what I say. It's wonderful!" In addition to reduced transition time, many teachers reported having more time for learning activities by adopting more efficient communication strategies. Jacob said, "Before, I would talk a lot and struggle to get kids to listen, now I give shorter and simpler instructions, and it's like there is more time in the lesson for activities that help kids learn." Julian expressed a similar sentiment when he said, "Before I would babble too much, and kids would stop paying attention. Now I give better directions and it seems like I have more time."

The improved efficiency in communication noted by most teachers in the study is also confirmed by the analysis of teachers' individual SOFIT data, as the majority of participants reduced percentage of class time spent in management (Table 2). Although

class management time decreased for most teachers, the percentage of time spent in knowledge instruction increased for all but four teachers. This may indicate that although they perceived themselves to be giving shorter bouts of instruction, teachers appear to have provided an increased volume of instruction by the end of the HELM/SLVPEA intervention, albeit in smaller individual doses. This interpretation is supported by Patty's comment where she describes giving repeated sets of instructions: "I give them (students) short instructions, have them do it (follow instructions) for a while, then pull them back together if I know it will take more complex instructions . . . then I let them go again. It's important to keep them active as possible."

Along with considerable changes to their management and communication strategies, teachers in the study also reported adopting the SPARK curricular resources (sparkpe.org, n.d.) as their primary source of curriculum and assessment materials. For example, when asked about program changes he made during HELM/SLVPEA, Winston commented, "When I started (teaching), I had no curriculum, and then with HELM we got SPARK and I finally have some direction about what to teach, where before I was just doing whatever sounded fun." Like Winston, Braden reported not teaching from a curriculum prior to the HELM/SLVPEA intervention and then adopting SPARK: "For 10 years I had no real curriculum, but then they (SLVPEA) brought in SPARK, and now the only curriculum I use is SPARK." In addition, teachers in the current study also reported continued use of SPARK assessments. Katelynn's comment was representative of several teachers when she said, "I have developed some of my own testing, but now I use SPARK as the main source of assessment . . . I use the SPARK curriculum so it makes sense to use the assessments too." Marcus indicated he now exclusively uses the SPARK assessments: "I used to just give a rules test in my lifetime activity classes, now I use the SPARK checklists at the beginning and end of each unit to assess how much they learned and progressed from a skill standpoint." Similarly, Autumn said, "Before I had SPARK, I gave participation points for grades, now I use the (SPARK) assessments for that (assigning grades)."

From Traditional Ideology to HOPE

The teachers were exposed to extensive PD that included a curricular emphasis on teaching health-related fitness through a variety of games and lifetime activities. This approach is consistent with what Metzler et al. (2013), described as *Health Optimizing Physical Education* or HOPE, and is the focus of the SPARK curriculum (McKenzie, Sallis, & Rosengard, 2009), which was central to the HELM/SLVPEA intervention. The programmatic changes teachers made throughout HELM/SLVPEA and maintained 3 years postintervention were accompanied by an obvious shift in ideology about the purpose of physical education and their role as physical educators. Most participants described their thinking prior to HELM/SLVPEA as more aligned with traditional sport-based physical education yet became aligned with teaching knowledge and skills for lifetime physical activity after the intervention.

Many teachers in the current study described how their beliefs about the purpose of physical education were altered. For example, when asked about changes he made during HELM/SLVPEA Braden offered, "I changed my thoughts about PE. I used to just focus on team sports, but I realized that it (physical education) is not just sport-related. Kids need to learn skills in different activities, be active, and make healthy choices." Other teachers

such as Miguel described a similar philosophical shift. He stated, "I think what changed was my thinking about PE. I used to just do a few units with different sports. Then HELM came in and gave us SPARK and it really made me reconsider how I was doing things." Like others, Jacob noted how he changed and emphasized that he tells his students about his own experiences as a student:

I used to teach (physical education) the same way I was taught, but now I use SPARK, and it is so much different. I tell my students that when I was in school we had a basketball coach that was the PE teacher and we just played basketball eight months of the year. My program used to be kind of like that, but has grown leaps and bounds from where it was and they (students) definitely have more variety now. I am proud of how I teach now, I feel like I am doing more for them than was done for me.

