

Published in “*JTRM in Kinesiology*” an online peer-reviewed research and practice journal

## **The Influence of Student Teaching on Physical Education Student Teachers’ Self-efficacy and Outcome Expectancy Beliefs**

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### **Abstract**

This study was designed to determine the impact of 12-week student teaching semesters on student teachers’ self-efficacy and outcome expectancy beliefs in teaching physical education classes. A pre-post design was used to examine changes in beliefs of 107 physical education student teachers. Self-efficacy (instructional strategies, class management, and student engagement) and outcome expectancy beliefs were measured by validated questionnaires. Data collection spanned over a 2-year period. The pretest was completed at the third week of the student teaching semesters, and the posttest was conducted at the end of the semesters. The results suggested that all student teachers’ self-efficacy and outcome expectancy beliefs increased significantly ( $p < .05$ ) over time. Therefore, we concluded that the student teaching experiences had a positive effect on physical education student teachers’ beliefs during this crucial early stage of their prospective teaching careers.

**Keywords:** *pre-service teacher beliefs, student teaching, physical education teacher education*

### **Introduction**

The development and maintenance of a physically active lifestyle and the promotion of health-related physical fitness have become two important components of the national standards for physical education in America (National Association for Sport and Physical Education [NASPE], 2004). The recently released Physical Activity Guidelines for Americans Midcourse Report (USDHHS, 2012) reinforced the health benefits of regularly participating in physical activities, such as disease prevention and enhancement of quality life.

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Submitted September 16, 2013; accepted December 6, 2013.

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As a result, physical education programs preparing children and adolescents for lifelong active lifestyle and good physical health are endorsed in public schools (Sallis, McKenzie, Beets, Beighle, Erwin, & Lee, 2012). Physical education specialists serve as the important force in providing health-enhancing physical education for children and adolescents, as they are more effective than classroom teachers in promoting moderate-to-vigorous physical activity (McKenzie et al., 1995; 1997). The qualification of physical education programs, in turn, largely relies on university physical education teacher education programs and their consequent products – physical education specialists.

Physical education specialists often encounter and teach hundreds of students every week. Their attitudes and beliefs influence their instructional behaviors that can have a great impact on their students' learning outcomes as well as beliefs pertaining to physical activity and health-related physical fitness (Silverman, 2011; Xiang, Lowy, & McBride, 2002). Educational researchers (e.g., Lancaster & Bain, 2010; Xiang et al., 2002) have called for attention to pre-service and in-service teachers' beliefs in various academic fields. Student teaching is a critical time for pre-service physical education teachers to confirm their vocational choices, assure commitment to education, learn roles in physical education class, and acquire the necessary skills and ideologies required in schools (Gurvitch & Metzler, 2009; Wright, Grenier, & Channell, 2012; Schempp, 1986). However, it would be too optimistic to claim that physical education specialists' beliefs are firmly shaped during student teaching or in their preparation programs. On the contrary, previous research unraveled that physical education specialists' beliefs are not set until several years of teaching experiences (Ennis, 1994), and that physical education specialists often experience ideals and principles inconsistent with their pre-existing knowledge, which further construct or reconstruct their initial beliefs (Rossi, Sirna, & Tinning, 2008). Because teachers' belief system is rather complex (Pajares, 1992), this study only focused on pre-service teachers' self-efficacy and outcome expectancy beliefs during student teaching periods. Specifically, the present study was designed to determine the impact of student teaching semesters on student teachers' self-efficacy and outcome expectancy beliefs.

