This chapter examines Physical Education (PE) teacher beliefs and efficacy and their relationship with teacher practice. We begin with a brief historical overview of topics followed by a discussion of the central theories supporting the literature on teachers’ belief systems and efficacy. Next we summarize the literature related to PE teachers’ beliefs and efficacy with particular attention to their relationship with teacher practice. The final section includes implications for evidence-based practice, future directions, and a summary of key findings.

Historical overview of teacher beliefs and efficacy

In the early 1980s the observational nature of teacher effectiveness research began to broaden to include teacher cognition. Moving beyond describing what teachers did or did not do in their classes, researchers began to focus on teachers’ cognition and the decisions they make. Teacher cognition consists of beliefs and knowledge that interact to create a personal cognitive framework from which teachers perceive and act upon their environment. The concepts of beliefs and knowledge are complicated and interdependent and it is therefore hard to distinguish between them. Traditionally, knowledge has been defined as objective, definable, and measurable facts that can be agreed upon by scholars, while beliefs represent the experiential and evaluative aspects of cognition (Nespor, 1987). For example, a teacher may “know” the basic skills and rules of a sport, but how they choose to implement a particular sport unit will be based in large part on a personal decision-making process that includes what the teacher believes about the purposes of PE, the skills of most importance, how students learn best (and how individuals/specific groups of students might learn differently if at all), and teachers’ role in the learning process, to name but a few belief considerations. Both knowledge and beliefs are continuously interacting to inform teachers’ practices, although the personal and deeply held nature of beliefs makes them arguably more influential on practice (Pajares, 1992).

Self-efficacy is a specific and critical sub-set of a teacher’s belief system. Specifically it refers to an individual’s collective beliefs about her or his ability to initiate, engage, and complete a behavior at a certain level of competence. The concept of self-efficacy was introduced by Bandura (1977) as a theory to explain behavior and motivation. There is a large body of research and meta-analyses supporting the critical role that self-efficacy cognitions play in human behavior (e.g., Multon, Brown, & Lent, 1991). Teacher efficacy is related to teaching behaviors that
foster student achievement (e.g., Ashton & Webb, 1986). Bandura stresses that efficacious teachers are more competent, develop a larger skill repertoire, manage their emotions more effectively, use more problem solving strategies, and persist longer in the face of failure than do less efficacious teachers (1997). More recently, the umbrella term, Social Cognitive Theory (e.g., Bandura, 1997, 2006), has been used as an overall cognitive framework that includes several core concepts including: (a) self-efficacy, (b) outcome expectations, (c) goal setting, (d) self-regulation, and (e) observational learning and modeling.

**Teacher beliefs and efficacy**

Teacher beliefs are key considerations in understanding teachers’ decision making and actions. They play a key role for teachers due to the uncertain, isolated, and complex environments in which teaching occurs. This section provides an overview of some of the areas of research about teacher beliefs.

**How do belief systems develop and change?**

Lortie’s (1975) seminal work noted that students enter teacher education programs with already well-developed educational belief systems due to their apprenticeship of observation in K-12 schooling. Specific to students’ belief systems in physical education teacher education (PETE), O’Sullivan (2005) suggested that PETE students enter programs as conservative individuals who often prefer coaching over teaching and prioritize skill development. During the first five to ten years of teaching, teachers’ beliefs change gradually to reflect combinations of beliefs and context constraints. In general experienced teachers’ belief systems are relatively stable and resistant to change. There is, however, some indication that belief systems are malleable during the college years (e.g., Solmon & Ashy, 1995) and for experienced teachers when faced with changing contexts (Ennis, 1994).

Many curriculum reform initiatives depend on teachers’ willingness and ability to change their beliefs. Davis and Andrzejewski (2009) suggest four specific steps for promoting belief change. First, the current beliefs must be made conscious so that teachers are actually aware of what they believe. For example, the Value Orientation Inventory (VOI; Ennis & Chen, 1993; Ennis & Hooper, 1988) could be used to help teachers examine their curricular values. Second, a situation must be created in which pre-existing beliefs are specifically questioned or tested. Working with pre-service teachers, Timken and van der Mars (2009) report success with case studies; while Sofo and Curtner-Smith (2010) suggest field experiences can provide a beliefs questioning and development environment. Next, teachers need to be helped to view the beliefs questioning and testing process as a professional challenge and not a threat to their personal identity. Finally they suggest that teachers must be provided with time to reflect and reconcile their pre-existing beliefs with the new information or context.