Many participants described that their beliefs about physical education were shaped by previous experiences in physical education, yet the HELM/SLVPEA intervention helped them overcome early socialization and had a sustained impact. For example, Winston said, "When I started teaching, I thought 'let's get a basketball game going' because that is what I learned from my teachers, now I see I have a responsibility to teach them (students) how to stay active the rest of their lives."

Despite the majority of teachers considerably changing their ideology, one negative case was evident. Most teachers indicated a shift away from traditional sport-based programming to an ideology consistent with HOPE, but in contrast, Marcus stated, "I decided to use SPARK and go along with the program (SLVPEA), but I will not go away from team sports and competition because I think it is good for kids to learn to compete in life." Despite Marcus' resistance to fully embrace the SPARK curriculum, his SOFIT data at the end of HELM/SLVPEA indicated large increases in MVPA, knowledge and fitness instruction, and reductions in management. This combined with his comments about utilizing assessment materials (see previous theme) suggest that his instructional practices changed, but some earlier acquired beliefs remained.

Demarginalized Programs and Legitimized Teaching

Many teachers in the current study perceived that their colleagues, administrators, and students viewed them and their physical education programs more favorably during and following the intervention. Arnold said, "They (teaching colleagues) always thought PE was just a place where kids just run and play, not a place to learn. That has drastically changed. Students have learning goals they are expected to achieve, and the other teachers know this now." Miguel also noted a change and stated, "It was all positive with HELM, and the other teachers noticed a big difference in the way I teach PE here. Some even e-mailed and asked me about how to do some of the activities in their classes."

Some participants said they now involve their nonphysical education colleagues in their physical education classes and offer expertise about classroom physical activity and staff wellness. For example, Roger said, "Almost every teacher in the school has come to my class at least once to participate. I also do trainings in the school on how to do 'brain breaks,' (classroom activity breaks) which are something I learned about during HELM."

Jacob noted, "Staff members come in during my classes to use the equipment or treadmills, and I give them workout programs to do before and after school. The students see, and it really promotes our program. HELM definitely helped with that."

Many teachers also perceived they had more positive interactions with school administrators than before the intervention. Autumn said, "They (principal and assistant principal) were really pleased with what I was doing, how kids were active, learning, and more socially responsible. My evaluations (teacher performance) improved a lot." Autumn continued to describe how her administration also ended the practice of allowing students to miss physical education class to complete make-up work in other classes: "It (physical education) was viewed differently by administration. They quit allowing teachers to pull kids out of PE for make-up work, or whatever." This more active support of physical education was apparent in many other teachers' schools. For example, Patty said, "Teachers (colleagues) are so much more supportive now. They very rarely pull kids out of my class to do other things, and my principal will not allow that (missing physical education) anyway. It feels like PE is more valued now, it has more merit, more respect."

Not only did teaching colleagues and administrators show greater support for physical education, but students, and in some cases their parents, were more satisfied with the physical education program. Candice explained, "They (students) responded well to all the changes. It made classes more fun for everyone and they are still learning the skills they need." Talia also saw a distinct difference in her students both in and out of class. She stated, "The change in them (students) was almost instant. They really enjoyed the small-sided games and new activities. Their insecurities went down, and they seem more comfortable with each other in and out of class. There was not such division." Roger noted both student and parent support for his program following the changes he made: "They (students) loved the change to SPARK activities all the way from kindergarten to middle school. Their parents were really supportive too. They (parents) do not want their kids pulled out of PE, and they voiced that concern to our administration."

Although Roger experienced support from parents, in most cases, teachers reported no change or only superficial difference in parents. Autumn, who perceived some additional support, said, "I had more parents come to parent-teacher conferences than in the past. I think it was just because kids liked being in class. They (students) were talking about it, so they (parents) wanted to meet the teacher." Overall, participants seemed to perceive a difference in support from socializing agents during and following, but not prior to participation in HELM/SLVPEA, suggesting that the project may have successfully offset the sociological zeitgeist that existed in participating schools prior to the intervention and is commonplace in schools nationwide.