### **Teachers' Self-Efficacy and Outcome Expectancy Beliefs**

Much of the research on teachers' beliefs is based upon Bandura's self-efficacy theory (Bandura, 1997). According to Bandura, self-reflection is the most unique human capability, through which people evaluate and alter their own thinking and behaviors. These self-evaluations include perceptions of self-efficacy and outcome expectancy (Bandura, 1997). Self-efficacy refers to the "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3). In contrast, outcome expectancy refers to an individual's estimate of the likely consequences of engaging in the specified behavior (Bandura, 1997). Self-efficacy is a future-oriented belief about the situational level of ability that a person expects he or she will display. It impacts thought patterns and emotions that enable actions in which people expend substantial effort in pursuit of goals, persist in the face of adversity, and exert some control over events that affect their

lives (Bandura, 1997). Conversely, outcome expectancy in the form of physical or social rewards, recognitions, punishments, criticisms, or self-evaluations can provide incentives and disincentives for a given behavior (Bandura, 1997). The level of motivation is largely determined by one's belief about the success rate of outcome. Nevertheless, as documented in research, there appears to be a positive relationship between self-efficacy and outcome expectancy (e.g., Williams, Anderson, & Winnet, 2005). More specifically, individuals who are more efficacious tend to envision positive rather than negative outcomes. On the other side, increases in expected positive outcomes make individuals more likely to perceive they are able to perform the behavior than the expectations of negative outcomes (Gao, Lee, & Harrison, 2008).

In a teaching setting, teachers' self-efficacy is defined as one's beliefs about his or her ability to teach effectively, while teachers' outcome expectancy refers to one's beliefs concerning how effective her or his teaching would be in having positive effects on student learning (Plourde, 2002). These beliefs are powerfully associated with teacher behaviors such as persistence, enthusiasm, commitment and instruction, as well as student outcomes, including achievement, motivation, and self-efficacy beliefs (Pan, Chou, Hsu, Li, & Hu, 2013; Schunk & Zimmerman, 2006). Teachers' self-efficacy and outcome expectancy are positively interrelated (e.g., Gibson & Dembo, 1984; Schunk & Zimmerman, 2006). Specifically, teachers with high self-efficacy were more committed to their students' success (Gibson & Dembo, 1984), and expressed an interest in trying various teaching approaches and a desire to implement innovative teaching methods (Allinder, 1994).

The examination of teachers' self-efficacy and outcome expectancy beliefs related to teaching has been the foci of numerous researchers (e.g., Angle & Moseley, 2009; Tschannen-Moran & Hoy, 2001). Theoretically, the development of self-efficacy and outcome expectancy is based upon the belief that effective functioning requires more than the acquisition of knowledge and skills and a level of perceived competence (Bandura, 1997). Through systematic training, it is anticipated that teachers (in-service or pre-service) may undergo improvement in these beliefs. For example, Lakshmanan, Heath, Perlmutter, and Elder (2011) examined in-service math and science teachers' change in self-efficacy and outcome expectancy beliefs after receiving standards-based professional training. Repeated measurements identified a significant growth in teachers' self-efficacy but not in outcome expectancy. The findings suggest teachers tend to feel more self-efficacious to teach science but not so optimistic in changing the teaching outcome, namely, student learning in this particular case (Lakshamanan et al., 2011). In addition, Plourde (2002) investigated pre-service teachers' self-efficacy and outcome expectancy beliefs in relation to elementary science teaching during student teaching semesters. They found student teachers' self-efficacy did not change significantly while outcome expectancy decreased significantly over time. The mixed findings from the above two studies suggest that changes in teaching self-efficacy and outcome expectancy beliefs may depend on the nature of the teacher training received by the teachers (both in-service and pre-service). Due to the specificity of different knowledge domains, a semester of student teaching may bring about distinct training experiences and psychological beliefs to teachers of different school subjects. Thus, the above research findings may have limited generalizability to physical education.