**Teacher beliefs about the purposes of PE**

Perhaps the largest body of literature specific to beliefs in PE is related to teachers’ value orientations. Values are a cluster of beliefs around a specific issue used in an evaluation or prioritization process. Jewett, Bain, and Ennis (1995) suggested that teachers have unique value systems that prioritize the importance of the subject matter, the learner, and society in the education process and those priorities guide their decision making. They described five value orientations: (a) disciplinary mastery (DM), (b) self-actualization (SA), (c) learning process (LP), (d) social reconstruction
(SR), and (e) ecological integration (EI). Subsequent work in the area (Ennis & Chen, 1993, 1995; Ennis & Hooper, 1988) led to the development of an instrument (VOI) to assess value orientations as well as a re-conceptualization of the social reconstruction value orientation. That orientation is now described as social responsibility to better reflect the belief systems of teachers in the field. Both DM and LP value orientations focus on the traditional body of knowledge in PE (e.g., motor ability, fitness) and how students learn (e.g., learning how to learn). The other three domains focus more on the PE student’s self and social development. In SA, the focus is on the student’s needs/interests, while in SR it is on developing positive interpersonal relationships. Finally, EI has an integrated emphasis across all areas, that is, the foundational knowledge base, the student as self and learner, and the student’s social development. Most teachers’ value systems reflect a blend of value orientations, described as their value profile with each teacher’s profile consisting of both high and low priority value orientations (Ennis & Zhu, 1991).

Research in numerous countries demonstrates the presence of each of the value orientations in a variety of teaching settings, although the context does seem to have a significant influence on the most common values. For example, Banville, Desrosiers, and Genet-Volet (2002) found that Canadian teachers gave a higher priority to the subject matter orientations and held a lower value for social skills, reflecting an opposite pattern to that found in a sample from the United States. Work by Chen, Lui, and Ennis (1997) demonstrated that Chinese PE teachers’ values of DM and SA matched their US counterparts, although the groups differed on other value orientations. Chinese teachers ranked LP and EI more highly while American teachers reported more value for SR.

Differences in belief systems are not limited to national contexts alone. In one study of US urban and rural teachers, teachers in the urban settings reported that SA and SR were higher priorities, while rural teachers rated DM and LP higher as outcome goals (Ennis & Chen, 1995). Working with teachers in Flanders Belgium, Behets and Vergauwen (2004) found differences by grade level with elementary teachers placing higher priority on DM and SA while secondary teachers reported more value for DM and SR. The authors suggest those differences may be influenced by national curricular innovations. Liu and Silverman (2006) also reported differences by grade level in their sample of teachers from Taiwan, reporting that gender, experience, level, and school location (urban or rural) were associated with teachers’ values. Specifically, these authors reported that females tended to prioritize SR while more males valued DM and LP. More experienced teachers valued the LP orientation and elementary teachers were most likely to value SR. Finally more rural teachers valued DM and LP. Liu and Silverman (2006) concluded that Taiwanese physical educators prioritized self-concept, self-control, and social responsibility to allow for the coming together of body and spirit in their teaching.

Teachers, however, may also hold values that are not strictly educational in nature. Cothran and Ennis (1998) reported that PE teachers’ top ranked class outcome was to provide a fun environment and their students reported similar beliefs about the importance of fun as a class outcome. Other research suggests teachers’ first priority may be class management (e.g., Siedentop, Doutis, Tsangaridou, Ward, & Rauschenbach, 1994). Those two priority beliefs may be precursors to or concurrent steps with teachers’ actualized educational value orientations.