From Hesitation to Willingness to Engage in PD

Teachers reported considerable benefits from their involvement in the intervention; although, many were initially hesitant about participating. For example, Candice said, "At the beginning I was kind of hitting the brakes and saying, 'wait, what is wrong with the way I am teaching?' But then once I saw PE a different way, I got over myself, and it was good." Kari also experienced a similar hesitation, and commented, "I was proud of my program before HELM, and I would say half of what I learned, I was already doing, but they provided me with so much help and after a while I enjoyed learning new ways to teach." Some teachers such as Winston noted how the response from socializing agents (students and principal) helped convince him to invest more completely: "In the beginning, I was sensitive; I was not excited about it at all. But the more the students bought in, the more my principal bought in,

the easier it was for me to not be intimidated by change." Talia expressed some reservations that were representative of many teachers in the program, but also experienced a positive response from socializing agents: "I was excited to work with HELM, but I did worry that it would change my program. But the students loved it. It was better for their learning, and my principal noticed, and the other teachers got more interested too."

In addition to becoming more comfortable participating in the intervention, teachers also indicated they are now more amenable to making changes to their program at the request or suggestion of external sources, such as administration, instructional specialists, state or district mandates, or through other PD opportunities. For example, Deidre said, "I got used to talking about what and how I was teaching during HELM, and now we have an administrative team and an instructional coach, and I look forward to talking to them about my program." Jacob noted that the intervention helped prepare him to better accept input from others: "HELM helped get my program in line with administration's expectations, and now I'm open to changes they suggest. We have a state (department of education) representative that comes to discuss fitness tests and goals, and I think it will help." Valerie expressed the sentiments of others, especially those with more experience by saying, "I've been teaching for 29 years. Most of that time no one paid any attention to the way I teach. Then with HELM, we talked and strategized about teaching. Now I want that interaction with administrators and our instructional support person." Similarly, Braden said, "I was not all that interested in changing the way I teach PE before HELM now I find myself looking for new ways to teach and I go to the summer institute (for professional development)." Based on participant responses, it is clear that physical education teachers acquired a renewed sense of optimism about accepting externally initiated change.

Resources + Support = Success

The key features of HELM/SLVPEA that helped teachers make and sustain changes were the provision of resources, such as equipment to implement the SPARK curriculum, training to use SPARK, and ongoing follow-up support from knowledgeable instructional specialists or site coordinators. Julian commented on the importance of this by stating, "The equipment to go with SPARK was huge because there is no way I could have taught some of the units without it. With basically no (equipment) budget, I would probably not have gotten the equipment myself." Jacob noted, "It was great to have equipment that was directly correlated to SPARK activities. It made it easier to plan and save time, and the colorful items really helped kids get engaged." Patty noted the critical nature of the equipment because it allowed for greater engagement: "Because of HELM I finally have enough equipment for every student. That means every kid is engaged, gets enough practice touches on the ball each time, and everyone has more fun." For teachers such as Deidre who already had adequate equipment, the additional provision allowed her to use her existing budget for other purposes: "The equipment was definitely a bonus even though I had a lot already. It helped because I have not had to buy equipment over the past couple years, and now I spend more of my budget on the state conference."

Many teachers also emphasized the value of the training workshops that were provided in conjunction with SPARK and the elite level trainers that were provided. When asked about the most beneficial aspect of HELM/SLVPEA, Katelynn said, "The workshops were really helpful. They (SPARK trainers) really

helped me understand how to use the SPARK curriculum and what quality physical education should look like.” Roger stated, “They (workshops) were very valuable because we were able to have hands on training, not just ‘here’s the curriculum, go for it.’ We got see the trainers use the curriculum, then we did some peer teaching with it as well.” Many noted that in addition to learning how to use SPARK and associated teaching strategies, the training workshops allowed them the opportunity to network with other teachers. Miguel noted, “I think the best thing I got out of them (workshops) was the ability to collaborate with other teachers in the area and share ideas about what was and was not working.” Valerie found the trainings valuable for networking and also commented that she has maintained contact with others teachers: “The trainings were excellent; very professional. You know I learned so much from the other teachers too. I still bounce ideas off many of them, and I certainly did not do that before HELM.”

In addition to equipment and training workshops, nearly all teachers considered working with site coordinators, to be critical to successfully adopting new teaching strategies and the SPARK curriculum. Arnold noted:

They (site-coordinators) really were the change for me, the kickstarter, the igniter that helped me see my shortcomings, the places where I could immediately improve. They helped me give more positive feedback to students, to use clear and concise instructions, to vary the level of challenge for kids, group students and transition quickly, and make sure my lessons were at least 50% moderate to vigorous physical activity. Then later in the project they helped me use the SPARK resources to build a curriculum with scope and sequence for all the grades I teach.