### **Self-Efficacy and Outcome Expectancy Beliefs in Physical Education**

Researchers in physical education began to focus on this line of research in the past decade. For example, Martin and Kulinna (2003, 2004) focused on in-service teachers' teaching self-efficacy beliefs and developed an instrument titled "Physical Education Teachers' Physical Activity Self-Efficacy Instrument." Further, the authors identified a predictive role of self-efficacy to in-service physical education teachers' intention to teach physically active physical education (Martin & Kulinna, 2004). In another study, Callea et al. (2008) examined in-service physical education teachers' self-efficacy toward teaching fundamental motor skills. This study demonstrated that two thirds of teachers felt competent in teaching children motor skills and this belief was positively related to teachers' interest as well as their participation in physical activity (Callea et al., 2008). In a large-scale study with health and physical education teachers, Pan et al. (2013) confirmed the positive predictive effect of self-efficacy to the teaching practices. Nevertheless, all above studies focused on in-service physical education teachers' beliefs, while fewer studies examined pre-service physical education teachers' self-efficacy and outcome expectancy beliefs. Gurvitch and Metzler (2009) tested the effects of laboratory-based and field-based practicum experience on pre-service teacher's self-efficacy. The study revealed that, if laboratory-based practicum experience is provided in an authentic manner, pre-service physical education teachers will feel as self-efficacious as those who receive field-based practicum experiences. To date, no papers have been found that include teachers' outcome expectancy beliefs in relation to physical education teaching. Given the important role teachers' outcome expectancy beliefs play in shaping their behaviors and student learning outcomes, it is critical to link this construct to teachers' self-efficacy beliefs in physical education research.

### **Student Teaching in Physical Education Teaching Education**

Minimal research explored physical education student teachers' beliefs and their changes in efficacy beliefs. In one study, Schempp (1986) examined changes in physical education student teachers' beliefs of control over student learning over a 10-week student teaching experience. Pre- and post-tests showed a significant decrease in student teachers' beliefs on total responsibility for student outcomes and responsibility for student failure. No change in beliefs on responsibility for student success was found. Earlier, Schempp (1985) explored how student teachers defined becoming a better teacher based upon their teaching experiences. Through critical incident technique, he found that student teachers defined a better teacher through experience when a teacher-planned lesson activity was felt to have worked because of the whole class responding to the teacher's efforts with proper social behaviors. Another study by Graber (1995) explored the influence of teacher education programs on student teachers' beliefs of incorporating general pedagogical knowledge and pedagogical content knowledge into lessons. The findings indicated student teachers had great difficulty incorporating pedagogical content knowledge which relied on various factors

such as the placement setting and students. Most recently, Xiang and colleagues (2011) investigated student teachers' use of instructional choices in teaching physical education classes. They found student teachers provided students with cognitive, organizational, and procedural choices in their teaching. The student teachers also believed instruction choice promotes students' motivation, autonomy, and engagement in physical education.

In spite of extensive work conducted in the area of teacher efficacy in education, this area of inquiry in physical education remains limited. Extending teacher efficacy research in pre-service physical educators may help predict how physical education student teachers with a strong sense of efficacy may be more persistent in their efforts and expectations to facilitate student success. That is, student teachers' beliefs have the potential to influence both teacher behavior and student achievement. Given the fact that student teaching is a crucial time in which such beliefs are consolidated, we should seek a better understanding of changes of teachers' self-efficacy and outcome expectancy among physical education student teachers. In the present investigation, our purpose was to determine whether self-efficacy and outcome expectancy beliefs among pre-service physical education students might change as a result of the 12-week student teaching experience.

## **Method**

### **Participants and the Research Context**

The present study is part of a larger project designed to investigate pre-service teacher beliefs and instructional choice during 12 weeks of student teaching (Xiang, Gao, & McBride, 2011). However, the data presented in this study have not been published. Participants were 146 physical education major students (58 males, 88 females) enrolled in student teaching at a major research university in the southern United States. The majority (87.5%) of the students were Caucasian, followed by Latinos (9.7%). The ethnicity makeup generally represents the student body of the physical education teacher education program at the university. Data were gathered from five cohorts from the spring of 2006 to the spring of 2008. Prior to this study, permission was obtained from the university's institutional review board and informed consent was obtained from all participants.