**Student learning**

Teacher beliefs about student learning also are important to understand within the context of teacher expectancy, described by Martinek as the Pygmalion effect (Martinek, 1981). Trouilloud, Sarrazin, Martinek, and Guillet (2002) reported that teacher expectations do have self-fulfilling effects and strongly predict student achievement. Teacher expectations also affect
students’ perceived competence (Trouilloud, Sarrazin, Bressoux, & Bois, 2006). Teachers’ beliefs about the amount of control they have over student learning is an area that needs more investigation. Further, researchers in this area found student teachers’ beliefs about their ability to affect student learning decreased over their student teaching experience (Schempp, 1986). It is a fairly consistent finding that teachers interact differently with males and females in class (e.g., Nicaise, Cogerino, Fairclough, Bois, & Davis, 2007), although the identification and nature of beliefs underlying those differing interactions has not been explored.

Teacher beliefs about working with students with disabilities is also an important area of work (see Mauerberg-deCastro’s chapter in this volume). Hodge and his colleagues reported that high school PE teachers had mostly favorable beliefs about inclusion; however, some teachers also indicated that they felt unprepared/unsupported to teach individuals with more severe disabilities (Hodge, Ammah, Casebolt, LaMaster, & O’Sullivan, 2004). Similarly, Obrusnikova (2008) suggested that PE teachers’ beliefs systems toward teaching children with disabilities is generally positive, although there may be different levels of support associated with the type of disability. Steven (2008) found that teachers’ attitudes towards inclusion were related to their practice. A more positive teacher attitude toward inclusion was positively linked to providing all students with significantly more practice attempts, at a higher level of success.

**Do beliefs influence actions?**

The beliefs-action link is a complicated one. For example, Ennis (1992) found that three elementary teachers engaged in a series of compromises when attempting to implement their espoused ideal program as measured by the VOI within the operational constraints of their school setting. One of those constraints is the teachers’ belief in the value of maintaining order. Siedentop et al.’s (1994) examination of secondary teachers’ value orientations and practice found that although teachers held clearly articulated curricular goals, those goals were secondary to class compliance and order. Ennis (1992) suggested that beliefs acted as one of several forces in the teachers’ settings. Bill, for example, had a clear preference for a skill-based movement curriculum; however, the time students spent in skill practice was limited in his classes due to disruptive students and his lack of focus on student social development. Kulinna, Silverman, and Keating (2000) reported a similar mismatch between stated goals and actions when studying teachers with high and low belief systems about physical activity as an outcome priority for PE. When these teachers’ instructional behaviors were measured with the System for Observing Fitness Instructional Time (SOFIT; McKenzie, Sallis, & Nader, 1991) instrument, there were no differences between groups in percent of class time spent in moderate to vigorous physical activity, fitness activities, or teacher-related fitness-related behaviors despite their reported belief differences. It seems possible in this case that the teachers’ knowledge base about how to teach physically active lessons was a key constraint on their ability to achieve their stated priority.

Arguably the most influential aspect of beliefs on teacher actions is the role they play in knowledge utilization. Given that teachers are convinced of the truth of their beliefs, the beliefs act as a standard by which new information is judged. Information that supports existing beliefs is more readily accepted and integrated into the existing knowledge structure while incongruent information is rejected. For example, Ennis, Cothran, and Lofus (1997) found that teachers with different curricular belief systems organized their curricular knowledge structures differently. Those beliefs and knowledge interact to influence practice. Ennis, Mueller, and Hooper (1990) explored the role of teacher beliefs in their acceptance of a professional development program to promote curricular change. They found that some of the program concepts (e.g., shared decision making, cognitive focus) were accepted by many teachers across most value
orientations. Interestingly, those same ideas were less likely to be adopted by teachers with a Disciplinary Mastery approach. Other types of teacher beliefs are related to self-efficacy, a person's beliefs about his or her ability to achieve in a particular situation.

**Self-efficacy and PE teachers**

Although not the only influence, self-efficacy is a key factor on an individual's willingness to engage in and maintain effort when involved in a task. This section provides a brief overview of some areas of self-efficacy research as well as an examination of factors that may influence efficacy, including the self-efficacy of classroom teachers required to teach PE.