Byron was one of many teachers who also found the support from site coordinators helpful in implementing best practices: “Having him (site coordinator) come in and give me tips on best practices helped. They (SLVPEA) developed this big rubric for what high quality PE should look like, and that helped keep me doing things that are most beneficial for kids.” While most teachers valued the input from site coordinators, Kari noted that although she appreciated feedback from site coordinators, meeting with them during the school day detracted from her planning time. She stated, “They (site coordinators) made me more aware of what I was doing, and I think that helped, but meeting during the day took me away from all the other work I needed to get done during my planning time.” The remaining teachers, however, found meeting with site coordinators productive, and this feature distinguished HELM/SLVPEA from other PD initiatives.

Discussion

The purpose of this study was to examine how the HELM/SLVPEA intervention influenced teachers’ beliefs about physical education and the extent to which they sustained pedagogical changes following cessation of project-related activities. Pre- to postintervention data collected during HELM/SLVPEA using the SOFIT instrument clearly showed a pattern of change whereby teachers implemented strategies to increase student MVPA, offered more skill and fitness instruction, while reducing game and free play. The data from 3-year follow-up interviews suggest that teachers not only sustained changes made during HELM/SLVPEA, but also altered their subjective theories about the purpose of physical education and their instructional role.

Among the most salient of changes were the use of strategies that promote more student MVPA during physical education and the adoption of high-quality curricular and assessment materials included in the SPARK program. The findings suggest that changes made during the HELM/SLVPEA intervention are relatively permanent and evidence of considerable program improvement. Only 20% of U.S. schools require the use of a particular curriculum and <25% require both written and skill performance assessment (U.S. Department of Health and Human Services, 2017). Participants in HELM/SLVPEA, however, made significant improvements using the SPARK curriculum and assessments. In addition, while approximately 62% of U.S. schools offer some type of funding for PD to increase MVPA during physical education class (U.S. Department of Health and Human Services, 2017), MVPA levels in U.S. school physical education classes remain low (Nader, 2003; Skala, Springer, Sharma, Hoelscher, & Kelder, 2012). The teachers involved in HELM/SLVPEA had considerably higher student MVPA than national averages following the intervention (Belansky et al., 2016), and results of this study suggest that the practices associated with increased student MVPA are still in place. It should also be noted that along with an increase in MVPA, teachers in the intervention increased the percentage of time spent in content instruction, thus indicating that they were not simply adding physical activity at the expense of instruction.

Another significant change occurred in the beliefs teachers have about the purpose of physical education and their individual roles as teachers. According to teacher socialization theory, beliefs are highly resistant to change (Terhart, 2013), and research indicates that even innovatively oriented teachers conform to custodial orientations of their socializing agents (Richards et al., 2019). Surprisingly, veteran teachers, who might be expected to be more resistant to change, noted changes to their instructional practices. This philosophical shift is likely the result of a large volume of PD provided during HELM/SLVPEA (three 2-day workshops), as well as the continuous one-on-one support from site coordinators and resources provided over a 2-year period. This inference is supported by the research literature indicating that leadership and guidance in conjunction with effective ongoing PD are critical factors in teachers making long-term changes to their pedagogy (Whitworth & Chiu, 2015), though this phenomenon is uncommon in both the teacher socialization (Richards & Lux Gaudreault, 2017) and PD literature (Armour & Yelling, 2007). It is worth noting that teachers in this study considered students’ response to their altered teaching practices a factor that influence their decision to maintain changes made as a result of the PD offered through HELM/SLVPEA. The power of socializing agents to influence teacher behavior is not only consistent with the dialectic nature of teacher socialization (Graber et al., 2017), but it also supports Guskey’s (2002) theoretical framework which posits that teachers’ attitudes and beliefs can change as a result of PD after successful implementation that includes improved student learning.

Another interesting finding in this study was the nearly unanimous agreement from participants about a reduced sense of marginalization they experienced during and after the HELM/SLVPEA intervention. Reports of physical education teacher marginalization are common in physical education (Laureano et al., 2014); however, few if any studies have noted scenarios where teachers reverse marginalization as a result of improved practice. Although not directly targeted during HELM/SLVPEA, the perceived improvement in teachers’ professional status may, in part, have been the result of efforts to educate school principals about high quality physical education and the instructional

materials and techniques teachers were being trained to use (Belansky et al., 2016). Principals are known to strongly influence the school environment (Burkhauser, 2017), and the HELM/SLVPEA site coordinators assisted teachers in garnering administrative support by helping to improve instructional quality and communicate effectively to principals about the benefits of physical education. Reduced marginalization may also have resulted from students' increased enjoyment and satisfaction with physical education class.