Student teaching occurred during the last semester of the preservice program after students had completed all coursework, including field-based classes. As a result, the participating student teachers in the current study had garnered certain levels of pedagogical knowledge, movement skills, and some field experiences. The student teaching program requires six weeks at elementary schools (serving students in grades K-5 with ages ranging from 5 to 11 years) and six weeks at secondary schools (serving students in grades 6-12 with ages ranging from 12 to 18 years). The majority of classes taught by student teachers were co-ed physical education classes. While teaching, the pre-service students were mentored daily by cooperating teachers as well as by a university supervisor at least six times. Student teachers were required to assume full teaching responsibility by the third week of student teaching when they planned and taught lessons from the set to the closure on their own without assistance from cooperating teachers. Finally, they were required to complete a total of six online reflective assignments on topics such as "A positive learning environment" and

“Self-reflection on growth and improvement areas.”

### **Procedures**

Participants completed the modified Teacher Sense of Efficacy Scale (Tschannen-Moran & Hoy, 2001) and the newly designed Teacher Outcome Expectancy Questionnaire (Huang, Gao, Xiang, & Liu, 2009) via email during the third week of their student teaching semesters, after assuming full teaching responsibility at their school (i.e., pretest). They also provided demographic information, such as gender, along with the questionnaires. Participants were instructed to answer all the items and questions truthfully. They were assured all responses would remain confidential and would not affect their student teaching grade. Participants who did not return their first email were sent a second request. Three weeks after the student teaching experiences, participants returned to the university campus for a debriefing day. Before the debriefing, they were asked to complete the questionnaires again (i.e., posttest). In general, participants took 15 to 25 minutes to complete the requested information.

### **Measures**

**Teachers' self-efficacy.** To assess teachers' self-efficacy beliefs, 24 items from the Teacher Sense of Efficacy Scale (TSES; Tschannen-Moran & Hoy, 2001) were modified. The TSES is based upon Bandura's theory (1997) and has been one of the widely used measures in the assessment of teacher efficacy. After several rounds of revision, Tschannen-Moran and Hoy (2001) measured three factors of teacher efficacy: (a) instructional strategies; (b) class management; and (c) student engagement. In their final analysis with 410 pre-service and in-service teachers, 58.47% of the matrix of association variance was explained by these factors. Strong alpha reliabilities were .91, .90, and .87 for the observed factors. Factor intercorrelations were .60, .70, and .58. Also, a second-order factor analysis resulted in one general efficacy factor.

In this study, we reworded “classroom” or “school work” to “physical education” wherever appropriate to reflect the context of physical education. The eight items measuring efficacy for instructional strategies were used to determine student teachers' beliefs in their efficacy to use different instruction and evaluation methods (e.g., How well can you respond to difficult questions from your students?). Another eight items measuring efficacy for class management were supposed to determine student teachers' beliefs in their efficacy to prevent or control the unwanted behaviors in the class (e.g., How much can you do to control disruptive behavior in the class?). The last eight items measuring efficacy for student engagement were used to determine student teachers' beliefs in their efficacy to encourage and motivate students in the learning process (e.g., How much can you do to get through to the most difficult students?). The participants responded to the items using a 9-point Likert-type scale (*1 = nothing, 9 = a great deal*). The means of the items were used as the values for teachers' efficacy for instructional strategies, efficacy for class management, and efficacy for student engagement, respectively.

**Teachers' outcome expectancy.** The teachers' outcome expectancy beliefs were measured by the Teacher Outcome Expectancy Questionnaire, which was established specifically for this study. It tapped teachers' beliefs about the positive outcomes of student teaching experience and consisted of 12 items rated on 100% likelihood scale from "not at all likely" to "completely likely". Prior to the study, a review of literature, with a focus on self-efficacy theory and previous instruments used to measure outcome expectancy in physical education and physical activity, was conducted. Based on the results of the literature review, a 12-item Teacher Outcome Expectancy Questionnaire was constructed.