**Measuring PE teacher efficacy**

Because self-efficacy is context specific, the development of measurement tools is quite challenging. Thus, an individual's efficacy may be different for different tasks or content. For example, a teacher may believe he or she will be more successful teaching dance than an invasion game. Yet even within the dance domain, that same teacher may feel more efficacious teaching younger children compared with adolescents or with a certain form of dance, such as folk dance, when compared to creative dance. As such the development of psychometrically sound instruments that can be used in a variety of settings is challenging. This leads many researchers to modify efficacy instruments from the general education field. However, a few instruments specific to PE have been developed. Martin and Kulinna (2003) developed a psychometrically sound instrument (Physical Education Teachers' Physical Activity Self-Efficacy Scale, PETPAS) to assess PE teachers' efficacy for teaching lessons with high levels of physical activity despite potential barriers.

Humphries, Hebert, Daigle, and Martin (2012) developed a valid and reliable tool (Physical Education Teaching Efficacy Scale; PETES) based on national teacher standards. The seven instrument efficacy-related factors in PETES include: (a) teaching content knowledge, (b) applying scientific knowledge, (c) accommodating skill differences, (d) teaching students with special needs, (e) implementing instruction, (f) providing assessment, and (g) using technology. The resulting PETES is a 35-item survey composed of seven efficacy factors and may serve as an overall measure of PE teaching efficacy.

**Teacher efficacy and practice**

Do teachers feel efficacious about teaching PE? That answer is very individualized and context specific; but in general, teachers do report a moderate level of efficacy in many studies. For example, descriptive results from Humphries et al.'s (2012) validation study showed that teachers were highly efficacious in accommodating student skill-level differences during instruction. A study of teachers using the PETPAS scale (Martin & Kulinna, 2003) also demonstrated that teachers were somewhat efficacious (e.g., approximately 60% on a scale of 0–100%) in their ability to overcome barriers (time, space, institution, students) they faced in teaching physically active classes. There was, however, a large range in teachers' efficacy scores relative to teaching physically active lessons. When a Turkish version of this scale was used with a sample of PE teachers, results indicated that teachers were overall less efficacious (ranged 31–55%) than their US counterparts (Gencay, 2009). Woods and Rhoades (2013) specifically examined teacher efficacy in a group of U.S. National Board Certified physical educators. Building on earlier work by Gibson and Demby (1984), the authors specifically differentiated between General Teaching Efficacy (GTE), when teachers believe that students can learn regardless of their capabilities
or particular environment and Personal Teaching Efficacy (PTE), when teachers believe they can personally affect students’ learning by their teaching behaviors (Woods & Rhoades, 2013). As might be expected given the targeted population, they found generally high reports of self-efficacy in this board certified group. Teacher Efficacy Scale scores for these teachers showed strong PTE scores and their PTE was higher than a measure of their GTE. Follow-up interviews with some participants suggested keys to their professional success. Factors differentiating them from non-board certified teachers were related to reflection, a deep commitment to teaching effectiveness, and a strong motivation to excel.

Does efficacy influence practice?

Similar to the complicated beliefs-teacher practice relationship, the relationship between teacher self-efficacy and practice is generally not a directly linear relationship. Working with PE teachers in Taiwan, Pan, Chou, and Hsu (2013) found that teachers’ self-efficacy had a positive impact on measures of their teaching practices. Specifically, teachers’ self-efficacy was positively related to their preparation for teaching, content taught, teaching strategies selected, and assessments used. Gorozidis and Papaioannou (2011) examined relationships among self-efficacy, achievement goals, attitudes, and intentions and teachers’ adoption of a new curriculum. Teachers with a “mastery” achievement goal orientation and high self-efficacy had more positive attitudes, higher fidelity toward the curriculum, and higher intentions to continue teaching the curriculum in the future than teachers with a “performance approach” goal orientation. Conversely, scores of teachers with a performance-approach goal orientation had a small positive relationship with the implementation of teaching plans that were unrelated to intentions for future curriculum use. All teachers reported significantly higher levels of self-efficacy toward teaching daily lesson plans for the new national curriculum in Greece, compared to their self-efficacy in using student-centered teaching styles or their self-efficacy in promoting students’ exercise self-regulation.

Hsiang (2013) also explored the influence of teacher efficacy. In this large-scale study involving over 400 teachers in Taiwan, teacher self-efficacy affected students’ learning motivation, learning atmosphere, and learning satisfaction. In contrast, Martin, Kulinna, Eklund, and Reed (2001) did not find self-efficacy to be an influential component in understanding teachers’ intentions to teach physically active PE classes. The difference in these findings may be due to the teachers in Martin et al.’s (2001) study indicating that they were quite efficacious about teaching physically active classes; although this may not appear to influence their intentions to make physically active physical education a priority.