Despite some initial hesitation toward HELM/SLVPEA, participants expressed gratitude for involvement in the intervention and seemed to become more amenable to externally initiated change. The acceptance of external change is relatively uncommon in continuing PD (Darling-Hammond et al., 2009; Kern & Graber, 2018) and few examples are available in the physical education literature. The HELM/SLVPEA intervention was radically different than typical 1-day workshops that characterize most in-service PD; thus, the likelihood of sustained change was enhanced, especially since participants also received essential resources. As a result of the initiative, several teachers became more accepting of other forms of external change and may be more likely than other teachers who did not experience this intervention to further enhance their programs.

Conclusion and Final Thoughts

The HELM/SLVPEA project success, from inception until the present, stems from its design and the provision of both extensive resources and follow-up support (Belansky et al., 2016). Because of this success, the HELM/SLVPEA should be considered a model for future PD. However, exact replication of the project may not be feasible for school districts due to high project costs. Overall, the HELM project was funded at approximately \$1.86 million, with \$1.2 million allocated just for the SLVPEA (Belansky et al., 2016). Despite not being financially feasible for schools without grant assistance, the project does highlight specific methods of administering PD that schools can and should emulate. For example, providing high-quality curricular materials, along with sufficient equipment to implement curricula is not an unreasonable expectation and cost effective options exist. In addition, while school districts regularly budget for PD, physical education-specific PD is often lacking or omitted altogether. Equitable resource allocation combined with instructional support from existing school faculty/administration (e.g., communities of practice) could potentially produce some similar results to those realized during HELM/SLVPEA, provided it is a school and district priority.

Despite the high cost of HELM/SLVPEA, the project demonstrated an extremely high return on investment not only with students during the original intervention, but also in the 3 years following. This point should not go unnoticed by funders, policymakers, and school districts because this one-time investment may offset future health care costs for these students. Experts estimate that for every dollar spent in the prevention of chronic disease, over five times that amount may be saved in direct health care costs (American Public Health Association, n.d.), not to mention the reduction of indirect costs of chronic disease, such as absenteeism and loss of work productivity which have considerable economic impact (Devol & Bedroussian, 2007). This study provides evidence that HELM/SLVPEA yielded dramatic results associated with preventing chronic disease, and related teaching practices were maintained 3 years later, suggesting they may continue in the foreseeable future. Conservatively, it could be estimated that each

teacher in the study interacted with roughly 150 students each year; thus, the long-term health of over 7,500 students was impacted at the time of the current study (May 2016) and continues in some capacity to this day.

In addition, given the underserved and underresourced nature of the rural communities where HELM/SLVPEA took place, the benefits of the program may be magnified and the impact on health could be generational. In lower socioeconomic status rural communities, resources are disproportionately scarce as compared with similar socioeconomic status urban communities (Johnson & Johnson, 2015); therefore, projects such as HELM/SLVPEA, though reaching a lower population density, may have a greater overall impact. To reduce the financial burden of implementing strategies that were successful in HELM/SLVPEA, rural school districts could consider partnering with local universities, as well as with neighboring districts to apply for grants and share costs for PD. This approach, along with organizing together to advocate with a collective voice to state policymakers and other state officials about the need to provide support to rural schools would potentially improve chances of funding. Furthermore, school districts should consider investing their current PD funds to the internal training of teachers and/or administrators in the techniques for supporting and promoting pedagogical change that were utilized by the HELM/SLVPEA site coordinators. Along with this strategy, rural schools could consider forming a virtual network improvement community using a platform, such as *Project ECHO*, which is an evidence-based virtual professional learning mechanism shown to significantly improve professional practice and individual outcomes (Katzman et al., 2014). Utilizing internal and more cost-effective strategies such as these, rural schools and districts can become less reliant on external sources for PD and reduce costs over time. In short, HOPE is achievable if the will exists, and the HELM/SLVPEA provides a framework for getting there.

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