A panel of six knowledgeable physical education professionals (i.e., pedagogy professors and a physical education teacher education coordinator) was asked to confirm content validity of this scale. They were asked to read each item statement carefully and evaluate its appropriateness to teacher outcome expectancy. All panel members completed the evaluation and submitted usable results. Percentage agreement with the proposed items was acceptable for each item (> 80%). The scale was validated in a pilot study to ensure its appropriate usage (Huang et al., 2009). The stem of the questionnaire was "What are the positive outcomes after completing your student teaching experience?" The sample outcomes were: master physical education content and disciplinary concepts; learn how to provide opportunities that support students' development; learn how to create appropriate instruction adapted to diverse learners; learn how to create a safe and positive learning environment. The mean of these 12 outcome expectancies was used as an overall indication of student teachers' outcome expectancy beliefs.

## Data Analysis

Since the TSES is a well-established questionnaire in the academic domain, a confirmative factor analysis (CFA) was performed with the modified Teacher Sense of Efficacy Scale to test the three-factor (instructional strategies, classroom management, and student engagement) model in the physical education context. Indices used to determine the goodness of fit included: (a) Chi-square divided by degrees of freedom, for which a value of less than 3.0 suggests a very good fit; (b) the comparative fit index (CFI); (c) the Goodness of Fit Index (GFI); and (d) the root mean square error of approximation (RMSEA). Values larger than .90 for the second and third indices, and .06 - .08 for the last indices, indicate good model fit (Schreiber, 2008). The CFA was conducted using the SAS 9.1 system's PROC CALIS, in which the data were entered as a covariance matrix. Maximum likelihood procedures were used, and the latent factors were allowed to correlate freely with one another.

The Teacher Outcome Expectancy Questionnaire was a newly constructed questionnaire. Stone (2004) suggested the use of exploratory factor analysis with principal component approach to explore an underlying factor structure of the scales. In general, a principal component approach uses an orthogonal transformation to convert a set of observations of possibly correlated variables into a set of values of uncorrelated variables called principal components (Stone, 2004). The loading of .40 or greater was used to identifying items to factors. To examine the construct validity (factor structure) of the 12-item

Teacher Outcome Expectancy Questionnaire, we conducted a principal-components factor analysis. Also, Pearson product-moment correlations were calculated to evaluate correlations between teachers' self-efficacy and outcome expectancy over time to confirm the concurrent validity of the scale.

The Cronbach's alpha coefficients were then calculated to examine internal consistency of these two scales. Next, descriptive and correlational analyses were conducted to describe the sample characteristics. Then, a multivariate analysis of variance (MANOVA) with repeated measures examined whether student teachers' self-efficacy and outcome expectancy beliefs changed over time (pretest vs. posttest). Partial eta squared ( $\eta^2$ ) was computed to assess the effect size of time effect. In the MANOVA, time served as the within-subject factor. Finally, follow-up univariate tests were conducted if the MANOVA yielded any main effects for time.

## Results

### Validity and Reliability

The final sample comprised 107 participants (46 males and 61 females) due to missing data on either pretest or posttest. To assess the factorial validity of the modified TSES, a CFA was conducted for the scale collected during the pretest period. CFA indices for the modified TSES were 2.89, .95, .92, and .06, suggesting an acceptable fit of the data with the three-factor models (instructional strategies, class management, and student engagement).

Table 1  
*Factor Loadings of Teacher Outcome Expectancy Items*

Item	Factor 1
1. Master physical education content and disciplinary concepts.	.57
2. Learn how to provide opportunities that support students' development.	.65
3. Learn how to create appropriate instruction adapted to diverse learners.	.53
4. Learn how to create a safe and positive learning environment.	.62
5. Develop communication techniques to enhance learning and engagement in physical education.	.67
6. Learn how to plan developmentally appropriate instruction units.	.71
7. Learn the varied types of assessment.	.55
8. Learn to be a reflective practitioner.	.66
9. Learn how to use information technology to enhance learning and personal and professional productivity.	.55
10. Learn how to foster collaborative relationships with colleagues, parents/guardians, and community agencies.	.45
11. Learn how to use effective classroom management skills for maintaining and increasing desirable student behavior.	.63
12. Increase confidence in teaching and pedagogical skills.	.67
Eigenvalue	4.46
% of Variance	42.23