Developing efficacy

There is clear evidence that self-efficacy can be enhanced via professional development for both pre-service and in-service teachers. For example, Zach, Harari, and Harari (2012) found that a four year PETE program positively affected students’ efficacy with increases across the four years in both general teaching efficacy as well as PE teaching efficacy. Similarly, Gurvitch and Metzler (2009) explored the influence of either laboratory or field-based practicum experiences on pre-service teachers’ efficacy. Although throughout the program the two groups’ efficacy varied slightly, by the end of student teaching, they were similar. The authors suggest the high level of authenticity in student teaching was a powerful and similar experience across groups.

Professional development for in-service teachers is a primary avenue for teacher change. There is some evidence to suggest that professional development can enhance teacher self-efficacy.
Martin and colleagues studied the direct effects of a curriculum change project at the elementary level on teacher efficacy (Martin, McCaughtry, Kulinna, & Cothran, 2009). This unique research design examined the effects of two professional development options. One group of teachers received a traditional one day workshop on the new curriculum while a second group received similar training plus additional support after the initial workshop. Both groups showed a general positive trend in efficacy toward teaching the curriculum, while the latter group demonstrated significantly larger increases in efficacy toward overcoming barriers. Working with a mentor also may increase both professional development effectiveness and teachers’ efficacy (Martin, McCaughtry, Kulinna, Cothran, & Faust, 2008). The same project also trained mentors and protégés in the use of technology with both groups increasing their reported pedometer and computer self-efficacy. An intriguing investigation by Mouton, Hansenne, Delcour, and Cloes (2013) suggests higher emotional intelligence is related to higher self-efficacy. Given that student-teacher relationships are a primary context factor for teacher success and enjoyment, the need for emotional intelligence is not unexpected. What is unknown is if programs to increase teacher emotional intelligence would have corresponding effects on teacher efficacy.

Classroom teachers’ efficacy for teaching PE

Classroom teachers often are required to teach PE in elementary grades and a few studies have investigated their efficacy toward teaching PE. In one of the first studies to investigate classroom teachers’ belief systems and PE teaching performance, Faucette and Patterson (2001) found that classroom teachers had “overwhelmingly negative attitudes toward the responsibility of teaching the subject” (p. 108). One study performed in Australia with classroom teachers from 37 schools reported that teachers had moderate levels of confidence in their ability to teach PE. Importantly, teachers who recalled more negative experiences during their pre-K-12 PE programs reported lower levels of PE teaching confidences and were less committed to sport and physical activities themselves (Morgan & Bourke, 2008). A single teacher education course was shown to help elementary classroom pre-service teachers begin developing their identities as PE teachers; however, there was insufficient exposure to change self-efficacy (Fletcher, Mandigo, & Kosnik, 2013).

Current trends and issues

Researchers will continue to examine the relationships among teacher cognition, beliefs, and self-efficacy. It is critical to know not only what teachers do in their classes but also why they choose to employ certain teaching behaviors. Only with that knowledge can professional developers effectively structure pre-service and in-service professional development programs to support and develop current beliefs and to help teachers change their belief systems to better meet student needs.

The advent of innovative approaches to education and physical education is contributing to changes in teachers’ beliefs and efficacy. One such recent development in the field is that of US physical educators working within a Comprehensive School Physical Activity Program (CSPAP; Carson, Castelli, Beighle, & Erwin, 2014). Centeio, Erwin, and Castelli (2014) studied PE teachers’ beliefs related to adopting CSPAP programming at their schools. The authors reported that PE teachers who participated in the training process were redefining their roles as PE teachers, expanding beyond teaching their PE classes to become organizers and promoters of physical activity across the school day. Within this transformation, teacher beliefs about physical education and their efficacy to take on new roles continue to grow.
Implications for evidence-based practice

Beliefs strongly impact practice at both the pre-service and in-service levels. At the pre-service level, it is imperative that educators realize the influence of candidates’ strongly held entry beliefs. Teacher educators, working with pre-service teachers, can bring those beliefs to consciousness by planning and guiding specific experiences to create belief dissonance that can be resolved through reflection and positive new experiences. In-service teachers also need opportunities to recognize and explore new beliefs and options in a safe and guided way. Patton and Parker (2015) provide an excellent guide for planning effective professional development. Their suggestions include focusing on teachers’ actual needs, approaching those needs from an active and social learning perspective. Both pre-service and in-service teachers need to realize that students, themselves, come to PE with their own beliefs about the class and effective teaching. Their ability to address those beliefs will be a key to teacher success (Cothran & Kulinna, 2006).