The principal-components factor analysis also yielded satisfactory results for the construct validity of the Teacher Outcome Expectancy Questionnaire collected during the pretest period. Specifically, all 12 items had loadings on one factor (i.e., outcome expectancy beliefs) ranging from .45 to .71 and accounted for 44.23% of the variance (see Table 1). The Pearson-Product Moment correlations revealed that student teachers' self-efficacy beliefs and outcome expectancy beliefs were significantly and positively related to one another ( $r = .23$ -.76; all  $p$  s < .01) during pretest and posttest periods (see Table 2), and thus confirmed the concurrent validity of the Teacher Outcome Expectancy Questionnaire. Taken together, both factor analyses and correlation analysis provide strong support for the validity of the scales. Both scales at the pretest and posttest periods demonstrated acceptable internal consistency reliability (see Table 2;  $\alpha > .70$ ).

Table 2  
Correlation Analyses

Pretest Variables	1	2	3	4	5	6	7	8
1. Efficacy for instructional strategies	-				.57*			
2. Efficacy for class management	.69*	-			.44*	.51*		
3. Efficacy for student engagement	.66*	.64*	-		.27*	.33*	.42*	
4. Outcome expectancy	.30*	.43*	.29*	-	.28*	.37*	.34*	.57*
Posttest variables								
5. Efficacy for instructional strategies	.57*				-			
6. Efficacy for class management	.46*	.51*			.76*	-		
7. Efficacy for student engagement	.46*	.46*	.42*		.73*	.74*	-	
8. Outcome expectancy	.42*	.54*	.26*	.57*	.59*	.61*	.62*	-

Note. \*  $p < .01$ .

### Results of the MANOVA

As shown in Table 3, the student teachers in this study exhibited moderate to high levels of beliefs, as the mean scores of the three self-efficacy beliefs and outcome expectancy beliefs were all above the midpoint (i.e., 5 for self-efficacy, and 50 for outcome expectancy) for both the pretest and posttest data (See Table 3). Results of the MANOVA analysis revealed a significant main effect for time, Wilk's Lambda = .57;  $F(3, 103) = 19.34$ ,  $p < .01$ . The value of  $\eta^2$  was relatively large ( $\eta^2 = .43$ ), suggesting that it is practically meaningful. Together, these results indicated there was a significant change of student teachers' beliefs over time.

Table 3  
*Descriptive Analysis and Reliability*

Variables	Mean		Standard Deviation		$\alpha$	
	pretest	posttest	pretest	posttest	pretest	posttest
Efficacy for instructional strategies	6.80	7.39	.97	.87	.78	.81
Efficacy for class management	7.34	7.78	.89	.71	.82	.79
Efficacy for student engagement	7.59	7.88	.90	.69	.84	.85
Outcome expectancy	85.16	89.46	9.31	6.97	.76	.75

Note:  $\alpha$  = Cronbach's alpha coefficient.

The follow-up test yielded that all student teachers' self-efficacy beliefs significantly increased over time. Specifically, efficacy for instructional strategies increased the most,  $F(1, 106) = 50.16, p < .01, \eta^2 = .32$ , followed by efficacy for class management,  $F(1, 106) = 30.85, p < .01, \eta^2 = .23$ , and efficacy for student engagement,  $F(1, 106) = 11.51, p < .01, \eta^2 = .10$ . In addition, student teachers' outcome expectancy beliefs also increased over time,  $F(1, 106) = 32.02, p < .01, \eta^2 = .23$ .

## Discussion

This study focused on physical education student teachers and the impact of the student teaching experiences on their self-efficacy and outcome expectancy beliefs. Prior to the main analysis, validity and reliability of the self-reported surveys were confirmed by a series of statistical analyses. For example, the content validity, construct validity, concurrent validity and internal reliability of Teacher Outcome Expectancy Questionnaire were consolidated before the final analysis. According to the descriptive data, student teachers in this study showed relatively positive beliefs toward teaching physical education both at the beginning of and after their student teaching semester. Teacher self-efficacy and outcome expectancy beliefs were also correlated with one another over time. In other words, student teachers who were more likely to see the potential outcomes and value the outcomes of student teaching tended to have higher efficacy beliefs to teaching physical education. On the other side, those who had higher teacher efficacy were more likely to anticipate positive or successful teaching outcomes and value teaching.

Given the apparent importance of teachers' beliefs for motivation in teaching, fostering positive teacher self-efficacy and outcome expectancy beliefs during teacher preparation and student teaching experiences represents an important outcome. In the present study, the educational training experience for the cohort groups (107 student teachers) involved their participation in the student teaching semester. In the U.S. teacher education programs, student teaching experience is specifically designed to facilitate pre-service teachers' transition to a professional career beyond their background knowledge, teaching

strategies and skill, and general pedagogical knowledge (Plourde, 2002; Woolfolk & Spero, 2005). Such experience provides opportunities for pre-service teachers to apply their content and pedagogical knowledge with children and to further develop teaching skills. Therefore, it is important for researchers to document whether student teaching can contribute to change (positive or negative) in the development of pre-service teachers' self-efficacy and outcome expectancy beliefs.

In general, student teaching occurs not only in the classroom but also within a broader school context. The interactions with the children and educational environment may either reinforce or deteriorate pre-service teachers' beliefs (Ryan, Bridges, & Yerg, 2001). To date, controversy exists among scholars in relation to whether student teaching can affect pre-service teachers' beliefs. For example, Plourde (2002) reported that pre-service science teachers' self-efficacy did not change significantly while outcome expectancy declined over the student teaching semester. However, our study provided empirical data showing significant changes in efficacy related beliefs among pre-service physical education teachers. Specifically, physical education student teachers' self-efficacy and outcome expectancy beliefs both increased significantly over the course of their 12-week student teaching experience.

The above inconsistent findings may relate to the domain specificity of various school subjects. As Plourde (2002) explained, in science domain, student teachers' attitudes and beliefs might be set firmly prior to entry into the pre-service program due to their science-related experiences in elementary and secondary schools, and thus the student teaching experience exerted minimal influence on their efficacy beliefs. On the other hand, Ennis (1994) contended that pre-service physical educators' beliefs and value orientations remain fluid or malleable throughout the teacher education program. The things they believe and value may change as they become more knowledgeable and skillful through various training opportunities. Furthermore, their beliefs continue to transform and evolve upon employment as they are frequently "confronted with the persuasive views of veteran teachers and traditional school policies" (Ennis, 1994, pp. 173; Rossi et al., 2008). The domain specificity in student teachers' beliefs is interesting and warrants corroboration of future research.

As stated earlier, this group of physical education student teachers received rigorous training in their teacher education program. In addition to movement skills, content knowledge and pedagogical knowledge they acquired in the program, the student teachers also obtained field experiences in their elementary school, middle school, and high school physical education methods courses. It appears that, during student teaching, these student teachers were able to integrate much of the knowledge they learned in their pre-service teacher education program and apply them to their daily lessons during student teaching. Graber (1995) suggested that student teachers' beliefs about their ability to incorporate general pedagogical knowledge into teaching was dependent upon the support of the cooperating teachers, the placement settings, impact of student, and other factors. Based upon our frequent interaction with the student teachers and their university supervisors, we learned that the student teachers had gained strong support from several sources including the schools of placement, the cooperating teachers, and the k-12 students. Anecdotal evidence emerged

from the student teachers' course reflections revealed that the student teachers resounded with enthusiasm and enjoyable experiences toward teaching physical education in schools. Technically, competent teaching practice often requires an integration of content and pedagogical knowledge via vast, repeated experiences (Shulman, 1987). Therefore, in this study student teachers' increased self-efficacy belief about teaching physical education might have originated from their prolonged exposure to "real world" teaching experiences (Lamorey & Wilcox, 2005).