Future directions

Given the importance of teacher beliefs and efficacy, it is clear that more research is needed in the area. More complete understandings of pre-service teachers’ entry beliefs will help in the design of stronger intervention programs. From a design perspective, additional intervention studies like Martin and colleagues’ (Martin et al., 2009) and Gurvitch and Metzler’s (2009) quasi-experimental designs are needed as scholars strive to identify high impact best practices.

Summary of key findings

- Although knowledge and beliefs both influence teacher cognition, knowledge often is defined as “facts” that can be agreed upon by scholars while beliefs are more experiential, evaluative, personal, and resistant to change (Nespor, 1987).
- Self-efficacy is a subset of an individual’s beliefs specific to one’s ability to initiate, engage, and complete a behavior at a certain level of competence (Bandura, 1977). Social Cognitive Theory is the umbrella term that includes self-efficacy and acknowledges the complexity and multi-dimensional nature of cognition and decision making.
- Values are a cluster of beliefs used in an evaluative manner. The Value Orientation Inventory (Ennis & Chen, 1993; Ennis & Hooper, 1988) is a widely used instrument to assess teachers’ program values. Teacher curricular values are stable, but influenced by context.
- Teacher beliefs (e.g., student learning, students with disabilities) influence their practice and their students’ experiences and subsequent learning opportunities. The beliefs-practice relationship, however, is not a directly linear one, with many factors affecting teacher practice.
- Measurement of teacher efficacy is challenging because it is very context specific. Most studies find teachers generally are efficacious in their teaching skills but those results vary widely for specific individuals.
- Self-efficacy does seem to impact teacher practice, although much like the beliefs-practice findings, the relationship is not a direct, linear one. The teaching environment is too complex for a single variable to explain fully teacher practice. Self-efficacy for specific tasks or content can be increased with effective professional development for pre-service or in-service teachers.
- Classroom teachers required to teach PE generally report negative beliefs about PE and low self-efficacy in their ability to teach it.
Reflective questions for discussion

1. Given the limited time and resources in most PE programs, difficult decisions must be made with regard to priority. Consider your current or future program and rank order the following program goals from highest to lowest importance: motor skill, physical activity, fitness knowledge, teamwork, fitness performance, self-control, academic integration, and fun. Focus on what you truly believe—do not worry about the “right answer” because there isn’t one! What would a program based on your value ranking look like in practice? What barriers might there be to implementing your values and how could you overcome them?

2. If we randomly sampled a large number of PE classes across the country, we would no doubt find a vast majority of teachers using direct instruction to teach sport. What specific beliefs about PE, teachers, students, knowledge, and learning underlie those content and instructional decisions? Think of other instructional methods (e.g., cooperative learning, guided discovery) and content (e.g., outdoor education, personal fitness); what similar and alternate beliefs might underlie those educational options?

3. Based on your personal experiences as a student in K-12 PE, what content or activities do you believe your teachers felt most efficacious about teaching? How could you tell? Rate yourself on a 5 point scale with 5 being “highly confident” about your ability to teach in the following content areas: lifetime/recreational sports, net games, invasion games, outdoor recreation, aquatics, dance, fitness, and martial arts. What do those ratings mean for you as a teacher with regard to curricular decision making (What are you most likely to teach?) and professional development (What options could you pursue to increase your efficacy in an area?)?

4. The local school district has hired you to design a professional development program. The district hopes to switch to a fitness focused program including formal fitness assessment at the secondary level but it has met significant teacher resistance to the plan. What current beliefs might the teachers have that you would need to understand and address? What types of experiences could you provide to address those beliefs and give teachers confidence in their ability to teach the new curriculum?

References


Teacher beliefs and efficacy