The statistically significant positive changes in pretest and posttest scores for outcome expectancy beliefs suggest that, during the student teaching the pre-service teachers gained confidence that their abilities to bring about student learning could be impacted through authentic teaching. While limited prior research has investigated on pre-service physical educators' outcome expectancy beliefs (Huang et al., 2009), it is seemingly difficult to identify the causes for their enhanced beliefs. However, the increase in outcome expectancy belief could be a concomitant result of the increased self-efficacy. In theory as well as in this present study, the two beliefs are found positively correlated with each other (Schunk & Zimmerman, 2006; Williams et al., 2005). The change in outcome expectancy belief may be attributed to the pre-service teachers' strong self-efficacy that is manifested in three aspects: instructional strategies; (b) class management; and (c) student engagement. The fact that the pre-service teachers felt efficacious to handle these three aspects of teaching might have strengthened their belief that they could bring about success in student learning.

Considering that a teacher's behavior can be predicted by his or her self-efficacy and outcome expectancy beliefs (Bandura, 1997; Pan et al., 2013; Schunk & Zimmerman, 2005), it is plausible that student teachers who scored high on both beliefs would exhibit effective teaching strategies and persist longer than those scoring low on those beliefs. Consequently, these student teachers might behave in a confident and assured manner, and enter into the teaching profession in a confident and self-assured manner.

### **Conclusions, Limitations and Implications for Future Research**

In summary, this study has confirmed that, for this group of student teachers, the student teaching experiences had a positive effect on their self-efficacy and outcome expectancy beliefs during this crucial early stage of their prospective teaching careers. Despite such positive effect, there are limitations to the present study that should be identified. First, this study is limited by its approach for sample selection. All participants were from a U.S. southern research university that had high entrance requirements and offered a rigorous teacher preparation program in physical education. This group of cohorts might be different from other student teachers in other institutions. Therefore, generalizability must be contained to student teachers trained in similar teacher education programs. .

Second, student teachers' efficacy beliefs can be changed as a function of context. Such contexts include but are not limited to cooperating teachers, university supervisors, administrators, time constraints, and the availability of equipment and supplies, and curricular concerns. Johnson (2010), for example, recommends that it is of utmost importance to examine the mediating role teacher educators and significant others (e.g., cooperating

teachers) can play to promote pre-service teachers' efficacy beliefs. Graber (1995) suggested that a single effective teacher educator might be more important in shaping prospective teachers' beliefs than an entire physical education teacher education program. While this study did not focus on interventions that might occur as a result of different contexts, future studies should explore the effective interventions or strategies that might further improve physical education student teachers' beliefs.

Finally, efficacy beliefs may be changeable early in one's teaching career (Bandura, 1997; Ennis, 1994; Rossi et al., 2008). Therefore, the first years of teaching might be critical to the long-term development of teachers' beliefs. However, few longitudinal studies have examined the changes of teachers' efficacy beliefs across a teacher education program. Future research should focus on the changes in teachers' efficacy beliefs that might occur from entry into a physical education teacher education preparation program through the first year of in-service teaching.

With these limitations noted, this study does make a unique contribution to the field of physical education teacher education. The key finding of this study is that a 12-week practicum could bring about positive changes to pre-service physical education teachers' self-efficacy and outcome expectancy, two determining factors of successful teaching practice and student learning achievement. Additionally, this study provides empirical support for the view that the theoretical frameworks of self-efficacy and outcome expectancy beliefs are insightful in evaluating student teachers' attributes and readiness as they progress toward physical education specialists. Teacher education programs and student teaching placement schools should work closely to afford student teachers with amenable but challenging opportunities, such as teaching innovative learning contents or single gendered classes, to enhance their self-efficacy beliefs about all aspects of teaching (e.g., instructional strategies, unit/lesson planning, class management, and student engagement).

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